Chapter 9
Social, Economic, and Political Impacts

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9.1 Introduction

Authors have conducted two case studies of stakeholder analysis on the utilization of sugarcane-based bioethanol in Brazil and palm-based biodiesel in Indonesia. Our research has focused primarily on the aspects of exporting these biofuels to Japan in order to give more concreteness to the stakeholder interviews. While these cases provide unique contexts in the production of feedstocks and distillation processes in each country, they also indicate common features that have to be considered in the policies, either at the international or the national level, for the sustainable utilization of biofuels.

9.2 Case from Brazil

9.2.1 Method

We have conducted interviews with a wide range of stakeholders in 2008. The interviewees are selected based on our literature review and inputs from the partner in Brazil (Table 9.1).

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Table 9.1 Stakeholder interviewees in Brazil

Government	Industry	Research and civil society
Ministeiro da Agricultura	Uniao da Industria de Cana-de-Acucar (UNICA)	Universidade de Sao Paulo, Centro de Estudos Avancados em Economia Aplicada
Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA)	Associacao Brasileira de Agribusiness (abag)	Economia & Energia (NGO)
Ministeiro de Ciencia e Tecnologia	PetroBras	ONG Vitae Civilis (NGO)
Banco Nacional de Desenvovimento Economico e Social (BNDES)	DEDINI	
	Mitsui company in Brazil	

9.2.2 Key Stakeholders

Based on the interview results, the following categories, described below, are identified as the key stakeholders that have interests in increasing the ethanol production for exports to Japan. Production of sugarcane in Brazil is concentrated mainly in the State of Sao Paolo and Brazil's northeastern region called Nordeste. The available land in the Nordeste region, however, is limited due to its hilly topography, and a large-scale production increase is unlikely. Therefore, we have focused on the possibilities of increased production in the State of Sao Paolo and other states on its north (namely, Mato Grosso do Sul, Minas Gerais, and Goias).

9.2.2.1 Industrial Sector

Sugarcane Plantation and Distillery Recently sugarcane plantations are mainly large scale and structured as a well-managed development project. Sugar mill and distillery are often developed as integrated part of the plantation. Because of large-scale investment requirement, they have concerns about the large fluctuation in demand and price and uncertainty in the investment environment (including government policy and infrastructure development). They are also affected by government regulations on the environment and labor. They are also interested in the electricity price because they benefit from selling the electricity generated through burning bagasse.

Investors and Trade Companies Several major corporations (oil, automobile, and trade) that have stakes in the agricultural and automobile industries have already made commitments to invest in sugarcane plantations. They share the concerns about the return from their investment, as the plantation owners do. These investors are also involved in the development of infrastructure, in addition to that of plantations. In particular, they are interested in the bioethanol pipeline from the inland

(e.g., Goias) to the Port of Santos in Sao Paolo state. An oil pipeline is already built along the way, and no concern about land acquisition is reported.

Mill and Distillery Plant Developers The large increase in the demand for ethanol has provided economic benefit to a few plant developers that provide crucial machineries to sugar mills and distillery. They are now even trying to expand their business by exporting their machineries to other developing countries that intend to explore sugarcane-based bioethanol production.

9.2.2.2 Government

President's Office At the time of the interviews, the previous administration, led by President Lula da Silva, had promoted the development of biofuels, and incumbent President Dilma Rousseff was likely to follow up on the promotion of bioethanol in the same line.

Ministry of Agriculture The Ministry has been very active in promoting the export of poultry to Japan. Bioethanol is the next target product that the Ministry intends to promote to Japan as the agricultural commodity. It is also concerned about the environmental impacts of plantation expansion and has been preparing a national map of appropriate areas for sugarcane plantations.

EMBRAPA It is a part of the Ministry of Agriculture and has been taking the central role in the research and development of biofuels, including biodiesel, in Brazil. Biofuel section was established in 2006.

Ministry of Mines and Energy The Ministry oversees the quality of biofuels and standard setting activities.

BNDES The government's investment bank promotes sustainable plantation development by offering a lower interest rate for energy recovery plant that burns bagasse. It has, however, concerns over the return from such investment as well.

9.2.2.3 Civil Society

Environmental NGOs They have strong concerns about the land use impacts of biofuel-related land use change on Cerrado and rainforests. They are also concerned about the impact of open burning on adjacent lands.

Labor Unions They are concerned about the employment at plantations. Due to the ban on open burning (which was introduced with an intention of environmental protection), the manual laborers are exposed to a harsher working condition because hazardous insects and leafs could not be removed before harvesting. On the other hand, mechanized harvesting, which relieves workers from the unsafe condition, means less demand for manual labor.

9.2.3 Key Issues in Biofuel Production in Brazil

9.2.3.1 Economic Issues

Unstable Demand Because the number of flex-fuel vehicles on the road is increasing rapidly in Brazil, the demand for bioethanol has been expanding with certainty. On the other hand, the large fluctuation of crude oil price in the last few years has been transcended to the unstable demand for bioethanols at the global scale. Higher the stability of public policy in the European Union, the United States, and Japan is, higher the certainty of demand for bioethanol production in Brazil.

Investment Environment Regulations on, as well as uncertainties in, foreign investments to Brazil limit the expansion of biofuel production. Brazil's economic policy has been relatively stable in the last few years, compared to previous administrations, and thus the uncertainty regarding the foreign investment is lower than before. However, the legacy of unreliable management of national economy in the past is affecting the decision of foreign investors.

Grid Connection Electricity generation by burning bagasse is rapidly increasing. The electricity is supplied not only to the distillery machineries but also to the grid. The supply to the grid would increase by 2,745 MW from 2007 to 2012. If the feed-in-tariff and similar regulation that promote power generation by plantations, the expected return from investing in plantation development would increase.

Infrastructure Development Pipeline is crucial in expanding the sugarcane production from the state of Sao Paolo toward its north. Transport of ethanols in the special lorries on the highway is costly and would harm the profitability of such expansion. The pipeline development toward the Port of Santos is a crucial element in predicting the future of biofuel development in Brazil.

9.2.3.2 Societal Issues

Employment Harvesting sugarcane is traditionally labor intensive, and the seasonal migrant laborers from the northern part of Brazil have undertaken the role. On the other hand, mechanization at plantations has progressed. It means that the expansion of new plantations does not necessarily transcend to the increased demand for manual labor force. Following the mechanization, skilled laborers who can operate agricultural instruments are likely to benefit from new employment opportunities. Meanwhile, those unskilled manual laborers need to be supported by providing vocational education and other job opportunities.

Labor Safety The ban on open burning has problems with labor safety. Scorpions and snakes cannot be removed from the field before harvesting. The sharp edge of the sugarcane leaf is another kind of risk to the laborers. On the other hand, there is a political pressure to ban open burning from the perspective of environmental

protection (including climate change and air pollution). The balance between these two pressures must be well balanced.

Income Disparity Within Brazil Sugarcane harvesting has traditionally been undertaken by the seasonal migrant workers from the north where the economic development is much slower than in it is other region. The majority of sugarcane plantation developments in Brazil is expected in the southern part of Brazil and this trend may even widen the income disparity between these regions. Meanwhile, the Brazilian government is promoting feedstock production for biodiesel in the northern Brazil, which have implications on adjusting the income disparity.

9.2.3.3 Environmental Issue

Land Use Environmental NGOs have strong concerns about impacts on the environment. In addition to those on rainforests, they argue that uncontrolled developments in the Cerrado area could pose a serious threat to the environmental benefits from the area. Land use impacts of sugarcane production are addressed by other contributors to this book by using life cycle assessment and other scientific methods. Even those who promote the expansion of sugarcane plantation admit the existence of such concerns about the environment. On the other hand, they argue that the physical area for sugarcane plantation is relatively small compared to the existing pasture and underused land. They also argue that the impact could be controlled through the mapping effort by the federal government and land use regulations by the state government. The tension between developers and environmental advocates needs to be addressed by stakeholder processes that incorporate sound science and forecasts.

Open Burning As we have mentioned before, open burning is another important environmental issue. The ban on open burning leads to the mechanization of harvesting. Therefore, this issue must be considered in connection with other societal issues such as national labor policy.

9.2.3.4 Political issue

Biofuel Deployment Policy of the Importing Countries Export demand is a political issue as well. For instance, several environmental NGOs challenge the prospect of CO2 reduction through sugarcane-based bioethanol fuels. Such pressures from the civil society organizations increase the political uncertainty of biofuel deployment policies in each country and region. Even there is a wide gap between the Japanese government's stated goals and the actual deployment of biofuels. From the perspective of Brazil as an exporting country, policies of other importing nations and their implementation are a crucial issue in forecasting the export demand for bioethanol.

In order to exert influence in these target nations, Brazilian government has been active in promoting bioethanol through conferences, such as "Biofuels as a Driving Force of Sustainable Development" in November 2008, and other kinds of bilateral discussions.

Alliance with Other Feedstock-Producing Nations Brazil has been active in exploring strategic relationships with other nations in the field of bioethanol production, and partnering with other Latin American and African nations for bioethanol production is likely. In the very long run, these bioethanol suppliers could form a cartel, something like a bioethanol counterpart for the OPEC.

Stakeholder Dialogue In Brazil, the Sugarcane Discussion Group was established for facilitating the collaboration among stakeholders. It is convened by the sugarcane producer's organization (UNICA) and hosts dialogues for environmental NGOs and labor associations to discuss on open burning and other relevant issues.

9.3 Case from Indonesia

9.3.1 Method

We carried out interview surveys of various stakeholders in Indonesia in September 2009. Prior to the survey, we identified the interviewees from relevant literatures as well as by consultation with the research collaborators inside and outside Japan.

9.3.2 Key Stakeholders

Based on the interview survey, we identified the following organizations as the major stakeholders in increasing biodiesel production with the primary purpose of exporting to Japan. Both palm and *Jatropha* were examined in respect of the biodiesel production. Given the scale of the procurement of raw material, however, the palm oil-based biodiesel production appeared realistic in the short term. Accordingly, we focused our survey on palm oil and identified the following stakeholders:

9.3.2.1 Industrial Sector

Palm Producers They are generally divided into private large-scale farms (plantations), small-scale farms, and government-owned farms. The plantations carry out their operations from the plantation development through to the product development on their own. The area planted by small-scale farms is expanding at a considerable rate of 25% per year. Control of independent farms, however, is difficult.

Biodiesel Producers The APROBI is an organization of the producers. The current membership stands at 22 companies.

Financial Institutions The development of plantations requires investment in which Japanese financial institutions are said to be involved. There is also a strong demand from NGOs for sustainable investment.

Trading Companies Major Japanese trading companies are involved in the palm oil production and trading and said to be interested in biofuel business as well. At present, Nippon Biodiesel Fuel Co., Ltd. and others are carrying out small-scale export to Japan on an experimental basis.

9.3.2.2 Government

Central Government In addition to strong sectionalism among ministries and the lack of a mechanism for them to coordinate with one another, the complexity of the jurisdictional coverage creates policies governing the processes from palm production to biofuel production that are not coordinated.

Ministry of Agriculture They formulate development plans and promote their policy from the perspectives of farm development.

Ministry of Forestry They are in charge of establishing a national policy on the conversion of forest to farmland. They also maintain statistics relating to forest.

Ministry of Energy They implement their policy on subsidies for energy which includes biofuel.

Ministry of Industry They have jurisdiction over the biofuel refining process.

Ministry of Environment The have jurisdiction over environmental assessment programs relating to farm development for biofuel crop cultivation, as well as the authority to regulate the quality of water discharged from the biofuel production processes and implement measures against global warming (which relate to palm plantation development in the context of discussions on granting credits for forest conservation).

Science and Technology Agency (BPPT) They have jurisdiction over the policies on science and technology relating to the biofuel development.

Local Governments Local governments were given the authority to issue permits for land use conversion as a result of the decentralization of government in 1999. Indonesia has 27 provincial governments under which regencies and cities operate. The regencies and cities are divided into sub-districts. Regulations vary from region to region as a result of the decentralization. The capacity of executive officers and corruption are problems.

9.3.2.3 Civil Society

Roundtable on Sustainable Palm Oil (RSPO) This is an organization of businesses and NGOs. It is working to build a consensus on the standards of sustainability as part of an approach to promote sustainable production and distribution of palm oil. The RSPO is headquartered in Malaysia with a liaison office in Indonesia. It has published the interpretation of the standards for Indonesia.

NGOs International and local NGOs are operating in Indonesia for the purpose of the forest conservation and the protection of indigenous peoples. They are active not only in Indonesia but also in consumer countries, such as the United States and EU. Some NGOs regard compliance with the RSPO standards as satisfactory, while others demand tougher measures.

Indigenous People The development may provide improvements in opportunities for employment and education for them. There is, however, a risk of these people losing a sustainable infrastructure for their livelihood.

Indonesian Consumers The price of crude palm oil temporarily spiked during the period from 2007 to 2008 corresponding to the rise in crude oil prices. The consumption of palm oil as food may be affected.

9.3.3 Major Issues Relating to Biofuel Production

The key issue which the Indonesian palm industry faces is the sustainability of the production process, including its impact on the environment and society.

Biodiversity may be lost and the rights of the indigenous peoples violated as the result of deforestation and peat bog development as part of new plantation development as well as the destruction of the existing ecosystems due to these activities. If small farmers practice their slash-and-burn method of farming in the process of switching to palm cultivation, peat bogs, which are extremely flammable during the dry season, can be easily ignited and develop into forest fires. Such forest fires will inevitably lead to the loss of biodiversity and the violation of the rights of the indigenous people, as well as the emission of greenhouse gases (GHG).

Water pollution in these regions as a result of wastewater discharged from the oil extraction process as well as the use of agricultural chemicals and fertilizers during cultivation may also lead to the loss of biodiversity and the violation of the rights of the indigenous people. It is apparent that the ecology of wildlife and the livelihood of the indigenous peoples will be in a very vulnerable situation as the logical conclusion of these various issues.

In addition to the abovementioned problems which are applicable to the palm industry as a whole, particular important issues relating to the production of biodiesel from palm oil include a macroscopic problem of an increased demand for biofuel competing with the demand for food supply and a question as to whether replacing petroleum-based fuels by biodiesel actually leads to the reduction of the GHG.

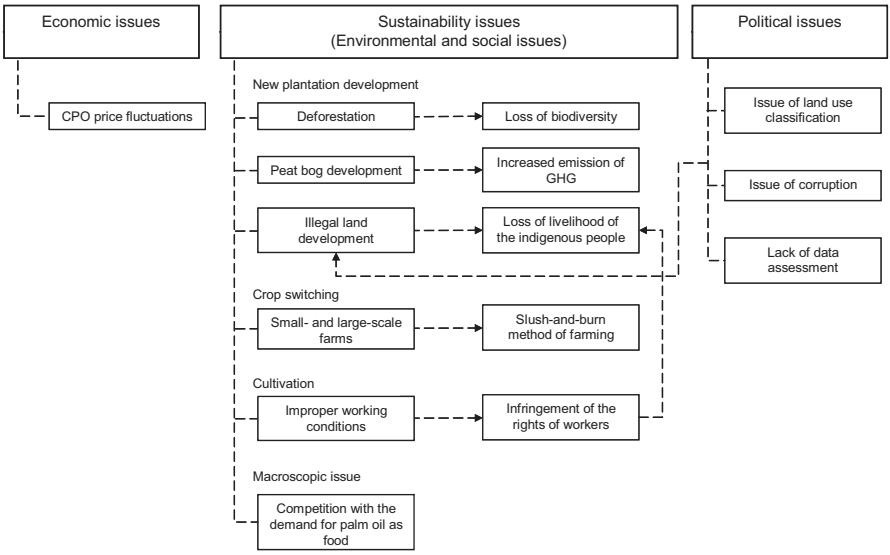

Fig. 9.1 Key issues in promoting palm oil biofuel in Indonesia

The issues relating to the palm oil industry and the palm oil-based biofuel production are intertwined in an extremely complex way. An overview, however, indicates that these problems can be divided into environmental and social issues, which may arise from palm oil farming and biofuel production (i.e., an issue of sustainability of the palm production); political issues, which prompt environmental and social issues; and economic issues, which may become an obstacle for the palm oil-based biofuel production in the future. Figure 9.1 illustrates the major issues.

9.4 Lessons from Two Cases

9.4.1 Variety of Stakeholders

There are six categories of common stakeholders in the production of biofuels in these countries. The first category is feedstock producers, including plantations, smallholders, and manual laborers. The second category is refineries, including those companies operating biofuel refineries as well as those producing machineries and developing plants. Investors are the third category. It includes trade companies and banks (national/corporate). The fourth category, transportation operators, is often neglected in the study of biofuels. Utilizing biofuels at the global scale means that they will be an equivalent to crude oil, which means safe transportation of biofuels will be a major concern from the perspective of protection of ocean environments as well as of geopolitics. The fifth category is government agencies. Multiple ministries and agencies are involved even in a single country, and they are often ill

coordinated, particularly in Indonesia. Therefore, government should not be considered as a cohesive and integrated group of stakeholders. Rather, different agencies should be considered separately in studying stakeholders in biofuel utilization. The final category of stakeholder is NGOs. While those concerned about natural environment are most active in the field, we should not forget about the human rights and animal rights advocates because plantation expansions and efficiency improvements in feedstock production can have significant impacts on pristine animals and manual laborers in the area.

9.4.2 Variety of Issues

Through an analysis of interview results, the authors identify the following seven categories of enabling and limiting factors that affect the increased production of biofuels at a large scale in these countries. First of all, domestic and international demands for biofuels define the course of biofuel production for sure. Second, domestic policies and regulations have substantial effect on the production of feedstock and the deployment of biofuels in these nations. Third, domestic political culture also has impacts on it. This is different from policies itself; it is about how policies change and how well they are implemented. Fourth, pressures from supranational institutions and international NGOs can have an influence from the demand site. Fifth, availability of transportation infrastructure is a crucial factor in the supply chain of feedstock and biofuels. For instance, further development of sugarcane-based ethanol is likely to require the development of pipelines. Sixth, investment environment in each country has influences on the future development. While foreign investors have substantial interest in the development, they are also concerned about the uncertainties associated with the investment in these countries particularly because of the legacy of instability of these nations' economic policy. Seventh, mechanization of harvesting processes is another crucial factor in the production of feedstock. And finally, R&D for the improvement of feedstock species is likely to be a major challenge in a near future. In order to achieve sustainable development, plantation owners are now faced with the challenge of increasing productivity per unit of area. Improving the yield, as well as increasing the portion of useful content in each crop, through hybridization and genetic engineering will be required for the sustainable future.

9.4.3 Implication to the Japanese Government's Policy on the Importation of Biofuels

Through interviews with stakeholders in Brazil and Indonesia, the authors identified a few areas that the Japanese government can contribute for the sustainable utilization of biofuels.

First of all, the lack of government's committed mandate and/or deployment strategy is causing confusion on the side of potential exporters. For instance, Japanese government has expressed its interest in importing palm-based biodiesels from Indonesia particularly during the visit of Prime Minister and other senior officials to Jakarta. Such informal encouragements had certain influence among the biodiesel producers. On the other hand, Japan has not yet imported a sizable amount of biodiesel from Indonesia. A few stakeholders, including those in Brazil, explicitly expressed their frustration with the lack of more formal commitment on the Japanese side. Therefore, it would be beneficial for all stakeholders in this field if the Japanese government sets official target regarding the import of biofuels.

Secondly, as mentioned above, the lack of appropriate transportation infrastructures in these countries could be a major bottleneck for importation. This is an area in which the Japanese government can assist through developmental aid and other schemes to fund infrastructure development projects. The Japanese government and aid agencies can be strategic in selecting the applications by considering proposed projects' implication to the transport of biofuel to Japan and other parts of the world.

The last concern about the Japanese government is its sustainability standard. While it is an area where scholars and stakeholders are still debating about, one pragmatic proposal would be to internalize sustainability standards, such as the one proposed by Roundtable on Sustainable Palm Oil, into Japanese regulatory structure. While some NGOs are still critical about the utilization of biofuels at the global scale, such a strategy could justify the biodiesel import to some extent because these international efforts have consciously involved nongovernmental stakeholders and tried to seek an agreement that these concerned parties could live with.