CHAPTER VI

THAILAND'S POLICY OPTIONS FOR TRADE IN BIOENERGY

The problem today is that farmers need to relearn agricultural practices – they have come to rely on too many chemical inputs. We need to improve the way we make use of resources.

Seri Phongphit, Director, Community Enterprise Institute, 11 July 2009

Much of the analysis in SOFA was based on advanced economies, and represents an elitist view. This report is so often referred to in policy circles. The consequence is that its conclusions will soon be taken at face value. Poor countries do not have the resources or the luxury to look beyond these face values, dictated to us by the high gurus in Rome.

Samai Jai-In, energy expert, Royal Thai Navy, 26 January 2010
Commenting on the FAO *State of Food and Agriculture* report on biofuels (2008)

6.1 Introduction: policy options for bioenergy

This research has provided evidence to highlight the contours of governance on agroenergy in Thailand and the Mekong, emphasising the emergence of a regional expression of modernity. Based on the findings from the field research, this chapter examines Thailand's policy options for trade in agroenergy.[50] This chapter outlines the main issues in the international policy arena to situate the Thailand's policy space to implement bioenergy in section *two*. Section *three* puts forward three possible policy scenarios for bioenergy development in Thailand: Business as Usual, the Great Gamble and Small is Smart. The discussion will show that the preferred policy alternative of *Small is Smart* needs to be implemented at the regional level in order to ensure socio-ecological sustainability of bioenergy. The chapter concludes with critical assumptions to ensure the implementation of this policy alternative.

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[50] This chapter builds on a paper that was published in *Rian Thai, the International Journal of Thai Studies* (2009), Chulalongkorn University, Bangkok. A version of this chapter was also submitted as the lead discussion paper for the roundtable panel on *Agroenergy trade and investment: articulating policy in practice in the Mekong* at the *Conference on Revisiting Agrarian Transformations in Southeast Asia: Empirical, Theoretical and Applied Perspectives (*ChATSEA) organised by the University of Chiang Mai, 13-15 May 2010. It benefitted from comments by Samai Jai-In, Chatthip Nartsupha, Charit Tingsabadh, Ronald Steenblik, Francisco Cannabrava, Patrick Cirillo, David Fullbrook, Mattijs Smitts and Ramine Shaw, with editing from Fritz Goss, Gabriella Gamini and Zaria Shaw.

While a community-based model of greater energy and agricultural efficiency is being implemented in Thailand, there are concerns with the broader regional implications. The challenges posed by socio-ecological sustainability are more pronounced in neighbouring Mekong countries where governance structures are less developed to shape economies that have only recently opened up to international trade and investment. That is why the current practice is leading to unsustainable development and there is a need to develop an alternative path for developing bioenergy in the Mekong.

6.2 Main issues concerning bioenergy

For all their power and vitality, markets are only tools. They make a good servant but a bad master and a worse religion.

Paul Hawken, Amory Lovins, Hunter Lovins, *Natural Capitalism*, 1999

This research has enabled an illustrated investigation of the linkages between theory, policy and practice of agroenergy production and use in Thailand and neighbouring Mekong countries. As a background to the elaboration of policy options, this section highlights the main issues drawing on the informant interviews, focus groups, survey responses and field work.

- What are the main options for bioenergy development at the *international* level?
- What are the incentives to develop bioenergy at the *national and regional* level?
- What is the evidence of bioenergy practice at the *local* level?

First and foremost, it is evident that there are points of convergence and divergence between the different levels of decision making. As the results of the survey questionnaire illustrate, there is a policy disconnect between the different levels of informants. Policies put forward at the international level in international organisations and think tanks emphasises different paths to implementing a sustainable energy economy than at the national and local levels.

The development of bioenergy has initiated a heated international debate concerning the social, economic and environmental implications of this renewable energy source. These three elements paint a complex picture of the bioenergy policy landscape for decision makers. The intensity of the discussions was heightened in mid-2008 when soaring food prices accompanied the rise of the price of petroleum. The result was food shortages in many low-

income developing countries, particularly those dependent upon food imports. The *food versus fuel* debate that ensued centered on rising competition for agricultural production between food and fuel, which according to the critics of biofuels threatened food security for the poorest (Oxfam 2008). At the heart of the discussion was the issue of competition for land on which to produce crops. The policy nexus between food and fuel essentially concerns competition for the use of land.

Another set of issues in the international debate on biofuels concerns their energy and environmental merits. First, consideration needs to be given to the life cycle of biofuels to calculate the net energy balance. If the consumption of fossil fuels in the production of biofuels is greater than the energy created, then biofuels demand more energy than they produce (Doornbusch & Steenblik 2007). Advocates of biofuels emphasise the potential efficiency gains from use of second generation conversion technologies (e.g., cellulosic ethanol). However, it is estimated that these technologies will only become commercially available in 10-15 years (IAASTD 2009). The International Assessment of Agricultural Knowledge, Science and Technology for Development (2009) concluded that "considerable capital costs, large economies of scale, a high degree of technological sophistication and intellectual property rights issues make it *unlikely* that these technologies will be adopted widely in small developing countries in the next decades."

Second, environmentalists argue that a higher energy balance of a biofuel is correlated with a greater reduction in net aggregate emissions of greenhouse gases and vice versa (WWF 2008). Some are concerned with the environmental damage caused by expanding agricultural land and, consequent, deforestation and biodiversity loss (Biofuelwatch 2007). There are a range of potential impacts on energy balance, greenhouse gas emissions and air, water and soil quality. Evidence suggests a wide range of variations in greenhouse gas emissions according to the feedstock, cultivation techniques (soil and water management), processing methods (cogeneration, use of residual by-products) and technology (first or second generation ethanol, Fischer-Tropsch biodiesel).

These concerns have led to the current effort to devise sustainability criteria on which to assess various elements of biofuels. For example, if the cultivation of biofuels is based on integrated and sustainable small-scale production, then the socio-ecological impacts can range from neutral to positive. If the large-scale production of biofuels leads to deforestation and

destruction of ecosystems and protected areas, the impacts will be largely negative (RSB 2009).

The crux of the economic criticism of biofuels, mainly in the OECD as will be discussed below, is the significant subsidies provided to the biofuels sector. Most discussions on bioenergy begin by acknowledging the realities of the global energy sector – a sector that is dominated by a single commodity that enjoys a monopoly and is subject to few trade barriers; governments worldwide provide significant levels of support to the production and consumption of fossil fuels. Globally, subsidies to the energy sector are estimated to be in the range of US$500 billion per year, of which two-thirds flow directly to fossil fuels (GSI 2009). If subsidies for fossils fuels to electricity generation are included in this figure, about 80% of all energy subsidies are used to support oil, gas and coal (GSI 2009). In effect, these subsidies are contributing to pollution and greenhouse gas emissions, as well as perpetuating the fossil fuel economy. Subsidies also contribute to poor energy efficiency by hiding the cost of consumption from users. The result is that subsidies depress market signals and incentives to develop greater energy efficiency.

As a direct result, the heads of state and government of the Group of 20 committed to phase-out fossil fuel subsidies at the Pittsburgh Summit in September 2009 (G20 Pittsburgh Communiqué 2009; Kirton 2009). Research spanning over two decades, including in the WTO Committee on Trade and Environment has emphasised the harmful impacts of fossil fuel subsidies (WTO 1996). More recently, calculations from the World Bank (2008), OECD (2008) and the International Energy Agency (2009) indicate that reducing global subsidies to the energy sector would result in global reductions of CO_2 emissions by up to 10%. A recent report by the Global Subsidies Initiative, tells the story of the "untold billions of fossil fuel subsidies spent by government with harmful consequences for public budgets, energy markets and pollution" (Victor 2010). According to the Environmental Law Institute (2009), the US provided $72 billion in subsidies to the fossil fuel industry between 2002 and 2008.

Due to market distortions and governmental support of fossil fuels in addition to the high initial costs of developing renewable energy (e.g., solar, wind and nuclear), it is difficult for alternative energy sources to compete. Therefore, there is a market failure that calls for government intervention at the national, regional and international levels. Hence, the

compelling arguments put forward by analysts for government incentives and support to stimulate more rapid development and use of alternative energy.

In OECD countries, supporting alternative energy sources linked with agroenergy is politically lucrative. This is due to their deeply entrenched emphasis on the agricultural sector, which represents a small but politically influential segment of the electorate (IFAP 2010). This is the reason it has proven difficult to eliminate subsidies despite the widespread agreement concerning their harmful impacts for trade and sustainable development (Victor 2010).

It is difficult for renewable energy sources to compete because of how markets, prices and information are structured. In this respect, David Fullbrook notes that "it is ironic that dynamic stream energies which are 'pure' and require basically zero processing are priced greater than static energies requiring processing. Fullbrook points out that a similar situation prevails with regard to food: "in many markets processed food derived from industrial oil-intensive monocultures is cheaper than simple unprocessed organic foods" (email correspondence February 2010).

Subsidies to the energy sector closely resemble those to the agricultural sector, except for the fact that there has not been an attempt to discipline energy subsidies in the World Trade Organisation. Most subsidies in the biofuel sector are linked to production, which has increased over time. Support in the US alone is likely to reach US$100 billion between 2006 and 2012 in order to meet the government mandates to blend biofuels with regular petroleum in the US and EU (Victor 2010). As set out in the table below, studies prepared for the Global Subsidies Initiative indicate that the total OECD subsidies to the biofuel sector amount to over US$13 billion per year (GSI 2009). US agricultural subsidies account for 22% of all US farm income, 32% in Europe and more than half in Japan. Farm reform is estimated by Ronald Steenblik, a subsidies expert at the OECD Secretariat in Paris, to be "as elusive as it is significant (Interview October 2009). Between 1995 and 2005, the US treasure gave $155 Billion for crop and feedstock subsidies – more than the total foreign aid budget (Economist 19 September 2006). This support was provided to a segment of the economy that contributes less than 2% of jobs and less than 1% of GDP in the US (Roberts 2008).

Table 39: Total OECD subsidies to biofuels

OECD economy (year of data)	Ethanol	Biodiesel	Total liquid biofuels
	Total support estimate (US$ billion)		
United States (2007)	6.9	1.2	8.1
EU (2006)	1.6	3.1	4.7
Canada (2006)	0.15	0.013	0.163
Australia (2007)	0.043	0.032	0.075
Switzerland (2006)	0.001	0.009	0.01
Total	**8.7**	**4.35**	**13.05**

Source: Global Subsidies Initiative 2009

Developing countries have long argues at the World Trade Organisation that removing trade distorting and environmentally damaging agricultural subsidies in OECD countries would permit them to reap the economic benefits of promoting their agricultural sectors, in which they have a comparative advantage. The same argument is valid for energy subsidies.

Following the FAO High-Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy in June 2008, the *State of Food and Agriculture* report (SOFA 2008) highlighted the following key messages:

te Demand for agricultural feedstocks to process into liquid biofuels will be a significant factor for agriculture over the next decade and perhaps beyond.

te Rapidly growing demand for biofuel feedstocks has contributed to higher food prices, which pose an immediate threat to the food security of poor net food buyers.

te In the longer term, expanded demand and increased prices for agricultural commodities may represent opportunities for agriculture and rural development.

te The impact of biofuels on greenhouse gas emissions – one of the key motivations underlying support to the biofuel sector – differs according to feedstock, location, agricultural practice and conversion technology.

te Harmonised approaches for assessing greenhouse gas balances and other environmental impacts of biofuel production are needed.

te Liquid biofuels are likely to replace only a small share of global energy supplies and cannot alone eliminate our dependence on fossil fuels.

te In many countries, the production of liquid biofuels is not yet economically viable without subsidies, given existing agricultural production, biofuel-processing technologies and recent relative prices of feedstocks and crude oil.

te Policy interventions, especially in the form of subsidies and mandated blending of biofuels with fossil fuels, are driving the rush to liquid biofuels.

Despite the complexity of the food crisis, this FAO report placed a large part of the blame for rising food prices on rising demand for liquid biofuels and focused attention on the need to reduce greenhouse gas emissions as a driver for biofuels.

However, as highlighted in the opening quote for this chapter by Samai-Jai In, there is a strongly held view amongst many interviewees for this research in the Mekong and Brazil that the FAO report represents an *unbalanced* assessment of bioenergy, particularly in the summary of the key messages.

Discussion has evolved over the last two years towards a more nuanced assessment of the contribution of agroenergy in developing countries. In this respect, there are three main issues raised by the interviewees and in the focus group discussions.

First, there is a need to make a distinction between the OECD experience with biofuels and the potential contribution of bioenergy in agriculturally-abundant developing countries, such as Thailand. Even in those countries with a significant comparative advantage in agriculture, the supply of land and water are increasingly under pressure and becoming scarce (IAASTD 2009; IWMI 2010).

Second, environmental criticism surrounding biofuels in Southeast Asia is also related to agricultural expansion in the rainforests and unsustainable deforestation. While Indonesia has attracted negative attention for cutting down rainforests to make way for oil palm for use in the biodiesel export market (Oxfam 2008). This is not the case in Thailand.

Third, the choice of agricultural crop to plant, process and, potentially export, is based on the expected revenue gains. Adding value to agricultural commodity exports would enable Thailand to reap greater dividends from the country's natural resource base. Fourth, ethanol production and use in Brazil is often cited during the interviews as a guiding example for Thailand. Whilst recognising the differences in the size of the domestic market and the fact that the Brazilian ProAlcool ethanol program was launched in the 1970s, Thailand joins the

ranks of many other developing countries in aspiring to emulate Brazil's strategy to develop the agroenergy sector.

A report by the UN Economic and Social Commission for Asia and the Pacific (ESCAP 2009) notes that the energy-food correlation is caught in a vicious circle that links agricultural production to energy inputs dependant on fossil fuels. This, in turn, leads to fluctuations and volatility of food prices and food insecurity. An energy demand to fuel agricultural exports has led to rising imports of fossil fuels in Asia and the Pacific countries. More to the point, "the scope and nature of the biofuel industry in Asia and the Pacific is *unlikely* to have caused any significant impacts on food security in the region" (ESCAP 2009).

Samai Jai-In argues that "blaming recent price hikes of food commodities on alternative energy is misplaced and unfair to agrarian economies." The roots of the crisis lie in the trade-distorting agricultural policies in OECD countries and the lack of multilateral trade disciplines to bring about cutting these subsidies in the WTO. In outlining Thailand's case for developing agroenergy, Samai and other interviewees make four key points.

First, Thailand is ranked as one of the most vulnerable economies in terms of energy. Energy security, thus, is the driving force behind using a share of Thailand's agricultural production towards meeting its energy needs.

Second, an added advantage is to reduce the country's reliance not only on increasingly costly energy imports but, equally important, reduce its export dependence and create rural jobs. Thailand exports 70% of its agricultural production and exports account for over 70% of the Thai gross domestic product (GDP) (World Bank 2009). Moreover, Samai concludes, "creating a domestic biofuel market able to absorb supply when global commodity markets fluctuate will at least help guarantee a reasonable income for farmers in the future."

Third, as a lead exporter of basic commodities Thailand, along with other developing country food exporters, has had to compete with heavily subsidised agriculture in developed countries.

Finally, recognising the need to balance food and fuel policies necessitates that the government put in place a solid long term policy framework to ensure policy complementarity and foster enduring investment in human resources, infrastructure and research and

development to build a "knowledge-based, bioenergy economy" (Bangkok Post 28 March 2008).

The evolving nuance in the biofuels debate, predominantly from the perspective of developing countries comes from several factors. First, the role of government is vital in stimulating a renewable energy transformation. This is abundantly clear from the informant interviews and focus group discussions conducted for this research over the course of 18 months in the Mekong and Brazil.

Second, the role of market forces in the choice of crops. The decision to plant a biofuel crop is the same as for any other crop. It is taken based on the consideration of expected revenue. The decision of an individual farmer to produce feedstock is not based on the prospective end use of the crop. Athiras Dumdee, a smallholder farmer in Aoluk, Krabi, Southern Thailand, will sell his palm oil to a biodiesel processor if the price he receives is higher than he could obtain from a food processor or as a feedstock. If the price of biofuels is competitive, agricultural communities will shift away from other uses. That is one of the reasons why crude oil prices drive biofuel prices that, in turn, determine the price of agricultural commodities. Nevertheless, farmers will produce the crop offering the best returns and that is best suited for their land. Rising oil prices enter the equation because they make inputs – fertiliser and fuel – consumed in production more expensive. Therefore, farmers will naturally seek out crops which require less inputs or methods to reduce inputs.

Rising oil prices causes countries as well as consumers to seek cheaper alternatives to reduce dependence and consequences for balance of payments and in turn growth and inflation caused by importing oil. Thus, crude oil prices determine the relative value and competitiveness of agroenergy. In addition, some agroenergy feedstocks are multi-use. That is to say that they can just as easily be used for food and beverages as fuel, such as sugarcane, oil palm, cassava and corn. Therefore, farmers will expand cultivation of particular crops for which prices are rising. The challenge for farmers is to know and understand why prices are rising. If it is because of disease or disaster then that is a transient factor and may not be a good planting signal, especially for crops requiring more than a season to prepare and mature (oil palm for instance).[51]

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[51] This paragraph benefits from a discussion with David Fullbrook (March 2010).

If prices are rising because of structural factors, such as a growing preference for agroenergy, then that might be a better signal for investing in expanding production. Moreover, it is often the case – and Thailand is no exception in this regard, that corruption distorts policy; policy interventions and subsidies are made in order to benefit particular patron-client networks.

In practice, thus, governments intervene for various reasons in support of certain agricultural crops. They are asked to intervene to assist in reducing risk and to support crop transitions, for example in the case of Thailand's fifty year-old Office for Rubber Replanting Aid Fund (ORRAF).

Third, as noted above, one of the driving forces behind the food crisis in 2008 was the rising price of oil, which, in turn, was the consequence of rising demand from emerging economies alongside speculation. Rising demand is likely to be the scenario to which the world returns as growth, particularly in Asia, rebounds in the coming decade.

Trade in biofuels

Although biofuels trade is estimated to only represent 1% of global trade, there is nevertheless significant potential for tropical developing country producers of ethanol to gain from the current Doha Round of trade negotiations (Abdel Motaal 2008). The main obstacle to increasing trade flows in *ethanol* is high tariffs. It is worthwhile to note that petroleum products are not subjected to such a high tariff regime. The result is to make imported ethanol uncompetitive with respect to fossil alternatives in the majority of the consuming markets, which, as a direct result, limits trade. In the Doha Round negotiations, the EU has indicated its intention to classify ethanol as a sensitive product in the agricultural negotiations. This limits the possibility for tariff reductions.[52]

As set out in the table below, tariffs for biodiesel are relatively low in consuming markets. Nevertheless, as discussed in this thesis, non-tariff barriers to trade such as certification and labelling have a much greater impact on the trade potential and flows for biodiesel.

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[52] In addition to tariffs barriers, the US has in place a secondary duty (54 cents per gallons) that the US Congress has continuously renewed since the 1990s and, moreover, that is not included in the country's bound tariff schedule. As a direct result, this secondary duty will not be included in any eventual tariff reductions from the Doha negotiations.

Table 40: Bound biofuel tariffs in selected countries (2009)

	Ethanol tariff (ad-valorem equivalent) Agricultural product – 2207 (AoA)	Biodiesel tariff (ad-valorem equivalent) Chemical product – 3824 (industrial goods - NAMA)
Brazil	20% (applied 0%)*	14%
China	30%	9%
European Union	42.9%	6.5%
Japan	27.2%	3.9%
United States	46%	1.9%

* Unless otherwise indicated the bound and applied rates are equivalent
Source: Compiled by the author based on information in the WTO tariff database and USITC (2009).

Brazil is the only country where ethanol is competitive with petroleum at between US$40 to 50 per barrel. As noted by Géraldine Kutas, European representative of the Brazilian Sugarcane Industry Association (UNICA), at an energy conference at the WTO in October 2009, "[w]hat is the logic behind a trade policy that taxes imports of clean, renewable fuels like sugarcane ethanol, but allows almost duty free access for dirty, non-renewable and price-volatile oil?" (Kutas 2009)

The failure of the Doha Round of trade negotiations in this regard was highlighted at the FAO World Food Summit in June 2008. Critics of agricultural subsidies in OECD countries, such as Martin Khor (Director, Third World Network) stress the lack of progress on removing agricultural subsidies in the United States and the European Union (e.g., corn in the US and rapeseed in the EU) (Khor 2008).

The contours of policy space for sustainability

As noted in reports by the FAO (2008) and the World Food Programme (2009), the Asian Green Revolution resulted in sharp reductions in rural and urban poverty and hunger. For this reason, improvements to agricultural productivity were led by government intervention in the market. Whilst the Washington Consensus that prevailed during the 1980s and the 1990s sought to reduce government involvement, most policymakers and development experts now agree on the need to intervene in support of sustainable

development. This is in large part due to the recognition of the need to address through government intervention the market failures outlined in Chapter II.

Based on a life time of experience in the field, Tariq Banuri (2009), the head of the sustainable development department of the United Nations, calls for "a green revolution in renewable energy knowledge dissemination to address energy poverty." The issue, in this regard, is to preserve Thailand's policy space to bring about a shift to renewable energy sources.

According to Robert Hamwey (2005), policy space is small and shrinking in many developing countries as they integrate in global and regional trading systems. Hamwey's research shows that developing countries in particular have recourse to a *narrowing* range of policy options permissible under international trade and investment agreements. As illustrated in the figure above, national policy autonomy may be reduced in certain respects as countries delegate authority to a regional body.

Conversely, this thesis argues that policy space for sustainable development is enlarged in accordance with greater levels of regional integration. As scope for making policy domestically decreases, the scope for decision making regionally or globally may increase to support growing trade and in order to tackle problems which do not respect borders, such as water management and climate change.

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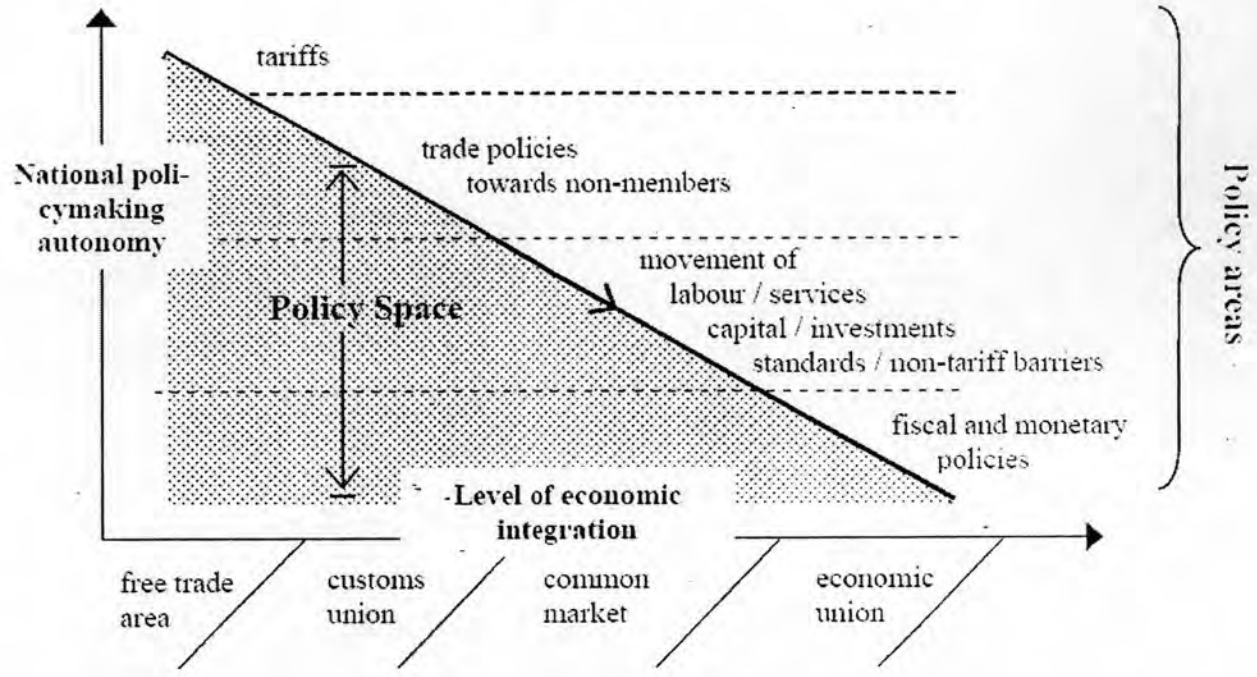
igure 33: Economic integration and policy space



Source: Hamwey 2005

Globalisation has been accompanied by an increase in trade and economic integration. Chapter IV describes the multilateral and regional agreements to which Thailand is a member and which have implications for the bioenergy policy nexus. The obligations that Thailand has undertaken in the context of these agreements, it is argued, act to restrict the national policy space and, consequently, the policy options available to Thailand.

The purpose of this research is to assess Thailand's national policy space to develop bioenergy and the prospects for trade in biofuels in the Mekong region within the framework and obligations imposed by trade agreements. In this respect, Thailand's biofuels policies are situated in a national, regional and international context. In an examination of the trade context, for example, the national policy space of governments is affected primarily by commitments undertaken under the rules negotiated in the World Trade Organisation, as well as under the increasing array of regional and bilateral trade agreements, such as the ASEAN Free Trade Area and ACMECS. Thailand has been actively engaged in bilateral trade agreements since 2001, and, to date, has finalised 15 bilateral or regional preferential trade agreements, with a further 4 agreements under negotiation.

Bioenergy has rapidly entered Thailand's energy policy discourse. Whilst once peripheral to policy, bioenergy crops are now at the center of a broad debate in Thailand and the Mekong region covering energy security, food security, rural development, agricultural productivity and climate change mitigation and adaptation. The presentation of the policy nexus as a contest between food *versus* fuel detracts from the consideration of the opportunities from capturing efficiency gains in agroenergy processing in Thailand and the Mekong region. These opportunities were illustrated by the case narratives and characterise the policy options outlined in this chapter. Moreover, it ignores the fact that focusing on food versus fuel crops is a false distinction. The main choice in the Mekong, for example, is whether to plant oil palm or rubber. Yet, there is no food versus rubber debate. In this manner, the arguments above illustrate the multifaceted dimensions raised by biofuels. The implications are best understood when they are contextualised. This has been the underlying task of this research. From this perspective, the biofuels policy nexus has provided a sense of urgency to address underlying structural concerns in Thailand, including land use, water and soil management and investment policies in the Mekong region.

This research leads to the conclusion that Thailand has sufficient policy space to develop the scenarios elaborated below to address the agroenergy nexus. In other words, Thailand has the flexibility – if it so chooses – to intervene to stimulate the diversification of energy sources and to promote renewable energy, including from biofuels. This policy space the theory advances will have a greater likelihood of being socio-ecologically sustainable in direct proportion to the level of regional integration.

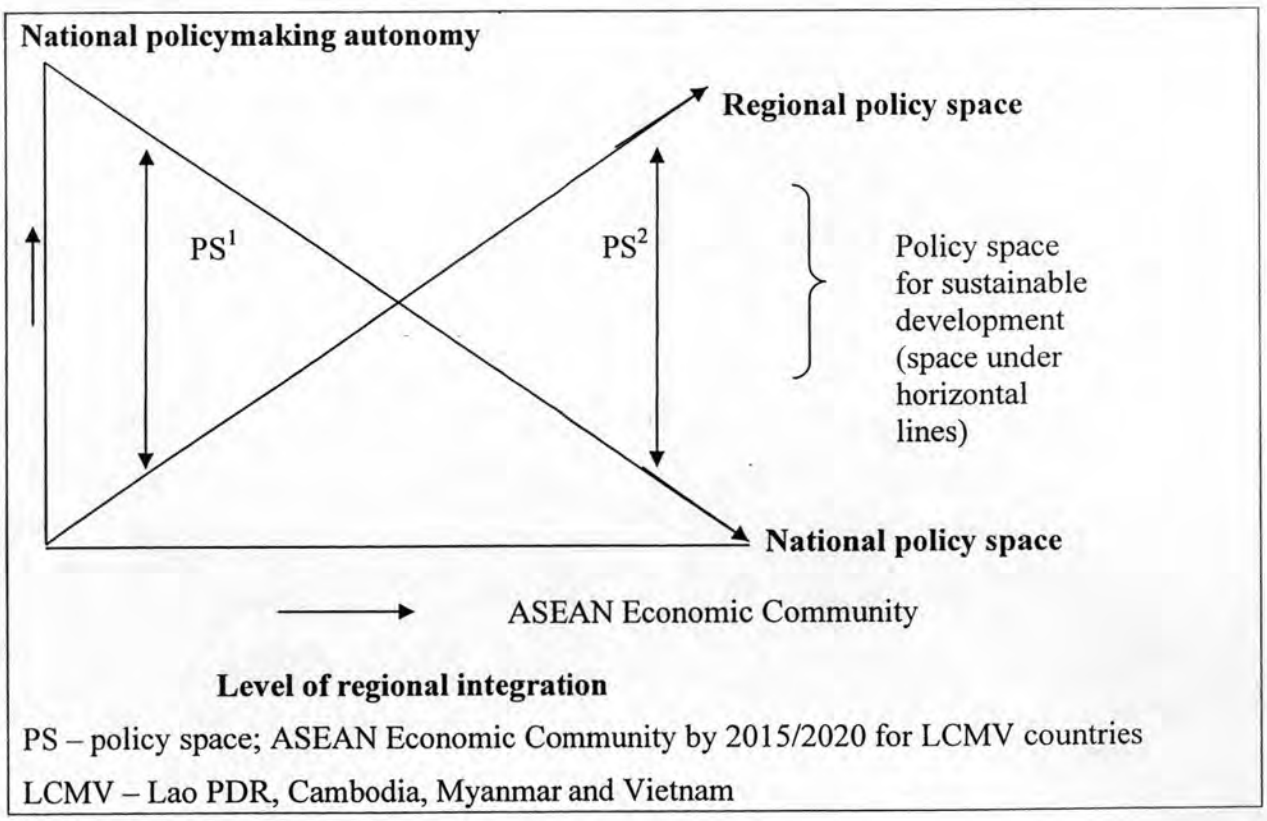
The constraints Thailand faces in effectively using its policy space are two-fold. First, there are domestic political economy considerations that impinge on the policymaking and implementation process. In theory, increasing the price of fossil fuels to internalise the environmental costs of production is the more efficient policy option. In practice, however, politicians choose to subsidise biofuels. Second, this research suggests that lack of coordination and other elements of good governance at the national level reduce the efficient use of policy space to further the provision of public goods.

Concerning the regional management of public goods, the evidence to date in the case of managing the Mekong collectively for sustainability suggests regional integration does not functionally exist in practice and indeed as some argue the situation is moving in the other

direction towards securitisation. None of the parties is yet ready to make serious compromises, nor endow regional organisations with a degree of sovereignty. They want all the rewards of cooperation without having to make any of the sacrifices. The quality and effectiveness of regional integration initiatives, thus, reflects and is correlated with the governance standards of the participating states and may even be dragged down by the lowest denominator.

In response to whether coordination among ministries dealing with bioenergy could be improved, all the respondents to the survey replied in the affirmative. Therefore, the evidence emerging from the agroenergy policy nexus emphasises that *good governance* is the most effective and efficient way to expand the policy space available to Thailand. The hypothesis put forward in this thesis is that the policy space for governance of public goods, in turn, is likely to be optimised through *regional* integration to design a sustainable framework for trade and investment in bioenergyin the Mekong.

Figure 34: Regional integration and policy space for sustainability



PS – policy space; ASEAN Economic Community by 2015/2020 for LCMV countries

LCMV – Lao PDR, Cambodia, Myanmar and Vietnam

Source: Compiled by the author

The argument is that a rigorous regional policy framework would allow for policy coordination and create greater coherence in trade and investment policies. This regional framework would act to balance market forces with policy intervention to address the collective public goods in the interests of the development imperatives of all parties in the Mekong. Figure 6.3 illustrates that as regional integration increases towards for example the ASEAN Economic Community, national policymaking autonomy as indicated above by Hamwey (2005) will decrease. Governments will cede some policy making space to the regional entity as represented in PS^1. Conversely, as the policy space of the regional entity increases, there is more scope for policy intervention at the collective regional level. The policy space, thus, is increased for sustainable development as shown in PS^2. The policy space PS^2 is that envisaged by the theory of regional modernities elaborated in this thesis.

At the same time as aspiring to integrate corridors of economic growth, the Asian Development Bank initiative for the Mekong is stimulating regional energy integration and infrastructure development. There are also plans to safeguard biodiversity corridors. A compelling rationale is linked agro-ecological systems – regional climate and soil are similar and use shared water resources (Mekong and its tributaries). The infrastructure is in the process of being laid out, with the possibility to develop regional farm-to-market transport and storage systems. The appropriate political and economic circumstances exist at this moment to put in place a visionary and dynamic construction of the emerging Mekong. Alongside energy, food security has emerged as a vital component of national security. With rising concerns about food security, advocates argue regional farming would sustain food production in the event of external shocks. Challenges to regional agroenergy development are not insurmountable. This transformation has already been set in motion with efforts to establish an ASEAN Economic Community by 2015.

Biologists also support the argument that regions matter for ecosystems. This is the idea championed by the Convention on Biological Diversity to provide incentives for Transboundary Conservation Areas to maintain the unity of ecological systems spanning different countries. This concept is considered to be a conservation revolution in the question to find ways to coexist with nature and respect local knowledge (Frasier 2009). The process of "creating linkages across landscapes and responsible economic relationships between

protected areas and people," Frasier writes, will require "unprecedented cooperation among nations, communities and individuals."

Therefore, the theory of regional modernities in the Mekong can help to define the conceptual boundaries to bring more security and sustainability to the converging agriculture, energy, and ecological systems.

6.3 Thailand's policy options: navigating a sustainability transition

Scenario analysis puts forward plausible future trends to enable strategic decisions that are cognisant of the range of possible outcomes. Scenario building exercises are an attempt to simplify the complexities of situations and associated uncertainty through bringing empirical evidence at the local level more firmly into the decision making equation. The purpose is to allow practice to inform policy. Notwithstanding these complexities, scenario building can help to clarify options available for policymakers.

Based on the current status of Thailand's policy nexus for the development of biofuels as described in Chapter IV, this section puts forward three policy scenarios in order to explore the prospects for Thailand's trade in bioenergy in the Mekong region. Each scenario represents one set of policy options for Thailand with accompanying policy tools. The discussion will illustrate why the third policy option *Small is Smart* is preferable to unsustainable *Business as Usual* and the *Great Gamble*.

The *first option* represents a baseline scenario with three variations: (i) an optimistic scenario; (ii) a pessimistic scenario; and (iii) an intermediate or more probable scenario. These variations are due mainly to projections for the price of oil, as well as reflections on the current evidence of policy implementation concerning biofuels in Thailand and the Mekong region. The first option, thus, represents *Business As Usual* with variations, illustrative of the conventional development paradigm. This has been the paradigm of sustainable development implemented without much success over the past twenty years since the Brundtland report (1990-2010). The policy tools to implement this option include a balance of policy reform with market forces.

The *second option* – the *Great Gamble* scenario, puts forward an exaggeration of the negative tendencies of the status quo scenario outlined in the first option. The second option, thus, represents a worsening of the status quo from the trajectory outlined in the first option.

The *third option* is an alternative roadmap. The *Small is Smart* scenario represents a first-best policy option that takes fuller account of the socio-environmental implications of the current state of play. The purpose of this option is to broaden Thailand's policy space for sustainable agroenergy development in the Mekong region. The policy tools that would be required for this option to unfold are linked with the set of policy recommendations in the concluding next chapter. These recommendations are formulated based, in large part, on the expressions from the interviewees themselves. In particular, this alternative option would require Thailand's policymaking to be proactive to internalise the socio-ecological implications of agroenergy development not only in Thailand, but within the Mekong region. This option is rooted in ecological and economic efficiency – environmental costs are internalised in the cost of production. It extends the status quo scenario beyond Thailand's border to include consideration of integrating neighbouring countries in order to design a coordinated renewable energy strategy for the Mekong region as an integrated whole. This is the option emanating from the theoretical construction of a *regional modernity* that underlies this research.

These options represent points in a continuum and are not necessarily mutually exclusive. It is a matter of scope and depth of regional cooperation and incorporation or internalisation of socio-ecological costs in the modernisation process. In all scenarios, Thailand continues to invest in renewable energy technologies for biomass, solar and wind, as well as crop breeding, especially in cassava, rubber and oil palm.

Scenario nota bene

The preceding three scenarios are meant to clarify possible policy options and to stimulate debate on current and alternative pathways for public policy related to the agroenergy sector. The point is to draw on the understanding of the current state of play of Thailand's bioenergy development and potential for trade in the Mekong and extrapolate into the future.

Two caveats are raised with respect to these scenarios. It must be considered an on-going process. These scenarios need to be refined through more data collection and scientific and technological innovation. Importantly, feedback from the policymaking community will continue to be a vital element to gauge the interplay of the various dimensions at play in the trade-environment-development-agroenergy policy nexus. This is a dialogue that needs to

occur to stimulate creative responses, inform the decision making process and monitor policy implementation.

For the Mekong countries which are just beginning the process of modernisation (i.e., LCMV countries), development entails significant costs. It is difficult to break away from the traditional capitalist-industrialist model of growth at any costs. This is the legacy of export-led growth in Thailand for over thirty years. This is what Polanyi (1944) meant by:

> the dilemmas of the self-regulating market mechanism (which involves the risk of physically destroying human kind and transforming the environment into a desert) and policies intended to oppose such development (which imply the risk of disorganising economic life placing society in danger in a different way (Martinelli 2000:100).

The result is to give priority to economic growth at the expense of socio-ecological compatible development.

Table 41: Policy options by scenario

Policy option	**Characteristics (building on the Bioenergy Matrix)**
Option I – Business as Usual	
Conventional policy reform and market forces approach (variations on the status quo according to the price of oil) (i) Optimistic scenario (ii) Pessimistic scenario (iii) Realistic "reference" scenario	-3 Political will to maintain renewable energy targets -3 Government revenues to subsidise the target prices for biofuels and waive the excise taxes and charges -3 Development of alternative renewable energy sources include biofuels as feedstocks for industrial, transport and electricity generation -3 Limitations on foreign direct investment (FDI) in the agricultural sector in Thailand -3 Resource-led investment in neighbouring Mekong region to source energy (coal, hydroelectric) and agroenergy feedstocks -3 Development of a national interpretation of the RSPO guidelines and criteria to certify the sustainability of Thai bioenergy (as a basis to expand ethanol exports through AFTA plus (e.g., ACFTA) -3 Development of a regional hub for renewable energy -3 Limited agricultural/land reform -3 Monitoring of food security with regional safeguards in place

Option II – The Great Gamble	
Variations on an ecologically destructive approach to development Suboptimal case scenario – outsource and contract primary resource inputs for domestic processing and value addition for export-led growth	-3 Outsource socio-environmental costs of agroenergy -3 Import raw feedstock from Mekong countries for processing in Thailand -3 Build an export base for ethanol focused predominantly on ASEAN as well as the US and EU -3 Liberalisation of foreign direct investment for agricultural and land through ACMECS and the ASEAN Investment Framework -3 Utilise contract farming (through ACMECS) to increase investments in agroenergy and increase the economic viability of ethanol production by decreasing the feedstock price through greater imports -3 Rising potential for a vicious circle of underdevelopment and overexploitation of natural resources in neighbouring countries
Option III – Small is Smart	
"Small is smart and can be efficient" scenario Transforming rural development – the preferred policy option Proactive regional leadership & cooperation, with dual track bioenergy development, emphasising decentralised community projects alongside commercial production and use	-3 Decouple economic growth and environmental degradation and pollution -3 Address energy poverty through efficient and inclusive resource use -3 Develop bioenergy by vertically integrated smallholders and adding value to agriculture at the regional level, including through building processing plants to add value in neighbouring countries -3 Internalise socio-ecological costs in the production process by bringing efficiency gains -3 Build food and energy resilience at the local level -3 Develop and monitor a regional code of conduct on socio-ecological sustainable trade and investment in the agriculture sector in the Mekong (through ACMECS) -3 Utilise public-private partnerships to improve contract farming (through ACMECS and the Mekong Business Forum), with appropriate incentives and monitoring mechanisms -3 Ensure a sustainable renewable energy hub that goes beyond meeting domestic targets to export biofuels -3 Transfer environmentally sound technologies and resilient crop varieties within region to ensure agricultural biodiversity resilience -3 Implement proactive agricultural and land reform -3 Ensure proper pricing of fossil fuels to make renewable energy (solar, wind, hydro) more economically competitive

Option I Business As Usual

Status quo reference scenario with three variations

This approach is characterised by conventional policy reform and market forces. The starting point for the following assessment of Thailand's policy options is a baseline scenario in which there is a continuation of the *status quo* or *business as usual* of current agroenergy policies in Thailand. Broadly speaking, this means that Thailand continues to mandate the blending of ethanol and biodiesel in the transport sector to increase the share of renewable energy in the domestic energy mix. Given the volatility of the price of oil and related chemical inputs in the agricultural process (fertilisers and pesticides), the baseline scenario foresees a continuation of subsidisation to bridge the price difference between biofuels and petroleum. It also forecasts that the biofuel blending mandates will not be met without this subsidisation. The implication is that if the price of oil remains too low to allow bioenergy to be competitive, the financial drain on the government budget of these subsidies will become too burdensome at some point. Simply put, the costs of providing incentives to the biofuel sector may become too costly to the government as to cause one of two scenarios. The government will be forced to revoke the price subsidy and the sector will collapse, or it will continue to provide the subsidy and incur a growing budget deficit.

The policymaking process in which Thailand is shaping the bioenergy sector is influenced by a convergence of factors as the local, national and international level. Thailand's policy context has been outlined in Chapter IV. The implementation of these policies and their consequences has also been examined in practice at the local level in Thailand and the Mekong region in Chapter V. The scenarios that are outlined below are an attempt to bridge the existing gaps between the policy and practice based on the theory of regional modernities.

Despite the promise of the Brundtland's sustainable development trajectory for reconciling economic growth and environmental quality, the legacy of the 20th century development paradigm is towards *growth at all costs*. This is the experience of Thailand to date as outlined in Chapter IV. Conventional wisdom based on a policy vacillation between government intervention, policy responses and market forces lacks the political momentum to push through sufficient change. The result is that the modernisation process remains unable to internalise or incorporate the socio-environmental costs of economic growth.

There are three variations to this *Status quo* baseline scenario.

The *first variation* is based on an optimistic forecast in which oil prices remain high. That is to say that the relative price of oil is higher than the cost of producing ethanol and biodiesel. This scenario reduces the budgetary pressure on the government to subsidise the price of bioenergy in order to ensure that the mandatory blending requirements are met.

The policy tools necessary to manage agroenergy development in this scenario are easier to establish primarily because the economic context has been favourably altered. It is new feasible to mandate ethanol blending. In this scenario, it is cost effective to operate the 24 ethanol plants in Thailand for domestic consumption and, increasingly, for export in the region. This scenario is optimistic from an economic perspective given a price of oil in the $60 range, which makes it difficult for ethanol to compete. Nevertheless, there would remain trade, environmental and social hurdles to overcome. In order to facilitate the increased ethanol exports and palm oil imports that may occur under this scenario, the relevant laws and regulations would have to be amended. The socio-environmental impacts of an expansion of ethanol or biodiesel would also need to be monitored and effectively mitigated.

The *second variation* is based on a pessimistic prediction that oil prices will tend to remain low over the short to medium term as a result of the economic recession and consequent reduced demand. In this event, the government is trapped politically to continue costly subsidisation of biofuel prices.

The *third variation* to the status quo is a more realistic prediction in which oil prices remain sufficiently high to enable bioenergy to be economically viable. This is considered to be the reference scenario for building alternative policy options. Some analysts put forward that it may well be the case that oil prices remain low for some time (Interview with Steenblik 2009). During the course of 2008, the price of oil fluctuated from close to $150 to just under $34 and back to around $60 in July 2009. The main rationale behind this forecast is that the high prices in 2008 and the current economic recession have severely dampened demand.

The policy strategy of the status quo emphasises two elements: on the demand side, energy efficiency and on the supply side, increasing the supply of renewable energy. In Thailand, this will require increasing the share of natural gas (the cleanest fossil fuel) in the energy matrix as a transition to a more renewable energy matrix. In the baseline scenario, it is

estimated that biofuels may displace about 14% of Thailand's total fuel demand in the transport sector by 2030 (USAID 2009).

Whilst the rapid fall and then rebound in oil prices during the course of 2008 came as a surprise to many, commodities markets are cyclical by nature, which makes it difficult to forecast prices with any degree of accuracy. The recent price volatility has resulted in a trend towards what some analysts refer to as "resource nationalism," whereby producing countries concentrate control over their resources in the hands of state-run entities and calls for energy security to ensure available and affordable oil supplies.

The economic crisis has brought with it a moment of pause to rethink the march to modernisation through an agro-industrial capitalist development model. There is a growing body of empirical research illustrating that the current *Business As Usual* scenario is resulting in an unsustainable resource drain in the Mekong. It does not present, therefore, an acceptable option for Thailand, nor for neighbouring countries. The evidence collected during the course of this research, as described in Chapter V, illustrates the need for socio-ecological sustainability to be considered in the development process. The status quo is no longer viable. Flowing from this premise, this research argues that the current development paradigm need not be the path chosen if the *Small is Smart* scenario is advanced *in concert* in the region.

Observations on the variations to the status quo scenario

There are four main contributors to the momentum of the status quo for bioenergy development in Thailand. First, the *institutional inertia* within Thailand's entire fuel economy system constrains the consideration of alternatives despite the obvious economic and environmental incentives arguing for change. Importantly, in the context of growing government budget deficits and the current global economic crisis, it is both economically burdensome and politically challenging to critique mainstream ideas and technologies.

The second contributor to maintaining the status quo is *political inertia* particularly related to the inability of states in the Mekong to move beyond historic tensions, border disputes and cultural and resource nationalism.

Third, stakeholders in the current system, such as agro-industrial producers and input suppliers in the agricultural chain of production, are unlikely to switch to more resource efficient methods of production *unless* the regulatory incentives are firmly in place.

Policymakers, in turn, are reluctant to push industry to change too quickly, particularly in the current global economic recession in which Thailand's exports have significantly decreased and there is a risk of economic contraction.

Fourth, *mainstream consumers* faced with the current transition towards a greater reliance on renewable energy would be required to pay substantially more for their fuel and related goods and services in which energy is embedded, ranging from food to cars. Politicians are reticent to take on the high risk of alienating voters by removing fossil fuel subsidies. On the other hand, it would make ethanol more competitive.

Although there are sufficient signals that the agro-industrial system is economically burdensome and resource inefficient, there is a general unwillingness to change the system based primarily on vested interests in the private sector. With the inauguration of the ASEAN-China Free Trade Agreement (ACFTA) on 1 January 2010, there is increasing trade and investment integration in the region to bring in the ASEAN Economic Community (AEC) by 2015. However, social and environmental integration lags behind despite the rise in awareness of the issues at stake and the rising socio-environmental costs of business as usual.

On the one hand, cynics may argue that there is also a profound *intellectual inertia* in operation. This is consistent with the arguments advanced by Pasuk and Baker (2004) concerning the fact that the Thai bureaucracy has systematically avoided risky ideas that might be sufficiently revolutionary to change the current agroenergy system.

Optimists, on the other hand, such as Samai Jai-In may point out that current proposals to reform agricultural prices or land reform are signs of willingness to take a chance with alternatives to the status quo (Interview 2009).

In this context, Thailand's current agricultural system has managed to contain the development of large-scale monoculture. As has been emphasised in this research, Thailand is a country in which the majority of farming is undertaken by small-holders. To return to the theoretical conceptualisation of this thesis, small-scale farming is an integral component of Thailand's construction of modernity. It is a model that many development experts in Thailand and in international organisations, such as the FAO, argue is vital to preserve in order to build sustainable growth. The question is how to embrace reform whilst preserving this element of the status quo. Paradoxically, this is a key element of the current system that

one Thai expert cautions "could disappear at any moment and quickly" if alternative paths forward are not put in place (Interview Baker May 2009).

The alternative options outlined in the next section are entitled the *Great Gamble* and *Small is Smart*. It should be noted that there are elements of both these policy alternatives in the status quo. Thailand is promoting both sufficiency economy community biodiesel in Thailand and its Mekong neighbours at the same time as it is stimulating large-scale contractual agroenergy investment through ACMECS. The point of the alternative options, however, one the one hand, is to exaggerate the possible negative consequences in the *Great Gamble* scenario and accentuate potential positive implications in the *Small is Smart* scenario. The alternative *Small is Smart* policy option seeks to recast efficiency in the production process as a means not an end; it endeavours to factor in external costs (internalise) instead of deferring these costs indefinitely as has been the case in the past. Several of the case narratives in this research illustrate where Thailand is moving towards the *Small is Smart* scenario.

Thailand has also announced its plans to deepen its technical assistance to build energy and agricultural resilience in neighbouring Mekong countries. This technical assistance could be used to capture efficiency gains in the agro-industrial process, for example mills and plants. As highlighted in the case studies in this research, there are significant gains to be developed from expanding the use of biogas digesters (e.g., livestock manure) and cogeneration from biomass waste-generating agroindustries (e.g., rice, sugar, cassava). Promoting the economic benefits of increasing energy efficiency for agro-industrial mills through cogeneration will: (i) increase energy self sufficiency in operating the mill; and (ii) increase earnings from selling surplus to the electricity grid.

It may be difficult to achieve in the short term the type of integrated sugar-ethanol industry as in Brazil. However, making resource streams more energy efficient is serving to (i) substitute costly energy inputs by making processing plants energy self sufficient (input efficiency gains) ; and (ii) decreasing polluting effluents, air pollution and wastewater (output efficiency gains). These input and output gains are improving the energy balance and reducing the impacts of waste streams on the environment (air, land and water).

There are a multitude of structural factors that may act to impede the possibility for the implementation of the *Small is Smart* scenario, while pushing the *Great Gamble* scenario

further along its course. It is put forward as an alternative policy choice in the event that: (i) the variations on the baseline reference scenarios outlined in the first option above do not work, given the disadvantages of the current policy framework (lack of a coordinated, cost effective strategy for bioenergy development); (ii) the pessimistic scenario outlined in option *Business as Usual* transpires (i.e. the price of oil remains relatively low, thereby price does not function as an incentive to stimulate cost effective agroenergy); or (iii) the evidence finds a negative energy balance in the production of agroenergy (i.e. it takes more energy to make biofuels than they produce).

The challenge of the status quo for neighbouring Mekong countries is to avoid the widespread and unsustainable exploitation of natural resources that has characterised Thailand's rapid export-led growth and industrialisation.

Option II The Great Gamble

Variations on an ecologically-destructive approach to development

The second option illustrates a worst case scenario in relation to the *Business As Usual* scenario outlined above. This option represents the model of industrialisation oriented towards economic growth without consideration of the broader socio-ecological externalities. In this scenario, Thailand and the newly industrialising Mekong countries cannot afford or do not choose to recognise the socio-ecological implications of development. As a result, they continue to neglect labour protection, social safety nets and ecologically-compatible development. This scenario is informed by the destructive tendencies already apparent in several of the case narratives, as well as the history of Thailand's rapid export-led process of industrialisation over the past three decades. For example, the opaque and arbitrary investment conditions in Champassak (case 5) and Myanmar (case 6).

In response to the fact that the price of feedstock represents between 60% to 90% of the cost of biofuels for both ethanol and biodiesel, the incentive is to increase the scale of production to bring the costs down (Shepley 2008). A large body of research, however, points to the risks associated with some large-scale agricultural plantations for monocropping agroenergy. The risks include increased likelihood of blight and pests (Altieri 2009). Homogenous cropping is highly vulnerable compared to the diversity and implicit resilience of polycropping on agroecology.

In the *Great Gamble* scenario, thus, increasing economies of scale and land concentration in Mekong countries act to limit the benefits of ethanol production for smallholders. Agro-industry increasingly takes over the land, cultivating monoculture plantations; former farmers become full time labourers or move to the cities. These trends are already apparent.

In order to reduce production costs to make first generation biofuels more competitive with fossil fuels, there are two basic ways to bring down costs identified by the interviewees: (i) improve technology; or (ii) increase productivity. In this respect, second generation technologies are estimated to take 10-15 years to be commercialised (IAASTD 2009). Increasing productivity, in turn, requires improvements in the yield and more efficient use of petroleum-based inputs in the production process. Better still, these inputs should be substituted with locally-produced natural fertilisers, pest-control methods and nitrogen-fixing crops (AAN 2009; Altieiri 2009).

Another way of decreasing feedstock costs is to source those feedstocks from, and even process them in neighbouring countries, where the costs of production (labour and land) are cheaper. This is another trend that is already underway in the Mekong. How long it can continue is another question. This strategy allows investment in research to increase productivity to be avoided saving money in the short-term. However, in the longer-term it raises the risk of being uncompetitive and obsolete. Higher costs drive innovation to remain competitive, upgrade skills and technology. Therefore, using cheaper assets in neighbouring countries is a form of externality that ultimately is not in the best interest of the production system of Thailand and the Mekong region as a whole. This is, thus, another aspect of the *Great Gamble* scenario that this research found to be flourishing in the Mekong region (cases 4, 5 and 6).

Given the volatility in the markets for vegetable oils and petroleum products, biofuels may become competitive with fossil fuels for certain periods. Some economists argue, however, that as the bioenergy sector competes with the food sector for the same feedstocks, as demand increases, so will the price. This thesis does not contest the importance of establishing an economically viability of bioenergy. In this scenario, however, the private sector is motivated to develop bioenergy, to a great extent, due to the government subsidies in place. As long as the price of fossil fuels does not internalise the full costs and impacts for the

environment, society and the economy, fossil fuels will continue to benefit from implicit subsidies such that they may undercut biofuels. In this way, the price of oil is likely to remain both volatile and low (under $60 per barrel), making it difficult for biofuels to gain economic viability.

The risk in the *Great Gamble* scenario is that there will be a breakdown of the environmental foundations that underpin growth and prosperity. A breakdown would be exacerbated by rising demand for a growing population in a divided region. In addition, intraregional migration is likely to continue to cause inequity and social strife. The historic legacy of distrust persists in this scenario. Therefore, the *Great Gamble* scenario is highly risky from a socio-ecological perspective.

The gamble, thus, is a socio-ecological one. The extent of the risk depends on the following two issues. First, is it possible to create a regional process of modernisation based on a small-scale integrated model? The evidence from the case narratives is that this model is working in many regions of Thailand - from Athiras Dumbdee in Aoluk in the south to Jarun Putson in Rangsit in the central plains and up to Rojanayol Vongsuksiri at the Mae Fah Luang project in the north. However, it remains to be seen whether this is the model that will develop in the rest of the Mekong – into Shan state, Champassak, Kampong Spue, Yunnan or Tay Ninh and beyond. This is the contested narrative told by Thongchanh Sengsoulivong in Pakse, Lao PDR and Win Myaing and Htay Aung in Mandalay and Shan state, Myanmar.

Second, alternatively, ASEAN investment integration and ACMECS act to facilitate the continuation of a status quo that externalises the socio-ecological costs of development. Thai investment in particular goes towards lignite power plants in Lao PDR and agroenergy and rubber monocrop plantations in Champassak to source feedstocks for Thai mills and plants. These opportunities for trade run the risk of being terminated whenever there is a crisis, as in the case of ACMECS corn investment in 2008 (see discussion in case 4). Investor confidence in this scenario, in turn, is low. In the *Great Gamble*, the best that can be hoped for is that there will be time to mitigate the worst effects once serious consequences become apparent – as is already the case with rapid deforestation and declining fertility of soils and water quantity and quality (IWMI 2010; Fullbrook 2009; Osborne 2009; Kalina 2010).

Option III Small is Smart

Variations on an energy efficient, socially inclusive and ecologically-integrated model

An alternative to the scenarios above is being developed by key reformers. In particular, Samai Jai-In is building an interpretation of modernity in which small-scale farmers can find a voice in Thailand. The hope is that this model can find expression in the Mekong region. Of course, it would be better for all Mekong countries to grow together. However, that does not mean that a predatory model will not be developed - even by default and delay. If it is not developed by Thailand, then it may be pursued by China or Lao PDR, which are already damming the Mekong with significant downstream consequences (Vientiane Times 5 March 2010).

That is why the next option – *Small is Smart* is based on 'prosperity without growth' in order to usher in a sustainability paradigm that enables, at a minimum, a shift towards greater efficiency in the use of the region's natural resource base, if not a transformation to low-carbon economies in the Mekong. This is the model for the transition to a sustainable economy put forward by the landmark report of the Sustainable Development Commission (2009) to enable "prosperity without growth." This report commissioned by the government of the United Kingdom in preparation for the Group of 20 summit in London in 2009 offers a 12-step plan to make the transition to a sustainable low-carbon economy. While the concept of well-being without growth is a radical proposal to some critics, there is increasingly no alternative to many.

This option offers an alternative, proactive use of policy space in a post-Brundtland 21st century. It recognises that change is necessary – and more urgent than even the most optimistic forecasts. It is a more nuanced scenario reflecting regional variations on the construction of modernity to include consideration of shared natural resource endowments and environmental tipping points within a broader setting than the nation state. This shift to a new sustainability paradigm in centred on energy, which is the foundation of prosperity. This scenario foresees Thai bioenergy investment continuing to rise in agroenergy crops in the Mekong region based on a dual track (commercial-community). It envisages codes of conduct incorporating principles of socio-ecological sustainability, such as Thailand's national interpretation of the Roundtable on Sustainable Palm Oil, or the Roundtable on Sustainable Biofuels. Modernisation based on agro-industrial models are reconceptualised to allow for the

vertical integration of smallholders, while allowing for economies of scale and internalisation of the socio-ecological costs. This allows for the energy and agricultural systems to maintain their resilience and responsiveness to local conditions, while building prosperity and expanding the opportunities available to rural communities.

In this scenario, Thailand would use its regional authority to expand this type of a model of energy development. The "*small is beautiful and can be efficient*" model is considered by smallholder community interviewees to show the greatest promise to support local livelihoods and contribute to sustainable development (e.g., cases 1, 2 and 3). Expert assessments (UNF 2008; SEI 2008; UNEP 2009) have found that the introduction and enforcement of standards and regulations alongside the use of environmentally sound technologies act to mitigate the concerns outlined in the *Great Gamble* scenario. Yet, it is also equally clear that the improvements will be slow to materialise where the policy framework is weak. This is the case generally in the Mekong.

Despite Thailand's leadership in export-oriented agriculture, the majority of the country's produce is sold domestically, or regionally. In the *End of Food*, Paul Roberts (2008) stresses the importance of regional markets as one of the lessons emanating from the Chinese experience. Local, small-scale strategies to produce low-input, medium-value crops such as vegetables and potatoes can be produced efficiently for the domestic and regional markets. Development experts are finding ways to preserve diversity and allow flexibility. In this respect, given the choice between rubber and oil palm in southern Thailand, the field interviews reflected the choice of many farmers to switch to oil palm. As explained by Athiras Dumdee and other local-level agrarians in the Mekong, there are more opportunities in the supply chains for oil palm in food, feed and fuel than for rubber (Interview 11 April 2009).

The theory of regional modernities put forward in this thesis posits that Thailand is capable of influencing some essential factors related to biofuel development. This is evident in the following ways. Thailand has the policy flexibility, for example, to implement land reform and better enforce environmental regulations, or to devote more public funds to invest in research and development to increase crop yields or to develop more efficient and environmentally sound technologies. Whilst Thailand is part of a global system, the domestic context has a distinct role to play in determining biofuel policies based on its local conditions of agricultural potential (i.e., related to land, water and soil). It is argued that Thailand

increases its policy space through regional cooperation and coordination to guide this development. Other factors, such as energy prices, however, are determined by the international price of petroleum, which is beyond the control of any individual government. This exogenous factor limits the policy space in which the Thai policymaking process operates. Yet, Thailand can also exacerbate the conditions underlying its current energy mix through a multitude of political economy reasons, for example, the decision to maintain direct and indirect subsidies to fossil fuel use.

To a large extent, the foundations have already been laid for this scenario to become the model for agroenergy development in the Mekong region. This option is influenced by Samai Jai-In's Rangsit "smart and small" (case 1) and Athiras Dumbdee's Aoluk (case 3) models of decentralised community biodiesel production. This option has been operationalised in over 500 communities nationwide in Thailand since the early 2000s, including through Pra Tawee and Sawaeng Ruaysoongnern's efforts in Vanghinlad and Si Prajan (case 2). It finds resonance in Peesamai Jenvanitpanjakul's conceptualisation of rice and sugar energy complex models advanced by Thailand's Institute for Science and Technological Research (TISTR) (case 4). It could also be the model for the agroenergy investment outlined in cases 4 and 6 in Lao PDR, Cambodia, Myanmar and Vietnam (referred to as the LCMV countries).

6.4 The preferred policy option: proactive regional cooperation

The *Small is Smart* scenario assumes a high degree of policy coordination at the regional level for five key reasons: (i) choice of feedstock; (ii) proximity to markets; (iii) national objectives (local sufficiency versus production for export); (iv) scale of production (economies of scale); and (v) access to finance and marketing. The weight and volume of perishability of agroenergy crops dictates that collection, transport and processing plants need to be located within a radius of 100 km to where the crops are grown. The logistical and economies of scale advantages favour a shift towards larger-scale, vertically integrated operations (UN-Energy 2007). However, this has not been and does not necessarily have to be the case in the Mekong region. Depending on the efficiency of the processing plant, more advanced plants could reach high levels of efficiency at smaller volumes thus can be smaller and built closer to the source of production.

This thesis argues that a regional construction of modernity is the preferred policy option to pursue. This option will enable the delivery of public goods to bring about a shift to a new sustainability paradigm. Experts suggest that a shift to sustainability invariably must be founded on an energy transition (Gallopín & Raskin 2002). It will be the scenario that emerges with the end of abundant and cheap fossil fuels that propelled the past era of industrial development at great environmental expense. According to the regional modernities theory, the mix of renewable energy forms in the sustainability paradigm will vary based on the natural resource endowments in a particular region. In this respect, the Mekong region has great potential for hydroelectricity and solar energy as envisaged by the World Commission on Dams (2000). Different from the first scenario, this option focuses on pico and micro-hydro projects that minimise human displacement and environmental disruption.

Regional cooperation allows individual governments in the Mekong to increase the effectiveness of policy intervention and investment in public goods by generating synergies from complementary and harmonised policies. This includes potential for a broad range of public goods, such as infrastructure, irrigation, roads, extension services, research and development in crop research, market information and rural financing. Moreover, it can allow for public private partnerships to flourish in a more sustainable policy milieu, with improved monitoring of investment terms (contract farming) and enforcement of contracts in the agroenergy sector.

6.5 Implementing the preferred policy option of *Small is Smart*

There are several critical assumptions that need to be taken into consideration in order to implement the preferred policy option of *Small is Smart*.

First, experts forecast that Thai politics may undergo continued instability for the foreseeable future. Based on accounts in Thai political circles, the roots of the current political unrest are not unrelated from the topic at hand. That is to say, the growing strength of the majority in the rural areas having suffered decades of policy neglect is exerting pressure at the centre of power in Bangkok. In order to implement the preferred policy option requires political stability as a first step towards maintaining political will for change and coordination at the national and regional levels.

Second, dynamics at the international policy level have led key international organisations to be sceptical of biofuels based on the trade distorting, environmentally damaging and economically burdensome experience of several OECD countries. This policy consensus has developed based on the OECD experience and notwithstanding the success of agroenergy in Brazil. As such, the increasing consensus at the international level to move *away* from advocating biofuel development is disconnected from the policies and practices currently being formulated in Thailand and neighbouring countries in the Mekong region. There is thus a need to make the case for sustainable small-scale bioenergy in Thailand and the Mekong region.

In this respect, the debate on food versus fuel and the role of biofuels in developing countries has yet to run its course. The crisis in 2008 served to heighten awareness of the food system as a whole and its linkages with the agricultural and energy revolution needed to address environmental crises. There is a need to bring more nuance to the discussion of bioenergy in the negotiations for a post-Kyoto agreement, in which the agricultural sector is gaining attention and focus in mitigating as well as adapting to climate change.

Third, alongside Thailand's role in the Mekong, China's ecological resource footprint in the region is growing. Chinese investment in the natural resources sector in general in Mekong region countries is increasing. The implications for land and water use, forests, biological diversity and local livelihoods need to be studied further.

Fourth, it may be possible to waive the economic constraints to biofuel development initially through government subsidies, but the private sector will weigh into the debate in a practical way by choosing whether or not to continue to invest in the biofuels sector based on market factors. For the time being, private sector bioenergy companies have great expectations for future returns on bioenergy investment, and are also seeking to capture the subsidies in place for biofuels to enable national targets to be met. Transparency in pricing oil, internalising costs currently externalised thus extracting implicit subsidies on the environment, society and the economy, would immediately change the biofuel/solar equation.

Fifth, the trade rules delve further into the domestic domain of policymaking to permit products to be distinguished based on the carbon footprint in production and processing. In this event, certification will be vital to ensuring biofuels meet sustainability criteria, such as

those developed in the Thai interpretation of the Roundtable on Sustainable Palm Oil guidelines.

Sixth, regional factors will have an increasing role to play in the way in which bioenergy develops, including economic recovery in China, the political situation in Myanmar and an easing of labour restrictions between en route to the formation of an ASEAN Economic Community by 2015. In this evolving context, migration within the Mekong will have socio-economic consequences, for the better and for the worse. The effects of migration deserve to be integrated into policy planning, particularly as it relates to bioenergy.

These six elements are among the factors that will shape policy development related to bioenergy in Thailand. As highlighted by the informant interviews and focus group discussions undertaken for this research, the regional narrative requires strong coordination and cooperation in collaboration with all stakeholders.

Through linking theory, policy and practice, this chapter has summarised several key issues in the case of Thailand's bioenergy development. On the basis of the evidence gathered during the course of the research, this chapter has put forward three policy options for consideration in the policy making process. In essence, the analysis leads to the conclusion that Thailand cannot afford to wait any longer to enact long-term policies on the issues discussed in this research. In fact, acting early is clearly in the longer-term interest of Thailand if it is to craft a constructive and sustainable role for the agroenergy sector in the Mekong region. This is the main lesson drawn from the Brazilian experience with sugarcane ethanol as elaborated in Chapter V.

There are both positive and negative implications of agroenergy development in Thailand and the Mekong region. In this light, the public sphere for authentic deliberation on the opportunities and challenges of bioenergy is strengthened by developing a regional approach to development that includes smallholders in the *Small is Smart* option.

The next chapter of this research concludes the analysis by revising the theory of multiple modernities to reflect the findings of the research. It puts forward the need to contest the agroenergy landscape from a coordinated regional basis.