
Nuclear Power and Civic Engagement in Southeast Asia

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Introduction

As Southeast Asian economies become increasingly incorporated into the global capitalist economy as active players, a rise in the level of economic activities and corresponding standards of living have contributed to increasing demand for energy consumption. Emerging economies like Thailand and Indonesia have seen a demand for greater electricity use from the affluent segments of their population. The demand for more energy stems not just from the consuming population, but also from the interests of state leaders to supply more power to fuel urbanization and industrialization. With the discourses surrounding nuclear power in which it is posited as an alternative source of energy desirable for its environmental friendliness and cost-effectiveness, its choice as an attractive solution to the energy security problem in the light of an international concern about climate change is worth examining.

This chapter focuses on the case of nuclear power and civic engagement in Southeast Asia, as exemplified in the specific cases of Indonesia and Thailand. It will be divided into four sections i) discussing the nuclear renaissance in Southeast Asia, ii) analyzing the risk discourse, iii) examining anti-nuclear movements led by civil groups, and finally iv) postulating the future implications of nuclear plans and the response to them. Before proceeding, a short discussion of the nuclear situation in Indonesia and Thailand will be provided as an introduction.

A growing trend in the desire for nuclear power has been seen recently as in the cases of Indonesia and Thailand. In Indonesia, the wish for a nuclear programme can be traced back to the 1950s when the first Indonesian President, Sukarno visualized the state's future nuclear capacity. In 1959, Sukarno inaugurated the Institute of Atomic Energy which

later became the National Agency for Atomic Power (BATAN). In 1972, the International Atomic Energy Agency (IAEA) assisted BATAN in a feasibility study of nuclear power in Indonesia. However, plans to go nuclear were undermined and delayed by Indonesia's political economy during the time of the Asian Financial Crisis in 1997. Nevertheless, in 2004, BATAN's nuclear power program was reinstated under Megawati's presidency (2001–2004) in which a decree of Ministry of Energy and Mineral Resources entitled '2004 National Energy Policy' was issued. This decree was based on a nuclear feasibility study and was later given official acknowledgment as part of the national energy strategy. This national policy was later translated into a detailed road map through which Indonesia would advance its nuclear program, which would involve building four reactors with a power-generating capacity of 4000 MW by the year 2025. The potential location for the first new nuclear plant was to be the Muria Peninsula in Central Java.

This visionary nuclear plan of Indonesian state technocrats, however, is not without opposition. As in many other countries which envisioned having nuclear power as part of their energy supply, the history of catastrophic nuclear tragedies such as the 1979 Three Mile Island accident and the 1986 Chernobyl meltdown looms as an overarching concern for not just the Indonesian general public, but also some professionals and special interest groups. Despite the extensive scientific research carried out and the protocols provided to assure the people of Indonesia about the safety of nuclear power, news of the nuclear plan was still greeted by the public with scepticism. Such scepticism is not unfounded given that the quantifiable risk assessments provided by the state technocrats are incompatible with the public's social definition of risk. In this case, it refers to the level of trust between the public (lay citizens) and the state (experts). Past mishandling of public service management has eroded the government's credibility and competency as mitigating risks for the people. Such a perception has thus led to various resistance and opposition groups in the civil society realm. Examples of such groups are *Wahana Lingkungan Indonesia* (Wahli) based in Jakarta, Greenpeace Indonesia and Manusia (antinuclear society comprising of professionals and academics with global connections).

In Thailand the government has been attempting to build nuclear energy facilities for the past thirty years, but has consistently faced public opposition such as that from environmentalists and local populations. Interest in nuclear power was revived by a forecast growth in electricity demand of 7 per cent per year for the next twenty years. In 2007, the Electricity Generating Authority of Thailand (EGAT) announced its plan to build the country's first nuclear plant (4000 MW power generating capacity), which is to start operation in 2020 to cope with a looming power shortage. The Thai government's latest 15-year Power Development Plan released in 2007 called for nuclear power to be considered as a new energy source. In April 2009, EGAT identified four provinces – Chai Nat, Surat Thani, Nakhon Si Thammarat, and Chon Buri as potential sites for nuclear power plants.

With Thailand's history of active civil participation and a dynamic political climate, anti-nuclear responses should not come as a surprise. The justifications for opposition against nuclear power, as in the case of Indonesia, stem from differences in perception of risk between the state experts and the lay public, and hence competing sets of knowledge systems about nuclear power. Environmentalists and interests groups such as *Palang Thai* thus question the claims of safety and the benefits of nuclear power advocated by the technocrats by raising public awareness about the costs and other considerations surrounding the employment of nuclear energy.

The objective of this chapter is twofold. First, it shows the growing popularity of nuclear power in Southeast Asia, which has arisen along with the spread of new global trends in energy production, the so-called 'nuclear renaissance', emphasizing nuclear energy as a seemingly inevitable option to remedy the global energy crisis. To pursue this goal, this chapter discusses three issues in which nuclear energy claims advantages over other energy resources. These include the rapid decline of fossil fuel, concerns over climate change, and new developments in safer nuclear reactor designs. The other goal this chapter seeks to accomplish is to analyze how the ongoing proliferation of nuclear energy in Southeast Asia is responded to by civil society elements across nations. Indonesia and Thailand are two countries best exemplifying the growing resistance of citizen groups

180 *Sulfikar Amir & Neo Shar Ni*

against nuclear power. As stated above, a number of different civil society groups in the two countries have joined anti-nuclear alliances that have come to the fore to challenge the state's decisions in producing nuclear energy. It should be noted that the emergence of anti-nuclear alliances in Southeast Asia cannot be separated from the shifts of political systems that have unfolded in this region, particularly in Indonesia and Thailand, during the 1990s. The decade saw democratic transitions after the demise of authoritarian powers, with some of these changes ignited by the failure of the regimes to overcome the Asian economic crises. The wave of democratization in this region consequently gave rise to civil society as a new power bringing different agendas and rationalities to public affairs. As nuclear power is seen as potentially harmful and a threat to the safety of citizens, civil society groups in Indonesia and Thailand have become democratic forces that shape the politics of nuclear power. As a result, the discourse of nuclear power has turned into a field of contestation in which civic groups engage actively in order to challenge technocratic rationality dominating energy production (see Hess 2007). The core of this chapter lies in this controversy in which nuclear power as a form of modern technology promising prosperity is scrutinized from risk dimensions (Van Loos 2002). Following an analytical approach in studies of new social movements, this chapter draws on risk theories to examine how nuclear risks are perceived, constructed, and contested by different actors who subscribe to contrasting epistemologies. What we wish to demonstrate in this chapter is how problematic the relations between technology and society are in the Southeast Asian context when it comes to the question of risks and benefits, a predicament that may have appeared distinctively from that in other Asian contexts.

Nuclear renaissance in Southeast Asia

Although nuclear power has recently gained popularity among Southeast Asian states, the beginning of the nuclear era in this region dates back four decades to the height of the Cold War. The interest of the United States in blocking the proliferation of nuclear technology for

military purposes while at the same time promoting nuclear technology for peaceful uses, most notably for energy production, led to the establishment of the U.S.'s *Atom for Peace* program, which was a follow-up to Eisenhower's speech delivered before the United Nations in 1953. Indonesia was one of the early states that responded to this call when in 1957 President Sukarno formed a special committee for nuclear radioactive investigation, which was later elevated into the Institute for Atomic Energy. With financial assistance from the United States, Indonesia constructed the first research reactor, Triga-Mark II, in Bandung in 1961. When the New Order regime led by President Suharto came to power, more research funds were granted to develop nuclear research facilities. Support from Suharto's government for nuclear research was a result of the ideology of developmentalism that occupied the New Order regime. As nuclear technology was considered a symbol of modernity, Suharto gave serious attention to the enlargement of Indonesia's nuclear research capacity. As a result, Indonesia built the largest research reactor in Southeast Asia in Serpong, in the outskirts of Jakarta. It is a 30 MW multi-purpose reactor, which reached criticality in 1987. The first initiative to develop nuclear power for energy production came up in 1972 and the first proposal was sent to the central government in 1984. The proposal, however, was rejected, most likely due to an abundance of oil resources which rendered nuclear energy unnecessary. This is a type of dilemma nuclear energy proponents have faced for years. The second attempt was taken in the early 1990s when the Indonesian Nuclear Energy Agency (BATAN) planned to build 12 600 MW reactors in the Muria Peninsula to be commercially operational by 2003. The proposal failed to get approval and when the Asian crisis struck Indonesia severely in 1997, Indonesia's dream of nuclear power seemed distant (Amir 2010).

The history of nuclear power in Thailand seems to have a similar trajectory. The influence of the U.S.'s *Atom for Peace* program was strikingly present in the beginning period of nuclear research in Thailand. This is indicated in the formation of the Office of Atoms for Peace (OAP) in 1961 followed by the operation of the first Thai research reactor in the following year. The close political relationship between the Thai government and the U.S. government, particularly during the Vietnam War in

which Thailand became a proxy for the United States, constitutes the main factor that led to massive assistance flowing from Washington to Bangkok. Accordingly, Thailand was able to institute a number of research and training centres for nuclear science and technology. As in the case of Indonesia, the attempts to produce nuclear energy in Thailand went through on-off processes. Serious planning steps were taken in late 1966 when EGAT proposed to construct nuclear plants in Bhai Bay, Chonburi. Although the proposal was approved, it never materialized. Thailand has considerable amounts of natural gas and when the cost dropped, this resource rendered nuclear power unimportant. One decade later, EGAT renewed the proposal but it stalled later due to strong public opposition. It took twenty years for a new nuclear power plan to be conceived by OAP. This time around it resulted in the approval to construct a 5–10 MW research reactor in Ongkarak. Despite government approval for the project, the Ongkarak reactor faced a prolonged delay caused by the safety and environmental concerns raised by a group of environmentalists in Thailand. Interesting to note from this historical trajectory, which appears slightly distinct from Indonesia's experience, is that while Indonesia's nuclear initiatives have been largely organized by the nuclear research community, namely scientists and technocrats at BATAN, the promotion of nuclear power in Thailand was centred on the role of the utility company EGAT. Another difference that should be pointed out is the role of the military. Indonesia's New Order regime was a military-controlled regime but the military elites had no influence on the nuclear agenda. Unlike Indonesia, the Thai military elites seem to be more proactive in establishing the production of nuclear power as a national priority. An observation by anti-nuclear activists in Thailand shows that every time a new military regime came to power through a *coup d'état*, it was always followed by the promotion of nuclear energy in the national policy (Bijoor 2007). This does not necessarily mean that the Thai military regime has interest in using nuclear technology for military purposes, as Thailand is bound by the Treaty on the Southeast Asia Nuclear Weapon-Free Zone.¹ What is obvious is how nuclear power is strongly associated with the power of the state, a symbolism that finds a parallel in Indonesia.

Entering the 21st century, nuclear power gained an unprecedented momentum in Southeast Asia. This is part of the global trend of nuclear renaissance (Nuttal 2004) that is spreading through many states, particularly in Asia. Nuclear energy seems to be back on the policy agendas of many countries today (Symon 2008), a fact particularly evident in nations (such as Indonesia and Thailand) with a history of expansive nuclear power generation programs abandoned due to unfavourable socio-economic circumstances. This revival in the support for nuclear power lately suggests a nuclear renaissance, which can be traced to a few broad factors such as increasing energy demand, climate change, economics, and technological advancement. Increasing energy demand stems from the growth in global population. Coupled with extensive and intensive industrial development, electricity consumption will double by 2030. Second, the increasing concern about climate change due to the (potential) impacts of global warming caused by the use of fossil fuels has led experts to advocate the use of alternative energy sources such as nuclear power. Third, the volatile economy of oil (fossil fuels) has made nuclear power more attractive given that the latter is more cost-effective due to its lower carbon emissions. In addition, various incentives for carbon emission reductions have enhanced the perceived economic value of nuclear power. Finally, advances in nuclear research achieved by distinguished experts have meant that the benefits of nuclear power can be more readily tapped and the costs (such as risks) can be more effectively reduced or mitigated, thus presenting nuclear power as a feasible and desirable source of energy (Parameswaran 2009).

In Indonesia, as in other Southeast Asian nations, the nuclear renaissance began in the context of neoliberalized economy guided by the belief that markets are the driving force for wealth generation. The contemporary revival of an Indonesian nuclear programme can be attributed to two factors. First, being a net oil importer, the fluctuation of oil prices on the international market has compelled the government to look for reliable alternative energy sources for large-scale, long-term production. Nuclear power, with its relatively low costs as claimed by nuclear proponents thus presents itself as a highly feasible energy option. Second, as one of the largest producers of greenhouse gases in the world, Indonesia faces

international pressure to mitigate emissions by adopting nuclear energy which is believed to be more environmentally friendly. What is interesting in Indonesia's case is that the perceived techno-economic advantages of nuclear energy are not the sole factors driving the nuclear renaissance that is pushing the Indonesian government to eventually materialize the nuclear dream. The nuclear agenda is to a large extent driven by nationalist sentiments, by the belief that building the first nuclear power plant in Southeast Asia would be an achievement of great national pride and prestige, as well as a symbol of the country's advancement into modernity and progress (Amir 2010). This becomes all the more imperative in the context of an increasingly competitive and rapidly developing (Southeast) Asian economy.

In the case of Thailand, the current key stimulants for renewed interest in nuclear energy stem from the imperative to strengthen energy security, the international pressure to mitigate global warming, and the economic necessity of staying competitive in a global market. Natural gas has been the main source of power production in Thailand, accounting for 72 % of total electricity generation in 2009. Against the background of the need for increasing energy security, alternative sources of energy must be considered to reduce this reliance. In addition, the high dependence on natural gas is further exacerbated by the ever-increasing and volatile oil and gas prices. Coupled with the global climate concern aiming at reducing greenhouse gases emissions caused by burning fossil fuels, nuclear power as an emission-free, alternative source of energy is proving to be highly attractive for economic and technological reasons. Recognizing such a need the Thai government introduced the idea of a nuclear power plant in Thailand's 2007 Power Development Plan (PDP). The PDP is a long-term power expansion plan to secure the country's electricity supply.

Interesting to note is the idea of utilizing nuclear energy is not new for Thailand. As discussed earlier, EGAT has already proposed a nuclear power plant project. Feasibility studies have been performed since then and in 2007, the Nuclear Power Infrastructure Establishment Plan was approved by the Cabinet. At present, a feasibility study comprising six tasks is being carried out. These task areas include energy economics and financing, technical and safety aspects of nuclear power, fuel cycle and

waste management, reactor technology, supplier and fuel supplier selection, a site and environmental study, and finally, human resources development and management aspects. Five nuclear power plant units are set to operate from 2020 to 2028. In this context the contemporary impetus to push ahead with implementation is justified by the need to decrease dependence on natural gas and to reduce greenhouse gases causing global warming. In addition, the extensive scientific research that seemingly suggests the effectiveness and safety of nuclear technology further substantiates and supports the adoption of nuclear energy as an alternative source for power generation.²

Anti-nuclear movements

The growing desire for nuclear power by Southeast Asian states has encountered public criticism. In Indonesia and Thailand, the state's nuclear ambitions are vividly opposed by non-state actors who believe that the proliferation of nuclear power in the region should be halted. Such an adverse response by civil society groups may seem similar to the situation in other regions that have seen the mobilization of anti-nuclear force against the nuclear industry (Flam 1994). To some extent, anti-nuclear movements in Southeast Asia follow the direction of anti-nuclear groups in industrially advanced nations. Groups in Indonesia and Thailand actually make use of anti-nuclear discourse developed by their counterparts in Asia, North America, and Continental Europe. We will discuss this discourse in the next section.

One can trace the history of anti-nuclear movements in Southeast Asia back to the period when nuclear power was first publicly promoted. In Indonesia and Thailand, this is a period when the ideology of developmentalism served as the driving force of social change as a result of which nuclear power was included among the national development priorities. This coincided with the general political trend of Southeast Asia where many countries were under military rule. Indonesia and Thailand share this history of military-controlled authoritarianism. Despite the oppressive power of military authoritarianism, pro-democracy movements in these

countries managed to survive under constant threats from the state. Early anti-nuclear groups in Indonesia and Thailand grew out of such pro-democracy activism. In Indonesia, the embryo of the anti-nuclear movement emerged from an organization of student activists who deemed nuclear power to be a representative of authoritarian force. In the mid 1990s, these activists were able to organize a few events aimed at raising public awareness of the nuclear issue. The Thai anti-nuclear groups were also part of student movements that sought to overcome the oppression of the military rule.

In Indonesia, the seeds of the anti-nuclear movement grew from a small group of student activists in Jakarta and Central Java. Concerns over the possible danger that threatened the life of local communities drove this group to organize opposition against the Suharto government's plans to construct nuclear power plants in the Muria Peninsula, Central Java. These activists managed to gather support later from environmental non-governmental organizations and other politically-oriented groups. This anti-nuclear movement succeeded in raising public awareness during the mid 1990s when the concerted effort of the nuclear energy plans by BATAN were close to implementation. Although the plans were halted for various reasons, the activists were able to show their power against the planned nuclearization. This sort of trajectory is also shared by Thai anti-nuclear activism. The national movement against nuclear power emerged immediately after the Tanin Kraivixien-led government, which received strong military support following the 1976 coup, favoured EGAT's second attempt to install nuclear power plants in the country. The proposal was short-lived, however, as it was terminated only one year after it was approved. In 1977, due to strong opposition from anti-nuclear student activists, Kraivixien decided to postpone the materialization of nuclear power despite firm endorsement from the military. Twenty years later, Thai anti-nuclear movements once again succeeded in halting the construction of the Ongkarak research reactor after they exposed potential safety and environmental hazards to the public, which led the OAP to review the planning details of the plant.

As discussed in the preceding section, the global nuclear renaissance began to spread into Southeast Asia in the 2000s, and Indonesia and

Thailand instantly picked up this global trend. However, nuclear proponents in the two countries must face the challenge from the rising force of anti-nuclear grassroots groups. This time around, the region began to see an extended network of anti-nuclear activism that connects various groups from different backgrounds and at different levels. One of the major players of anti-nuclear movements in Southeast Asia is Greenpeace. This global civil society group represents a new form of geopolitics driven by concerns over threats to humans and the environment caused by science and technology. It is a struggle by non-state groups across national boundaries wielding the power to play what Ulrich Beck refers to as *sub-politics*. Greenpeace arrived in Southeast Asia in 2000 by opening branches in three democratic countries in the region, namely, Indonesia, Thailand, and the Philippines. The presence of Greenpeace in these countries was welcomed by local activists, who were soon to comprise the core of each local organization. The impact of Greenpeace has been profound for anti-nuclear movements in Southeast Asia, particularly in Indonesia and Thailand. One main agenda of Greenpeace in Southeast Asia aims to keep the region free from the proliferation of nuclear power. This is particularly indicated in prioritized campaigns of Greenpeace Indonesia and Greenpeace Thailand. The activity of this international environmental organization supplies critical knowledge and crucial information on nuclear energy that strengthens existing anti-nuclear groups in both countries. Greenpeace Southeast Asia allows anti-nuclear activists in Indonesia and Thailand to become connected organizationally with the result that exchanges of information, ideas, knowledge, and resources are likely to strengthen the opposition to nuclear power.

Side by side with the Greenpeace activists are national environmental groups that have been fighting fervently against the state's nuclear ambitions. In Indonesia, Wahana Lingkungan, known as Walhi,³ is the flagship of environmental NGOs and plays a major role in anti-nuclear campaigns. This organization has extended networks of membership that reach all the way down to the district levels where Walhi activists serve to monitor development projects that cause environmental problems. In the issue of nuclear energy, a special taskforce within Walhi's structure was created to constantly respond to BATAN's nuclear socialization. An

organization of a similar type is also present in Thailand as exemplified by Palang Thai. Unlike Walhi, which is intended to tackle broad problems related to the environment, Palang Thai is a non-profit organization that places its focus on energy issues. It 'works to ensure that the transformations that occur in the region's energy sector are economically rational, and that they augment, rather than undermine, social and environmental justice and sustainability'.⁴ Palang Thai addresses a number of problems that potentially emerge from the use of nuclear energy and thus proposes renewable energy alternatives that are sustainable and safer to humans and the environment. While Walhi and Palang Thai are two environmental NGOs that deal with nuclear issues among other things, other national-level organizations have formed specifically with the intention of curbing the production of nuclear power. Again Indonesia and Thailand have a point in common with the presence of such organizations although their intensity and size varies. The Indonesian Anti-Nuclear Society, known by the acronym 'Manusia' attempts to mobilize intellectual resources to encounter the nuclear discourse propagated by pro-nuclear technocrats in Jakarta. Manusia collaborates with a number of non-profit organizations to examine the legal, environmental, and economic pitfalls of BATAN's proposal. A counterpart of Manusia in Thailand is the Anti-Nuclear Organization of Thailand organized by a group of activists in Bangkok. Although this organization is less active than Manusia it nevertheless continues to monitor developments in nuclear issues and has organized protests in several locations. Both anti-nuclear societies have joined the No-Nuke Asia Forum.

At the local level, the struggle between anti and pro-nuclear groups appears more intense. In Indonesia, the local resistance against nuclear power emerged from concerns over the inability of the government to protect the local communities who live in the vicinity of the future plant. This is the case in Jepara of Central Java, where a group of local activists, intellectuals, artists, and students regularly organize public meetings to raise the awareness of local villagers of the potential dangers of nuclear power. This sort of hostile response also occurs in several villages in Thailand which EGAT has chosen to be potential sites for future nuclear power plants. One such village is Tha Chana of Nakhon Si Thammarat,

where local residents were actively blocking the attempt by EGAT to conduct survey.⁵ Aside from the hostility by local groups against pro-nuclear technocrats, one striking element that marks anti-nuclear movements in Southeast Asia is the engagement of religious groups. This may not be seen in anti-nuclear movements in Western societies, as the issue of nuclear power seems to belong to secular sectors of civil society. In Indonesia, the largest Muslim organization, Nahdlatul Ulama, plays a significant role in criticizing nuclear policy through its branch in Jepara. Using their religious authority the Muslim clerics from Nahdlatul Ulama have decided to claim that nuclear power is forbidden in Islam because its detriments were considered to outweigh the benefits for local communities. In a similar role, although less organized, Buddhist monks in a few villages in Thailand favour local anti-nuclear organizations to show their responsibility for the safety of their adherents.

The effect of campaigns organized by anti-nuclear movements in Indonesia and Thailand has been profound. Although they have not succeeded in completely abolishing nuclear power from the national energy policy, their activities have resulted at least in the postponement of nuclear power production in both countries. Whether these movements will be able to keep the countries free of nuclear power remains to be seen. Nevertheless, as democracy in these countries continues to provide space for public criticism the movements will continue to play a major role in raising public awareness of the high risk of nuclear power.

Risk discourse

Risk discourse essentially refers to how nuclear risks are perceived and talked about. The definition of nuclear risk varies according to different actors. Risks perceived by one social group are likely to be given different interpretations by another group whose values and knowledge are structured by different lived experiences and social conditions (Douglas & Wildavsky 1983). The variation in the definition of nuclear risk is most pronounced between experts and lay people. Here, it is interesting to understand the discrepancy between expert and lay epistemology, or

knowledge systems, towards nuclear technology that shape the contestation between pro and anti-nuclear groups in Southeast Asia.

It is relevant to situate the discourse of nuclear risk in Southeast Asia within the framework of the risk society as conceptualized by Ulrich Beck (1992). The proliferation of nuclear risk in Southeast Asia is part of the growing production of manufactured risk that characterizes the culture of late modernity, not only in industrially advanced societies but also in emerging and industrializing ones. The imperatives to pursue accelerated growth in economic production render nuclear energy inevitable (see Winner 1986). Concealment of risk is further reinforced by technoscientific arguments that are inclined to underscore the benefits of nuclear energy as compared to other sources of energy, while downplaying the potential risk. As Beck has argued, technoscience in late modernity serves to produce not only solutions to existing problems but also a new kind of risk. Our scientific knowledge is sadly limited in the understanding of the complexity of risk caused by rampant production of science and technology. In the context of nuclear risk, the interests of the nuclear industry, scientific experts, the state, and private sectors have created a condition where nuclear risk analysis is presented as a strict domain of experts. Thus, the perception of nuclear risk by scientific experts overrules the interpretation of nuclear risk by the lay public. The consequences of such unilateralism are profound when situated in the context of rising democracy in Southeast Asia. The absence of institutional arrangements intended to facilitate a healthy dialogue between governmental experts and civil society leads to a situation of distrust and hostility between the two sides. On the one side, the inability of technical experts not only to communicate, but more importantly to comprehend how the public perceives risk from its own points of view is a factor that escalates tensions and disagreements with the public. On the other side, organized civil society groups that constitute anti-nuclear alliances were able to mobilize multiple resources from a variety of grassroots sources indispensable for examining the scientific claims of the experts on nuclear risk.

The engagement of civil society groups in the discourse of nuclear risk results in public assessment of nuclear risk organized and conducted by non-state experts. Relying on civic epistemology (Jasanoff 2005), the

public assessment of nuclear risk examines both the technical and non-technical dimensions of risk in nuclear power plants. It questions, for example, the safety aspect of nuclear power plants in relation to geological stability as shown in Indonesia's plans to construct nuclear power plants on the earthquake-prone island of Java. Economic calculations are also examined, for example, by anti-nuclear activists in Thailand who disagree with EGAT's projection of the financial benefits of nuclear power plants. What is more important to note is that the interpretation of nuclear risk by anti-nuclear activists diverges from that of pro-nuclear technoscientific experts. While the latter draw their analysis of nuclear risk from technical and economic factors, the former broadens the context of nuclear risk to social and political considerations, thus rendering nuclear risk as not only embodied in technical arrangements of the nuclear facility but also in institutional arrangements involved in its planning, operation and control.

In Indonesia, the BATAN experts' technocratic view holds that nuclear risks are minimal and nuclear power reactors are safe based on scientifically-tested systems and technical calculations. As such, in order to gain public support and acceptance, education and distribution of knowledge of nuclear safety standards are assumed to be the key to changing negative public opinion about nuclear energy use. Such quantitative concepts of risk assessment differ from the layman's perception of nuclear risk, which is rooted in a broader social context where issues of risk and distrust interact to produce scepticism toward the government's decision to go nuclear. In the view of many anti-nuclear activists in Indonesia, the source of the problem in the government's plans to produce nuclear energy comes from the government itself. The corrupt governmental bureaucracy and the history of poor public service management have undermined the public's trust in the state's competence and capacity to implement and deliver the nuclear project credibly and safely (Amir 2009). As such, the lay public's assessment of risk stems from an understanding of the broader political and social system rather than a narrowly defined idea of risk based on scientific and mathematical calculations.

In Thailand nuclear risk is rarely discussed by the political elites and technocrats whose interest is in developing nuclear power infrastructure in the country, or it is defined in an ambiguous manner, reassuring the

public that '(nuclear) risks are overblown with new technology that has significantly reduced the possibility of radiation leaks'.⁶ A survey of news reports also reveals that the experts often downplay nuclear risks and emphasize the benefits of nuclear energy instead. In fact, Thailand's Energy Minister claimed that 'nuclear energy is very safe' and EGAT will launch a public education campaign on the merits of coal and nuclear energy. Nuclear risk is thus presented to the public as minimal and negligible as compared to the numerous benefits that nuclear energy can bring to the development of Thailand. On the other hand, opponents of nuclear technology such as those from NGOs and interest groups highlight the inherent health risks involved in utilizing nuclear energy. Some members of the lay public adopt a 'not-in-my-backyard' (NIMBY) mindset in which many oppose the building of nuclear plants near their homes for fear of potential health risks and undesirable impacts like noise and environmental pollution (Neo 2009). In addition to health problems, the political instability of the government is a point that anti-nuclear groups highlight as one of the main sources of risk.⁷ Over the past five years, Thailand has been going through a volatile political situation due to conflicts between elite groups that severely affect how the government works. The prolonged conflict between the red shirts and the yellow shirts alarms civil society groups who perceive potential threats from the instability of the political system as compromising the safety of nuclear power plants.

Conclusion

Focusing on the case studies of Thailand and Indonesia, this chapter has outlined Southeast Asia's nuclear renaissance, analyzed the prevailing nuclear risk discourse and examined in detail some of the anti-nuclear movements led by civil groups in response to the growing rhetoric and potential materialization of nuclear use. The chapter has essentially illustrated three main ideas drawn from the above discussion. First, nuclear power is no doubt an emerging technology in Southeast Asia, with its feasibility and possible advantages being increasingly advocated.

Second, the context of rising democracy and hence a more liberal political economy situation has presented opportunities for civil society groups to challenge the rise of nuclear energy. Finally, what constitutes nuclear risks is contested by the multiple societal groups and organizations whose definitions and perspectives on potentially negative effects of nuclear use vary.

With the rising standard of living of Southeast Asians leading to a greater demand for energy, and scientific developments leading to new global trends in energy production, nuclear energy has gained increasing popularity and feasibility as an alternative energy source in Southeast Asian political economies where energy security issues and rising costs of fossil fuels loom large and real. These factors have prompted previous unsuccessful or disrupted attempts of launching nuclear energy in Southeast Asia to be revisited and consequently a revival of adopting nuclear energy as a highly plausible energy source. The many ongoing and rigorous feasibility studies of nuclear energy plans carried out attest to the growing likelihood of nuclear energy as an electricity supply option. Finally, apart from practical reasons, the emergence of nuclear technology to be adopted by Southeast Asian economies is read by many as an immaterial and symbolic representation of a progression towards a more advanced (as reflected by the utilization of a high-tech energy source compared to traditionally burning fossil fuels) stage of the developmental paradigm where technological supremacy can translate into political clout in the international economy.

At the same time, the changing political atmosphere of the region where there is a gradual shift towards a more liberal and democratic civil society sphere also suggests that the capacity for nuclear controversies has been broadened. The multitude of various formal or informal associations and societies reflect the growing engagement of not just the experts' scientific concern with the nuclear issue, but also the lay public's negotiation and contestation of the nuclear plan. The rising democratic social patterns of Southeast Asia imply that the ruling powers who wish to materialize the nuclear plan will have to reckon with possible dissent from an increasingly committed general public. A rising democratic socio-political environment is tied into the varying definitions of what

194 *Sulfikar Amir & Neo Shar Ni*

constitutes nuclear risks. A more actively engaged lay public suggests a greater multiplicity of stances towards nuclear risks as this public brings with it diverse perspectives on how nuclear risk is defined. Broadly speaking, key to note is the different concepts of nuclear risk between the lay public and the experts. For the lay public, nuclear risk is to be perceived within a broader social and political context where the dynamics of the relationship between the ruled and the ruler (such as level of trust and confidence in competence and stability of the government) can affect how nuclear power is viewed. For the experts and rulers, risk is very often defined in terms of scientific and technical calculations built on a technocratic epistemology. In sum, for any successful and effective eventual materialization of nuclear power use in Southeast Asia, the ruling elites will have to face possible confrontations with the increasingly engaged lay public, taking into account the multiplicity of civic rationalities towards nuclear risk

Notes

- 1 The treaty was signed in 1995 by ten members of the Association of Southeast Asian Nations.
- 2 Interview with Somporn Chongkum, Bangkok 30 July 2009.
- 3 See www.walhi.or.id
- 4 See www.palangthai.org
- 5 See 'Nuclear power plant faces strong resistance' http://www.nationmultimedia.com/2009/11/12/business/business_30116406.php Retrieved 20 October 2010.
- 6 *Tribune Business News*, 10 March 2008.
- 7 Interview with Tara Buakamsri, Bangkok 16 July 2009.

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