ISLAM AND THE SOCIAL CONSTRUCTION OF RISK: A DISCOURSE ANALYSIS OF THE FATWA TO THE MURIA NUCLEAR POWER PLANT IN INDONESIA

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Keywords: Risk, Nuclear Power, Indonesia, Islam, and National Identity
Abstract: academia audience. This thesis analyzes Badan Tenaga Atom Nasional (BATAN, the Indonesia National Nuclear Energy Agency and the the Ulama of Pengurus Cabang Nahdlatul Ulama (PCNU, the Islamic scholars of District Branch of Nahdlatul Ulama) Jepara’s different risk assessments of the purposed nuclear power plant in Muria, Indonesia. Using a discourse analysis combined with the social construction of risk from a science and technology studies (STS) perspective, this thesis focuses on the Ulama’s risk assessments, and looks at how the Islamic interpretations of fiqh (Islamic Jurisprudence) and the knowledge of perceived risk of the State’s nuclear inexpertise, environmental degradations, the type of the reactor, and foreign technological dependence are used simultaneously by the Ulama of the PCNU Jepara to construct maslahah (benefits) and mafsadah (disadvantages) on the fatwa to the proposed Muria nuclear power plant. I argue that the different risk assessments converge on the proposed Muria nuclear power plant, which are based on not only scientific and political discourse but also Islamic beliefs. In contrast to alternative forms of knowledge, Islamic belief not only has orientations to the social world but also the afterlife. I found the Ulama’s concerns regarding perceived risk of the State’s nuclear inexpertise did not change whether from the authoritarian regime to the democratic model. Across the contesting political regimes, the Ulama articulated their concerns of perceived risk of the State’s nuclear inexpertise through distrust of the State’s capacities and capabilities in handling a commercial nuclear power plant. Furthermore, the different ways of constructing risk through BATAN and the Ulama depict the contested meaning of national identity after the Indonesia independence. Lastly, this thesis offers a unique view of studying Islam and the social construction of risk from a non-Western context.
Islam and the Social Construction of Risk: A Discourse Analysis of the Fatwa to the Muria Nuclear Power Plant in Indonesia

Abstract: general audience. As a response to *Badan Tenaga Atom Nasional* (BATAN, the Indonesia National Nuclear Energy Agency)’s plan to construct a nuclear power plant in Muria, Indonesia, on September 2\textsuperscript{nd} 2007 the *Ulama* (Islamic scholars) of Jepara’s District Branch of *Nahdlatul Ulama* (PCNU Jepara) declared a *fatwa* (legal opinion based on Islamic interpretations) that the proposed nuclear power plant was *haram* (forbidden in Islamic law). The *fatwa* is mainly concerned with the perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence, which affect the local community in Muria. Using a discourse analysis combined with the social construction of risk from a science and technology studies (STS) perspective, I analyze how these risks are constructed by the *Ulama*. The thesis demonstrates the different risk assessments converge on the proposed the Muria nuclear power plant is based on not only scientific and political discourse but also Islamic beliefs. In contrast to alternative forms of knowledge, Islamic belief not only has orientations to the social world but also the afterlife. Furthermore, the different ways of constructing risk through BATAN and the *Ulama* depict the contested meaning of national identity after the Indonesia’s independence. Lastly, this thesis offers a unique view of studying Islam and the social construction of risk from a non-Western context.
Dedication

This thesis is dedicated to my dad and mom.

"You are fortunate indeed, my students,' he said, 'to be able to witness the beginning of the modern era here in the Indies.' Modern! How quickly that word had surged forward and multiplied itself like a bacteria throughout the world (at least, that is what people were saying). So allow me also to use this word, though I still don't fully understand its meaning." -- Pramoedya Ananta Toer in This Earth of Mankind
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## References
Chapter 1. Introduction

I grew up in a rural area in Indonesia where some people lacked electricity access. When I was a child, my grandfather’s house only had electricity available for a maximum of 10 hours a day. In 2005, I traveled to Eastern Indonesia and found that many people could not access medical assistance because of the limited electricity. In contrast, I discovered some places in Western Indonesia had huge access to energy supplies, which were also supplied from fossil fuels in Eastern Indonesia.

Furthermore, as an Indonesian who was raised in a Muslim family, my parents encouraged me to attend a regular activity called *mengaji* (reciting Al Qur’an). I remembered some Ulama (Islamic scholars) interpreted QS Al Maidah verse 3 to "God forbids us to drink blood," as meaning human beings must avoid exploiting the environment, including other humans. Using Islamic interpretations, these Ulama often warned us against promoting issues of social justice. On some occasions, Ulama interpretations went against the state’s motivation in developing its economy, which adopted the power of science and technology: however, sometimes these Ulama supported scientific and technological development with the goal of economic development. I saw massive, often controversial, development projects increase the Ulama’s awareness of environmental degradation, such as the risks of the construction of a dam. These Ulama were becoming aware of the risks that come along with industrial development, including the construction of nuclear power plant.

While social studies of nuclear power technologies have persisted for decades across multiple disciplines, only a few studies have considered the controversy involving
concerns of the *Ulama* regarding the risks of nuclear power. These experiences are the main reason that led me to write this thesis. I analyze the risks of technology application in Indonesia, the largest Muslim country in the world and one that is situated along the "Pacific Ring of Fire," lined with nearly a hundred active volcanoes and a high chance of earthquake and tsunami hazards.

1.2. The Context of Indonesian Islam and the Social Construction of Risk on the Proposed Muria Nuclear Power Plant in Indonesia

While constituting the largest Muslim population in the world, Indonesia does not claim to be an Islamic state. However, *Pancasila* is the foundational philosophical theory of the Indonesian state, emphasizing God as the top priority. In addition, the influence of Islam in public policy can be seen in the establishment of the *Majelis Ulama Indonesia* (MUI, the Council of Indonesian 'Ulama') as a body of the Indonesian government in July 1975. Through this council, the *Ulama* have advisory roles in supporting the government policy. Accordingly, Ichwan stated, "MUI's political activities are limited mostly to the issuance (and non-issuance) of fatwas and non-legal recommendations known as *taus*yahs (Ar. tawsiya).”¹

However, there are various Islam organizations in Indonesia. Several organizations have *Ulama* who stand with the Indonesian government’s plans, but sometimes oppose them. In Indonesia, *Nahdlatul Ulama* (NU) is the largest Muslim

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organization, which has *Pengurus Cabang Nahdlatul Ulama* (PCNU, the District Branch of *Nahdlatul Ulama*) in each region. The *Ulama* of PCNU sometimes have different views with the State. In Muria, the *Ulama* of NU have been opposing the Indonesian government’s plan to construct a nuclear power plant since the 1990s.

In 1970s, *Badan Tenaga Atom Nasional* (BATAN, the Indonesia National Nuclear Energy Agency) proposed building a nuclear power plant. Having considered the technical and socio-economic impacts of nuclear power plant, BATAN aimed to construct a nuclear power plant for commercial purposes in Muria, Central Java, Indonesia (the Muria nuclear power plant). BATAN is a nuclear agency under the Indonesian government. BATAN has been operating nuclear reactors in Bandung, Yogjakarta, and Serpong since 1965. This institution also has the authority to conduct nuclear research and to control the use of nuclear technologies in Indonesia.

The Muria nuclear power plant proposal resulted from a government policy decision-making at the national level, which saw energy supply, economic growth, and modernization as the main reasons to construct a nuclear power plant. During that time, the Indonesian government under the Suharto authoritarian regime oriented towards a national development agenda. Hanneman and Oki noted the Suharto administration adopted the national development agenda in terms of economic production: Indonesia was more open to global economy/investment and the state development agenda was based on capital accumulation and modernization of culture.² Furthermore, the Suharto

² Hanneman Samuel & Oki Rahadianto Sutopo, “The Many Faces of Indonesia: Knowledge Production and Power Relations” *Asian Social Science*; Vol. 9, No. 13; 2013 p 290
administration controlled energy distribution and had more energy supply from oil: therefore, the nuclear power plant had not yet been built in Muria.

After the Suharto authoritarian regime stepped down in 1998, and oil production had decreased, BATAN pushed to continue promoting the Muria nuclear power plant as energy supply. However, the majority of the local people were against the BATAN plan in Muria. The public resistance to the proposed Muria nuclear power plant was primarily driven by perceived risk of the State’s nuclear inexpertise. ‘The State’s nuclear Inexpertise’ refers to the questions of the State’s capacities and capabilities to propose, handle and maintain a nuclear power plant. These concerns are based on the lack of trust towards State’s (including BATAN) expertise in handling nuclear power plant. In particular, it relates to the local community concerns about the State’s incapacities to handle high-risk technology.\(^3\) Since then, the public attention for the resistance of the proposed Muria nuclear power plant has increased. On September 2\(^{nd}\) 2007, the Ulama of Pengurus Cabang Nahdlatul Ulama (PCNU, the Islamic scholars of Jepara’s District Branch of Nahdlatul Ulama) declared a fatwa (legal opinion based on Islamic interpretations) that the construction of nuclear power plant in Muria was haram (forbidden in Islamic law).\(^4\)

A *fatwa* is an interpretive opinion based on Al-Quran and Hadith (the reports


based on the Prophet Muhammad's words, attitudes, actions) to answer questions regarding people's problems. To be defined as a *fatwa*, the opinion must be given by a Muslim jurist (a person who has qualifications to issue a *fatwa*). In the proposed Muria nuclear power plant, the *Ulama* of the PCNU Jepara as well as Muslim jurists reached their decision using *maslahah* and *mafsadah* (consideration of public interests in advantages and disadvantages) of the principles of *fiqh* (the Islamic laws).

The *fatwa* regarding the proposed Muria nuclear power plant is mainly concerned with perceived risk of the State's nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence, which affect the local people; as Suleiman argues, the concept of risk is a main issue in the construction of nuclear power plants in Indonesia. In this thesis, I rely on the concept of risk within Science and Technology Studies (STS) scholarship, which is often used in relation to the issues of science and technology, such as nuclear technologies. Particularly, I refer to Deborah Lupton's constructivist definition of risk, which states, "risks are the value-laden judgments of human beings concerning these natural events or possibilities." This concept focuses on the politics of risk. I treat risk as a socially constructed concept.

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Therefore, this thesis is about the politics of risk which means how risk is politicized, not a study of the real danger of the proposed Muria nuclear power plant.

1.3. Academic Objective

As part of the Global South, Indonesia’s history is entangled with the history of colonialism. Before the Indonesia independence in August 1945, the Portuguese, the Dutch, the Spanish, the British, and the Japanese had colonialized “Indonesia” since the 16th century. In the history and social science scholarship, Mrazek’s study of Indonesia technological politics during the colonial era takes Indonesian nationalism as fundamental to his analyses.7 Furthermore, some historical studies of the role of Islam in Indonesia depict the duty of Ulama in engaging with the social-political issues, which has been presenting since the colonial era.8

Situated in the post-colonial period, the fatwa reflects the Ulama's response to risks of the sophisticated nuclear power plant. The fatwa has the concepts of maslahah and mafsadah as the main foundations of the risk assessment. Those concerns informed the way in which certain issues are identified as risks, which can be different over actors and time. Given that story, a central objective of this thesis is to investigate how the principles of Islamic jurisprudence along with perceived risk of the

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State’s nuclear inexpertise, environmental degradations, the type of the reactor, and foreign technological dependence are used simultaneously by the Ulama of the PCNU to construct maslahah and mafsadah on the fatwa to the proposed Muria nuclear power plant.

1.4. Thesis Structure

Following the introduction, Chapter 2 provides a literature review of the relationship between religion and technology, the social construction of risk, and Islamic studies regarding fatwa in Indonesia. I describe some accounts, which deal with the issues of Islamic jurisprudence, scientific controversies, and social construction of risk theories concerning science and technology studies. Chapter 3 is the methodology chapter that discusses a discourse analysis to the fatwa, data collection, the process of analyzing data, and problem resolving in this analysis. In Chapter 4, as the main analysis of this thesis, I describe a social shaping of Islamic jurisprudence and the social construction of risk in framing the fatwa. Lastly, Chapter 5 contains a conclusion section that discusses the main points of the thesis.
Chapter 2. Literature Review

2.1. Introduction

This chapter reviews studies of religion and technology, the social construction of risk, and the Islamic fatwa, which relate to my research objective. My aim of this review is to position the thesis. In the multiple disciplines of social science and humanities, I intend to review the conceptual issues raised by studies of the relationship between religion and technology, the social construction of risk theories, and Islamic fatwa and then describe their contributions to the thesis.

2.2. The Position of the Thesis within Relevant Literature

Although there is a broad range of topics in technology and religion, the study on the influence of religion on technology and vice versa remains a marginal topic within science and technology studies (STS) scholarship. The existing literatures regarding religion and science and technology have most often highlighted how they influence or conflict with each other. For example, David F Noble investigates how religion, especially Christianity, had an important impact on the development of technology in the West. Noble provides a study of how the religious vision of transcendence and salvation motivated the development of technology.9 Noble demonstrated how the development of technological programs, such as nuclear weapons, space exploration, genetic

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modifications, and artificial intelligence are not separated from religious dogmas. His exploration of “the ally” of religion and the development of nuclear weapons, space exploration, genetic modifications, and artificial intelligence in the West depends mostly on secondary data and biography of scientists and engineers. In my opinion, Noble’s study is lacking an analysis of the role of scientific institutions in shaping those technology programs.

In contrast to Noble’s historical works, I adopted an STS approach, which included a historical analysis of Indonesia’s nuclear program and its relation in shaping the understanding of risks of the proposed Muria nuclear power plant. I extend Noble’s study by examining how two different institutions, which are BATAN and the PCNU shaped risk assessments of the proposed Muria nuclear power plant in the context of the non-West.

To look at the ways of the interaction of politics, economy, and culture influence the shaping of perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence, I am indebted to Mediating Piety: Technology and Religion in Contemporary Asia (edited by Khek Gee Lim, 2009). This volume of essays depicts a study of the relationship between religion and technology in the intersection of identity formation, politics, the state, and spirituality.¹⁰ Broadly, the book covers social theories of technology as applied to spiritual and religious practice in Asia. In relation to this thesis, the book,

¹⁰ Francis Khek Gee Lim (ed), Mediating Piety: Technology and Religion in Contemporary Asia, (Brill; 2009)
especially chapter 4 and 5, offers key analyses of the relationship of technology, religion, and nationalism. However, the book missed the role of the history of the colonialism in shaping some Asia countries. In contrast, I intend to touch on Indonesia’s colonial experiences to risk assessments of the proposed Muria nuclear power plant.

In a study more specifically focused upon the influence of physician religiosity on their recommendation for or against medical procedures which are ethically controversial from the vantage point of Islam, Mahdi et al. argue that the opinions of Islamic jurists and the reading of scripture influenced the physicians’ medical procedure, including tubal ligation, abortion, and porcine-based vaccine. Moreover, in studying the intersection between Islamic *fatwa* and scientific controversy, Noor Munirah Isa and Man Saadan provide a useful analysis in understanding the categorization of *maslahah* and *mafsadah* in a *fatwa*. Examining the case of Genetically Modified Foods (GMFs), their study depicts how Islamic interpretations of *Fiqh* have prioritized between *maslahah* and *mafsadah* in scientific issues. In contrast to other prioritizations, such as economic, which tended to be secular, Islamic principles of *maslahah* and *mafsadah* have a relation to *ushul fiqh*, concerned with how it can bring good karma to the doer’s life and afterlife. It also invokes the concept of remembering God.

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Although their study assists me in analyzing *maslahah* and *mafsadah*, in the *fatwa*, which shaped by the social and cultural process, these accounts have not answered the question of what the political meaning behind the Islamic interpretations of *fiqih* to scientific issues. Furthermore, I intend to discuss further the political meaning behind the *fatwa* to the proposed Muria nuclear power plant.

In addition, some studies have framed the *fatwa* as a public resistance to the proposed Muria nuclear power plant. However, these recent accounts have not answered technological issues behind the *fatwa*. My thesis is to complete these studies by exploring technical issues through an investigation of what kinds of potential hazards were categorized as risk from the perspective of the *Ulama*, and how risk was selected and conceptualized in the *fatwa*.


The word of risk is originally from the Latin called *risco* and sailors entering uncharted waters used it firstly as a navigational term. Since then, the concept of risk has been developing in multiple disciplines. In analyzing perceived risk of the State’s nuclear inexpertise, environmental degradations, the type of the reactor, and foreign technological dependence in shaping the *fatwa*, I adopted Lupton’s risk, as “the value-

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laden judgments of human beings concerning these natural events or possibilities.\textsuperscript{15}

The judgments are shaped by social and cultural processes. Using this way, I treat risk as a social construction. For this reason, I review risk studies in STS scholarship, particularly from social constructivist theories.

According to Kathleen Tierney, a sociological perspective of symbolic interaction and social construction of reality (1966) is the root of social construction of risk. Accordingly, Tierney argues:

> The key insight of social constructionism is that both perceptions and social activity are based not on our direct apprehension of 'objective reality' (risk) but rather on systems of meaning that are provided by culture, developed through social interaction, and produced through claim-making activities that advance particular views of the world.\textsuperscript{16}

The perspective of the social construction of risk is useful to observe the rationale of people in emphasizing some risks while sometimes ignoring others. In the thesis specifically, why the fatwa focused on perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence as principal sources of concern while BATAN did not see them as issues.

In the perspective of the social construction of risk, Lupton notes three main group scholarships researching risk, which are Douglas and Wildasky (cultural/symbolic perspective), Beck and Giddens (risk society and reflexive modernization), and Foucault

\textsuperscript{15} Deborah Lupton, \textit{“Risk and sociocultural theory…”} 17

\textsuperscript{16} Kathleen Tierney, \textit{The social roots of risk: Producing disasters, promoting resilience}. (Stanford, California: Stanford Business Books, an imprint of Stanford University Press. 2014), 26
In this thesis, I adopt Douglas and Wildavsky’s approach that examines the different concern about pollution between the American people and the Hima tribe. I use their way of identifying the different perceived risk between the Ulama and BATAN. Furthermore, I treat risk as part of shared cultural understandings and practices of the Ulama. In other words, risks of the proposed Muria nuclear power plant are not individualistic but rather shared within the group. Accordingly, Douglas and Wildavsky argue risk as a socially/culturally-constructed phenomenon, not driven by personal preferences or properties of risk objects. Cultural adherence and social learning have a role in defining something as risk and how dangerous it is. The point of this perspective is not emphasized by real risks or not. Rather, using this perspective, it looks at the ways in which the concept of risk operates and describes how we deal with the future of danger and hazard.

Treating the fatwa as the product of the Ulama of the PCNU, I also adopt a sociological analysis of risk, which tends to emphasize social organization as an institutional practice in simultaneously producing, categorizing, and distributing risk. In addition, to analyze the politics of expertise in categorizing risk, I return to Ulrich Beck’s reflexive scientization. Accordingly, Beck states reflexive scientization as, “science confronts with itself, that is its own products and defects, and as a result our relation to

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17 Deborah Lupton, Risk. (New York: Routledge, 1999), 25-26


science becomes scientized.\textsuperscript{20} Using Beck’s reflexive scientization, I see the \textit{Ulama} as a new participant who deployed their religious expertise as a resource in politicized risk over BATAN’s claims in decision making of the Muria nuclear power plant.

In categorizing risks of perceived risk of the State’s nuclear expertise, environmental degradation, the type of the reactor, and foreign technological dependence, I use Douglas and Wildavsky’s identifications of risks categories: (1) Foreign affairs: the risk of foreign attack or encroachment, war, and loss of influence, prestige, and power; (2) Crime: internal collapse, failure of law and order, violence versus white-collar crime; (3) Pollution: abuse of technology, fears for the environment; and (4) Economic failure: loss of prosperity.

For Douglas and Wildavsky, some groups may have a different concept of risk, which depends on sociocultural and historical context. Accordingly, they argue that, “at the elite level of public debate, the actors-political parties, interests groups, government officials do not uniformly attach the same dangers to different objects. People who are most concerned about attacks from abroad, for instance, tend to be less worried about pollution at home.”\textsuperscript{21}

Following the cultural and symbolic perspective, Herbert Gottweis offers a social constructivist approach by analyzing different assessments of risk. Gottweis stresses that risk does not have a singular meaning,

Risks do not exist. They come into existence through complex multiple processes of inscription, interpretation, and boundary work carried out by a


\textsuperscript{21} Douglas and Wildavsky. “Risk and Culture… “14-15
variety of actors and informed by scientific and political discourses. Typically, different actors involved in a risk-regulation dispute tell different risk stories. In this thesis, I identify BATAN as another actor who constructed the risk of the proposed Muria nuclear power plant and the Ulama as the main actor who responded to the agency’s claims. My analysis does not ask whether the risks were “real”, since each group has different risks assessments that in turn constitute their realities. As Ewald argues, “nothing is a risk in itself; there is no risk in reality. However, on the other hand, anything can be a “risk”; it all depends on how one analyzes the danger, considers the event.” Therefore, to analyze the different risk assessments, constructivists treat risk as a social product of a certain sociocultural and historical context.

In the Indonesia context, Sulfikar Amir’s study in the politics of nuclear power plant in Indonesia offers an analysis of structural factors in risk production by looking at the introduction of sophisticated technology in the non-Western world. However, Amir doesn’t include the fatwa as part of the main analysis, instead focusing on the role of the state in escalating risk. His study maps of the social structures of the actors involved in the proposed Muria nuclear power plant. Differently from Amir, I focused on the Ulama and BATAN as the main actors, who constructed different risk on the fatwa.

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2.4. The Previous Studies of the Fatwa.

To date, the fatwa has not been studied as the main analysis in social studies. In this sub-chapter, I discuss some relevant studies related to the fatwa and position the social construction of risk within these studies. Regarding policy studies, Richard Tanter examines the role of the fatwa not only in its relation to the state but also within the Islamic community in Indonesia. His study tends to see the role of fatwa through a lens of the Nahdhatul Ulama (NU), which helps us to understand the institution concerns. He also looks at the making of the fatwa, and identifies three remarks of the fatwa. First, Tanter notices the fatwa depicts the alliance of the dominant Islamic group with local people, Non-Government Organizations (NGOs), business and political groups to oppose the national government's plan. Secondly, the fatwa is the first decision from NU as the largest Islamic organization. Lastly, the fatwa shows a process of cultural renewal of Islam in Indonesia.25 His institutional analysis informs us the fatwa has a relation to social practice not only in local Muria, but also at the national level.

The second study is by Sulfikar Amir. Although Amir has not particularly examined the fatwa, he looks at the role of the fatwa within the relationship between the state and technology. The fatwa can be seen as a political move of the Ulama of PCNU because the local people were largely opposed to the Muria plant.26 In addition, he notices the state as an actor in using technology to govern society. As Amir argues that,


26 Amir, “the State and the Reactor…”p.142
the state institution serves as a venue that technical elites use to impose a set of predetermined goals on society, along with the risks involved in achieving these goals. Because technology is inherently political, these technical elites must be recognized as political actors who play a prominent role in governing society through technological means.\textsuperscript{27}

While, Amir does not detail the risks here, I want to focus on perceived risk of the State’s nuclear expertise, environmental degradation, the type of the reactor, and technological foreign dependence on the \textit{fatwa}.

Using a social movement framework, Achmad Uzair Fauzan and Jim Schiller study the \textit{fatwa} as part of the Indonesian anti-nuclear movement. Still, the \textit{fatwa} depicts Islamic laws in dealing with the contemporary issues of nuclear technologies.\textsuperscript{28}

Regarding the role of Islam in the Indonesian anti-nuclear movement, Hisanori Kato provides a comparative analysis of global and local civilization in the controversy over the construction of the Muria nuclear power plant. Kato compares the cases of the Muria plant and Iran’s development of nuclear technologies and points out Islam neither supports nor opposes nuclear technologies. In other words, Islam has a neutral role in nuclear issues.\textsuperscript{29} In an analysis of the NU in responding the proposed Muria nuclear power plant, using a sociological analysis, George Junus Aditjondro argues that the debate between proponent and opponent groups over the construction of the Muria nuclear power plant largely represents the bottom class of the NU community in Muria.

\textsuperscript{27} Ibid p.146

\textsuperscript{28} Achmad Uzair Fauzan & Jim Schiller. "After Fukushima…"p.20

However, the NU members at the national level, who opposed the *fatwa*, represent the upper class. These alternative social structures represent dissimilar interests that emerge in the risk assessments on the *fatwa*.

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30 George Junus Aditjondro, “Polarisasi Seputar Fatwa NU atas PLTN Muria” (A Polarization of The NU’s Fatwa and the Muria Plant), *Sinar Harapan*. March, 14, 2008
Chapter 3. Methodology

In this chapter, I describe and justify the methodology of my thesis. I chose discourse analysis, as my current project focuses on how risk is constructed within the text of the PCNU Jepara’s fatwa, instead of ethnographic data. In her study of risk, Lupton notes, "a discourse may be understood as a bounded body of knowledge and associated practices, a particular identifiable way of giving meaning to reality via words or imagery." Discourse analysis is widely used in STS scholarship on the social construction of risk. The following section of this chapter explains my data selection and collection strategy. The third section outlines my data analysis, in particular my discourse analysis of the fatwa. The final section addresses potential limitations in analyzing my data. I describe the problems that I faced during the analysis and how I dealt with the issues.

3.1. Obtaining the Primary Data

As part of my research objective in observing risk discourse regarding the fatwa, I examine primary data including the language of the fatwa issued by the Ulama of the PCNU Jepara on September 2nd 2007, the selected documents and archives which published from 1958 to 2016 by BATAN, as well as a selection of the Indonesian government’s policy documents regarding nuclear technologies from 1954 to 2010, and President Sukarno: Selected Speeches 1958-1966, collection of Professor Angus McIntyre, LaTrobe University, Bundoora Campus, Australia.

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31 Deborah Lupton "risk..." 15
In addition, I analyzed the *Jakarta Post*, the English newspaper in Jakarta and *Suara Merdeka*, a local newspaper in Central Java, academic books and journals about social construction of risk, nuclear technologies, and Indonesia nuclear program, and Islamic studies, the selected BATAN's magazines which published between 1963 and 2016, and *CNN Indonesia* news articles covering the Indonesia nuclear program, and the translation online of Al-Quran on Quran.com for the secondary data.

The majority of the primary data is in the Bahasa Indonesia language. As a native of Indonesia, I was better able to understand a cultural relation between the Ulama of the PCNU and the local people which these two groups represent the Indonesian communal identity on the text of the fatwa. I chose the data based on my argument that the risk discourse of the fatwa was constructed by forms of knowledge of nuclear technologies and the principles of Islamic jurisprudence. Secondly, for verification purposes, I needed to consult diverse sources regarding the proposed Muria power plant from BATAN as well as the Indonesian government and the Ulama of the PCNU Jepara.

First, I collected the primary data through visits to local libraries in Indonesia during May 2015, the Indonesian National Library in June 2015, inter-library loans through Virginia Tech, and emails from an Indonesian friend in November 2015. In the first step of my research, I surveyed the existing literature for secondary data sources and noted their bibliographies. After that, I collected the sources via Internet databases. I expected this method would also be useful to collect the primary data that I need to analyze. Since by then I was in the United States, I continued conducting archival
research and collecting documents through the Virginia Tech’s inter-loan library. In Summer 2016, I had a month-long visit in Indonesia and obtained three unpublished theses regarding the controversy over the construction of the Muria nuclear power plant that I could not access in the USA. In the fall of 2016, I returned back to the United States with the data and started my analysis.

3.2. Data Analysis

After formulating my research objective and collecting source materials, I treated the *fatwa* as a form of discourse. I applied this conception by using the *fatwa* as a way of talking about and understanding the meaning of the risk of the proposed Muria nuclear power plant. Adopting Jonathan Potter’s explanation of discourse analysis, my analysis is based on an argument that a risk discourse is socially constructed. According to Potter, the discourse analysis that emerged within the sociology of scientific knowledge was not focused on linguistics or genealogies, but instead, “the key focus was epistemic, and the analytic focus was on the role of talk and texts in constructing the social world.”

32 The social constructivism in my analysis supports an argument that risks are socially constructed in the discourse of the proposed Muria nuclear power plant.

I employed four main methodological tools in my data analysis. First, I analyzed data to frame the context of the proposed Muria nuclear power plant, as discussed in Chapter 1. Using the primary data, I developed the social and historical context that

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framed the proposed Muria nuclear power plant and its risks. I analyzed the BATAN documents and archives because the *fatwa* emerged in response to the BATAN proposal of the Muria nuclear power plant. In this first step, I also identified the main actors: the *Ulama* of the PCNU Jepara and BATAN. The *Ulama* are the producer of the *fatwa* and BATAN is the promoter of the Muria nuclear power plant.

Second, I explored the production process of the *fatwa*. I traced the role of the *Ulama* and their affiliation group in the proposed Muria nuclear power plant. In addition, I studied the BATAN and its frame to the proposed Muria nuclear power plant by examining the agency’s history. After establishing the institutional background, I explored their various framings of the proposed Muria nuclear power plant and concluded the *fatwa*’s risk assessments are based on pre-existing knowledge about the Islamic *fiqh* and nuclear power technologies.

Third, I coded the data. In coding the *fatwa*, I assigned attributes to specific units of analysis including paragraphs, sentences, and individual words that associated with risks of the proposed Muria nuclear power plant. I identified subjects for codes, which included *mashalah*, *mafsadah*, risk, BATAN, industry, national identity, the *Ulama*, the proposed Muria nuclear power plant, the *fatwa*, the Islamic jurisprudence in the *fatwa*, perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence. Having finished the categorization of subjects, I reviewed the secondary data and looked for relations between them. Lastly, I interpreted the data, presenting the findings within the context that I described earlier in Chapter 1.
3.3. Problem Resolving

The primary data are mostly in the Bahasa Indonesia language and a few sentences in the Arabic language. The translation from Bahasa Indonesia to English and Arabic to English was challenging work because the Bahasa Indonesia language that does not have past and future tenses. It is challenging to articulate the terms of risk because risk is associated with future perspective.\textsuperscript{33} I tackled this issue by positioning risk in the present because a study of risk inevitably draws the future perspective into the present.

Chapter 4. Main Discussion

4.1. Introduction

The present chapter contains my main analysis of the thesis that frames the relationship between the fatwa and the social construction of risk in the proposed Muria nuclear power plant. In illustrating the process, I divided this chapter into five main sections. The first section provides an introduction, which informing the reader about the organization of the chapter. The second section provides a brief history of Indonesia's nuclear program that discusses the emergence of BATAN originally from a nuclear weapon risk analysis. It provides a specific historical context of the proposed Muria nuclear power plant is not inseparable from nuclear risks analysis.

The third section discusses the social construction of risk and the ways in which the actors (the Ulama and BATAN) assessed risk. It also depicts the role of the Ulama

\textsuperscript{33} Saul Halfon, Week 9: Risk & Precaution, Introduction to Science and Technology Policy (STS 5614)
in engaging with the local people to resist the proposed Muria nuclear power plant. This fourth section aims to provide information about the conceptualization of the fatwa. It explains the method of risk assessments to the proposed Muria nuclear power plant from the Islamic fiqh.

The fifth section discusses mafsadah (disadvantages) and maslahah (the benefits) of the proposed Muria nuclear power plant. I describe the considerations of mafsadah and maslahah that attached to scientific knowledge of the nuclear power technology. This section also discusses the relationship between perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence along with the principles of Islamic jurisprudence on the fatwa.

4.2. The Origin of the Indonesia Nuclear Program: A Turn From Risk Assessments of Nuclear Weapon into the Development of Nuclear Technologies

The origin of Indonesia’s nuclear program is inseparable from BATAN’s establishment, which has a relation to risk analysis of atomic weapon. The BATAN’s establishment is intertwined with the political spectrum in the Cold War. In December 1954, President Sukarno issued President Order 230/1954, declaring the enactment of a national research committee for investigating radioactive impacts, entitled Panitia untuk Penyelidikan Radioaktif (the State Committee for the Investigation of Radioactivity). Part of the impetus was Sukarno’s interest in how the United States of America (USA)’s nuclear weapon test in the Pacific Ocean would affect eastern
According to this order, the aim of the research was to investigate radioactive and nuclear technologies, to explore the use of nuclear technologies for a new energy in the development of the state, to provide information about nuclear technology to public and its impacts for peace or war purposes, and to report to the government about the results.

Their research started within the eastern Indonesian territory, including the cities of Manado, Ambon, and Timor. The most important results from their investigation were not only the conclusion that there was no hazard related to the USA’s nuclear test bomb, but also the recommendation that the Indonesian government should establish *Lembaga Tenaga Atom* (the Atomic Energy Council and the Atomic Energy Institute, LTA).

In 1958, the Indonesian government established the LTA. The Indonesian government considered strengthening research in nuclear technologies to enhance the welfare of the people. On November 12 1964, the Indonesian government announced a law act for the development of nuclear technologies. The Indonesian government

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political-economic agenda shaped the development of the nuclear technologies.\textsuperscript{38} Accordingly, the law act stated,

\ldots Nuclear power has the important meaning for development and research progress in education, health, biology, agriculture, industry, and the other fields. These must be used for the state and citizen’s interest in doing the national revolution. Therefore, the state has a right to possess them \ldots\textsuperscript{39}

This act emphasized how the research activity of nuclear technology was shaped by the contemporary political manifesto of the Republic of Indonesia.\textsuperscript{40}

On January 16, 1965, President Sukarno inaugurated the first nuclear research center in Serpong, Tangerang. He pointed out the central role of technological progress as part of the Indonesian revolution. In strengthening the development of nuclear technologies, the Sukarno administration changed LTA to BATAN in March 1965. BATAN had an authority to conduct nuclear research along with controlling the use of nuclear technology in Indonesia. Institutionally, BATAN was the highest institution at the national level where Indonesian scientists could conduct nuclear research.\textsuperscript{41} At that

\begin{itemize}
\item[39] Ibid
\item[40] Ibid
\end{itemize}
time, BATAN had several main duties regarding nuclear technology, including research, development, and its application under national policy.\textsuperscript{42}

However, Indonesia's aspiration to become an advanced state in nuclear technologies ended in late 1965,\textsuperscript{43} after G30S/1965, a coup against Sukarno. This coup had various interpretations and it was a critical event, which changed the country's political structure.\textsuperscript{44} There was no single narrative in the cause of the coup movements. Following the coup, the mass killings of “the alleged communists” occurred in many places in Indonesia.\textsuperscript{45} In late 1966, in conjunction with an economic crisis, BATAN lacked funding to develop its projects.\textsuperscript{46}

After Sukarno stepped down, Suharto took over the government and policymaking, including nuclear technologies. In the period between 1966 and 1998, the Indonesian government named the Suharto era as the “New Order.” During the Suharto era, the Indonesian government halted its ambitions to build a nuclear weapon facility

\textsuperscript{42} BATAN Profile, Accessed on March 5, 2016 http://www.batan.go.id/index.php/id/home/profil-batan


\textsuperscript{45} Ibid

and opened widely to foreign direct investments. Additionally, Suharto was close to the USA. Under the Suharto administration, the Indonesian government stopped receiving assistance from "the communist countries." Furthermore, the Indonesian government only developed nuclear programs for the peace purposes and BATAN focused on the use of radioisotopes in agriculture.

Despite having a long history of research of nuclear technologies, the construction of a nuclear power plant in the Suharto era was not realized. The massive production of oil influenced the politics of energy policy under his administration. As a result, BATAN’s proposal to construct a nuclear power plant in Muria was postponed until the downfall of President Suharto in 1998.

After Suharto stepped down, the next government administration, called “the reformation era,” began. In late 1998, Indonesia faced a difficult economic situation. One of the main reasons was its heavy dependence on oil exports. The presidents following Suharto have had to deal with the fact that Suharto’s energy policy in subsidizing oil became a heavy burden for Indonesia. In the politics of energy policy, because of the expensive cost, the Indonesian government put nuclear energy in lower priority than the other energy resource.

In “the reformation era,” Indonesia developed democratic political principles such as public participation in making politics decision, including public hearings regarding

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48 ibid, p. 102

the proposed Muria nuclear power plant. During this transitional regime, the Indonesian
government raised the oil price a few times. This required the government to design a
new energy security policy both in the short and long-term. Between 2004 and 2007, the
Indonesian government published the National Energy Policy, which mentioned nuclear
energy as part of the national strategy to tackle energy issues. This National Energy
Policy underlined Indonesia as not only needing to reduce the dependence on oil fuel,
but also to diversify the energy portfolio and promote environmentally friendly
development. Accordingly, Amir noted the global climate that encouraged re-introduction
of nuclear power in Indonesia: the renaissance of the nuclear industry in the global
market, prompted by issues such as climate change and the recent international oil
crisis. Following this moment, BATAN used the issue of Indonesia’s oil dependence to
reintroduce the idea of the Muria nuclear power plant. To strengthening Indonesia
energy security, BATAN argued that the country needed more than one resource and
specifically nuclear energy is a good solution because of its purported safety,
cleanliness, and cheapness.

4.3. The Different Ways of Constructing Risk Through the Ulama and BATAN.

In this section, I discuss between the social construction of risk and the ways in
which the Ulama assessed risk. For the actors, I focus on the Ulama rather than BATAN
because the representation of the Ulama is not appeared well. Utilizing a social

50 Amir, “State and Reactor,”... p.103
constructivist approach, risk assessment is tied to cultural adherence and social learning. Douglas and Wildavsky argue that risk assessment is constituted by social and cultural process:

The perception of risk is a social process … Some fears are physical, some are social … The different social principles that guide behavior affect the judgment of what dangers should be most feared, what risks are worth taking, and who should be allowed to take them.\(^5\)

In the Douglas and Wildavsky perspective, therefore, people do not only recognize particular risks, related alternatively to health, safety, environment but also beliefs, values, social institutions, nature, and moral behavior.\(^5\)

The Ulama’s risk assessments are shaped by the social, cultural, and moral acceptability. Following the social and cultural process, Gottweis emphasized how different actors assessed risk differently depending on scientific and political discourses\(^5\). In addition, Douglas’s perspective underlines different risk perceptions caused by different social structures.\(^5\) In this thesis, I identified the Ulama and BATAN as different actors who constructed risk. The Ulama who had training in Islamic studies, they played a role in engaging with the local people interests in the proposed Muria power plant. The Ulama referred to the interests of the local community, Islamic fiqh, along with scientific knowledge of nuclear power technology in constructing risk.

\(^{52}\) Douglas and Wildavsky, “Risk and Culture an Essay…” p.6


\(^{54}\) Herbert Gottweis, “Governing Molecules the Discursive Politics…” p.77

Meanwhile, BATAN dealt with the rationales of the energy supply to support economic growth, which represented elite and industry interests.

As a response to BATAN’s proposal to construct a nuclear power plant in Muria, the Ulama joined thousands of people to gather together in protesting the proposed Muria nuclear power plant. In this alliance, there were numerous actors who consisted of Non-Government Organizations (NGOs), nuclear experts, scientists, activists, students, local religious leaders, and academics. These actors joined to participate in *Bahtsul Masa’il*, a tradition in which the Ulama undertakes an in-depth examination of an unsettling, contentious issue and makes a decision with reference to Islamic principles. In this public hearing, the Indonesian government facilitated the discussion. The Ulama met and discussed the proposed Muria nuclear power plant with those actors for two days.

After the *Bahtsul Masa’il*, the Ulama announced that the construction of the Muria nuclear power plant was *haram* (forbidden in Islamic law). This sudden announcement shocked the Indonesian government representative as well as BATAN. They were surprised that the opponents of the Muria nuclear power involved the *fatwa*. Even though BATAN has experience in nuclear technologies, they had never directly met the *fatwa* opposition previously. Furthermore, the *fatwa* approach was novel in debates over nuclear power plants in Indonesia and even in the world. The *fatwa* pointed out that the risks of the Muria nuclear power plant outweighed its potential benefits for the local people.
The *fatwa* opposition is new in the discourse of the proposed Muria nuclear power plant, but not the *Ulama* opponent. The 1990s saw the *Ulama* move into the controversy over the proposed Muria nuclear power plant. In 1996, the former leader of *Nahdlatul Ulama* (NU), the main body of PCNU, Abdurrahman Wahid contributed to write a book *Pembangunan PLTN: Demi Kemajuan Peradaban?* (*The Construction of Nuclear Power Plant: Is It a Progressive Civilization?*). Using perceived risk of the State’s nuclear inexpertise as an issue, he critiqued the government plan to construct a nuclear power plant. According to Wahid, debates over nuclear power technology were not only belonging to nuclear experts because the technology poses constantly threatening dangers that affected the local people. Wahid also emphasized that the public needed to be involved in the decision-making process.  

Further, Wahid joined the public resistance movement against the proposed Muria nuclear power plant. As a prominent *Ulama* of NU, Wahid had successfully influenced local opinion sufficiently to postpone the plant until 2006 when the Indonesian government finalized the National Energy Policy that mentioned the importance of nuclear energy. In the Islamic society, Nur Ichwan, an academic scholar at the Leiden University noted, “In Islamic tradition, the Prophet is seen as both a religious and political leader, while the ‘ulama’ are considered "the heirs of the Prophets."

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The Ulama have stood with the local community in opposing BATAN’s proposal. The Ulama’s stand with the local community has a relation to their similar cultural identity. As Douglas argues,

What is considered as risk, and how serious that risk is thought to be, will be perceived differently depending upon the organization or grouping to which a person belongs or with which he identifies, as will the disasters, accidents or other negative occurrences which occur in a culture.58

Culturally, the majority of local people are Muslims who are close to the PCNU. Furthermore, the local community shares a similar social class with the Ulama. Mostly the Ulama and the local people are from the middle to lower class. Hence, they have a similar class identity in constructing risks of the proposed Muria nuclear power plant.

In contrast to the Ulama claims, BATAN identified a potential of energy crisis as a risk in the Indonesia’s economic development. Economic growth and energy supply centered the rationales of BATAN. These rationales were associated with the industry interests. This argument is based on an assumption that Indonesia needs a reliable energy supply for industry in the long-term and nuclear power provides this in ample supply. Furthermore, the ally of BATAN and Industry represented upper class interests in the national level.

However, in constructing risks, the Ulama categorized perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence as mafsadah. These concerns of risks portrayed Douglas and Wildavsky’s identifications of risk covering (1) Foreign affairs: the risk of

58 Mary Douglas, “Risk and blame:..” p. 78
foreign attack or encroachment, war, and loss of influence, prestige, and power; (2) Crime: internal collapse, failure of law and order, violence versus white-collar crime; (3) Pollution: abuse of technology, fears for the environment; and (4) economic failure: loss of prosperity. 59

4.4. How Did the Ulama Address the Risk of the Proposed Muria Nuclear Power Plant?

In this section, I discuss how the principles of the Islamic jurisprudence shaped the Ulama’s construction of risks. It describes the process of making fatwas, not Islamic studies of fiqh. The Ulama started examining the proposed Muria nuclear power plant through the lens of fiqh. The process of the examination was called the Bahtsul Masa’il. As I mentioned earlier, this is a tradition in which the Ulama undertakes an in-depth examination of an unsettling issue and makes a decision with reference to the Islamic principles. In making the Ulama, the Bahtsul Masa’il process had a long discussion involved the opponent and proponent groups of the proposed Muria nuclear power plant. There were the government’s representatives including BATAN, and experts in nuclear physics, biology, law, religion and culture, and social issues. In this forum, the Ulama listened and asked questions about the proposed Muria nuclear power plant.

The function of bahtsul masa’il was to legitimize the Ulama’s opinion, as Kaptein describes a making process of a fatwa,

59 Mary Douglas and Aaron Wildavsky, “Risk and Culture...” p.2
In the course of time, fatwas issued by important muftis have been collected and these collections can be regarded as manuals of applied legal science. In short, it can be said that fatwas constitute a meeting, and in many cases a compromise, between the ideals of the Holy Law, as expressed by the `ulamâ’, and the reality of daily life, as experienced by the believers. The *bahtsul masa’il* mediated not only the debate over the Muria nuclear power plant between proponent and opponent groups but also their different risk assessments.

There were four possibilities for the final conclusion in the *Bahtsul Masa’il*. At the time, the Ulama proposed four choices and had to decide a final among the options to the proposed Muria nuclear power plant:

1. The Muria nuclear power plant is *haram* or prohibited;
2. *Makruh* or permissible but repugnant;
3. *Murbah* or acceptable or neutral; or
4. *Mandub* or recommended.

There was no single interpretation of the Muria nuclear power plant in the *Bahtsul Masa’il*. According to Tanter, “there were the Ulama who spoke strongly in favor of the Muria proposal, but not many.” Some in the meeting wanted to take the middle ground of a *makruh* judgment, but the final result was clear-cut, as an Ulama, later clarified:

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61 Richard Tanter, “Nuclear fatwa: Islamic jurisprudence…”
Islamic law is basically neutral towards nuclear energy, neither recommending nor forbidding. The use of nuclear energy in Indonesia will be investigated more deeply by the Central Board of Nahdlatul Ulama (NU). “What was clearly judged to be forbidden [haram] is the Muria nuclear power plant to be developed in Jepara.”… The question of other applications of nuclear energy was not part of the discussion by the religious leaders in Jepara. He acknowledged that other nuclear power plants may be judged to be neutral. Moreover, nuclear power may bring benefits for health or agriculture or genetic engineering. Therefore, we will not react negatively in such a case.62

However, the final decision made was the first option and announced that the construction of the Muria nuclear power plant is haram (forbidden in Islamic law). This choice represents the local people interest.63 The local community’s interests can be seen in the three main questions called masail, which the Ulama inquired to propose the fatwa:

1. From the fiqh (Islamic laws) perspective, does the Muria nuclear power plant belong to maslahah or mafsadah?

2. If maslahah aspects predominate, how should the Muria nuclear power plant be operating? If mafsadah, who is responsible to stop the Muria nuclear power plant, and how this process to be done?

62 ibid

63 PCNU Religious Scholars: “The Proposed Muria Nuclear Power Plant is Haram…”
3. Who is responsible for the safety of the local people from the overall impacts of the Muria nuclear power plant?\textsuperscript{64}

These questions were the main foundations of the \textit{Ulama}'s risk assessment to the proposed Muria nuclear power plant. These assessments were based on the \textit{Ulama}'s argument that the proposed Muria nuclear power plant was not merely an issue of energy supply, but also environment, ecology, social, politics and economy problems.\textsuperscript{65} The \textit{Ulama} need empirical evidences of Indonesian government claims in regards of nuclear power technologies, environmental degradation, type of reactor, and foreign technological dependence to get along with the principles of \textit{ahlussunnah wal jama'ah, tawassuth, i‘tidal, tasamuh, tawazun, al-shidqu, al-amanah al-wafa-u bil al-`ahd} [Original in Arabic].

By framing these main questions, the \textit{Ulama} proposed that the decision was in accord with humanism principles included how to avoid \textit{mafsadah} and to achieve \textit{maslahah}. In defining \textit{maslahah}, the \textit{Ulama} considered three main foundations: \textit{dlaruriyyat} (primary needs), \textit{Hajiyyat} (secondary needs), and \textit{Tashiniyyat} (tertiary needs), which were based on several priorities: the social life, the fulfillment of needs, and accordance with Islamic \textit{sharia}. The \textit{Ulama} emphasize that those terms must refer to the real conditions, not conditional circumstances.\textsuperscript{66} The principle that avoids

\textsuperscript{64} Ibid
\textsuperscript{65} Ibid
\textsuperscript{66} Ibid
mafсадаh and achieves маслаhаh in assessing risk, is associated with the local community’s social and economic life.

In prioritizing between mafсадаh and маслаhаh, the Ulama refer to Al-Quran QS Al-a’raf verse 56 along with QS Al-Baqarah verse 219 which emphasize the concept of the benefits should fit the needs of human beings. In the Ulama, the concept of benefits must align with the principles of humanism. As Al-a’raf verse 56 states, "And cause not corruption upon the earth after its reformation. And invoke Him in fear and aspiration. Indeed, the mercy of Allah is near to the doers of good." In addition, Al-Baqarah 219 states,

They ask you about wine and gambling. Say, ‘In them is great sin and [yet, some] benefit for people. But their sin is greater than their benefit.’ And they ask you what they should spend. Say, ‘The excess [beyond needs].’ Thus Allah makes clear to you the verses [of revelation] that you might give thought.

By preventing the mafсадаh aspects of the Muria nuclear power plant, the Ulama had to take precedence following the rule, “дар’у al-mafсид muqaddam ‘ala jalb al-mashalih.”[Originally in Arabic] It is widely interpreted that nature has a place for all species. Human beings are part of nature and therefore, they must be protected. This rule marks an obligation not to destroy the environment and avoiding mafсадаh.

Noor Munirah Isa and Man Saadan's account may be useful to understand the categorization of маслаhаh and mafсадаh in the fatwa. They argue that, “Most маслаhаh and mafсадаh in this life can be identified through reason, specifically self-

evident facts, experiences, customs and reliable presumptions.” In the Muria nuclear power plant, the Ulama adopted Ahlussunnah Wal Jamā’ah (Aswaja), the majority Islamic group which has three main considerations in making a priority: hablun minallah (God), hablun minan nas (humanism), and hablun minal alam (the protection of environment) [Originally in Arabic]. Generally, in solving public issues, Ahlussunnah Wal Jamā’ah uses a method that combines the interpretation of Al-Quran and Hadiths, including their applications, and consequences.

The second term is at-tawassuth [Originally in Arabic], meaning, “moderate behavior.” This term refers to QS Al-Baqarah: 143, which states:

And thus we have made you a just community that you will be witnesses over the people and the Messenger will be a witness over you. And we did not make the qiblah, which you used to face except that we might make evident who would follow the Messenger from who would turn back on his heels. And indeed, it is difficult except for those whom Allah has guided. And never would Allah have caused you to lose your faith. Indeed Allah is, to the people, Kind and Merciful.

The third term is Al-i’tidal [Originally in Arabic], which is usually translated as “straight in the truth.” This term refers to QS Al-Maidah 8:

O you who have believed, be persistently standing firm for Allah, witnesses in justice, and do not let the hatred of a people prevent you from being just. Be just;

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70 https://quran.com/2/143 accessed on March 8, 2015
that is nearer to righteousness. And fear Allah; indeed, Allah is Acquainted with what you do.\textsuperscript{71}

The fourth term is \textit{tasamuh} [Originally in Arabic], defined as “tolerance.” Even though the \textit{Ulama} declared the Muria nuclear power plant as \textit{haram}, different opinions about the plant have to be respected. This consideration refers to \textit{QS. Thaha: 44} “And speak to him with gentle speech that perhaps he may be reminded or fear [Allah].”\textsuperscript{72}

The fifth term, \textit{Tawazun} [Originally in Arabic], translates as a balance between the use of rationality (science and technology) and the interpretation of the Al-Quran and Hadiths. It based on \textit{Qs Al-Hadid: 25}

\begin{quote}
We have already sent Our messengers with clear evidences and sent down with them the Scripture and the balance that the people may maintain [their affairs] in justice. And We sent down iron, wherein is great military might and benefits for the people, and so that Allah may make evident those who support Him and His messengers unseen. Indeed, Allah is Powerful and Exalted in Might.\textsuperscript{73}
\end{quote}

The remaining terms are the words which are most used in Al-Quran. The \textit{Ulama} refer to these words as frameworks in conceptualizing the \textit{fatwa}. \textit{Al-shidqu} is “honesty.” The last term is \textit{Al-amanah al-wafa-u bil al-`ahd} [Originally in Arabic] which is literally translated as the “responsibility of the duty.” These Islamic \textit{fiqh} are the main theoretical frameworks in assessing \textit{maslahah} and \textit{mafsadah} of the proposed Muria nuclear power

\textsuperscript{71} https://quran.com/5/8 accessed on March 8, 2015
\textsuperscript{72} https://quran.com/20/44 accessed on March 8, 2015
\textsuperscript{73} https://quran.com/57/25
plant. To categorize *maslahah* or *mafsadah*, the *Ulama* used simultaneously the four dimensions of perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence.

4.5. *Mafsadah-Maslahah* and Perceived Risk of the State’s Nuclear Inexpertise, Environmental Degradation, the Type of the Reactor, and Foreign Technological Dependence

The revival proposal of the Muria nuclear power plant can be seen on the *Kebijakan Energi Nasional* (the Indonesia National Energy Policy) 2004. The plant was a product of policy decision-making at the national level. The Indonesian Ministry of Energy and Mineral Resource proposed this nuclear energy policy along with the other energy resources. In the presidential regulation no. 5/2006, nuclear energy along with the other renewable energy sources had to be contributed up to 5% of the total national energy.74 Using this national energy policy, BATAN framed and promoted the Muria nuclear power plant. In July 2006, BATAN announced that the first of four 1000-MW reactors would be constructed in Muria.

However, BATAN’s proposal provoked various responses from the public. In the local area, there were opponent groups who rejected the proposal. Given the fact that Indonesia had developed democratic principles in pursuing the development goals, the public challenged the “top-down” decision-making process with a call for a "bottom-up" principle that would encourage public participation, including the *Ulama*. Furthermore,

74 The President of the Republic of Indonesia, *President Regulation No.5 year 2006 the National Energy Policy*. (Jakarta: the Secretary of State, 2006)
the Indonesian government has never studied the *fatwa*. The *fatwa* emphasized the risks of the Muria nuclear power plant outweighed its potential benefits. In particular, the *fatwa* addressed concerns about perceived risk of the State’s nuclear inexpertise, environmental degradation, the type of the reactor, and foreign technological dependence.

4.5.1. Perceived Risk of the State’s Nuclear Inexpertise

In the *fatwa*, the framing of perceived risk of the State’s nuclear inexpertise is socially produced, and its categorization is influenced by the set of Islamic values belonging to the local community in Muria. Perceived risk of the State’s nuclear inexpertise is covering a set of accusations, including deceptions and lack of technical capacities and capabilities. As mentioned in the introduction, 'nuclear inexpertise,' refers to the *fatwa*, which questions the State’s capacities and capabilities to propose, handle and maintain a nuclear power plant. These questions become the main foundation of the *fatwa*, which includes:

“If *maslahah* aspects predominate, how should the Muria nuclear power plant be operating? If *mafsadah*, who is responsible to stop the Muria nuclear power plant, and how this process to be done? And who is responsible for the safety of the local people from the overall impacts of the Muria nuclear power plant?”

In my opinion, this concern is solely based on *Ulama*’s distrust towards State’s expertise in handling nuclear power plant.

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75 PCNU Religious Scholars: “The Proposed Muria Nuclear Power Plant is Haram…”
In addition, the local community accused BATAN of lying to them. According to the local community, BATAN promoted nuclear technologies for agriculture, medicine, but not a nuclear power plant. In fact, BATAN would construct a nuclear power plant. Furthermore, BATAN had always discussed the potential benefits of nuclear technologies, but not its risks. In the Ulama perspective, it contrasted to the terms of Al-shidqu, which means honesty, and Al-i'tidal that interpreted as straight to the truth. In the fatwa, the term of Al-i'tidal refers to QS Al-Maidah 8:

O you who have believed, be persistently standing firm for Allah, witnesses in justice, and do not let the hatred of a people prevent you from being just. Be just; that is nearer to righteousness. And fear Allah; indeed, Allah is Acquainted with what you do.

The following concern is the lack of technical capacities and capabilities related to the expertise of handling nuclear power plant for the commercial purposes that BATAN doesn’t have any experience in yet. Accordingly, Amir describes, “The credentials of BATAN in research and development is not considered reassuring because the scope of nuclear power production is far beyond research-oriented activities, where the agency is seen as competent.”

However, before addressing perceived risk of the State’s nuclear inexpertise, the Ulama mentioned maslahah (benefits) of the Muria nuclear power plant. Having mentioned maslahah, the Ulama refuted its consideration in each summary. I think the

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76 Sulfikar Amir, Nuklir Jawa (Nuclear Java), Film Documentary, Jakarta: WatchDoc, 2012.
78 Sulfikar Amir, Nuclear Politics…” p. 300
*Ulama* mentioned *maslahah* as part of the requirement of the *fatwa* making. The first *maslahah* of the Muria nuclear power plant is a potential benefit to supply electricity so that the Indonesian government could tackle the potential energy crisis that BATAN claimed.

In the next sentence, the *Ulama* refuted this *maslahah* by questioning the issue of inexpertise, "the argument which claims there is energy crisis is in the categorization of prediction (*mauhumah* and *dhanni*)." Thus, the *Ulama* categorize the need of this supply as tertiary (*tahsiniyyah*), and not secondary (*hajiyyah*) nor primary (*dharuriyyah*). The *Ulama* mentioned the supply of the proposed Muria nuclear power plant contributes only between 2 and 4% of the national energy needs.\(^79\)

The second consideration of *maslahah* regards the potential decrease in electricity price.\(^80\) However, the *Ulama* refuted this point at the end of the argument. The *Ulama* questioned the estimates, which came from Indonesian nuclear experts. As an argument of prediction (*mauhumah* and *dhanni*), the electricity price is only an estimate, not the real condition. For example, the price calculation is the electricity from a nuclear power plant can be achieved about 9.66 US cents per kilowatt-hour (kWh), but oil-based plants about 30 cents per kWh. This price is an assumption of the result of the proposed Muria nuclear power plant while the cost of the construction of a nuclear power plant and the impacts of nuclear waste are not included.

Historically, the perceived risk of the State’s nuclear inexpertise is not a new

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\(^{79}\) PCNU Religious Scholars: “The Proposed Muria Nuclear Power Plant is Haram…”

\(^{80}\) ibid
issue in Muria. In 1996, Wahid addressed a similar question to the proposed Muria nuclear power plant: the issue of incompetency and incapability of the Indonesian nuclear experts. Wahid, as the former leader of NU at the time, critiqued the government’s plan on the Proposed Muria nuclear power plant, which was only dominated by nuclear experts.81 Wahid critiqued the power of experts on the Proposed Muria nuclear power plant. According to him, the Proposed Muria nuclear power plant was not only an issue for the experts, but for the public. The public resistance is needed to be involved in decision-making. The public resistance depicted the interests of many people.82

Regarding perceived risk of the State’s nuclear inexpertise, the Ulama distrusted the capacities and capabilities of the Indonesian nuclear experts in managing a nuclear power plant, so that the Proposed Muria power plant could be danger for the local people. By emphasizing the local community’s interests, the Ulama joined with the local community in opposing the plant. The Ulama argued that the Muria nuclear power plant could result in nuclear waste, which contains radioactivity. The Ulama also questioned how the Indonesian nuclear experts in managing nuclear waste. In assessing perceived risk of the State’s nuclear inexpertise, the Ulama adopted the term of Al-amanah al-wafa-u bil al-`ahd [Originally in Arabic] which is literally meaning as the responsibility of the duty. It reflects the Lupton’s account, which mentioned, “risk is seen as something that can be managed through human intervention; and risk is associated with notions of

82 Ibid
choice, responsibility and blame.”

In making claims, the Ulama echoed a theoretical physicist and nuclear scientist who claimed a nuclear power plant was not the best solution for tackling the potential energy crisis because Indonesia has plenty of renewable energy resources. On the other hand, a nuclear scientist who was the former nuclear scientist of BATAN argued Indonesian nuclear experts have not only cultural issues regarding the maintenance of technology but also a corruption mentality. The Ulama, however, also cited the issue of high-level nuclear waste, which has to be stored for at least 50 years, and the resulting uncertainty of how to manage it in the long-term. This categorization of perceived risk of the State’s nuclear inexpertise reflects the Ulama’s understanding of a nuclear power technology. As a real condition, the plant would result nuclear waste. On the other hand, the technology of handling nuclear waste is unsure.

Even though BATAN has been developing nuclear technologies since 1954, the Ulama were not sure about the agency’s capabilities. Accordingly, Amir noticed that nuclear experts’ research experience for thirty years in their work place was not adequate to appease the anti-nuclear groups in Muria. The BATAN research-oriented activities can be seen in the beginning of Indonesia nuclear program, which consisted of a team of medical research. In 1954, Gerrit Augustinus Siwabessy, a professor of radiology who had academic training in Great Britain, led the State Committee for the

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83 Deborah Lupton, “risk...” p.26

84 PCNU Religious Scholars “The Proposed Muria Nuclear Power Plant is Haram...”

85 Sulfikar Amir, “Nuclear Politics..” p. 300
Investigation of Radioactivity.\textsuperscript{86} He was also the Indonesian Minister of Health and proposed the idea of nuclear research for medical purposes.\textsuperscript{87} At the time, the State Committee for the Investigation of Radioactivity had a team with diverse backgrounds in medical science, physics, chemistry, defense studies, engineering, international relations, geology, and biology. Their early primary research concern was about radioactivity impacts of the USA’s nuclear weapon test in the Pacific Ocean to Indonesia.

The research-oriented activities have been continuing for years. Between 1966 and 1969, BATAN constructed three labs for isotope production, radiobiology, and electronics. In the 1970s, BATAN successfully constructed two reactors in Yogyakarta and Serpong. The Yogyakarta's reactor had a 100-KW capacity and the later reactor was 30-MW. On December 4 1970, President Suharto inaugurated a Triga mark II reactor with a 1-MW capacity in Bandung. Still, these historical achievements did not convince the \textit{Ulama} that BATAN had the capabilities and capacities in managing the

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\textsuperscript{86} Daftar Radiolog di Indonesia pada tahun 1968 (the List of Radiologist in Indonesia in 1968) in “Ten Years of Atomic Energy in Indonesia, December 5, 1958-December 5, 1968…”
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\textsuperscript{87} G.A. Siwabessy mentioned “Nowadays, the Ministry of Health has a department for measuring radioactivity and I will show it to you the way in which the measurement works in the water and atomic which contained radioactivity.” in Pengaruh Tenaga Atom Atau Tenaga Nuclear Dalam Hubungan Antar Negara (Influence of Atomic Energy or Nuclear Energy in International Relations) (Jakarta: Ministry of Information, 1958), p 21; His historiography can be found on “Sang Upuleru : Mengenang 100 Tahun Prof. Dr. Gerrit Augustinus Siwabessy, 1914-2014” (Sand Upuleru : the Memoriam of the 100 Years Professor Gerrit Augustinus Siwabessy, 1914-2014)
\end{flushright}
Muria nuclear power plant because it would have different reactors for the commercial purposes.

BATAN’s plan to construct a nuclear power plant in Muria had originated in 1970s. In this period, the rationale of the construction of a nuclear power plant was to support energy supply for increasing economic production. By that time, the Indonesian government established Komisi Persiapan Pembangunan PLTN (the committee for the preparation of the construction of a nuclear power plant, KP2PLTN), which initiated by a partnership between BATAN and Departemen Pekerjaan Umum dan Tenaga Listrik (the Department of Public Works and Electricity Power). This collaboration team chose Muria as the best site in the Java Island. Accordingly, Soedyartomo Soentono, the former chair of BATAN wrote,

The Muria Peninsula region has been selected to be the most suitable area in Java. The plan for a final site investigation has long been prepared. It consists of selection and evaluation of the preferred site…. The study itself had to be carried out by BATAN under the directives of the Energy Technical Committee of the Department of Mines and Energy, also involving relevant institutions. Furthermore, BATAN chose Muria as the site based on the technical and socio-economic impacts cited in the feasibility study and included two main components:

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89 Soedyartomo Soentono, “Nuclear Power Development in Indonesia,” (National Atomic Energy Agency, Indonesia), 57
1. The on-site studies including among other things, energy economics and financing, technical and safety aspects, the fuel cycle and waste management, and general management aspects.

2. Site and environmental studies, including field investigations and assessment of site selection, site qualification/evaluation, and environmental, socio-economic and socio-cultural impacts. \(^{90}\)

I noticed this feasibility study made analogous assessments with the \textit{Ulama} that argued the proposed plant was not merely an issue of energy supply to energy issues, but also potential environmental, ecology, social, politics and economy problems.\(^{91}\) However, the BATAN feasibility study had not mentioned who would be responsible for managing any potential disaster in the future. This uncertainty also belonged to be part of perceived risk of the State’s nuclear inexpertise. In the \textit{fatwa}, the concern of perceived risk of the State’s nuclear inexpertise also questioned nuclear experts’ decision to choose the most appropriate reactors for the Proposed Muria nuclear power plant.

\textbf{4.5.2. The Type of the Reactor}

The uncertain type of reactor in the Proposed Muria nuclear power plant was also categorized as a risk because it has a relation to the estimation cost, which is unpredictable. This uncertain cost relates to the construction of the reactor and its type. Secondly, it was argued that BATAN’s preference for the Pressurized Water Reactor (PWR) was not appropriate for Muria. This risk assessment of the type of reactor is also

\(^{90}\) ibid

\(^{91}\) Ibid
inseparable from perceived risk of the State’s nuclear inexpertise in deciding the most appropriate nuclear power technology.

For the proposal of the Muria nuclear power plant, officially, BATAN had not decided the type of the reactor that would be constructed in the site. However, it was clear the PWR would be BATAN’s preference. This reactor uses water as its main coolant. The fission of atoms heats the water with high pressure and the steam produces energy. At that time this reactor had an estimated cost of about USD 1.5 million. Even though the PWR requires a lot of money to invest, its cost operation is cheaper than the other type of reactor that generated by oil-fueled. Given the electricity demands of industry, the PWR technology is considered the most suitable and reliable form of nuclear energy production for Indonesia.

On the other hand, the Ulama argued that the nuclear experts could not construct the same type of reactor in a different place. The choice of the reactor would have to fit the geography and geology conditions in Muria. This concern to the Muria site is not separated from the geographical condition of Indonesia. The country is situated along the "Pacific Ring of Fire," an archipelago lined with nearly one hundred active volcanoes and a high chance of earthquake and tsunami hazards. It heightened the popular conceptions of risks and concerns on nuclear power plant.

The Ulama questioned the moral responsibility of the proponents of the Proposed Muria nuclear power plant, by asking questions like, “If any nuclear disaster happens,

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The question of responsibility in the perception of risk refers to the term of *Al-amanah al-wafa-u bil al-`ahd* which emphasizes the duty and its responsibility in operating the Muria power plant. Accordingly, Steve Rayner argues,

> If the cultural process by which certain societies select certain kinds of dangers for attention are based on institutional procedures for allocating responsibility, for self-justification, or for calling others to account, it follows that public moral judgments will advertise certain risks powerfully, while the well-advertised risk will turn out to be connected with legitimating moral principles.\(^{93}\)

In this risk assessment, the type of reactor directly relates to the responsibility of the operation and maintenance of the PWR in the certain place in Muria. This risk perception rose because BATAN had not given sufficient explanations regarding the specific duty and responsibility in case a disaster occurred.

According to the *Ulama*, if Indonesia adopted technology transfer with Build, Operate, and Transfer (BOT) model, that would mean the country must then pay the cost of decommissioning and storing an old and run-down nuclear power station.\(^{94}\) In the global agreement, the World Bank explains BOT model as:

> BOT model is typically used to develop a discrete asset rather than a whole network and is generally entirely new or Greenfield in nature (although refurbishment may be involved). In a BOT Project the project company or operator generally obtains its revenues through a fee charged to the utility/

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\(^{93}\) S Rayner, “Cultural theory and risk analysis” in *Social Theories of Risk*, edited by S, Krimsky and Golding (Westport, CT: Praeger, 1992), 92

\(^{94}\) PCNU Religious Scholars: “The Proposed Muria Nuclear Power Plant is Haram…”
government rather than tariffs charged to consumers.\textsuperscript{95} The *Ulama* perceived this BOT model as *mafsadah* as well as risk. The *Ulama* were not sure about a BOT scheme used for reactors in Muria, which would have expensive costs for maintenance.

The *Ulama* also categorized nuclear decomposing costs and maintenance for long decades as a risk. Accordingly, the *Ulama* emphasized, “the cost of reactor decomposing after the operation of the Proposed Muria nuclear power plant, and its maintenance of nuclear waste with high radioactivity which has to be stored about 24.000 years.”\textsuperscript{96} In addition, the maintenance of the PWR requires a strong commitment and high cost. In the fatwa, the requirement of the strong commitment of the maintenance of the PWR technology refers to the term of *Al-amanah al-wafa-u bil al-`ahd* which is literally meaning as the responsibility of the duty. It is also based on the third question that the *Ulama* articulated to assess risk “who is responsible for the safety of the local people from the overall impacts of the Muria nuclear power plant.”\textsuperscript{97} In conceptualizing this risk, the *Ulama* emphasized the principle of *Al-Waqi`iyyah* (the aspect of locality). Furthermore, the concern of the nuclear decomposing had a relation to environment degradation issues for the local community.

\textsuperscript{95} World Bank "Concessions, Build-Operate-Transfer (BOT) and Design-Build-Operate (DBO) Projects"\url{https://ppp.worldbank.org/public-private-partnership/agreements/concessions-bots-dbos} accessed on March, 30 2017

\textsuperscript{96} PCNU Religious Scholars: “The Proposed Muria Nuclear Power Plant is Haram…”

\textsuperscript{97} Ibid
4.5.3. Environmental Degradation

The Ulama adopted the principles of maslahah (benefits) and mafsadah (disadvantages) in addressing environmental issues of the Proposed Muria nuclear power plant. In prioritizing between mafsadah and maslahah, the Ulama referred to Al-Quran QS Al-a’raf verse 56 along with QS Al-Baqarah verse 219 which emphasize the concept of the benefits should fit the principles of humanism. As Al-a’raf verse 56 states: "And cause not corruption upon the earth after its reformation. And invoke Him in fear and aspiration. Indeed, the mercy of Allah is near to the doers of good." In addition, Al-Baqarah 219 states,

They ask you about wine and gambling. Say, ‘In them is great sin and [yet, some] benefit for people. But their sin is greater than their benefit.’ And they ask you what they should spend. Say, ‘The excess [beyond needs].’ Thus Allah makes clear to you the verses [of revelation] that you might give thought.

By preventing the mafsadah aspects of the Proposed Muria nuclear power plant, the Ulama gave precedence according to the rule “dar’u al-mafasid muqaddam ‘ala jalb al-mashalih.” (Originally in Arabic) It literally translates as the “environment is a place for all species.” Human beings are part of nature. Therefore, we must protect each other. This rule marks an obligation not to destroy the environment and avoiding mafsadah.

Before addressing the risk of environmental degradation, the Ulama mentioned maslahah of the Proposed Muria nuclear power plant would reduce carbon emissions as well as BATAN claimed. Thus, it would assist in mitigating climate change. However,


this *maslahah* comes with a refutation by saying this hope (its contribution to limiting global warming) is not absolutely true because the Proposed Muria nuclear power plant would actually contribute emissions to the earth, Furthermore, the cooler system on the technology of the Pressurized water reactors (PWR) 1000 Megawatt needs 3 million liters/minute and its operation raises the seawater temperature.\(^{100}\) The concern about the environmental issues based on the protection of the nature as the Islamic *fiqh* mandated.

In terms of *mafsadah* (disadvantages), the Proposed Muria nuclear power plant would produce nuclear waste that would in turn affect the environment. The *Ulama* mentioned the reactor design with Pressurize Water Reactor (PWR) 1000 needs 3000 million liters water per second. As a consequence, it would increase the water temperature up to 7° Celsius so that many organisms would be dead and the local fishermen will be affected.\(^{101}\) This concern depicts an environmental concern and an economic concern that is not separable.

The categorization of environmental impacts of the Proposed Muria nuclear power plant as a risk make sense in terms of its effects not only belong to nature, but also the fishermen. In the risk literature, the concern of nuclear waste has been emerging since the 1970s as Kathleen Tierney wrote, “…Concern about the safety of nuclear reactors began to emerge in the early 1970s, and later public attention also began to focus on potential risks associated with nuclear waste at sites such as Yucca

\(^{100}\) PCNU Religious Scholars: “The Muria Nuclear Power Plant is Haram…”

\(^{101}\) ibid
Mountain, Nevada.” Furthermore, Chauncey Starr’s classic study of public perception of risk and technology describes two points of analysis, which are the historical national accident records are adequate for revealing consistent patterns of fatalities in the public use of technology and social preferences and costs are sufficiently enduring to permit their use for predictive purposes.¹⁰³

The Ulama was concerned with the impacts that might affect the environment along with local economic activity because of the nuclear plant’s operation. This argument contrasted with BATAN’s claims about clean energy and economic growth. BATAN assumed a nuclear power plant would tackle the potential energy crisis and improve economy (industry) in the long-term. This different risk perception can be understood as resulting from the contrasting relation groups between BATAN and the Ulama. BATAN stood with industry interests. Meanwhile, the Ulama position with the local community included the fishermen’s interest.

The industry interests are key to the development of the nuclear program in Indonesia. In the early development of Indonesia nuclear technologies, Subandrio, the Indonesian Foreign Minister stated, "The appropriate use of nuclear technology is a way

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¹⁰² Dunlap, Karft, and Rosa in Kathleen Tierney, The Social Root of Risk; Producing Disasters, Promoting Resilience (Johanneshov: MTM, 2015), 16

of improving capacity to take off from the current economy and industry condition.\textsuperscript{104} He added, "By doing this research \textit{[nuclear technology]}, we could be heading to a progress. We could achieve the same position with the other ("developed") countries in the world."\textsuperscript{105} His statement depicts the idea of political economic progress has been inseparable from the rationale of the development of nuclear technologies.

For industry consumption, BATAN's economic calculation is based on the assumption that the electricity cost from a nuclear power plant can be cheaper than oil fuel, as they said,

Although the share of the nuclear energy is small but it is indispensable since fossil fuels have been optimized taking into consideration the infrastructure needed and the impact on environment. The shares of coal and gas, although necessitate thorough consideration relating to environment and infrastructure preparation, have to be significantly increased to replace the oil share as much as possible.\textsuperscript{106} This comparison is driven by operational costs. In addition, the industry's interests depict Java Island where the Muria nuclear power plant will be constructed, as a center of economy production. In other words, the Muria nuclear power plant is a good answer

\textsuperscript{104} Dr. Subandrio, \textit{Kata Pengantar (forewords),} in \textit{Pengaruh Tenaga Atom Atau Tenaga Nuclear Dalam Hubungan Antar Negara (Influence of Atomic Energy or Nuclear Energy in International Relations)} (Jakarta: Ministry of Information, 1958), p 10

\textsuperscript{105} I added "nuclear technology", ibid p.13

\textsuperscript{106} Soedyartomo Soentono, Ferhat Aziz, “Expected role of nuclear science and technology to support the sustainable supply of energy in Indonesia,” \textit{Progress in Nuclear Energy,} Volume 50, Issues 2–6, March–August 2008, Pages 75-81, ISSN 0149-1970)

for supply energy for the economic growth in the Java Island, while the other places seem neglected. This is far from the equity aspect, which the Indonesian constitution mandates.

In addition, BATAN’s economic rationale was calculated at the national level. On the other hand, the Ulama focused on local environmental impacts of the Muria nuclear power plant. Thus, while both sides used economic arguments, they have different priorities. BATAN’s economic rationale relates to the dominant ideology of developmentalism, which had been dominant since the Suharto regime. According to Ariel Heryanto, developmentalism can be described as technocratism with a Javanese militaristic accent. Developmentalism is an economy oriented with precepts of modernity. As such, it was the most important sponsor of the quantitative growth of education and research, including the social sciences in Indonesia.

On the other hand, the Ulama recognize the impact of the Proposed Muria nuclear power plant to the local environments in the long-term. It went against BATAN’s promotion, which claims Indonesia needs a reliable supply to tackle potentials energy crisis in the future. The argument of energy crisis is a matter of estimation and prediction (mauhumah and dhanni, originally in the Arabic). Accordingly, Tanter argues, “the needs that are to be met may be categorized as tertiary or extravagant needs

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108 ibid
(tahsiniyyah) and not secondary (hajiyyah) nor primary (dharuriyyah) needs. In supplying energy, the Ulama suggest that the Indonesian government should use the other energy resources such as renewable energy, not nuclear power. Furthermore, as Indonesia has plenty of energy resources, the exploration for alternative energies was recommended rather than constructing a nuclear power plant.

In identifying risks of environmental degradation, the Ulama also quoted the Indonesian Ministry of Environment policy 51/1995 that states the limitation of sea temperature is no more than 2° Celsius and the local Central Java government regulation 10/2004 about non-specific waste. The Proposed Muria nuclear power plant will need seawater, as coolant and it will be affecting the sea ecosystem and the local fishermen. This impact would be categorized as a risk. The concern about the local environment and the local fishermen can be understood as the Ulama’s commitment to their community and environment. Furthermore, the risk concern relating to the environment has a relation to the evaluation to the most appropriate reactor that will be constructed in Muria.

4.5.4. Foreign Technological Dependence

The relationship between nationalist concerns and Islam in identifying technological foreign dependence as risks can be traced to the history of colonialism in Indonesia. In the colonial era, Islam was used to unite the larger masses against the colonial government. Accordingly, Arskal Salim wrote, “The Islamic nationalism helped

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109 Richard Tanter, “Nuclear Ulama….”
Indonesians avoid dividing into a great number of small ethnic group nationalism.”\textsuperscript{110} Furthermore, the \textit{Ulama} mentioned the analogy of the case of the Iranian nuclear program, which has been largely obstructed by the West. It might depict the experience of dominantly Muslim countries that were colonized by non-Muslim powers. The risk of foreign technological dependence might have a relation to the perception of foreign infidel power, as Salim argues that, “in the light of colonialism, nationalism was often understood as a shared response of Muslim peoples to the foreign infidel power.”\textsuperscript{111}

In contrast to the other concerns of risk, the \textit{Ulama} emphasized foreign technological dependence as a threat not only for the local people but also for the national identity.\textsuperscript{112} The Ulama addressed the design, technology, and operation of the Proposed Muria nuclear power plant, which mostly depend on foreign sources of aid and resources as \textit{mafsadah}. It becomes a risk of the Proposed Muria nuclear power plant. Accordingly, the Ulama states:

The design of the proposed Muria nuclear power plant, its technology, its operation and maintenance, all of them are going to be in foreigners, leaving Indonesia dependent. The main raw material of the Proposed Muria nuclear power plant is uranium, which requires enrichment. Still, Indonesia doesn't have

\begin{footnotesize}
\begin{itemize}
  \item \textsuperscript{110} Arskal Salim, \textit{Challenging the secular state: the Islamization of law in modern Indonesia}, (Honolulu: Univ. of Hawaii Press, 2009), 52
  \item \textsuperscript{111} ibid
  \item \textsuperscript{112} I adopted Hecht’s national identity, which is “the ways in which people imagine the distinctiveness of their country and define uniquely national ways of doing things.” See Gabrielle Hecht, \textit{The Radiance of France: Nuclear Power and National Identity after World War II}. (Newition ed. Cambridge, Mass: MIT Press; 2009), 10
\end{itemize}
\end{footnotesize}
the large deposit uranium with great grade. Like Iran, as the developing country, Indonesia's efforts to enrich uranium will be obstructed by the West because they want the country will always be dependent on foreign uranium producers.113

This mafsadah mentioned in the fatwa derived from the nationalist concerns about foreign technological dependence. It went against BATAN's claim that argued the possession of a nuclear power, as a movement would show that Indonesia has political clout in the international political system. In BATAN’s perspective, even though the purpose of nuclear power is for non-proliferation, a nuclear power, particularly the multifunction type, will change Indonesia's position in the global political system.114

Understanding the possession of sophisticated nuclear power as the solidification of national identity is associated with transnational history. Particularly, the origin of nuclear power technology comes from nuclear weapons as a superpower symbol. In the French nuclear program, Gabrielle Hecht has argued that the momentum of states going nuclear is not only for electricity purposes but also for the formation of a new identity.115 Nuclear power, therefore, symbolizes a change in status from a developing state to a developed one. BATAN’s argument that nuclear power is not only for supplying energy, but also achieving political goals is part of technopolitics, which Hecht defined as "the strategic of designing or using technology to constitute, embody, or

113 PCNU Religious Scholars: “The Proposed Muria Nuclear Power Plant is Haram…”

114 Hani Nur Fajrina, Batan: Nuklir Bukti Kekuatan Negara, CNN Indonesia


115 Gabrielle Hecht, “The Radiance of France…"
enact political goals.\textsuperscript{116}

The concept of nuclear power as a symbol of global prestige is common in the Third World. In India, Itty Abraham’s study informs us how the postcolonial state framed nuclear power as a form of modernity.\textsuperscript{117} BATAN framed the ownership of a nuclear power plant as part of diplomacy in the global political system. Echoing the conceptualization of nuclear technology as a symbol of superiority, the ownership of nuclear power would increase Indonesia’s geopolitics in international community.

The use of nuclear technologies as a nationalist concern is not new in Indonesia. In the early development of the Indonesia nuclear programs, Subandrio, the Indonesian Foreign Minister 1950s wrote,

.... Indonesia is a sovereign state with 80 million populations, and we have to strengthen our economy and military position so that we can protect threats from the foreign countries. We have been studying the ways of using nuclear technologies since years ago. Indonesia is a member of United Nation Atomic Agency (IAEA, now), which located in Vienna. We are ongoing process to make an agreement with the Soviet Union to learn scientific knowledge of nuclear technologies and its use for non-proliferation purposes. Lastly, we have taken a role in the project of Brookhaven, which established the first nuclear technologies in Asia.\textsuperscript{118}

\begin{footnotesize}
\textsuperscript{116} ibid, 15
\textsuperscript{118} Dr. Subandrio, \textit{Kata Pengantar (forewords)}, in "Pengaruh Tenaga Atom Atau Tenaga Nuclear..." p.12-13
\end{footnotesize}
By the time of the Cold War, the Indonesian government under the Sukarno administration fully supported the development of nuclear technologies by establishing LTA (BATAN, now). Sukarno’s background in engineering might have influenced his vision that technological issues were important to improve the quality of Indonesian lives. His visions of technological development, it was hoped Indonesian scientists and engineers to produce scientific knowledge so that Indonesia as a nation-state could be equal with other "developed" countries. When Sukarno inaugurated the second nuclear reactor on February 27, 1965, in Bandung, he stated: "A few weeks ago, I inaugurated the first nuclear reactor in Serpong. Now, I am inaugurating the second nuclear reactor in Bandung. This (reactor) is a proof that we are heading to progress." Sukarno's ambition to develop nuclear technologies was shaped by technological advance as a proof of progress. Further, when Indonesia had a confrontation with Malaysia, on July 24, 1965 Sukarno revealed his nuclear weapon aspirations to Muhammadiyah, the second largest Muslim organization in Indonesia, expressing his desire to have a nuclear bomb facility:

Accordingly, God willing, Indonesia will shortly produce its own nuclear bomb! This is true. I don’t say this nuclear bomb is a replica or only fake atom. However, will we use the nuclear bomb to be an aggressor? No, this is not for attacking the other country but for saving our sovereignty, for persisting our nationality. We are the peaceful citizens! We don’t want to make aggression to another country.

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119 Sukarno, “Amanat Presiden Sukarno pada Peresmian Reactor atom di Bandung pada tanggal 27 Februari 1965 (Sukarno’s Speech to the inauguration of the Atomic Reactor in Serpong, Tangerang, February 16, 1965) in Sukarno: Selected Speeches 1958-1966, collection of Professor Angus McIntyre, LaTrobe University, Bundoora Campus, Australia, p.1
Aggression means attacking. Nevertheless, if Indonesia's independence threatened by another country, we have obligation to defend our homeland.\textsuperscript{120}

Sukarno’s speech revealed Indonesia’s nuclear aspiration to a wider audience, the Muslim community in particular, and the public, both at the national and the international level, in general. Sukarno mentioned Islam as an integral part of his nuclear weapon aspiration, "If the state needs, we can go to missile. We use our own nuclear bomb so that we could persist our homeland that God mandates us, no threat from another party. This is the essential teaching of Islam."\textsuperscript{121} In this way, blending with nationalist rhetoric, Sukarno tied Islam and nuclear technology as critical to Indonesian national identity. Sukarno's ideological motivation for the development of nuclear technologies adopted by BATAN in framing Indonesia desired to have a nuclear power plant based on this nationalist conceptualization.

As long as the Muria power plant could be constructed, BATAN would not recognize foreign sources of aid and resources as risks. It can be understood this way because the establishment of BATAN has depended on foreign sources of aid and resources. Although in the early development of Indonesia nuclear technologies Foreign Minister Subandrio stressed that the Indonesian government wanted to develop nuclear technologies without depending on foreign aid,\textsuperscript{122} in fact, the cost of the development of

\textsuperscript{120} Sukarno, “Amanat Presiden Sukarno pada Kongres Muhammadijah di Bandung, 24 Djuli 1965” (Sukarno Speech to the Muhammadijah Congress in Bandung, July 24, 1965), in Sukarno: Selected Speeches 1958-1966, collection of Professor Angus McIntyre, (LaTrobe University, Bundoora Campus, Australia), p.11

\textsuperscript{121} Ibid..

\textsuperscript{122} Dr. Subandrio, Kata Pengantar (forewords), in “Pengaruh Tenaga Atom Atau Tenaga Nuclear…” p.12
nuclear technology was far from inexpensive and Indonesia received foreign aids.

In the 1960s, the Indonesian government established agreements with the United States of America and the Soviet Union for the development of nuclear technologies for the non-proliferation purposes.\textsuperscript{123} To develop the nuclear program, the LTA (BATAN) received funding from the United States and the Soviet Union. The first step was to build a nuclear research center in Pasar Minggu, Jakarta, designed for producing and distributing radioisotopes. This program, funded by the United States, was targeted to support research in the fields of biology, medical treatment, and agriculture and industry. Secondly, the LTA (BATAN) had to construct an IRT-1000 reactor in Jakarta. The Soviet Union funded this project. Thirdly, the LTA (BATAN) had the mandate to build a TRIGA MARK III reactor in Bandung with funding from the US government. Lastly, with the Soviet Union’s funding, the LTA (BATAN) assisted the University of Gajah Mada in developing nuclear research, especially sub-critical assembly.\textsuperscript{124} The USA and the Soviet Union funded the LTA almost at the same time. Two small reactors, resulted from the Soviet Union’s aid, were completed in Bandung in November 1962

\textsuperscript{123} There are two versions in BATAN's documents. In Ten Years of Atomic Energy in Indonesia, December 5, 1958-December 5, 1968, the contract agreement signed between Indonesia and the Soviet Union in January 1962. However, BATAN's official website (http://www.batan.go.id/index.php/en/deputy-en/science-nuclear-technology-application/science-nuclear-applied-technology) does not mention this agreement, instead they mention Indonesia received a grant from USA for a research reactor type Triga Mark II in 1962. Meanwhile, Cornejo (2000) noted, “the agreement between the Indonesian government and USA became effective on September 21, 1960 and under it the United States pledged cooperation in the civilian uses of atomic energy." p. 32

\textsuperscript{124} E. Nataadidjaja in “Sekitar Pembentukan Tenaga Atom”…p. 1.4
and another agreement was signed in January 1964.\textsuperscript{125}

In June 1967, the Indonesian government signed a nuclear treaty with the International Atomic Energy Agency (IAEA) and the following year, as part of the diplomacy, BATAN put a delegation for strengthening diplomacy in the nuclear treaty in the IAEA headquarter, Vienna. After that BATAN, with IAEA assistance conducted a market survey of the potential nuclear power plant in Indonesia. This research partnership adopted a combination of "Markov method to growth probabilities in certain economic sectors that are closely related to energy demand,"\textsuperscript{126} and the methodology concept of Aoki who argues that "a correlation exist between per-capita values of electricity generation and the state of the national economy, as expressed by the per-capita Gross National Product or Gross Domestic Product."\textsuperscript{127} As a result of the research, they argued that nuclear power would play a significant role in generating low-cost electricity.\textsuperscript{128} Still, the other rationale was that nuclear power would reduce the share of oil to be burnt as fuel.\textsuperscript{129}

In contrast, the Ulama viewed the Proposed Muria nuclear power plant

\begin{flushleft}
\textsuperscript{125} Taomo Zhou, “China and the thirtieth of September movement" Indonesia 98 (1): 42
\textsuperscript{127} Ibid
\textsuperscript{128} ibid, 136
\end{flushleft}
differently. Instead of creating a symbol of sovereignty, the Proposed Muria nuclear power plant would rely on foreign technological dependence, i.e. a threat to Indonesian national identity. The construction of this risk was based on an argument that the design of the Proposed Muria nuclear power plant, its technology, its operation and maintenance, all of them are going to be in foreigners, leaving Indonesia dependent.\textsuperscript{130}

However, BATAN has a different illustration by demonstrating the possession of nuclear power facilities in other Asian countries such as Iran and South Korea that has increased their political position in the international community. In this perspective, the Iran nuclear program has strengthened the country’s political clout in relation to the West.

From BATAN’s and the Ulama’s opposing sides, I noticed that although they use the same nationalist concern, there were different perception in interpreting the meaning of Indonesian national identity. The Ulama see Indonesian national identity as inside national borders. In contrast, BATAN refers consistently to outside national borders, or the global context. The different risk perception construction by BATAN and the Ulama depicts the dissimilar concerns of a “threat.” BATAN assessed the ownership of nuclear power plant as a way of gaining international prestige. On the other hand, the Ulama considered the possession of nuclear power as a threat for Indonesia because of the potential for foreign intervention.

\textsuperscript{130} PCNU Religious Scholars: “The Muria Nuclear Power Plant is Haram…”
Chapter 5. Conclusion

In this chapter, I conclude the thesis by highlighting my main findings, and discussing them in relation to issues in STS. In contrast to many studies of STS in the West, I took the proposed Muria nuclear power plant in Indonesia. Although Indonesia is categorized in the non-Western countries, Indonesia has a strong relation to the West in the past. The emergence of Indonesia is inseparable from the West. Indonesia as a homeland and nation discovered by university students who received scholarships from the colonial government in Netherlands. The name ‘Indonesia’ means Indian Islands. This name itself was invented by an Englishman that then popularized by the German ethnologist Adolf Bastian (1826-1905). Regarding Indonesia’s social cultural and religious diversity, Ruth McVey noticed, “religious beliefs are too varied and nearly important world religions are represented, in addition to a wide range of indigenous ones.”

Regarding Indonesia’s cultural and religious diversity, Ruth McVey cited Hildred Geertz, "religious beliefs are too varied and nearly important world religions are represented, in addition to a wide range of indigenous ones." Furthermore, Indonesia has long colonial experiences with different countries such as the Portuguese, the Dutch, the French, the British, and the Japanese. The thesis presents an example of the way in which the different entities interacted, learned and competed with each other after the State’s Independence.

131 Pramoedya A. Toer on Max Lane, Unfinished Nation: Indonesia Before and After Suharto. (London: Verso, 2008), 8

132 Ibid, 11
In this thesis, I demonstrated the social construction of risk with regard to the proposed Muria nuclear power plant has relations to the Indonesia’s colonial experiences, the development of the Indonesia’s nuclear program, the Ulama of the PCNU, BATAN, the principles of Islamic jurisprudence, national identity, the local people, industry, knowledges of perceived risk of the State’s nuclear inexpertise, environmental degradations, the type of the reactor, and foreign technological dependence. Furthermore, conducting a discourse analysis of the fatwa, I extended the framework of the social construction of risk that different risk assessments converge on the proposed Muria nuclear power plant, which is based on not only scientific and political discourse but also Islamic beliefs. In contrast to alternative forms of knowledge, Islamic belief not only has orientations to the social world but also the afterlife.

My principal findings tell us the contesting meaning of risk between the Ulama and BATAN depicts the narration of being Indonesian is not a single interpretation. Even though the Ulama and BATAN have similar concerns regarding national identity, they, as the main actors, represent different social identities as well as interests. By social identity, I mean “the set of ways in which groups understand and portray their relationships with one another and with the state.” ¹³³ This finding can be a reference for policy-making regarding the application of high-risk technology such as nuclear power plant. For example, how the diversity of risk perception can be completed with the development of the nuclear power plant.

¹³³ Gabrielle Hecht, “The Radiance of France…” p.10
5.1. Risk and the *fatwa*

Risk is not a new analytical component in the discourse of nuclear power plant. In Indonesia, risk is an important idea, which influenced the Indonesian government to establish a nuclear energy agency (BATAN, now). Before the 1990s, nuclear experts were the primary actors who generally governed risk assessments surrounding nuclear power plants. The nuclear experts occupied all domains of the decision-making process of nuclear power plants. The proposal of the Muria nuclear power plant was also originally a result of scientific consensus among the nuclear experts and the government. From the BATAN perspective; the Proposed Muria nuclear power plant proposal depicts risk assessments to the potential energy crisis, economic crisis, and Indonesian national identity in the global political system.

The Muria nuclear power plant proposal was originally created in a top-down planning system. Under this system, nuclear experts and the government representative had an interest for the State mission to achieve political economy goals. However, the top-down planning system has been challenging since the authoritarian Suharto regime stepped down in 1998. This hierarchical decision-making process transformed to a democratic model, which adopted public participation in a bottom-up model. This model depends on public participation, including the *Ulama* of the PCNU in the decision-making process.

My principal findings indicate that despite having different political contexts between the authoritarian regime and the democratic model, there is no difference of
BATAN's risk assessments regarding the potential energy crisis, economic growth, and the national identity. While the main focus of my thesis is on the fatwa, the way in which BATAN constructed risk in response to different political regimes can be a new important study in future. On the other hand, Wahid’s and the Ulama’s concerns regarding perceived risk of the State’s nuclear inexpertise did not change whether from the authoritarian regime to the democratic model. Regardless of the political regimes, perceived risk of the State’s nuclear inexpertise was one of their main concerns. Across the contesting political regimes, the Ulama from Wahid to the PCNU articulated their concerns of perceived risk of the State’s nuclear inexpertise through distrust of nuclear experts.

The other main finding is that the fatwa offered an alternative view of seeing risk from the principles of Islamic jurisprudence. Before the fatwa was announced by the Ulama, the local people had depended on information from BATAN. However, after the fatwa was announced, the local people have a choice to see the Proposed Muria nuclear power plant differently. In addition, the fatwa depicts the Ulama’s response to significant degrees of risks that BATAN has not recognized them. The Ulama understood risk not only through discourses of scientific knowledge, but also through the Islamic fiqh. Mafsadah (disadvantages) and maslahah (the benefits) on the fatwa depicted the Ulama's risk assessments regarding perceived risk of the State’s nuclear inexpertise, the type of the reactor, environmental degradation, and foreign technological dependence.
5.2. Risk and National Identity

As a response to the risk of foreign technological dependence, I noticed BATAN and the *Ulama* have the same concern of national identity, but these two actors interpret the meaning of national identity differently. Since the Indonesian government established BATAN in 1954, the use of nuclear technologies has been not only for developing economic condition at the national level but also for enhancing the national identity at the global political system. Nuclear power is to be believed an advanced technology that could shift the country’s status from a “developing world” to a “developed country.”

As I discussed in chapter 4, the *Ulama* assessed the possession of nuclear power plant and concluded that such as a plant is a threat for Indonesia because risk of being dependent on foreign countries who have access to nuclear technologies. Using the analogy of the case of the nuclear program in Iran that has been obstructed by the West, the *Ulama* emphasized the experience of a dominantly Muslim country that was intervened by non-Muslim powers. I think the *Ulama* only chose the Iranian nuclear program, not North Korea, because Iran has a similar identity as Muslim, regardless of the fact that the *Ulama* and Iran have different Muslim associations such as Sunnis and Shia. Generally Sunni Muslims are close to *Ahl al-Sunnah*, which refers to *Hadits* (the Prophet Muhammad's behaviors and speeches). On the other hand, Shia Muslims literally mean the “Party of Ali.” Shia Muslims recognized Ali as the right guider after the Prophet Muhammad. Interestingly, in many cases they have ideological conflicts. However, in the *fatwa*, the *Ulama* mentioned Iran as an analogy. This finding offers a
counterfactual condition. I think if BATAN has agreement with a company of nuclear power technology, which comes from the Muslim country, the risk of foreign technological dependence may be shifted.
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