HYBRID ENVIRONMENTAL GOVERNANCE IN VERY SMALL POWER PRODUCERS : A COMPARATIVE STUDY OF THREE MICRO-HYDROPOWER PROJECTS IN THAILAND

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การจัดการปกครองด้านสิ่งแวดล้อมแบบผสมในผู้ผลิตไฟฟ้าขนาดเล็กมาก : ศึกษาเปรียบเทียบกรณีโครงการไฟฟ้าพลังน้ำระดับจุลภาคของชุมชน 3 แห่งในประเทศไทย

นางสาวธิตา อ่อนอินทร์

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ธิตา อ่อนอินทร์ : การจัดการปกครองด้านสิ่งแวดล้อมแบบผสมในผู้ผลิตไฟฟ้าขนาดเล็กมาก : ศึกษาเปรียบเทียบกรณีโครงการไฟฟ้าพลังน้ำระดับจุลภาคของชุมชน 3 แห่งในประเทศไทย (HYBRID ENVIRONMENTAL GOVERNANCE IN VERY SMALL POWER PRODUCERS : A COMPARATIVE STUDY OF THREE MICRO-HYDROPOWER PROJECTS IN THAILAND) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: คาร์ล มิดเดิลตัน, หน้า.

ประเทศไทยอยู่ในสภาวะความต้องการการใช้ไฟฟ้าสูงขึ้นอย่างต่อเนื่องและไฟฟ้าจากพลังงานหมุนเวียนซึ่งรับซื้อจากโครงการผู้ผลิตไฟฟ้าขนาดเล็กมาก (VSPP) เป็นโครงการที่มีความสำคัญ ไม่เพียงเสริมความแข็งแกร่งในแง่ความมั่นคงพลังงาน แต่ยังตอบโจทก์เนื่องเรื่องการพัฒนาอย่างยั่งยืนในการแง่การจัดการปกครองสิ่งแวดล้อม ในอนาคตโครงการผู้ผลิตไฟฟ้าขนาดเล็กมาก(VSPP) ในระดับชุมชนจะเป็นปัจจัยที่มีความสำคัญเพิ่มขึ้นในการจะทำให้เป้าหมายการผลิตไฟฟ้าด้วยพลังงานหมุนเวียนเป็นไปตามที่ตั้งไว้คือ ๒๕ เปอร์เซ็นของพลังงานทั้งหมด อย่างไรก็ดีเรื่องนี้ยังได้รับความสนใจศึกษาน้อย จึงเป็นเหตุให้การศึกษาเชิงเปรียบเทียบโครงการไฟฟ้าพลังน้ำขนาดเล็กในสามชุมชน แม่กำปอง (เชียงใหม่) แม่โจ้ (เชียงใหม่) และ บ้านสามขา (ลำปาง)เกิดขึ้นเพื่อการศึกษารูปแบบการจัดการปกครองที่มีหลายภาคส่วนเข้าร่วม (การจัดการปกครองที่มีรูปแบบผสม) กรณีศึกษาเหล่านี้สร้างกระบวนทัศน์ใหม่เกี่ยวกับการกระจายศูนย์การผลิตไฟฟ้าโดยงานวิจัยชิ้นนี้จะศึกษา ปัจจัยความสำเร็จ อุปสรรค และโอกาสเป็นไปได้ที่โครงการจะถูกถ่ายทอดสู่วงกว้างมากขึ้น งานวิจัยชิ้นนี้ใช้วิธีวิจัยเชิงคุณภาพ โดยมีการสัมภาษณ์แบบเจาะลึกบุคคลสำคัญในชุมชนที่เป็นกรณีศึกษา รวมถึงภาคส่วนที่ได้ร่วมงานด้วยทั้งบริษัทเอกชน ภาคประชาสังคม และหน่วยงานของรัฐ

งานวิจัยนี้เสนอว่าการรวมตัวของหลายภาคส่วนเป็นการจัดการปกครองสิ่งแวดล้อมรูปแบบผสมนั้นมีส่วนทำให้โครงการผู้ผลิตไฟฟ้าขนาดเล็กมาก (VSPP) ระดับชุมชนประสบความสำเร็จ นอกจากนั้นยังเป็นการเริ่มการให้นิยามของความมั่นคงทางพลังงานที่เน้นการกระจายรายได้สู่ท้องถิ่นจากโครงการที่ชุมชนคิดขึ้นเองซึ่งสอดคล้องกับแนวคิดความมั่นคงมนุษย์โดยเนื่องมาจากการเพิ่มศักยภาพให้ชุมชน การร่วมมือกันของผู้ทำโครงการชี้ให้เห็นถึงพลวัตของความสัมพันธ์เชิงอำนาจระหว่างภาคส่วนต่างๆคือชุมชน ภาคเอกชน ภาคประชาสังคมและภาครัฐ อย่างไรก็ตาม ถึงแม้ชุมชนจะมีศักยภาพเพิ่มขึ้นจากการร่วมมือกันกับหลายภาคส่วน รัฐยังเป็นภาคส่วนที่มีอิทธิพลสำคัญกับการเข้ามาของชุมชนในธุรกิจนี้ ผู้ผลิตไฟฟ้าขนาดเล็กมาก (VSPP) ระดับชุมชนประสบกับอุปสรรคที่เนื่องมาจาก การสนับสนุนที่ไม่เพียงพอจากนโยบายภาครัฐ การดำเนินการตามกฎหมายที่เข้มงวดเกินไป และการขาดความโปร่งใสในการขอใบอนุญาต การจัดการปกครองรูปแบบที่เกิดขึ้นในกรณีศึกษานั้นมีลักษณะเฉพาะ ยากแก่การถ่ายทอดหากรัฐไม่แก้ไขระเบียบบางประการให้เกิดการสนับสนุน อย่างไรก็ดีถึงโครงการเหล่านี้จะมีปัญหาเรื่องการสร้างรายได้แต่โครงการได้นำมาซึ่งฐานของการพัฒนาการจัดการปกครองสิ่งแวดล้อมในชุมชน

สาขาวิชา การพัฒนาระหว่างประเทศ ลายมือชื่อนิสิต .....

ปีการศึกษา 2557 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5681210724 : MAJOR INTERNATIONAL DEVELOPMENT STUDIES
KEYWORDS: HYBRID GOVERNANCE / ENVIRONMENTAL GOVERNANCE / COMMUNITY VSPP / THAILAND VSPP / COMMUNITY ENERGY / ENERGY DECENTRALIZATION / COMMUNITY ELECTRICITY

THITA ORN-IN: HYBRID ENVIRONMENTAL GOVERNANCE IN VERY SMALL POWER PRODUCERS : A COMPARATIVE STUDY OF THREE MICRO-HYDROPOWER PROJECTS IN THAILAND. ADVISOR: CARL MIDDLETON, Ph.D., pp.

Thailand needs to create the supply to meet an increasing demand of electricity consumption. Renewable sources produced by Very Small Power Producers (VSPP) are a promising scheme that not only would strengthen energy security, but also inform solutions for the problem of sustainability in environmental governance. In the future, community VSPPs will be an important contributing factor for Thailand's 25% renewable energy (RE) production to be met, but to date this issue has received inadequate attention. A comparative study at the Mae Kam Pong, Mae Jo (Chiang Mai) and Ban Sam Ka (Lampang) Micro Hydro power projects was conducted in order to illustrate multi-partner governance (Hybrid Environmental Governance as referred to in the thesis). These communities' VSPPs mark a new paradigm of decentralized energy production and environmental governance. This study explored successes and challenges, as well as the opportunity for the project to be replicated to assess the feasibility of a national-scale community VSPP program in the future.

To conduct this research, in-depth interviews with key informants from the community, their partners from firms and civil societies as well as other governmental authorities were carried out.

This paper argues that the formation of hybrid environmental governance contributed to the success of establishment of community VSPP projects. Moreover, by empowering the community, it introduced the emphasis on the human security aspect within the energy security concept, e.g., local income distribution through self-initiated VSPP projects. The formation of the projects points out dynamics of power relation between the community, private sector, civil society and state actor. Although communities become more empowered by partnering with firms and civil society, the state is still a dominating actor that determines the ability of community actors to participate in VSPPs business. Community VSPP projects faced challenges such as lack of policy support, rigid legal process and lack of transparency during the approval process. The hybrid governance that occurred in the projects is so unique that it is difficult to replicate on a mass scale unless government regulations are amended so that they supports the adoption of the model. And, although the financial sustainability of the project is uncertain, the project highlighted a platform of environmental governance development within the community.

Field of Study: International Development Studies St dent's Signature .....
Advisor's Signature .....

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CSR	-	Cooperate Social Responsibility
BOT	-	Build Operate Transfer
DIW	-	Department of Industrial Work
DPT	-	Department of Public work and Town & City Planning
EforE	-	Foundation of Energy for Environment
EGAT	-	Electricity Generation Authority of Thailand
ERC	-	Electricity Regulatory Commission
IPP	-	Independent Power Producer
MEA	-	Metropolitan Electricity Authority
MoE	-	Ministry of Energy
MOST	-	Ministry of Science and Technology
NGO	-	Non-Government Organization
NIA	-	National Innovative Agency
NPCO	-	National Council for Peace and Order
PDP	-	Power Development Plan
PEA	-	Provincial Electricity Authority
PPSP	-	Public-Private-Social Partnership
RE	-	Renewable Energy
RFD	-	Royal Forestry Department
RID	-	Royal Irrigation Department
RN.4	-	Factory Operation Approval
SCG		Siam Cement Group
SPP		Small Power Producer
TAO		Tambon (Sub-district) Administrative Organization
VSPP		Very Small Power Producer

CHAPTER I
INTRODUCTION

1.1 Introduction

Electricity has played a fundamental role in the world's development in the centuries since industrialization. Thailand is more and more in need of electricity and at a growing consumption rate of 2.6 per cent annually (DEDE, 2013)[1]. Despite the fact that Thailand's energy policymakers strive for more efficient ways to generate electricity that are adequate for development, Thailand still depends greatly on both domestically produced and imported fossil fuels resources as its main sources of electricity. This includes 70% natural gas, 12.6 lignite, 8.2% imported coal, and 7.8% other sources. By contrast, renewable sources contribute only 1.4%. (EGAT, 2014).[2] It is usually the responsibility of the state to design mechanisms to secure energy for domestic usage. With a rising rate of consumption, and a diminishing amount of global fossil fuel, the state must take energy security into account as an issue of national security. Therefore, locally produced renewable energy has become an issue in experts' interest that could be an alternative method to strengthen energy security by utilizing stored energy from natural resources and renewable energy(EnergyForum, 2013).

In addition to national energy security issues, community energy projects can respond to the global initiatives to address climate change and sustainable development. The world's paradigm for electricity production from local, renewable sources was at a turning point due to global concerns over climate change. Conventional fossil fuel production of electricity would be optimized through large-scale production. On the other hand, electricity from renewable sources is more

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1 See more, http://webkc.dede.go.th/testmax/node/252

2 More details, see EGAT 2014 http://www3.egat.co.th/re/

efficient when produced on a small and decentralized scale.(Limiyakorn., Pers Comm., 30 May 2014)

In the 1980s there was an initiative urged by the World Bank on the concept of decentralizing energy[3] production in Thailand (Greacen C. S., 2004). The Thai government under the Thaksin administration had attempted to follow the model for "decentralizing[4] and liberalizing[5]" the energy industry by introducing the privatization of the Electricity Generation Authority Thailand (EGAT) and its umbrella organization. The attempt was terminated, and therefore Thailand has had only one buyer and distributer to date. This model is called the "enhanced single buyer model", where EGAT and PEA (Provincial Electricity Authority) are the buyers, who allow smaller private power producers to produce and sell energy back to state-owned enterprise (C. Greacen, & Tongsopit, D, (2012)). In 1986, the Independent Power Producer (IPP) program was introduced to allow the purchase of electricity IPPs to transfer the risk and cost of production to the private sector. IPPs are typically big companies with EGAT as shares' holder that can produce a large amount of electricity. In 1992, Small Power Producers (SPPs) and in 2002 Very Small Power Producers (VSPPs) were introduced to allow smaller producers to enter the electricity business.

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3 Due to public debt, Thailand was unable to accommodate fast growth, and after the Asian 1997 crisis a series of World Bank consultations were conducted regarding privatization as a strategy for decentralization. Later there was a trend towards local energy production with renewable energy for community resilience.

4 Decentralizing Energy Production- refers to the delegation of production opportunity and technology to the hands of non-state actors, such as private firms. The production and distribution systems are owned by various actors and not monopolized by one.

5 Liberalizing Energy Industry – Liberalization of the electricity market refers to the act of *increasing competition* in the electricity market by various means, e.g., allowing private investors to invest and allowing more electricity providers to step into the business. But the electricity market is a natural monopoly due to the restrictions on distributive infrastructure, cost investment and regulations. Therefore liberalizing the electricity market in one country can be a difficult debate. Liberalization usually goes hand in hand with privatization. Privatization is a process in which state assets are sold off to private operators.

The VSPP program is an essential scheme for the state to show support for community energy production. The program allows the state to buy electricity in amounts less than 10 megawatts from renewable sources (see more in Chapter 2). PEA's main function is to act as a local distributer of EGAT's main production. However, the electricity from VSPPs would be brought and synchronized directly to the PEA grid and distribution system as the only buyer from VSPPs. In Thailand, electricity produced from VSPPs is restricted for sale to the PEA only, and producers cannot install parallel lines for other domestic or local use. Conventionally, VSPP developers are private investors with financial and expertise. The idea of locally-based electricity production that sells back to the grid system (VSPP) is new in Thailand because community-based electricity production has so far been predominantly supported by Ministry of Energy for the sole purpose of storing electricity in remote community where the national grid cannot reach, and it was restricted for local use only.

However, the importance of locally produced electricity, where surplus can be sold, has been seriously discussed in the global context, as for example in the European Union. Germany is a good example of a country with community-owned electricity and other energy system, as it is one of the leading countries pioneering energy decentralization practices[6] (Energy sustainable community, 1994). There is an emerging trend of local communities entering the electricity business and generating economic and social benefits for the community. A prominent example from Germany is the promotion of communities that can produce their own electricity as well as other energy (heat, oil, gas etc.) from their own local production. The benefit of this model is independence from a centralized energy system, and more benefits in terms of community income from optimal use of waste products. From a macro-economic viewpoint, the benefits are contributions towards increased efficiency in electricity production as well as the creation of competition, as the number of electricity service providers increases (Greacen C. S., 2004). This trend in Europe toward liberalization contrasts with Thailand's "enhanced single-buyer model.

[6] See more, http://www.go100percent.org/cms/index.php?id=19

With more attention to policy and incentives for community-owned electricity, communities should be able to contribute to energy security as relates to the concept of human security, especially in under-developed countries. In Sub-Saharan African countries, locally owned electricity production exists with the aid of developed countries (RNWAfrican, 2012), mainly to provide electricity to their town when the state can't provide infrastructure. The benefit of the formation of such communities is the direct electricity supply benefit, as well as other social and economic benefits. Therefore, community power producers operate successfully in two main circumstances. One is in the global north countries, where locally produced power pioneers a new paradigm of decentralized energy production, while the other is in the Global South, in low-income countries where electricity infrastructure wouldn't necessarily exist if the community did not take the initiative. This growing trend of community-produced electricity from renewable sources for the benefit of "national energy security (effective provision of adequate energy)" as well as to promote "human security" (good standard of living reached to marginalized group) should be adopted by Thailand's electricity industry.

However, in Thailand the concept of decentralizing electricity production has not been successful as EGAT and PEA monopolize the industry as single buyers. However, the emergence of VSPP programs is a phenomenon that signifies the delegation of some production power to privates and locals. Unlike private developers equipped with financial capital and expertise, communities have the potential to develop VSPP projects, but lack the capital necessary for effective development. The emergence of VSPP business in community level not only corresponds to the state's "enhanced single buyer model", but also has the potential to benefit local people. The main socio-economic benefits to local communities include local job opportunities, extra income generation, energy security on the local level, community resilience, etc. It generates extra income for village activities by turning local waste material or stored kinetic energy from natural resources into power that can be sold. Therefore, a study about the relationship between electricity-related state agencies, non-state

actors, and community developers is essential to describe how the power is delegated and what relationships exist within the governance that has been formed.

This thesis selected three case studies of communities that attempted to develop VSPP businesses. The first covers Mae Kam Pong (Chiang Mai), a village well-known for its state-supported off-grid Micro-Hydro power plant cooperatives, which just converted its third project into a VSPP. The second case is a grid-connected micro-hydropower plant in Mae Jo village (Chiang Mai) (EforE, 2011). The Mae Jo hydropower was another project which had a private partnership from a CSR grant from the Thaioil Company and a partnership with energy NGO, the Energy for Environment Foundation (EforE) in their work team. The third case is in Ban Sam Kha (Lampang), and discusses an on-grid Micro-Hydro power plant that received funding support from Siam Cement Group's (SCG) CSR program, and also partnered with EforE. This cooperation is an emerging new form of business arrangement in the electricity generation industry in Thailand (O. R. D. Young, M 2009)[7]. By selecting these case studies, a comparative study can be done by looking at state-community partnership in Mae Kam Pong and partnership between civil society, private, community and state actors in the Mae Jo and Ban Sam Kha communities.

Hybrid environmental governance is a concept introduced by Young (2009) that explain the cooperation between the public, private, and social sectors, which are the three most influential actors. This configuration is therefore called the Public-Private-Social Partnership (PPSP). Hybrid environmental governance is therefore the key concept for this study, as it explains the concept of cooperation between these three actors with different incentives that act with the community. The three case studies each show some form of PPSP partnership with the community as Mae Kam Pong has a state-community configuration, while Mae Jo and Ban Sam Ka involve non-state actors (private firm and civil society). Two of the three community VSPPs (in the case studies) clearly have the arrangement of a Public-Private-Social

7 See more, 5.2 Conceptual Framework, Public –Social Partnership

Partnership within themselves. However, although the state's relationship with the community is rather a contractual relationship, the state played an important role in the formation of community VSPPs on various levels, including both the approval and operation process (e.g. local government (TAO)), the Energy Regulatory Committee (ERC) etc.).

This study focuses on community actors that attempted to develop VSPP businesses in partnership with other actors following the hybrid governance model. Moreover, the emergence of community VSPPs in the form of PPSPs is a new and promising phenomenon. Therefore, this study is conducted not only to seek understanding regarding the incentives of VSPP formation and how it operates, but also to explain what this partnership can bring about successful VSPP operation in economic, environmental and social aspects. These can be understood through identifying the incentives of each actor and power relationships within the governance model, as well as exploring what the partnership can contribute to the successes of the setup and operation process and overcome challenges. All of these are brought together by the framework of Public-Private-Social-Partnership, which is organized following under hybrid environmental governance model. This study, therefore, would not only bring understanding towards the emergence of hybrid governance in the formation of community VSPPs with Micro-Hydro power technology that help inform the issue of more sustainable national energy security, the study will also explore why the community VSPP concept is not widely adopted.

1.2 Research Questions

The main question that this thesis will address is *"What are the incentives, power relationships, and supporting and undermining factors that shape the governance of a partnership between the state, the private sector, civil society and the community (Hybrid Governance) in Very Small Power Producers (VSPPs) in Thailand?"* To further elaborate on the answer to this question, the following sub-questions are proposed.

1. What are the incentives of each actor in economic, social and environmental aspects?
2. What are the power relationships between the actors (community, state, private sector and civil society)?
3. What are the supporting and undermining factors contributing to the successes and challenges for the community VSPPs in obtaining VSPP approvals and contracts, as well as operating the VSPPs?
4. Building on the findings, under what conditions could this pioneering projects be advanced to the replicability of the community VSPP in mass scale?

1.3 Research Objectives

The main research objective is to study the incentives, power relationships, and supporting and undermining factors that shape the governance of a partnership between the state, the private sector, civil society, and the community (Hybrid Governance) in Very Small Power Producers (VSPPs) in Thailand. For clearer understanding other minor objectives are proposed.

1.1 To study the incentives of each actor in economic, social and environmental aspects.

1.2 To explain power relationships between the community, the state, private firms and civil society within the configuration of hybrid environmental governance.

1.3 To study factors leading to successes and challenges for community VSPPs in obtaining contracts, and approvals, and establishing a successful operation.

1.4 To explore the potential as well as the benefits and risks for the community VSPP concept to be successfully replicated on a mass scale.

1.4 Conceptual Framework

The study aims to give explanations for the interactive relationships among these actors with different interests.

- **Energy Security:** The ability of state and other actors to meet increasing demands in energy usage. The ability to meet the demand means, offering affordable prices, conducting outreach to local populations, an ability to sustain production line, and ability to transport the electricity. The failure of energy security means the failure to sustain production that would affect the livelihood of citizens to the extent that said failure would threaten national security (S Bamrungsuk, 2006).

- **Governance:** governance is a social function focused on efforts to shape societies away from collective disastrous outcomes and towards socially desirable outcomes (O. R. Young, 1999).

- **Hybrid Environmental Governance:** An emerging alternative form of governance, as opposed to the conventional state-led governance. There is an increase of non-state participant in environmental regime, including by private firms, civil society and local communities (Young, 2009).

- **Public Sector (State):** the State's main interest is to secure its "energy security" agenda through the provision of adequate, quality electricity for its citizens. It promotes mechanisms to control, incentivize and regulate the production of electricity (Haufler, 2009).

- **Civil Society:** In this case, advocacy NGOs whose main interest is to advocate in conformity with state's policy or against it. Environmental NGOs are known for their anti-state, anti-corporate activism. Civil society actors are

known to work closely with local communities, advocating via a bottom-up approach (Haufler, 2009).

- **Private Sector:** Private companies whose main interest is to yield optimum benefits to investors. However, nowadays the participation of the private sector in environmental governance signifies other more complicated interests than the ultimate return on investment (Haufler, 2009).

- **Local Community**: The main interest of communities is to maintain social benefits by achieving standards of equal distribution of welfare among members over income generation.

The figure below illustrated the study's conceptual framework:

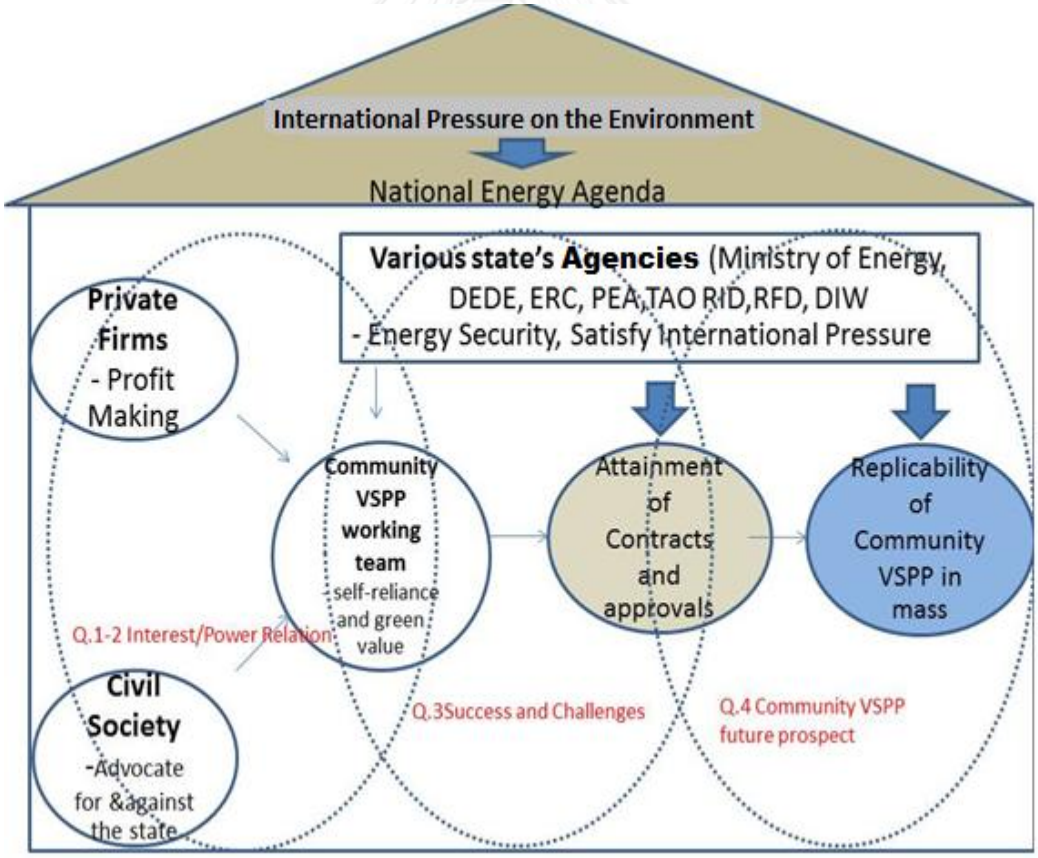

Figure 1Conceptual Framework

The conceptual framework diagram depicts the study framework as follows.

1. The arrows indicate the interacting relationships each actor has with the others.
2. The three dotted circles show to scope of research questions. The first circle covers the scope of sub-question 1 and 2. The second circle covers sub-question 3. Finally, the third circles covers sub-question 4 and conclusions.

These ideas will be explained in detailed in the following sections: 1.4.1 International Pressure on the Environment towards Energy Agenda 1.4.2 Very Small Power Producers, 1.4.3 Hybrid Environmental Governance (PPSP), 1.4.4 Public Sector (State) 1.4.5 Private Company, 1.4.6 Civil Society and 1.4.7 Community

1.4.1 International Pressure on the Environment towards Energy Agenda

State actor in energy production has been influenced by many pressures both from outside the nation state and even domestic pressure that they feel the urge to satisfy. International pressure is another important influence for state's action on the energy generation policy. Environmental issues that had raised the concerns of the international community are for example; climate change, global warming due to the emission of greenhouse gas and carbon emission from fossil fuels. Over the past decades, many summits and conferences had led to agreements and protocols among international communities. Although Thailand isn't a prominent nation that is marked on a watch list on its carbon emission, showing actions that address the hot issue would keep Thailand in the same pace in international community.

Stat agencies' main obligations on the central level are obliged to formulate policies promoting national energy security but at the same time must integrate global agenda on the production of Renewable Energy. This concept would be discussed further in Chapter 4 (See 4.2.2)

1.4.2 Very Small Power Producers (VSPPs)

VSPPs generate less than or equal to 10 megawatts of power, which are sold directly to the PEA grids, depending on the location of the VSPPs. Eligible VSPP

applications must go through an approval process and the operators must later sign a Power Purchase Agreement (PPA). The agreement lasts for five years, and is automatically renewed if neither party needs to terminate it (Tongsopit, Greacen, 2013). According to the PEA's manual for power purchase (2006), the power source must be from a renewable technology, e.g. Solar thermal, Photovoltaic, Wind Turbine, Hydro-Power, Biogas, or Biomass (from agricultural and household waste). Production input can be co-used by commercial fossil fuels not to exceed 25% of the yearly production. There are five major processes that VSPP applicants need to go through: 1. The application and approval process 2. Issuing long-term purchasing contract process 3. The approval and installation of generators to the grid system 4. Conducting a synchronization test to the grid system 5. The issuance of a commercial operation date (COD) to start selling to the PEA/MEA. Throughout the process, there are requirements set forth in the "PEA's Application Manual for VSPPs"[8]

The Ministry of Energy grants final approval. Criteria include grid availability; guarantee of access to financing, land, and a government permit and a security deposit must be submitted (which is returned after project commissioning).

[8] For more info, see https://www.pea.co.th/vspp/Pages/home.aspx

1.4.3 Young's Hybrid Environmental Governance and Public-Social-Private Partnership (PSPP) Model

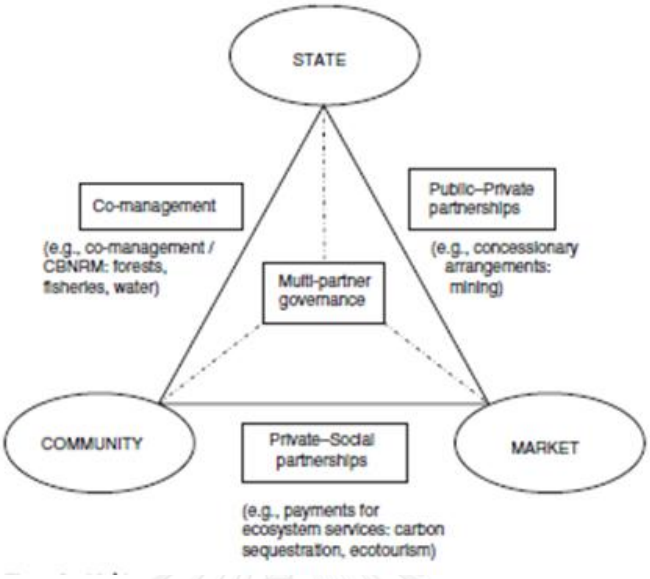

Figure 2 Multi-partner governance. Reproduced from Environmental Governance, 2009

Oran Young (2009) introduced the above "Hybrid Environmental Governance" diagram in his paper. He claimed that decentralized and cross-scale governance is an important alternative form of governance. In the diagram, he further explained the present the schematic structure to classify strategies of environmental governance that are founded upon the actions of the three different social mechanisms. Moreover, Young had cited Agrawal (2005) that

> "*These efforts, champions state, market and community based governance strategies, were built around perceived strengths of the particular social arena being considered: the capacity for action across jurisdictions backed by state authority, mobilization of basic human incentives through market exchange; and the deployment of socialistic relationship and time-and place-specific knowledge embodies in communities*"

In the concept of hybrid governance (or public-private-social partnership (PPSP)), both state actors and social actors play similar role because the public actor (State) protects the wellbeing of its citizen through laws and regulations, whereas

social actors do so by providing the context of the locals as well as protection of the people's wellbeing through monitoring the common good and the guarantee of equity through social activity. In hybrid governance PSPP, private actors are there to share financial risks which public and social actors are accountable for. Sharing risks can refer to various means, such as investing, taking on responsibility for debt, or providing maintenance services.

To adopt Young's framework regarding hybrid governance, the case studies formed their partnerships in a slightly different way according to the diagram below.

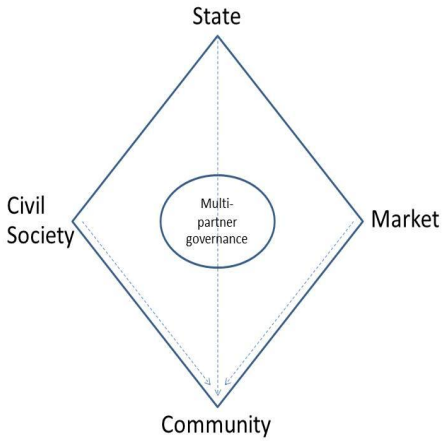

Figure 3 Adapting FW from Young's Multi-Partner Governance; refers to figure 2

This thesis adapted Young's concept of hybrid governance by contextualizing it to match with the study. Community actor in Young's original diagram refers to social actor as one unit. Community may have worked with or been empowered by civil society, and therefore this sector is an association of community. This new diagram was adapted from Young's original triangle into a diamond shape relationship of four partners, which consist of state, market, and the community and civil society actors. This thesis would like to clarify that community and civil society actors are two different entities. By separating the two actors, the diamond shape relationship between the four actors is identified. This configuration facilitates separate analysis of each actor.

1.4.4 Public Sector (State)

State agencies are involved in the process of operation in electricity business on many different scales. Possible main state actors that interact with the VSPP industry in general are the Department of Alternative Energy Development and Efficiency (DEDE) under the Ministry of Energy; the Energy Regulatory Commission (ERC), the Electricity Generation Authority of Thailand (EGAT), the Provincial Electricity Authority, and Tambon Administration Organization (TAO).

- ***Department of Alternative Energy Development and Efficiency (DEDE) under the Ministry of Energy***: DEDE was established in 1953 with the missions of supporting the development of commercial clean energy technology for export and domestic use, and to bridge the network of collaboration for sustainable economic growth and social well-being that derive from clean energy consumption. Specific responsibilities are to promote energy efficiency, regulate energy conservation, develop integrated energy use, and disseminate energy technology in a systematic process in response to the demand of different sectors, all at optimal cost and benefit. Similar duties are prescribed under The Energy Conservation Promotion Act 1992.(DEDE., 2012).

- ***Electricity Regulatory Commission (ERC)*:** The ERC is an independent regulatory agency whose responsibilities are based on the enactment of The Energy Industry ACT 2007. The ERC's missions are to regulate the energy industry to establish a secure energy system that is reliable, efficient, and fair to both the customers and the industry operators, for the benefit of sustainable development and social well-being. The ERC's duties include overseeing regulation that deals with electricity system; generation, transmission, distribution etc., as well as monitoring the energy market, tariff review, and licensing and approval of power purchasing.

- ***Provincial Electricity Authority (PEA) (and Electricity Generation Authority of Thailand (EGAT)):*** PEA (PEA, 2012)and EGAT (EGAT., 2013)are state enterprises that collaborate to invest in generation and acquisition of electricity and the transmission and sale of bulk electricity via the transmission network. The two authorities work in collaboration through connecting networks, but their responsibilities are concentrated in different area. The EGAT is responsible for central electricity generation, investment in electricity generation, as well as the provision of energy-related services to external companies and private power plants, whereas the PEA's function is to retail bulk electricity through their transmission and distribution systems throughout Thailand, with the exception of Bangkok, Nonthaburi and Samut Prakarn Provinces. The PEA is the main authority responsible for the purchase of VSPP products. Therefore, VSPP developers must deal directly with the PEA.

- ***Tambon Administrative Organization (TAO)***: TAOs are decentralized governmental bodies in Thailand established in 1994. With the main mandate to carry out central government development agendas as well as setting their own, the organizations must report to the ministry of Interior. Therefore they receive an annual budget from the central government as well as generating their own income from local tax, etc. TAOs have the authority to take charge of local infrastructure education and social services, all according to the agenda set locally. Hence, an electricity generation business in a TAO's locality is another tax generator.

1.4.5 Private Company

Generally, the role of the private company in hybrid governance is to increase the efficiency of the state's business via the mobilization of basic human incentives through market exchange. In a Public Private Partnership, private entities are invited to invest in stated-owned enterprise as an alternative to privatization that proves complicated. Usually, a private company in partnership with other sectors will be given a cooperation contract such as service contract, management contract, public-

private joint venture agreement, Build-Operate-Transfer Agreement, etc. (Rondinelli, 2002). However, the role that a private company plays in the formation of a "community VSPP" will be explored by this research. Recently, corporations are involved in hybrid governance as a form of Corporate Social Responsibility (CSR). CSR entails to embracing responsibility and encouraging corporate actions and to encourage a positive impact on the environment and stakeholders, including consumers, employees, investor communities, and others (Haufler, 2009).

1.4.6 Civil Society

Civil society actors, especially environmental NGOs, are currently actively taking part in hybrid environmental governance. The NGOs either work against or in cooperation with the state to shape rules, norms and regulations. Especially in an increasing globalized world, civil society actors can take advantage of networks through which advocacy objectives can be channeled from INGOs to local NGOs and get in touch with local communities. NGOs gain negotiating power through activism. (Haufler, 2009). Environmental NGOs typically produce empirical research that can generate influence from the policymaking level to the local advocacy level. To contextualize the role of the civil society actor for the study, the NGO involved in community VSPPs is working to reinforce the state's policy. However, deeper analysis of the NGO role will be explored in the research

1.4.7 Community

Communities are a unit of social configuration activated though an empowerment process. Empowered communities can pursue their own direction of development. The will for their development usually attached to their social context. Often natural resources to benefit locals are managed though a system of local governance.

1.5 Research Methodology

In the methodology of the research, in-depth interviews with key informants were conducted between July and August 2014. Interviews included key informants from the Mae Jo, Mae Kam Pong and Ban Sam Ka communities, some local and central governmental agencies, as well as from their NGO and corporate CSR partners. The sources of data are from the collection of secondary data (1.5.1) and qualitative research methods (1.5.2).

1.5.1 Secondary Data Analysis

Some secondary documents were reviewed for the analysis. Most documents were received from the officials, such as the EGAT, PEA and MEA reports, regulations, agreements and other reports.

1.5.2 Qualitative Research

This research method used qualitative techniques e.g. in-depth interviews and non-participatory observation of various key informants.

1.5.2.1 Tool Use

In-depth interviews were used to explore deeply into various ideas from the respondents. This tool was good for discovery and open-ended questions. This technique makes it possible for one question to lead to another flexibly, while remaining relevant to the topic. This technique allowed the interviewer to get in-depth results when it was necessary to emphasize, and freely build up questions according to previous answers. This technique was used to interview key informants, such as the officials or other individual key informants in this study.

1.5.2.2 Non-Participatory Observation

It is a tool used to observe the environment, and atmosphere present in the case studies without verbal exchange. This technique permitted the gathering of non-verbal evidence.

1.5.3 Data Collection and Analysis

The interviews were conducted in Thai and were recorded either in MP3 tape or via note-taking. In the data organization process, the data was transcribed and translated into English later on for content analysis. Photographs of the case studies were taken during the fieldwork.

As a coding strategy, the data was listed and categorized according to research questions, and important quotes were extracted from the interviews. A table with three columns was created to facilitate the coding. In the first column, facts from the data were listed. The second column indicates number of research questions supported by the facts. Lastly, the third column includes actual spoken quotes from the data. The data sorted in the table was used as a basis for the content analysis.

Table 1 Interview Strategy

	Schedule	Interviewee	Location	Method
1.	1. July, 2014	Mae Jo Ban Din Leader	Chiang Mai	In-depth
2.	2. July, 2014	Mae Jo Enterprise Leader	Chiang Mai	In-depth
3.	3. July, 2014	Mae Jo Plant Technicians	Chiang Mai	In-depth
4.	3 July, 2014	Mae Jo Plant Technicians	Chiang Mai	In-depth
5.	4 July, 2014	Mae Jo TAO	Chiang Mai	In-depth
6.	4 July 2014	Mae Jo Local PEA	Chiang Mai	In-depth
7.	5 July 2014	Mae Jo community member	Chiang Mai	In-depth
8.	5 July 2014	Wai Jo group leader	Chiang Mai	In-depth
9.	5 July, 2014	Mae Jo plant land owner	Chiang Mai	In-depth
10.	11 July, 2014	MKP community leader	Chiang Mai	In-depth
11.	12 July, 2014	MKP plant technician	Chiang Mai	In-depth
12.	13 July, 2014	MMP cooperative member	Chiang Mai	In-depth
13.	14 July, 2014	Thaioil Group CSR officer	Bangkok	In-depth
14.	17 July, 2014	ERC approval officer	Bangkok	In-depth
15.	18 July, 2014	ERC approval director	Bangkok	In-depth
16.	21 July, 2014	EforE expert	Bangkok	In-depth
17.	23 Aug, 2014	BSK wise person	Lampang	In-depth
18.	24 Aug, 2014	BSK leader	Lampang	In-depth
19.	25 Aug, 2014	BSK village headman	Lampang	In-depth
20.	25 Aug, 2014	BSK community member	Lampang	In-depth
21.	25 Aug, 2014	BSK plant technician	Lampang	In-depth
22.	26 Aug, 2014	SCG CSR officer	Lampang	In-depth
23.	19 Oct, 2014	Energy Research Institute expert	Bangkok	In-depth

1.6 Research Scope

The research targeted three active communities in the north of Thailand that have attempted to establish VSPPs project. The three communities had started the setup process for varying period of time. All of them used Micro-Hydro power technology for their electricity generation due to geographical circumstances. The three case studies had different partnership configurations, were at different stages of the process, and were experiencing different constraints. Therefore different comparisons could be made.

The first site was in Mae Kam Pong, Chiang Mai, which is known for its first and second off-grid hydropower projects that had community cooperatives to manage them. The 3rd project has been turned into on-grid VSPP. (See section 3.2)

The Mae Jo project, located in Mae Jo, Chiang Mai, was selected as the second site. It is a grid-connected hydropower project at Mae Jo village close to PunPun community.[9] It has supporting corporate CSR funding from the ThaiOil Company. It is owned and operated by the community, with revenues supporting the local community. (See section 3.3)

The third site is in Ban Sam Kha, Lampang. The Bam Sam Kha micro- project is supported by CSR funding by SCG as well as locally funded through the selling of shares among community members. (See section 3.4)

1.7 Limitations of the Study

The information received from the interviews is from different personal perspectives. The information can be biased depending on the interviewee, thus information triangulation is an important technique. In each topic, as many different

[9] More info, see www.punpunthailand.org

perspectives were taken as possible. However, there are some topics for which this is not possible. For example, the perspectives of some state authority that refused to give an interview could not be obtained. Access to the interviewees and information, especially partners engaged in conflicts with other partners (e.g. local government agencies) that refuse to give interview was the major challenge. This was mitigated by triangulating the information from secondary sources and the review of additional documents.

1.8 Significance of the Study

This research hopes to contribute to the success of communities participating the VSPP program in the context of Thailand's Renewable Energy and the sustainability aspect of the energy security agenda. The findings, lesson learnt, and best practices of the research will benefit policymakers in the field of electricity decentralization as well as the communities that wish to enter the business. The study also depicts Thailand's current energy decentralization situation for as relates to the global agenda. Further research can also be built from the findings and would hopefully lead to the shaping of a new paradigm for electricity production in Thailand.

1.9 Ethical Issues

This field of the research should not involve sensitive topics related to human rights. However, there might be some confidential commercial information that is important for the research. Informed consent will be obtained for every piece of information from both interviews and documents.

CHAPTER 2
REVIEW OF LITURATURE

2.1 Introduction

In this chapter, literature review will reveal relevant related pre-research information and related information necessary to the analysis. This chapter will begin by exploring the global context of RE and decentralization of energy production (See section 2.2). This will be explored through case studies on Germany's Electricity Cooperatives and community energy in the U.S. Midwest was selected. Thailand's concept of energy security will then be introduced (See section 2.3). Following that, Thailand's RE plan and Power Development Plan (PDP) 2010 (the most current PDP), along with varying critiques of these, will be explored (See section 2.4). To further describe the electricity industry, the background of decentralization in Thailand's energy production is described. Then, official procedures and documents necessary for the VSPP approval process are listed and described (See section 2.8). And lastly, broad concepts of governance and power-relation which will be useful to the analysis are discussed (See section 2.9).

2.2 Global Context for the Urge for Renewable Energy and Decentralization of the Production.

For several centuries, energy extracted from fossil fuels has been the mainstream source of energy. Scientific experiments have proved that non-renewable energy derived from fossil fuel will not only eventually run out, but it also causes chronic pollution that is a generator of global climate change. Therefore a new shift to alternative energy sources must be promoted to sustain economic growth as well as to protect the environment. Given that energy is the most essential element for development of any kind, to shift to the alternative, cleaner energy along with an

effective distribution strategy is the agenda that both developed and developing countries must consider. The renewable energy agenda was introduced primarily by developed countries. A prominent example is the European Union, which set a target of 20% renewable energy production by 2020[10] However, there is a trend for developing countries, such as China, India, and Brazil, to invest a high amount in renewable energy to fuel their fast-growing economies(UNEP, 2014).

Electricity from renewable energy sources and decentralized systems go hand in hand with each other. Lovins (2004) made an argument that the principal of economies of scale in electricity production made sense in the early twentieth century for central large-scale electricity production when power stations were more expensive and grids were combined for reliable and economical supply. In the twenty-first century however, people can easily access electrical service. The author argue that central thermal power plant could no longer deliver competitively cheap and reliable power when the grids linking the central station to remote customers have created the customers' power cost[11] and power quality problems. Renewable energy technologies, namely local thermal power plants from biogas and biomass sources (using waste products found locally), wind, solar and mini/micro hydro technologies are all small scale technologies that can serve the purpose of distributed and decentralized production. According to the market mechanism, the ineffective in cost, efficiency and financial risk can lead to the gradual collapse of the conventional order. By restructuring to create a market environment for small-scale RE production to become more efficient, e.g. increase competition on every scale, RE technologies are affordable and more standardized for commercial use(CenterforCleanAirPolicy, 2012).

[10] The 2020 climate and energy package proposed by the European Commission, is a set of binding legislation known as the 20-20-20 package which aims for 1) 20% reduction of EU's greenhouse gas emission, 2) raising the share of energy production to Renewable energy to 20% 3) 20% improvement in energy efficiency.

[11] Customers in remote areas must bear the cost of power lost along the distribution line. The longer the line, the more expensive the electric bill.

2.2.1 Germany's Electricity Cooperatives Pushing the Country's Energy Revolution

Currently there is a so-called rural energy revolution underway which could potentially lead Germany to transition from centrally planned energy service to a more decentralized structure. This is a cooperative model has come to serve the decentralized objective. Germany set up a firm robust goal of supplying 80% of Germany's electricity needs through renewable sources by 2050. As a result, there are now 158 energy cooperatives as of 2011, and the trend is sharply increasing. The government has posted an agenda to shape citizen consciousness of their contribution to renewable energy. All across Germany, wind turbines, solar panels, and biomass generation facilities are increasingly owned by locals, especially solar panels installed on the rooftops. The idea of decentralizing energy is widely accepted, as it provides people with economic incentives. An economic benefit also reverts to the government as a form of tax revenue. As a result of the encouragement of German Cooperative and Raiffeisen Confederations (DGRV), cooperatives have played important role since the end of the 19th century due to the period of economic struggle. (Bilek, 2012)

Gro bardorf, a village in Germany, leads the way of locally produced renewable energy in the form of cooperatives. It has 928 inhabitants. The project started from citizens investing 19$ million in solar roof systems and a biogas plant with a combined heat and power unit (CHP). After four years of operation, the village is able to produce 4 times the energy needed for both household and business purposes. The community's alternative source of energy saves $100,000 in electricity. The revenues add economic value to the village through local taxes. The project was first inspired by a cooperative promotion group called Raiffersen's that was the first banking cooperative. The concept was adapted for the local renewable energy project with the motto "The energy of the village for the village" and to enable locals to own the energy they need, contribute to sustainability in development, and add economic value through their activities. The group hoped to be able to implement energy cooperatives in every village in Germany (EnergySustainableCommunity, 1994).

2.2.2 Community Renewable Energy in the Midwest, USA

In the Midwest America, communities turn their existing cooperative model to apply for local community renewable energy cooperatives, but serious effort is still needed. One example is that of the Iowa rural electric cooperatives founded in 2011, which the U.S. Department of Energy helped organize. Until now, they develop two wind farms whose production output is 21 megawatts. The project is a famous case of the development of innovative methods to use existing technology for the transmission system instead of building a new expensive one. In addition, bio-refineries for electricity under a cooperative ownership model are found in the U.S. Midwest. This business will provide benefits that include well-paying jobs, tax revenue to local government, and empower community engagement(Bilek, 2012).

2.3 Thailand's Energy Security Regarding Electricity Generation

As oppose to "Traditional Security" that deals mainly with state sovereignty, a reconceptualization of security or "Non-Traditional Security" has been introduced since the Cold War due to major changes in the world's economy. The concept of security since the Cold War has shifted to concerns over economic security as the world's economy becomes more integrated and transboundary threats can arise. As the ability to produce in today's market-based economy directly impacts state's security, energy security is a security concept state's concerned in relation to its national security "*The conventional conceptualization of security defines energy security as the ability of state to provide adequate and affordable energy (oil, gas, electricity), while the reconceptualization of security focusing on the human security aspect results in the shift of the objective of energy security toward "the outreach of quality energy that can elevate standard of living of citizens"(Surachart Bamrungsuk, 2006a).* The term "energy poverty" was coined by Surichart Bamrungsuk (2006) who explained that the world's poverty was a cause of the inability to access to energy resources. Inequality can be viewed as the global north domination of the access to energy sources at the expense of the global south. Different interpretations of and reactions to of energy security should be highlighted in that different actors involved

in energy policy have different ideas. (Surachart Bamrungsuk, 2006b)The state, as the conventional actor responsible for energy supply sufficiency, prefers a centralized model (which is the existing model in Thailand). Other emerging governance actors (e.g. civil society and community) are interested in the decentralized RE model (S Bamrungsuk, 2006).

The current centralized model is called the "enhanced single buyer model". The structure of Thailand's current electricity industry is the reason behind inevitably high electricity prices, because its monopolizing model places the EGAT, the PEA and the MEA in control of buying, generating, and distributing electricity. Therefore, no price competition with other providers can take place. By contrast, in many countries, consumers can choose from various electricity producers, which market mechanisms were introduced to control price efficiency. Another downside to Thailand's monopolizing structure is that participation in the planning process can be low. For example, there are criticisms that the EGAT, which develops PDPs, overestimates its power generation, resulting in huge expected budgets to be invested in their future projects.

One threat to conventionally defined energy security regarding electricity is insufficient supply in relation to GDP. Thailand is the third highest country in Asia in electricity consumption per capita. But when compared with GDP, Thailand's rate of energy shows that electricity use doesn't contribute much to its production. Another threat to Thailand's energy security related to electricity production is insufficient electricity supply in the dry season (April-May). All of the approaches, demand side management and effective use of electricity is another issue that needed to be considered along with the plan for generation (PDP, 2010). The energy efficiency PDP is trying to promote the transformation of existing and new generations of power stations into the "co-generation" system. Co-generation refers to a system that utilizes the heat of the steam produced as by-product from the first round of production to the second-round heating system (EnergyForum, 2013).

Thailand has principally relied on conventional fossil fuel (coal and natural gas) from either domestic production or importing from neighboring countries to support its energy use. Thailand imports from countries including Malaysia, Laos (Mega-hydro project) and Myanmar. As policymakers see that nuclear technology can generate efficient electricity even amidst the controversy, electricity from nuclear technology was put in the PDP 2010.

Conventional policy makers who are concerned about securing enough electricity for domestic use would rather support a centralized approach such as the coal-fire station, mega-hydropower, or nuclear technology (Raktapongpaisarn, 2013). Nonetheless, proponents of the RE and decentralized approaches support more development of RE technology. The VSPP program therefore is the scheme that supports reduction of conventional fuel's dependency. The downside of the promotion of VSPP projects is primarily related to cost-efficiency, given that the technologies (solar cell, windmill, micro hydro power generator, etc.) are still expensive due to low the demand mechanism, cost to incentivize developers by e.g. "the adder program", and the electricity production is scattered and small. However, proponents see the importance to support decentralized RE schemes such as VSPP for instance, state should invest to kick-start and provide business-friendly environment. There are potentials of the installation of windmill technology and solar cell. The issue of energy security regarding the provision of electricity is still debated by policymakers (Nilubon, 2010).

2.4 Thailand's Future for Renewable Energy: Production Plan by the Ministry of Energy

Thailand's Ministry of Energy has adopted the global agenda on renewable energy production and put it into a plan as presented in the 15-year Renewable Energy Development Plan (REDP). It is the RE roadmap for Thailand between 2008-2022. A highlighted goal from this plan is the ambitious target for 20% of the share of production to be RE by 2022. The period of development has been divided into three phases: short term (between 2008-2011), mid-term (between 2012-2016) and long

term (between 2017-2022). In the first phase, the aim was to improve RE production potential through technology development. Following that, in the second phase, the emphasis shifts to the promotion of the RE technology industry and diffusion of technologies as well as the promotion of a green city model and the strengthening of local production. In the last phase, the target is the advancement of economically viable new RE technology as well as elevation of Thailand's RE production status to ASEAN export hub level. However, in August 2011, the government under Yingluck Shinawatra reaffirmed the target of meeting 25% of Thailand's energy demand with renewable and alternative energy. Subsequently, the REDP was replaced by the 10-Year Alternative Energy Development Plan (AEDP 2012-2021). The AEDP mainly put in action a plan to increase the share of RE production to 25%. Thailand has challenged itself through a more ambitious plan, yet there are problems to be tackled to smoothly arrive at the target.

2.5 Power Development Plan (PDP) 2010

The Thailand PDP 2010 is the 20-year power development plan for Thailand, which was written by the EGAT and approved by the Ministry of Energy. The PDP 2010 includes a prediction of energy demand from 2010-2030 and the method in which that particular amount of electricity could be produced. The PDP 2010 predicted that during the following 20 years, the future demand of electricity would be around 54,005 megawatts in total. Details of different technologies that contribute to production proportion are explained in the following table (MoE, 2010).

Table 2 The proportion of technologies contributing to Thailand's electricity demand between 2010-2030

Technologies	**Megawatts**
Combined Heat and Power (CHP)	16,670
Import from neighboring countries[12]	11,669

[12] From Mega Hydro Power Projects

Co-generation Technology	7,137
Coal-Fired Power station	8,400
Nuclear Technology	5,000
Renewable Energy Generation from Private Sector	4,617
Hydropower Technology	512

The PDP 2010 also predicted the amount of investment in which the electricity demand would be met as pointed out in the following table.

Table 3 Required amount of investment into electricity sector from 2010-2030

Investment in the Electricity Generation Sector (EGAT, IPP, SPP, VSPP, neighboring countries)	Investment in the Distribution System (MEA, PEA)	Grand total
3,469,526 Million Baht	749,259 Million Baht	4,218,785 Million Baht

The PDP was developed from the criticism of the PDP 2007, and therefore placed more emphasis on efficiency in the production process, demand side management, Renewable Energy, and participation of the private sector in the decision-making process. However, it still met with similar criticism regarding an inadequate emphasis on clean energy and especially over-estimation of the budget. An example of such criticisms is the PDP 2012, proposed by an energy expert. Details will be described in the following section.

2.6 Expert's Proposed Power Development Plan 2012

Greacen argued in her Proposed PDP 2012 that the 2010 PDP produced by the EGAT reflected inefficient electric power production for future of electricity

development itself as well as its social and environmental landscapes. The 2010 official PDP document reflected a planning process in crisis, as it selected excessive amounts of controversial, expensive, risky, and polluting power plants over cheaper, cleaner and safer alternatives. The primary problem of the plan lies in its unrealistic over-estimation of the future electricity demand, leading to excessive construction of large-scale power plants. The author recommended more accurate estimation of future power demand to avoid excessive supply. The existing plan is also criticized in the document that it doesn't put enough effort on the investment on energy efficiency rate. The author then recommended the Integrated Resource Planning (IRP) (Swisher from Greacen, 2005) framework that involves investment to acquire energy savings, clean renewable energy operation, promotion of cogeneration power plants to increase the efficiency rate, power plant life extension, repowering and the brownfield siting, which refers to the location of power plants near consumption intensive areas. This introduced framework Greacen introduced aims to ensure the national target of 25% RE share, as well as energy security and the preservation of the environment (C. S. Greacen & Greacen, 2012).

2.7 Background Information Regarding Thailand's Electricity Decentralization Policy

During the rapid development era in the 1950s, the Electricity Generation Authority of Thailand (EGAT) was founded in order to generate electricity that would be managed by the Provincial/Metropolitan Electricity Authority (PEA/MEA) in the distribution process. These authorities were established as State-Owned Enterprise (SOEs) that centrally calculate supply and demand, generate energy to meet the assumed level of demand, and distribute it to the destination area. The EGAT produced its electricity mainly with conventional market fuel, e.g. coal-fired power plants and natural gas.

In the early 1980s to 1990s, with the evolving global economic and development situation, there were a variety of domestic and international forces for a

transition. While Thailand was becoming more democratic, as the military regime was declining, it invited business and industries to grow, and as a result there was an escalating demand for electricity. With that, the EGAT during that time failed to generate to enough energy to meet the demand, resulting in a nation-wide shortage in industrial zones and an inability to reach marginalized remote areas. Moreover, due to years of heavy infrastructure investment to catch up with the world's "development", coinciding with the 1997 Asian Financial Crisis, the public sector was in heavy debt. During this time, the Thai's government turned to the international development agencies like the World Bank and international funding agencies like the IMF. But there was an increasing tension during that period that these lenders were reluctant to lend to state-owned enterprises and preferred private institutions.

Once the agenda was raised, solution packages followed. Firstly, the National Energy Policy Office (NEPO) was founded in1986. NEPO policies were market-oriented. The IPP[13] policy model allows the EGAT to purchase power from private investors, while holding some share of those private companies, or in other words, the EGAT outsourced power generation to hands of the private sector in the first step towards transferring risk, dissolving centralized power and increasing efficiency. The model was designed such a way that it attracted private investors, for example, by providing long-term purchasing contracts to guarantee a stable income. Later, the Small Power Producers (SPPs) scheme was introduced to invite producers able to produce up to 90 MW of clean electricity while making efficient use of fuels and domestic renewable resources. Similarly to the SPP, the VSPP model was introduced in 2002 for producers having less than 10MW of production.

After the 1997 Asian Financial Crisis, the World Bank suggested listing the EGAT, PEA, and MEA on the stock exchange, but this was stopped by court ruling.

13 IPP stands for independent power producer. It was introduced by the National Energy Planning Office (NEPO) in 1995 as a strategy for a stepping stone towards the privatization of the state electricity industry via long-term purchasing agreements from private companies in which the EGAT holds some shares. (Greacen, 2004)

Although the scheme failed, the principal was still there. The establishments of IPP, SPP and VSPP programs allow partial ownership by private operators and shift economic risk, while the objective of privatization is to dissolve state power from this industry. However, privatization couldn't guarantee decentralization if the industry is monopolized by a few owners. Decentralization therefore should be guaranteed by the process and regulations within the privatization scheme to ensure fair distribution of shares. Moreover, SPP and VSPP programs are a promising strategy for power decentralization as the geographical characteristic of the production setting is dispersed. It is a good start for locally produced but nationally subsidized power.

2.8 Procedures for the Application Approvals

2.8.1 Thailand's Electricity Industry and the VSPP Program

Over the last 20 years, Thailand's electricity industry has gradually evolved from a government monopoly to the "enhance single buyer" Model (Tongsopit, Greacen, 2013). The state-owned EGAT owns 100% of transmission asset and around 50% of generation assets. The other 50% is owned by private producers from three different scales depending on the capacity of the electricity and type of resources being used i.e. IPP, SPP, and VSPP programs. IPPs and SPPs produce and sell power to the high-voltage transmission system own by the EGAT, while VSPPs sell power through the distribution system of either the PEA or the MEA (PEA., 2006).

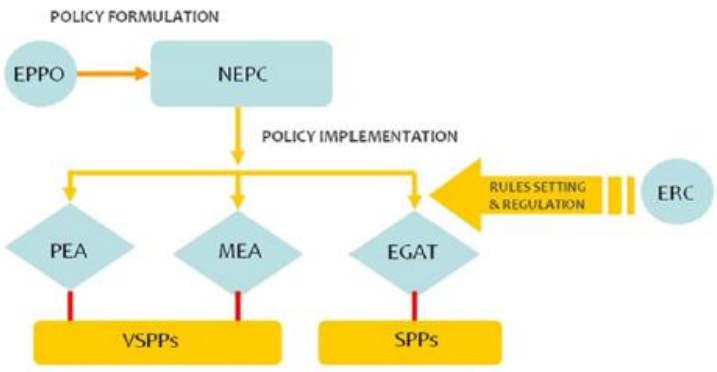

Figure 4 Thailand's Energy Policy Formulation Mechanism

As described in figure 4, Thailand's energy policies are drafted by the Energy Policy and Planning Office under the Ministry of Energy (MoE) and proposed to the National Energy Policy Council (NEPC). The Energy Regulatory Commission (ERC) has legal authority to regulate the implementation of policies over the EGAT, PEA and MEA.

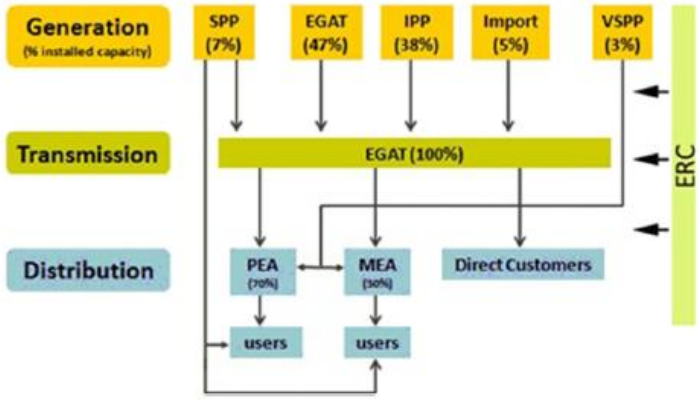

Figure 5 Structure of Electricity Industry in Thailand

Unlike other generating utilities, electricity produced by VSPPs would be synchronized to either the PEA or MEA system directly[14] (depending on the location). It is an exception in that VSPP energy does not need to be routed to the EGAT's transmission system first. The design of rules and regulations, mainly the approval of purchase agreements and the Feed-in-Tariff program also known as "the adder program" are covered by the Energy Regulatory Commission (ERC).

Under the design of the VSPP program, projects are required to apply for approvals that mainly demonstrate basic safety and power quality standards. Other than that, projects are assessed on their readiness in four criteria: land, financing, technology, and permits from other governmental agencies, EIA report (if needed)

[14] Depending on the location- PEA purchases electricity from VSPPs located outside the Bangkok Metropolitan area (in provincial areas) while MEA purchases from Bangkok Metropolitan area VSPPs. But almost all VSPPs are located in the provincial area, therefore MEA has no function in buying from VSPPs.

and other deposits on the asset to prevent a "solar gold rush"[15] effect(C. Greacen, & Tongsopit, D., 2012)

Feed-in-Tariff, also known as the "Adder program" is another program that not only incentivizes electricity investors tremendously, but also helps the country meet its renewable energy target. The program was basically governmental subsidies for RE production for private investors. Since it was introduced in 2007, the structure of the rate has been adjusted a number of times. The structure of rate is determined by the technology, installation capacity and geographic location of the projects. Tongsopit and Greacen (2012) criticized the latter phase of the program, saying that its lack of transparency in dealing with the "solar gold rush" problem in the earlier phase demonstrate their poor governance and affects the confidence of investors.

2.8.2 VSPP Approval Process[16]

The guidelines for related approvals and for VSPP can be found in the Electricity Regulatory Commission guidelines. The guidelines were created in accordance with the Energy Generation Business Act of 2008. VSPP developers need to attain the following documents:

1. Long-term purchasing contract from the PEA
2. Approval for energy generation business from the ERC
3. Approval for factory operation from the DIW
4. Approval for construction from the local TAO
5. Approval for controlled energy from the ERC.

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[15] The term "Solar Gold Rush" describes an effect of EPPO policy on the Feed-in-Tariff or "adder" during the beginning period (2007-2010). The adder program incentivized investors to come into the business, resulting in a sharp increase in number of projects. Many of these contracts were made by small companies that lacked the ability to develop the project themselves, instead securing the PPA with the intention of reselling the contract.

[16] See more; http://www.erc.or.th/ERCWeb2/Upload/Document/Flow-Licences-Concept.pdf

In the guidelines, this was divided into three phases: Pre-Licensing, Licensing, and Construction / Permit to operate.

The essence of the pre-licensing phase is to prepare for approval, e.g. the process of applying for the PEA's long-term purchasing contract, giving notice to local authorities, conducting local community consent process, and the EIA if needed. Once the long-term purchasing contract from the PEA is attained, financial support (financial closure) will be granted.

In the licensing phase, it is necessary to obtain 3 approvals: the energy generation business approval from the ERC, the approval for factory operation from DIW, and construction approval from the local TAO. Upon obtaining the three approvals, fees are to be paid according to requirement at this stage(ERC., 2006).

The Construction/Permit to Operate phase is when the main construction of the building and installation of VSPP devices are completed. The last application for approval, for obtaining approval for controlled energy from the ERC, is filed after this process. After the approval, grid synchronization with the EGAT/PEA system is done before starting the operation.

2.9 Governance and Power Relationships

2.9.1 Governance

Governance can be defined in broad terms. It refers to the "processes of interactions and decision-making among the actors involved in a collective problem, that lead to the creation, reinforcement or reproduction of social norms and institutions". Governance processes are found in any society (Bevir & Mark, 2013). Governance can be described as multi-layered interplay of negotiations, agenda setting, decision-making, management, and administration between many actors and institutions in the State-Society complex on different levels and scales. (Label et al, 2012) In the modern market-based economic system, the market has become part of

governance. Evan (2012) expressed an opinion on the governance of the environment such that governance towards sustainability outcome must incorporate the power of market and state into a broader steering process in order to achieve the goal. Governance extends the practice of governing to non-state actors, or stakeholders, who are interested in governing, including NGOs, charities, businesses, and the public(Evan, 2012).

2.9.2 Power and its Relationships

Power has been defined in many different ways such as "the ability to achieve a wanted end in social context, with or without consent of others" (Vermeulen, 2005). Some say it is the ability to set agendas, take decisions or shape preferences (Luke, 1974). To add more nuances, it is the ability to shape the context and conduct of others. In this, the subject about "leadership" with credibility and trust as well as "position" that tag with hierarchy, authority legitimacy is generally discussed. However, in politic, these power dynamics that interplay among different actors in an "arena" is discussed as Miller (1962) stated that politics is a natural reflex of the divergences between members of a society. The interplay of powers should be considered beyond state's exercise of power. Interaction of power in an arena can be defined by actors that take part in their processes. It can be focused on particular *scales* (spatial, temporal, quantitative or analytical dimension) and *levels* (the units of analysis located at different position on a scale. For instance, a level of administration can either be at the district, provincial or national level) (Gibson et al., 2000). Sometimes the studies of power interplay can be multi-scale and multi-level. Power relationships will, in some form or another, be associated with the state's exercise of power, because power relationships have come more and more under that state's control. It is certain that in contemporary societies the state is not simply one of the forms or specific situations of the exercise of power —even if it is the most important. Rather, in a certain way, all other forms of power relationships must refer to it (Dore, 2012).

In the arena of the market world economy, there are powers exercised by major sectors e.g. politician, bureaucrats, and businessmen. Currently, there is a rise

in the power of private businesses that take part within an arena. The power dynamic among these three actors in the arena can be studied to see their relationships.

2.10 Knowledge Gap

Thailand energy experts have been talking about the adequate provision of electricity in reference to energy security. Thailand has been though periods of policy changes to achieve more efficiency in electricity production. The new paradigm in the provision of electricity is the idea of decentralization of the ownership of electricity production and distribution systems to local area. So far, private developers supported through the VSPP program have attracted attentions through their RE proposals, but there is not enough research or literature on community actors in VSPPs. The emergence of hybrid governance in electricity production industry marks a new benchmark for communities to join the electricity industry. It is important to understand their relationships within the configuration and the state, as well as factors leading to both successes and challenges. Moreover, in the diffusion process of RE technologies, there are literatures about technical and political aspects, whereas the social aspect that provides context to the diffusions is rarely discussed. This study can contribute to the body of knowledge related to the formation of community VSPPs in Thailand.

CHAPTER III
FOUNDING COMMUNITY VSP PROJECTS IN THREE CASE STUDY

3.1 Introduction

The characteristics of the communities are important for the formation of the projects. Mae Kam Pong, Mae Jo, and Ban Sam Kha are similarly unique in terms of the idea of community self-reliance,[17] resulting strong and empowered communities. They are, in fact, well-known for being knowledge hubs of sustainable livelihood[18] and are usually studied by other communities. This is partly because they have strong governance organization and leadership. Although all the main income of all three is from agriculture and they are still considered agrarian societies, they have begun promoting community-based tourism business, consisting of homestays and other supporting activities by the locals. They quality micro-hydropower projects have in common is the opportunity to make money out of the running water from their dike. This signifies extra income generation activity for the purpose of managing their local natural resources. They are models for circulating their local resources, facilities, labor, culture, and products to promote local sustainable livelihood. Mae Kam Pong, Mae Jo, and Ban Sam Kha community and their VSPP projects will be explained in greater detail consecutively.

The chapter will explain each community's socio-economic background, the chronology of the setup process, addressing problems and solutions during the process and the current electricity usage situation. At the end of the chapter, comparative table of facts are made to facilitate the analysis.

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[17] Self-Reliance is a philosophy promoting a lifestyle that's less dependent on other communities and based on the community's own production and services.

[18] Sustainable Livelihood – based on H.M. the King's initiative on sufficiency economy: communities that promote sustainable livelihood and advocate for their members to produce for their own production and sell surplus as well contributing to the community and environment.

3.2 Mae Kam Pong

3.2.1 Community Arrangement and Empowerment

Mae Kam Pong has a very systematic community arrangement. It is especially well known for the tourism business that the community promotes. A cooperative was set up initially by the micro-hydropower management fund. Later the fund covered the management of community-based tourism business as well. There are community committees who are annually elected and leaders of particular groups under the same umbrella. For example, the homestay group, the handicraft group, and other service provider groups e.g. massage, tour guide, and music and entertainment. Community members are usually members of the Micro-Hydro power cooperative for electricity service, while there are some who are members of the homestay group. Despite its small member number of 28 households, this group has created the essentially large amount of income to the community. Therefore the arrangement of income distribution among members has been under carefully planned process in which the 28 members take turns and rotate equally, and fees are deducted into the cooperative's central fund for further administration and investment. Homestay members can make around 500-2000 Baht per night when there are customers. However, there are costs they have to bear, such as for room refurbishment, provision of facilities, food service etc. Households that are considering providing homestay service can get loans from the cooperatives for refurbishments and services, and need to be inspected and certified according to the national homestay standard. Other community members can also benefit from community-based tourism by providing other services as stated above, resulting in an improvement in economic activity and income circulation in the community. These facts have shown that the community has quite a democratic form of arrangement although some leaders are more influential than others. All in all, Mae Kam Pong has an ideal community arrangement based on cooperative and democratic principals necessary for a participatory-decision making process.

Figure 6 Mae Kam Pong's Village and Homestay and Landscape

3.2.2 Mae Kam Pong's Chronology of the VSPP project

The pioneering village of Mae Kam Pong, located in Mae-On sub district, Chiang Mai, is a mountainous area. This area is biologically diverse due to the density of the forest and watershed. Given its location, the state's electricity Provincial Electricity Authority (PEA) was unable to install power system in this village. During the inspection of H.M King Bhumibol to the area, this was brought to the government's attention. In 1983, funds from the Ministry of Science and Technology[19](energy department) together with some USAID donated funds were brought in to build the village's first off-grid Micro-Hydro power station installed at the village's strongest water stream. The project was technically supported and partially funded by the Ministry of Science (now changed to MoE), while 40% of the cost was borne by the villages as construction materials (e.g. stone, cement, sand etc.) and all of the construction labor was contributed by the villagers too.

[19] The Ministry of Energy was formerly a department of Ministry of Science and Technology.

Figure 7 Mae Kam Pong's Off-Grid Power Generator

Once the construction was finished, the power station could operate as an off-grid station for the village's domestic usage, and a cooperative was set up to manage the income and other welfare the project provides to the members. Several regulations were also put in place by the cooperative committee. For example, villagers wanting to connect to the line must buy a certain number of shares and become a member; each household must not possess more than three light bulbs (at the time the regulation was enacted), etc. The first Micro-Hydro power station immensely benefited the lives of the people of Mae Kam Pong as well as the nearby villages who bought shares as cooperative members for the purpose of connecting their homes to electricity. The cooperative had been running so efficiently that it had enough savings to give loans to members in 1993, and it initiated other activities including the second and third plants and community-based tourism business in subsequent years.

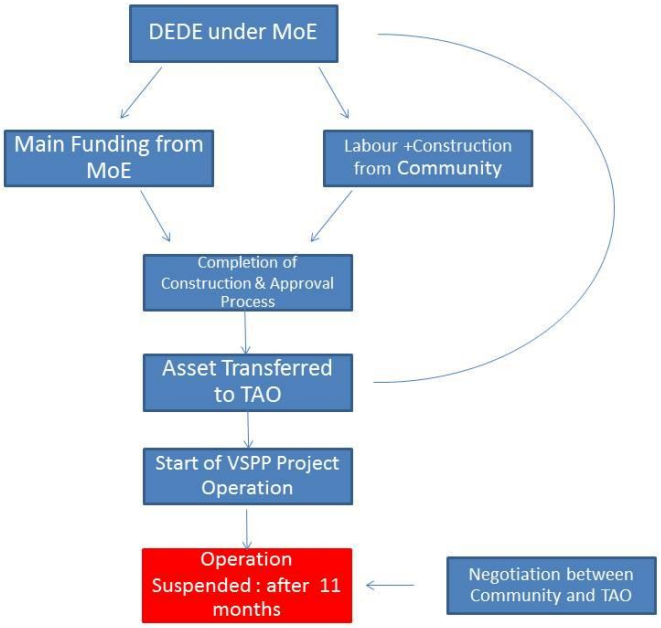

Figure 8 The Chronology of the Project, Process and Situation

3.2.3 Third Power Generator; chronology of VSPP Project Establishment

The concept of a community VSPP was brought to the attention of the Mae Kam Pong Village committee by the Ministry of Energy. A representative from the Ministry of Energy introduced the idea of synchronizing their third generator to the PEA's grid under the VSPP program (Mae Kam Pong plant's technician, Interview, 12 July 2014). The support this time around followed similar conditions as the earlier ones. DEDE under MoE invested in the machinery and facilitated technical support, while 40% of the labor and construction costs were contributed by village members. The application process for several approvals required by authority was carried out by DEDE officials who were responsible for the project without community's participation. After the system's synchronization with the PEA grid, the system (technically owned by the MoE) was transferred to the local TAO. The generators and other assets owned by the MoE were required to be transferred to an agency under state ownership due to official regulation (in this case the TAO was designated). The system could run and sell to PEA under this condition for 11 months, making around 500,000 Baht income in total with 10% deduction from for the operation of the TAO. However, at the 8th month of business-as-usual operation, TAO filed a letter to inform the cooperative committee that, as the project was under TAO administration, the

profit from Micro-Hydro project would be managed by the TAO. The village's shares would be calculated and divided equally with seven other villages under the TAO's responsibility. Mae Kam Pong village committee found this condition unacceptable, as they claimed that 40% of the costs were contributed by the village and therefore shares must be allocated accordingly. Therefore, operation has been halted since 2005. To date, the negotiation between the village committee and TAO remains unsettled. The TAO offered Mae Kam Pong extra financial grants of development project[20]. However, Mae Kam Pong still sees this as unfair and prefers receive larger share of money from the operation. They are satisfied with a 50/50 share, or worst case 40(Village)/60(TAO) share. However, it wasn't possible to arrange an interview with the responsible TAO officer to cross-check the data.

Figure 9 Mae Kam Pong VSPP Plant No.3 Project Site

3.2.4 Mae Kam Pong's Current Electricity Usage

The first and second off-grid generator was successful in bringing electricity to the village which was previously impossible due to the remote location of the village. The generator could supply around 80 households and some more in the surrounding villages. During the utility of the first and second off-grid electricity from the Micro-Hydro power plant, the reliability of electricity hasn't recently been efficient due to two reasons. Firstly, there wasn't enough supply for all users. The

[20] Villages are obliged to propose their needs and concerns in a form of a project proposal for the TAO to consider. Each year the TAO will reflect those needs in its annual budget.

users were asked to install not more than three light bulbs, and refrigerators were not allowed. Secondly, the system connection was old and lacked good maintenance. In 2002, PEA expanded their distribution lines to Mae Kam Pong and the surrounding villages. Every household then installed a parallel system both from the off-grid system and the PEA, and could switch between lines. The price of PEA's electricity is higher at 3 Baht per unit whereas the off-grid system is 2 Baht per unit. The PEA incentivized people to use the PEA system by granting free usage up to 50 Units a month[21]. People take advantage of the policy to use the PEA electricity up to 50 Units, and then switch back to the off-grid electricity for the cheaper price. However, the PEA has stronger and more reliable electricity, and people can therefore use more electricity-intense devices. Recently, people have complained that they would only switch from the PEA line to the off-grid line if they exceed the 50-unit limit (Most household usually don't) and only when there is a blackout on the PEA line. There are always complaints when the PEA lines have blackouts and users must switch to the off-grid system that the electricity quality was poor (users switch at the same time, and there is not enough supply). This shows that the Mae Kam Pong off-grid system is becoming inefficient when competed with the PEA system. The sales have dropped from the level at the early stage of around 10,000 Baht a month to around 1,500 Baht a month. It can be foreseen that the system won't be able to keep the standard up to provide service in competition with PEA service in the near future, even though the community tries its best to keep the service. This suggests that, the off-grid systems are inefficient business-wise, and it is necessary to turn the off-grids to on-grid instead for income generation for the community.

3.2.5 Mae Kam Pong's VSPP Project and Human Security

Mae Kam Pong has been well established and self-sustainable in terms of electrical energy, as they were able to produce electricity to supply households in the

[21] In December 2011, the government approved the pay exemption for electricity fees for households that use less than 50 units of electricity, who are considered marginalized users. The burden would be borne by larger business operators. See more at, http://www.erc.or.th/ERCWeb2/Front/PublicHearing/PublicHearingDetail.aspx?rid=123&muid=36&prid=74

community and some nearby. This is operating, securing their energy supply, which they wouldn't have had otherwise for several decades. An institution such as the cooperative was formed to manage the operation. Within the institution, the operation has trained the community to systematically manage their local resources and pursue equal distributions among community members. As the operational effectiveness of their off-grid generators declines and the efficiency of PEA power increases, the VSPP project offers the potential for existing facilities to effectively operate to benefit local people through income generation. Through extra income generation that goes to the village fund, community members can benefit through extra dividends and village welfare.

3.3 Mae Jo

3.3.1 Community Leadership and Empowerment

First of all, Mae Jo leaders and the project committee are recognized by the authorities. They contributed to an essential part of the negotiation. Ms. Tongbai (54), who also owns Mae Jo Ban Din, a community-promoted tourism business, took a position as the project leader. Local people who are also members of the enterprise are often hired on a daily wage on regular basis, and the business attracts tourists, benefitting other small local businesses. Mr. Prasarn (61), the community enterprise chairman, is a former Tambon Administrative Organization (TAO) committee member, and is a respected person equivalent to village elder. These two powerful figures, one influential big business owner and a politically respectable public figure, represent a strong partnership that's influential for internal and outside negotiations negotiation. It is not complicated for the community support system in this community to clearly be seen. As a result, obtaining public participation through advocacy and empowerment action was almost effortless in the sense that people were convinced that their leaders would serve the purpose of their community development. The two figures that are seen as project leaders for the community were not only equipped with social and financial capital, but also the assertiveness and ideology to be convincing in gaining local participation and support.

The results of the advocacy include public approval of the micro-hydropower plant from the public hearing session in the initial stage, the acquisition of personal documented land where the station would be located, the formation of the Mae Jo community enterprise itself, in which everybody had contributed their labor as shares to the group, and the formation of the "Wai Jo" juvenile group who are responsible for the community's forest conservation schemes. The Wai Jo group consists of young generation community members who used to work in town, earning a daily wage, and had returned to support the project initiated by their parents. The group is a result of advocacy based on local pride and self-sustainability. The ultimate intention of the formation of the Wai Jo group was to ensure the project's sustainability through the participation of members of the younger generation.

Figure 10 Community Leader Describing and the Natural Environment around the Dike Area

3.3.2 Mae Jo Community and VSPP Initiative

Mae Jo Ban Din community business (or Mae Jo in short) was inspired by the famous PunPun[22] community's self-reliance and sustainable livelihood. In contrast to

[22] See more at: http://www.punpunthailand.org/

Mae Kam Pong, this community was newly established by a group of community elites who had returned from town with the will to improve their community. The statement of the leader of Mae Jo Ban Din's reflected the community's core philosophy on sustainable livelihood, which is mainly tied to agriculture.

> *"Water is essential for our life and the forest is the origin of water. If we don't look after the forest, there would be no water or life. People wouldn't be able to grow crops anymore and would eventually have to leave our homeland. Life wouldn't be this easy." (Mae Jo Ban Din's leader, Interview, 1 July 2014)*

Keeping this doctrine in mind, the micro-hydropower station was initiated for the purpose of local resource management. The project was expanded from the Mae Lerm local dike that was located upstream of the community. The dike was surrounded by rain forest, which to be important for the dikes' water reservation. The community elites place importance on the dike, which was a product of H.M. the King's initiative for the village for irrigation purposes. Later, they were inspired by Mae Kam Pong village's micro-hydro power project about the idea of turning wasteful running water to use for the VSPP project's input that can generate extra income to the community.

Although main income of locals is from agriculture, the extra tourism income can support other expenses as needed. Similarly, the Micro-Hydro power plan was expected to generate income to run community activities related to resource management. This mainly includes reforestation and building a forest fire buffer zone. Therefore, their project principally an initiative to manage of their natural resources and local labor to locally promote a sustainable environment and livelihood. (Community Enterprise Leader, Interview, 2 July 2014)

3.3.3 Mae JO's chronology of VSPP Establishment

After the idea had crystalized, Ms. Tongbai, the project leader who owns Mae Jo Ban Din, the homestay business, got in touch with the foundation of Energy for Environment (EforE) through a connection with the PunPun community. The

foundation's mandate is to promote energy efficiency, particularly to enhance the foundation of RE production as well as advocate state-led RE policy in Thailand. They are equipped with engineering experts, policy experts, as well as connections with funding sources. A working team was formed, and the process began.

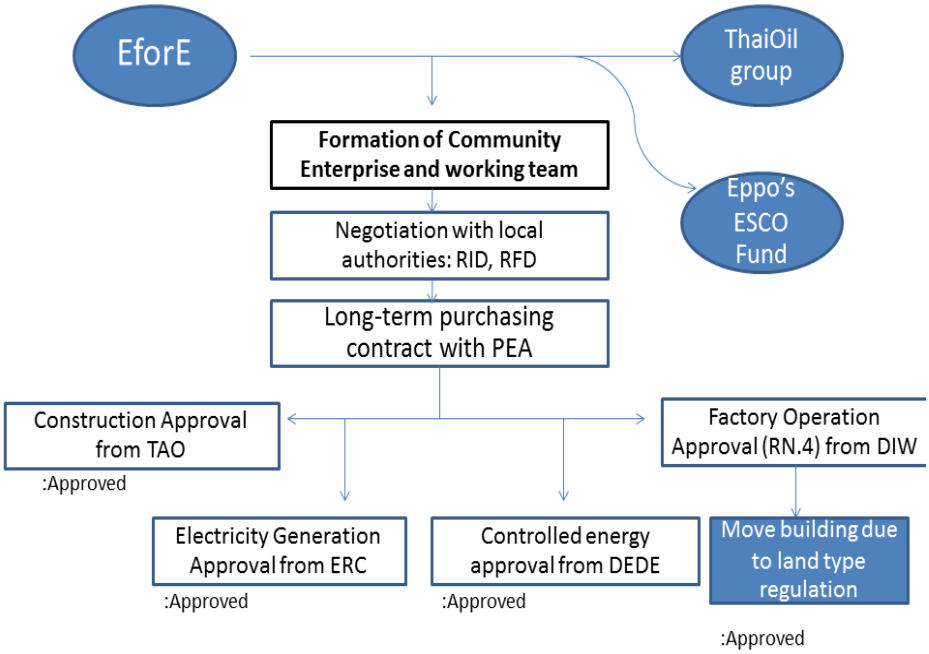

Figure 11 The Application Approvals Process for Mae Jo's Micro-Hydropower Project

First of all, the community registered as a community enterprise group to attain juristic person status. EforE facilitated the funding proposal procedure and got the community in touch with ThaiOil Corporation[23] through its CSR program foundation. The project was granted 2.5 million baht from the Thai Oil group, and other 1.7 million of loan had been allocated from DEDE. The working team was formed consisting of EforE officers, a ThaiOil CSR program officer and the community members. The approval processes started with a local public hearing, followed by an application for the PEA long-term purchasing contract and applications for four approvals from four different authorities. These approvals included a construction approval from the Tambon Administrative Organization (TAO), electricity generation approval from the Energy Regulatory Commission

[23] Thai Oil group is in the petroleum business. Their business consists of oil refineries, petrochemical and lube base, power generation, transportation, and others.

(ERC), factory approval from the Department of Industrial Work (DIW), and an approval for controlled energy production from the Department of Alternative Energy Development and Efficiency (DEDE). The procedure took almost four years before they were able to start selling to PEA's grid in February 2014.

Figure 12 Mae Jo's Clay-House VSPP's House of the Generator

Figure 13 Property co-Management between the community and RID

3.3.4 Mae Jo's Current VSPP Project Operation

Mae Jo's Micro-Hydro project has been operating since February 2014. Currently, there is not enough surplus energy to invest in other activities as planned, but the group has anticipated that they will generate more electricity. However, what they have achieved along the way is the establishment of a platform for governance in their community

> *"This project is a common ground for people's participation and community spirit. Everyone has a sense of ownership of the power station. The project can support our reforestation activity and holds out future hope for more projects, such as a community compost center from the profit of the operation" (Community Enterprise Leader, Interview, 2 July 2014)*

Mae Jo is now receiving around 13,000 bath of income per month. Currently, the project is hiring two technicians who will operate the sluice gate with a monthly salary of 5,000 Baht each. Initially, they planned that around 30% of the amount of money would cover the operating expenses for two technicians and some engine oil. Some 20% would be saved for the community's annual forestation activity and forest ritual ceremony. The other half will be used for loan payment. Currently, 77% of the income is taken up by the salaries of the technicians. This is because the community is unaccustomed to the operation process. For example, the community was struggling with the sluice gate open time in order to run the generator in relation with farmers' agricultural water use pattern. As the project operators gain more experience in the next season, the production is expected to increase. Although this amount of income is temporary and is predicted to increase, it is currently not enough for future community projects, which include the compost center, welfare for members, and increased benefits for the enterprise members, unless they can manage to gain more from careful water management.

3.3.5 Mae Jo's VSPP Project and Human Security

Mae Jo was the first to successfully obtain a contract to sell electricity to the PEA grid and earn income. The income generated destined for natural environment conservation. Although the economic benefit has not yet reached the target, it is enough for sustaining the operation without external support, and the project has set up a systematic platform for community governance. "Wai Jo", the juvenile group, was the product of systematic step towards sustainability in terms of the continuity through generations. The formation of the group tightens the bonds between generations and keeps young educated personnel in the village to sustain the operation. The project thus created a platform for systematic natural resource management in their locality. The established system that generates income for community's common interest and the emergence of conservation group contribute to the village's capacity for sustainable development, which reflects the human security agenda on the local level.

3.4 Ban Sam Kha

3.4.1 Ban Sam Kha Community and its Structure

Similarly to the previous community, Ban Sam Kha, Lampang has been a well-established community embracing a self-reliance and sustainable livelihood promoted and supported by a community-relation working team from Siam Cement Group (SCG). The community is known for its outstanding water resource management, and subsequently there is a prominent improvement of the village's natural resources and ecosystem, e.g. indigenous dike technology (facilitated by SCG). The community received consecutive Green Globe Awards[24], and its water resources management system was so successful that it became a learning model for other communities in the network. According to SCG's community program officer, almost 20 years ago Ban Sam Kha and other surrounding villages addressed a

24 See more at: http://pttinternet.pttplc.com/greenglobe/history.html

shortage of water for agriculture by holistically conserving the surrounding forest (e.g. reforestation, restructure of the dirt dike, advocacy to stop burning of the forest). With these measures, the community was able to retrieve a sufficient amount of water resources, solving the problem of the agriculture water resource shortage. Later, the conservation area was expanded to connect the community to wider forest area conservation for more effective results. Consequently, a more systematic water resource management regime was established with the construction of Hway Sam Kha reservoir by RID, a village irrigation system constructed using an indigenous method. In terms of management structure, Ban Sam Kha has demonstrated strong leadership through the success in the implementations of many projects. Ja Chai and Ajarn Somsri are a married couple known for their high level of education and successful career prior to their retirement from their positions as a former soldier and school teacher, respectively. They were successful in achieving community solidarity and participation in any project they engaged with, including the community VSPP.

Figure 14 The Reservoir Where the Project Site Located

3.4.2 Initiation of the Community's VSPP

In 2007, Ban Sam Kha was an active member of "the sustainable community network[25]" and the idea of power generation from renewable energy was formed during a group discussion. The idea for the community VSPP derived from a discussion panel among community network leaders and village's elders. Energy was one of the options for creating future self-sustaining community. Therefore, one of the pilot advocacy activities for alterative renewable energy had resulted in the construction of Ban Sam Ka's on-grid Micro-Hydro power plant. As a result of that discussion, few members from different communities have agreed on a piloting of on-grid community-scale power generation project from renewable energy by various types of generation e.g. solar farm, biomass and micro-hydro power plant. However, Ban Sam Kha agreed to develop a Micro Hydro Power plant based in the potential of the geographical characteristic of Ban Sam Kha community. Ban Sam Ka's micro-hydropower has been the only active community for this RE piloting projects while others had abolished the projects.

Figure 15 The Water Reservoir as a Result of Forest Conservation

[25] The sustainable community network consists of communities with similar ideology i.e. self-reliance and sustainable livelihood. There are a number of members from different regions of Thailand joined into a form of network. They regularly meet to share ideas and co-implement projects.

3.4.3 Chronology of Ban Sam Ka's VSPP Project Funding

After the discussion in the community network meeting, the community elites held a public hearing and obtained member approvals. Later, they got in touch with EGAT, which had already been supporting the community since one of EGAT's most controversial coal-fired power plants is located in the vicinity. With a close relationship with the community, EGAT offered the community inspections and feasibility study for the project as well as a customized assembly of a power generator for sale under contract to the community for 2.1 million baht. It was agreed that the payments would be made in two installments, with 50% for the down payment, and the other 50% after the operation ended. As regards the funding, the community had ideally planned to raise fund from selling shares for community member. And as the result, the community have gathered around 500,000 baht from its members the community, with each member invested 1,500 in average 1,500 baht. During the process, SCG, which had already been working with the community on the issues of capacity building, empowerment for self-sustainability, and environmental conservation for decades, agreed to the idea of the VSPP project. SCG donated 1.6 Million baht out of their community project-related CSR fund, under the condition that once the project succeeded and was able to turn a sustainable profit, the same amount of fund would be transferred to another similar community project. Another lump sum in the amount of 600,000 baht was donated by the National Innovative Authority (NIA) under the Ministry of Science and Technology after proposing the customized generator design as an innovation by EGAT. The fund was an award to fund the new innovative design, and this amount paid for EGAT's generator. All together the community gathered around 2.7 million baht needed to pay for the generator, the house of the power plant, distribution system, and other management costs. However, as the approval process and the set-up became prolonged, the sum of money has gradually diminished Furthermore, due to the fact that the operation hasn't started and no profit has been made, some community members are upset and want to withdraw their money. In the later stage, the Energy for Environment (EforE) foundation was in touch with Ban Sam Ka for legal and technical facilitation and coordination with government agencies. Towards the end a coalition existed between

the community, the EGAT (hardware and technical service), SCG (community empowerment support and funding), and EforE.

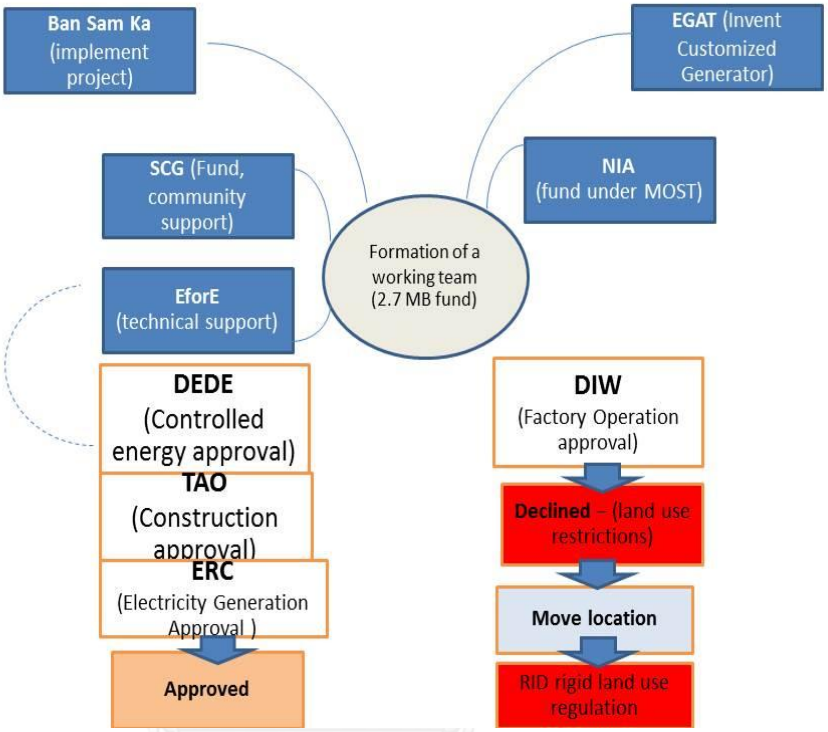

Figure 16 The Chronology of the Ban Sam Ka Project

3.4.4 Application for Approvals

The approval process in Ban Sam Ka's VSPP project was fraught with similar challenges as in the previous case studies. First, the long-term purchasing contract was obtained from the PEA. Then, the Construction Approval was granted by the TAO; Energy Generation Approval by the ERC, and Controlled Energy Approval by the DEDE. Lastly, the consideration of the controversial Factory Operation Approval from (RN.4) from the DIW set the process back for many years since the start of the project in 2009.

Initially, the building to house the VSSP/generator was designed to be located on a piece of land under the Royal Forest Department (RFD). The authority over that land had been transferred to the Royal Irrigation Department (RID) for Sam Kha

Dike construction under an agreed contract. A construction permit was asked for an extended construction for the building of the power generator house around the dike's vicinity and RID under a previous director had accepted. However, in presenting the contract between RFD and RID, the application for RN.4 was declined by the DIW. DIW explained that RFD transferred the authority over the piece of land to RID for the purpose of the construction of the Sam Kha dike 'only', and the community's VSPP project did not fall within the parameters of approved land use specified in the regulation. Moreover, the project was fined for unauthorized construction prior to receiving requisite approvals in the amount of 20,000 Baht by the DIW. The process has been suspended at this stage, and the committees have formulated a plan for the next move.

3.4.5 Current Situation

Consequently, the project committee planned to move the generator building to another place where the land had a private title deed. A negotiation to rent a piece of land from a local resident has been arranged. Yet, this plan faces another challenge, as RID under the administration of a new director could refuse to permit extended construction of a water way on RID land due to his narrow interpretation of RID regulations. The future of the project now depends on RID permission, which is necessary for obtaining several approvals as stated above. Currently, while the project is suspended and has no way to move forward, community members who invested in the shares have become discouraged, and EforE stepped in to find a solution.

Figure 17 Project Building Locked for Project Suspension

3.4.6 Ban Sam Kha VSPP Project and Human Security

Ban Sam Kha has been heavily promoted as a model for self-sustainable communities, with natural resource management as a key strength. The VSPP project the community is attempting to operate is one of many activities the community is piloting to promote sustainable community. Ban Sam Kha is the only community where community members have participated through shares to raise funds. This reflects community capacity for common public development projects gained from previous practice, as the community's capacity has been built from decades of collaboration with SCG. Although income has not yet been obtained from the project due to its suspension, the project, if successful, would be one of the community's many other natural resources management project strengthening community capacity.

3.5 Summary of the Three Case Studies

3.5.1 Conclusion Table and its Description

The table below shows a comparison of the three case studies, showing their similarities and differences. Major differences can be identified, such as difference in actors initiating each the project, funding conditions resulting in the ownership type of the project, and differences in the types of conflicts with government agencies. Firstly, it can be seen that Mae Kam Pong's VSPP project was initiated by the government and later imposed on the local area, while Mae Jo and Ban Sam Kha self-initiated their respective projects. Secondly, with regard to the funding and ownership of the project, Mae Kam Pong was principally funded by the MoE and thus it became a state asset, whereas Mae Jo received loans from the MoE, and Ban Sam Kha received private funding and raised money from the community; thus the assets are administered by community's enterprise. Thirdly, the three case studies each experienced varying conflicts with different government agencies over different details in the process.

On the other hand, in terms of similarities, three major similarities can be identified. These include community will to manage commonly held natural resources, the configuration of the partnerships, and the setbacks caused by government agencies. However, the details differ within these similarities. First, the will for local natural resource management, which was reflected in the similar ideology the communities shared in seeking self-reliant and sustainable communities. Mae Kam Pong had been generating off-grid electricity for decades before the initiation of the VSPP project. And although the VSPP project was initiated by the DEDE under the MoE, the will to operate and generate income as part of community's cooperative income could be obviously seen. By contrast, Mae Jo has obviously shown that income generated by VSPP project would be able to benefit their community forest conservation activities. Finally, for Ban Sam Ka, with a strong will to establish itself as a self-reliant community, the VSPP project was intended to be a pilot project for other communities to learn from. All this reflected

that the three communities were willing to manage their own natural resources as regards electricity produced by water. Another essential similarity is the partnership among the community and other actors. Mae Kam Pong had been principally facilitated by the DEDE under the MoE, and later collaborated with the TAO prior to the project's suspension. Mae Jo had been facilitated by EforE (energy advocacy NGOs), which offered technical, legal, and minor financial support, and the ThaiOil (CSR projects) for its principal source of financial support. Ban Sam Ka was technically facilitated by the EGAT and EforE, and principally financed by SCG. The similarity in terms of partnership signified that the communities were not sufficiently financially, technically, or legally equipped to operate without partnership from private developers. Other prominent similarities were the disputes caused by government agencies that decelerated the project approval processes. Mae Kam Pong had a conflict with the TAO over the issue of revenue share and distribution. Mae Jo was obstructed by the DIW in the issue of the RN.4 condition concerning land type, resulting in the relocation of the project site. Ban Sam Ka faced the same problem with the DIW as Mae Jo concerning land type. Upon relocation of project site, the expanded construction wasn't approved by RID.

Table 4 Comparison Table

	Mae Kam Pong (Chiang Mai)	Mae Jo (Chiang Mai)	Ban Sam Kha (Lampang)
Community characteristics	Agrarian community with community-based tourism for additional income generation; establishment of community self-reliance and sustainable community characteristics reflected in their development projects. Communities have strong leaders that are influential for member participation.		
Community Specialty	Home stay, organic coffee, tea leaf, learning center, handicraft product, community-based tourism facility complex	Adobe clay house, PunPun learning center, longan	Water resource management learning center, organic rice & vegetable farming, forest products
Reasons for VSPP initiative	Existing off-grid generators were operating so well that the on-grid option was raised for consideration	Seeing Mae Kam Pong as a model, on-grid Micro Hydro power plant was feasible in this area to generate income. The income was expected to pay for forest conservation activities.	The VSPP project was raised during a discussion panel about Renewable energy within the sustainable community network. Ban Sam Ka promise to set up a pilot for a Micro-Hydro power plant
Actor initiating	DEDE under	Mae Kam Pong	Ban Sam Kha

VSPP project	Ministry of Energy	community leader	community leader
Year of the initiation of VSPP	Completed as off-grid: 1994, Modified as on-grid: 2006	2010	2009
Project specification	40 Kilo Watt	27.5 Kilo Watt	22.5 Kilo Watt
Partnership in the project	The community, DEDE, TAO	The community, EforE, Thaioil	The community, EforE, SCG, EGAT
Project's Budget	N/A	2.5 Million Baht	2.7 Million Baht
Funding agencies	MoE, Community shares	MoE, EforE (ESCO fund), Thaioil, Community (labor costs)	Community shares, MOST, SCG
Funding condition	Non-repayment, dividends for member shares	Repayment of loan from MoE, dividends for member's share	Repayment of SCG loan, dividends for member shares
Government officials that the project contact	TAO, RID, RFD, DPT, PEA, ERC, DEDE, DIW		
Ownership of the project	MoE transfer to TAO	Community enterprise	Community enterprise
Controversial issue	Project under TAO administration was force to provide all revenue to TAO instead of the	Land type didn't meet DIW conditions for factory operation approval (RN.4)	Land type didn't meet DIW conditions for factory operation approval

	community		RID: Expanded construction on RID land wasn't allowed
Government agency generating the conflict	TAO	DIW	DIW, RID
Solutions to the problem	Still unsolved	Project location moved to land with a private land title deed	Still unsolved
Year of projects' completion	2008	2014	Incomplete
Project Current Status	Suspended	Operating	Suspended

3.5.2 Summary

The three case studies explore communities with green initiatives to generate electricity for sales from to the VSPP program to PEA in order to increase community income generation. Two of the communities approached the government to offer the proposal for their projects while the third was approached by the state. Each project confronted similar challenges, with some differences in the details of the challenges. One project has been successfully operating since 2014 while the other two are still suspended. However, this is an early emergence of community actors participating in the VSPP program and these are pioneering communities. These pilot-scale projects draw attentions to communities producing their own electricity for sale, although difficulties were faced during the process, as will be explained in Chapter 4.

CHAPTER IV
DEPICTION OF HYBRID ENVIRONMENTAL GOVERNANCE IN THE PARTNERSHIPS SEEN IN THREE CASE STUDY : INCENTIVE AND POWER RELATION BETWEEN EACH ACTORS AND THE COMMUNITY

4.1. Introduction

In this chapter, incentives and power relations among the different actors involved will be discussed. The discussion in this chapter responds to research questions 1 and 2.

4.1.1 Conceptual Discussion

Hybrid governance has recently become a significant concept in environmental governance. First of all, governance is a social function focused on efforts to shape societies away from collective disastrous outcomes towards socially desirable outcomes (Young, 1999). The recent emergence of non-state actors in the form of 'Hybrid Governance' became essential as they help to bring the significant capacity of new partners to bear on problems each actor cannot solve individually. In the arena of hybrid environmental governance, in addition to the state, which acts as conventional governance regime, non-state actor corporations from the private sector, and NGOs as civil society actors, are often mentioned in literature. Each possesses different important characteristics. The state actors can cover the issue of authority with their assertiveness; market actors can provide resources (mainly financial capital) and insert corporate efficiency into the equation; while civil societies can set firm goals and strategy. The latter also often have public support, but lack of all the others. The pressure that hybrids environmental governance emerge, was because of the raise of *decentralization*, accelerating speed of *globalization* and intensified *marketization* of today's world system (Young, 2009).

To clarify, decentralization is the delegation of central state power to local ones. In discussing the government in this chapter, central government and local government agencies are separately explored, as they have different characteristics that later will be explained. "Central government agencies" refers to the Ministry of Energy and its sub-departments, e.g. the PEA (and the EGAT), and approval granting agencies such as the ERC, DIW and DEDE. By contrast, local government agencies are those with the authority to look after natural and renewable local resources. A Tambon Administrative Organization (TAO) is a local governmental body that acts to enforce central policy. TAOs are responsible for granting approvals for any construction activities in their area. The TAOs are similar toother decentralized state's agencies involved in the process of granting approvals for village Micro-Hydro power plants, such as the Royal Irrigation Department (RID), Royal Forest Department (RFD) Department of Public work and Town & City Planning (DPT). The function of these departments makes government's task of administrating the resources on the local level more effective as they are vested with a measure of executive authority to some extent.

Globalization worsens environmental problems to the point that states by themselves cannot solve. Ironically, globalization influences the emergence of global governance regime to mitigate environmental problems. Positive impact of globalization enhances the depth of participation and diversity of actors, broadens the scope of potential governance, as well as increases awareness and relevance on the individual level, resulting in the emergence of transnational networks, INGOs, concerned communities and individuals, as well as concerned corporate actors. The world's connectedness encourages a shift from elaborate centralized control towards a more democratic model, with a high level of citizen participation and societal involvement. Globalization favors the alternative way to deal with the ineffective state-centric regime by introducing multi-level, non-hierarchical, information-rich loose network, institutions and actors (Hass in Haufler, 2009). Non-state actors influenced by globalization such as civil societies are becoming for important participates in hybrid environmental governance.

In an increasingly liberal market-based economy, market instruments have become another pillar for environmental governance. Usually, one of the prominent effects of a market-based economy (neo-liberalism) is that firms produce with the principal of cost reduction for maximum profit, and usually costs are shifted onto the environment. Therefore, on the one hand, market-based economy undermines the environment, but on the other, a "market-based strategy" is emerging in environmental governance. Market-based strategy aims to mobilize individual incentives in favor of environmentally positive outcome through careful calculation of cost and benefit (Young, 2009). As a result of marketization, for-profit firms are playing a part in environmental governance. Due to the interest firms have in building their reputation as a market principal, CSR schemes in firms that produce climate externalities are common.

In environmental governance, the problems are so complex and multi-scale that conventional state authority as seen in most modern governance alone is inadequate. In order to understand their interactions, we need to explore actors' strategies, performance and identities as reflected in their interests and power relationships, which this chapter will discuss.

4.2 Incentives of Each Actor

In order to understand the interaction, it is better to keep in mind the interests each actor has in engaging in the partnership. Incentives of the community, state, private and civil society will be discussed consecutively.

4.2.1 Community

Table 5 Community Interests and Incentives

Community interests and incentives			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Establishment of Natural Resources Management (NRM) regime within the community	Cooperative	Community Enterprise	Community Enterprise
Income generation	To circulate in their CBT[26] program	For Natural Resource Management activity	Generate profit for members who have invested
Attitude towards good environment	CBT	Indirectly as the result of income (Received income used toward forest conservation activities)	micro-hydropower project as a result of good water resources management

The three communities in the case studies reflect a neo-liberal economy that has strong influence on what Sangkhamanee called "modern communities" (Sangkhamanee, 2013). Agrarian societies such as these are adapting to survive in a market economy in their own unique ways by incorporate agrarian identities into the income generation process. By being modern communities, they are trying to establish a regime of self-governance to the extent that they can control, make use of, and manipulate certain resources that are available in their locality.

26 Community-Based Tourism

First of all, they created a platform of governances though an institutionalization process. Mae Kam Pong formed a community cooperative had initially formed support the off-grid power plants and other community-based tourism businesses. The other two formed community enterprises to deal with both the VSPP projects and other community businesses as well. The establishment of such institutions was to vest the communities with legal rights as juristic persons for administrative related activities that modern business administrative processes require.

Secondly, the creation of community institutes entails income generation for any cost that may arise, such as administrative costs and procurement for the implementation of activities. Modern communities such as these ones in the case studies tried to act like private firms, as seen in the structure of the cooperatives and enterprises, which have clear labor distribution and profit goals. The difference between private firm and community-based businesses is the purpose of the created profits. These communities had similar goals for the use of the profits, namely to propel the communities' activities for the ultimate benefit of community members. For instance, Mae Kam Pong and Mae Jo utilized the profit to propel their community-based tourism businesses, and Ban Sam Kha hope to provide dividends for members who had invested in the VSPP projects. The establishment of these community economic institutions, as well as their active income generation activities, makes the communities appear more powerful to their negotiation partners, namely government authorities.

Another quality of "modern communities" presented in the case studies is the will to gain control of the ability to look after the environments that economically benefit them. They acknowledge that a fertile environment will later result in good living standards, as in the case of Ban Sam Kha, which successfully achieved enough water storage for its Micro-Hydro power project, and soil re-fertilization for agriculture through reforestation. This acknowledgement also affected Mae Jo in its decision to reinvest in Natural Resource Management activities. These similar interests evident in the three case studies signifies that they are the modern

communities and are willing to manage the natural resources that have economic value to them through institutionalizing and engaging in active income generation process.

4.2.2 State

Table 6 State's Interests and Incentives

State interests and incentives			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Central state			
Supply energy	State-owned enterprises PEA/EGAT want private developers to supply energy (referring to the energy security concept)		
Regulate energy	Provision of electricity must comply with state's regulations, as reflected in the many approvals and permissions required (referring to the centralization of Thailand's energy production)		
Meet RE goal on environmental agenda	SPP and VSPP program as a strategy for its 25% RE production to be met in 2020 (referring to the response to global agenda for RE in Thai policy)		
Technology of control (concept): Compliance with bureaucratic/ legal condition (granting approvals)	The four approvals for VSPP, the adder for different technologies, feed-in tariff		
Local State agencies			
Control Management of Resources within local government units.	TAO clearly illustrates the control of profit from NR in locality	Co-management is seen (an observation from	Conflict with RID illustrates that the state holds authority over

			water resources
Gatekeeper for higher government agencies in bureaucratic system	TAO spending audited by OAG[27]	-	RID officer afraid to sign for anything
Technologies of control	TAO as regards distribution of income with OAG	DIW as regards land type for RN.4 approval	RID as regards extended construction from state property
An ability to co-exist with community member	Negotiation in process (community resisting authority by suspending the operation)	Blurred boundaries between local civilians and state officers	Negotiation in process (community resisting by threating to sue DIW) RID negotiation in process (respect to seniority (RID officer))

States actors in this arena have many interests that may either support or contradict each other depending on the level of government. In this case, central and local governments have separate agendas. Government agencies on the central level are obliged to formulate policies promoting national energy security, and even the global agenda on the production of Renewable Energy production. The function of

27 OAG – Office of Auditor General of Thailand

the EGAT and PEA's is to generate and distribute electricity according to the interest of the Ministry of Energy in providing adequate and stable electricity reaching as much population as possible. To do so, the concept of outsourcing the production to private actors was introduced in the IPP, SPP and VSPP programs (see literature review). This is what Greacen (2012) called "the enhanced single buyer model" which allows private developers to invest, but under a monopolized, state-led buyer. For example, private developers either have commercially partnered with EGAT (in case of IPPs) or are in long-term contractual relationships with either the EGAT or PEA. The contracts have conditioned developers to comply with their regulations in the way that facilitates their monitoring and regulation.

From the perspective of the central government in looking at national energy security, cheap and efficient electricity from commercial fuels and conventional production on an economy of scale is preferable. However, at the same time, in the world of international relations, nation states must act to fit with peer standards and norms. In this case, renewable and clean energy is the norm towards which state must act responsibly, yet these "unconventional production methods" are less economically efficient. The fact that RE is not established is because it requires more investment for material developments as well as efforts in research as advocacy. This is less appealing to the state, which also keeps its national agenda on energy security in mind. But the state has to demonstrate action promoting the global agenda more or less.

The state delegates electricity generation from RE sources to private VSPP developers under conditions that the state can control through an approval process[28]. According to the principal of economies of scale, the state is less interested in investing in RE to meet energy security agenda as RE production on national scale costs more. The state would rather outsource the task to private VSPP developers who are close to production inputs (e.g. agro-wastes for biomass technology etc.) and

[28] See more, in literature Review 2.8.1

regulate them so that the production is in line with mainstream production. The state also manipulates the RE market by the adder[29] and regulate feed-in tariff[30](C. Greacen, 2009) schemes to subsidize high production costs from RE to private developers to regulate the price of the end product. The central government has both a national security agenda and global environmental agenda to consider. They use the "tools" of regulation to control and regulate private VSPP developers and the market to meet the two agendas.

In principal local governments are obliged to reinforce the central government agenda as representatives of central policy enforcement. However, executive authority is given to local government, and therefore the interests of local governments can extensively differ from those of the central government.

As local governments are representative of central ones, they act like gatekeepers for agendas to pass through to higher levels in the bureaucratic process. One interest (really an obligation) of local governments is to process local agendas in a way that complies with the centrally-led agenda and policies to avoid penalties from higher levels of government. This implies the interest to "control" from higher government agencies that local ones need to reinforce. In the case of Mae Kam Pong, the community and the TAO (local government) failed to find common ground for the distribution of the VSPP project income, because the TAO had claimed "the office of the auditor general of Thailand" would accuse TAO of distributing its budget in a way that does not comply with regulations (equal distribution of budget among other villages under TAO)" (Mae Kam Pong Community leader, Interview, 11 June 2014). Similarly, Ban Sam Ka's project is suspended while waiting for the local RID director to authorize extended construction of the waterway. The RID

[29] Adder Program – government incentive fund for private developers to promote RE production, price of adders are different due to timely governmental notice, See More http://www.erc.or.th/ERCWeb2/Front/StaticPage/StaticPage.aspx?p=7&

[30] Feed-in Tariff Program-A government measure to promote RE production that offers a guaranteed purchasing price for electricity generated from renewable energy sources for a specified period of time so as to ensure cost-effectiveness.

director claimed that there was no similar case in which local authority could authorize such conditions for construction and the director must take responsibility if higher level does not approve (Ban Sam Kha community leader, Interview, 22 August 2014). This can be seen as a tool for either central regulation of local government or local government alibi against the community to control their budget strategy or control under bureaucratic regulation by reporting to the community in such way.

In addition to the obligation to reinforce central government policy, local governments have some executive authority to manage their area's resources, e.g. natural resources, budget, etc. Mae Kam Pong clearly exemplifies a case where the TAO is in charge of controlling resources in terms of development project budgets. With the project under the TAO's possession, the TAO has the authority to legally earn and allocate the budget as it sees fit. Similarly, Ban Sam Ka's conflict with the RID director illustrated the control of local authorities over natural resources. In cases where the negotiation is successful, as in Mae Jo, co-management between local government and the community can be seen. However, this idea is argued by Ornphrom (2012) that as a technology of power, co-management between state and local governments is an alternative way of control whereby the state gives up some authority but gains more in terms of efficiency by saving more cost used in control mechanism(Ornphrom, 2012).

Finally, the most important interest for local governments is a good environment for the local government and community to co-exist. This is because local government has to depend on local members for elections and local members depend on local government for development projects. Both parties have a close relationship, given that sometimes local government officers and local members have a blurred and overlapped identity. The Mae Jo case highlighted how blurred identity among both parties accelerated the document authorization process, leading to success in establishment of their VSPP project. With regards to Mae Kam Pong and Ban Sam Kha, although the negotiation is still in process, the relationships among the two parties remain compromised. For instance, Ban Sam Kha community committee

was urged to sue the RID office but it didn't, as members claimed that it would cause further complications in their relationship with the office.

The evidence has demonstrated that governmental agencies have different interests and obligations from different levels, and there are contradictions within bureaucratic lines, which complicate the approach with different state authorities in different processes.

4.2.3 Private Sector

Table 7 Private Sector Interests and Incentives

Table 2: Private sector interests and incentives			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
CSR for corporate reputation	-	Thaioil won the CSR award for the entire PTT group	This department in Lampang won the CSR award
Corporation value commitments	-	one of their CSR value is to support findings of Renewable Energy	SCG- community work is one of its core working principals
Local Accountability	-	-	-EGAT approach community area near Mae Mor power plant -SCG – approach area near their community

Non-state actors such are significantly different from state actors, although they act towards a similar goal of "governance". One widely observed phenomenon is that private firms are becoming actors in environmental governance, because firms are at the center of market-economy production and can shape production structure through their investment decisions. The studies on their interests in taking part suggest many points. Conventional arguments about firms and their interest reflect a focus on return on investment and assert that firms are rational actors responding to narrowly defined profit motivations (Friedman in Haufler, 2009). Recent studies suggest that firms have more complex interests, and highlight that "profit" is a very flexible and variable goal (Ford in Haufler, 2009). Moreover, some scholars argue that both interests and ideas are driven by cooperate strategies, in which many decisions involve value judgments and not just an expectation of profit (Sell & Prakash in Haufler, 2009). Corporate social responsibility (CSR), a form of self-regulatory behavior, responds to the concept of reputation, the threat of government regulation, and the cost of anti-corporate activism and commitment to value. CSR is, according to Haufler (2009), a "corporate diplomacy" strategy for firms that directly produce environmental externalities to avoid the above-mentioned threats. This is the case of Thaioil Group and SCG's CSR program on Mae Jo and Ban Sam Kha.

As regards corporate reputation, Thaioil Group, SCG, and the EGAT are obliged to produce CSR annual reports. The CSR reports from different firms in the same group are put into contest to improve outputs. Value commitment in firms are driven by peer pressure among firms or what Dunning (1933) "alliance capitalism", which describes what happens when networks of firms set standards that members must follow in order to maintain their place in the network (Thaioil Group/ PTT/SCG branches). Environmental sustainability is a widely accepted discourse that these networks adopt due to modern global agendas. Firms' drive for local accountability can clearly be seen in the SCG and EGAT cases in their support of the Ban Sam Kha VSPP project. As the SCG Lampang Branch had its cement production factory situated in a sub-district connected to the community. SCG has chosen Ban Sam Kha for its community as a target of development. Similarly, the EGAT built a tight

relationship with the community because it operates the controversial Mae Moh coal-fired power plant not far from the village in the Mae Moh area.

Although the corporations interviewed in the case studies tried to appear purely philanthropic, corporate CSR action and policies, including decisions to participant in hybrid environmental governance, are actually in response to political, economic, and peer normative pressure.

4.2.4 Civil Society

Table 8 Civil Society Interest and Incentives

Table 2: Civil Society Interests and Incentives			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Pursue state energy policy	-	Facilitate the installation of electricity derived from RE	
Influence of global agenda on local implementation	-	Advocacy for RE and Community VSPP due to structural reform through decentralizing energy production	
Advocacy against state norms	-	Facilitate negotiation with DIW	Facilitate negotiation with RID
		Facilitate negotiation regarding bribery	
Models for community VSPPs	-	EforE	EforE, Sustainable community network

Advocacy NGOs are non-state actors that work to influence policy. They either work in cooperation or against the state to shape rules, norms, and regulations. Advocacy NGOs that advocate for environmental agendas bring together unbiased research through empirical investigations to pursue coalition building among actors. They sometimes connect with locals in translating global or national agendas into actual implementation. Civil society actors and private firms are fundamentally different as firms are primarily incentivized by profit. However, Tarrow (2001) argued that they can be similar in the way both types of organization have to operate in a competing (NGOs compete for media attention, donors, etc.)

In this case, the Energy for Environment foundation is the key civil society actor implementing policy advocacy in Mae Jo and Ban Sam Kha through facilitation in the setting up of the community VSPP projects. EforE was an actor that facilitated the approval process with the central state authorities. Originally, EforE's objective was to support the energy efficiency projects of the state as well as the private sector. EforE's main actions were the implementation of MoE's ESCO fund, which signified the direct transfer of energy-related government. At the same time, EforE also criticized and monitored the work of energy agencies, e.g. the ERC, and provided neutral energy policy to relevant government agencies. They also facilitated the negotiation with other non-energy related government agencies that could obstruct their application process. EforE stated that the reason behind its support for Mae Jo and Ban Sam Kha was that the projects would promise a useful model for future reference in the new paradigm of community energy production from RE sources (Monthol, Interview, 28 June 2014). EforE has also been in touch with other energy advocacy NGOs, scholars, and experts to help push structural reforms to achieve more decentralized electricity production from RE sources and pass the attitude on to the local community.

4.3 Power Relations

4.3.1 Introduction

Studying power relationships between each actor in detail can help in understanding more about the relationships and dynamics within the partnership. Power relations among different and same level and organizations will be discussed as follows: Community-State, Community-Private, Community-Civil Society and Community-Private-Civil Society vis a vis the state, consecutively

4.3.2.1 Community-State

Table 9 Community-State's Power Relations

Community-State Power Relations			
	Mae Kam Pong	Mae Jo	Ban Sam Ka
State is in control of knowledge	State has experts on RE and technology and research that later influence structural set up of the energy production. Recent information connectedness from globalization brought power relationship dynamic.		
Community approached state for development project	-	Community proposed the project for authorization	
State approached the community to pursue policy implementation	MoE (Ministry of Science) introduced the VSPP project to MKP	-	-
State controls production technology in structural way	As monopoly in the industry, all developers must produce electricity that can synchronize with the existing grids, controlled by state-led EGAT/PEA electricity-related state enterprise		

State sets legal obligation as a form of control	Law has become a technology of control in the modern state, leading to conformity of actions which are easy to control. Interpretation of law is important.		
Community needs local government for future approval from central state	-	Negotiation with local government succeeded	Local RID/RFD approval needed for further approval
Unofficial norms of bribery of government officials	-	Negotiation for exemption from payment succeeded.	-
State used community as alternative regime for NR management	Co-management between TAO and community failed	Co-management regime found around the Mae Lerm Dike area.	Co-management in the form of community forest as part of their NRM.
			Co-management between RID and the project failed
Community and local state officer blurred identity and role	-	Community members who are also local government officers accelerated the process	-

As Foucault pointed out that power is closely attached to knowledge (Foucault from Boonmee, 2008), he said that "it is important that new knowledge and discourses are produced to contest the old ones in the rotation of power". Initially Thailand's energy discourse was focus around "energy security" and the technology arising to support the discourse was created to support mainstream energy security discourse(Boonmee, 2008). Later, a new energy discourse regarding "renewable and green energy" was introduced by the state itself (different departments). Following this, fragmentations of discourses are found within the state itself. Implementations within different section of governments influenced by different discourses brought confusion to policy. Recently, the connectedness of information from globalization created effects prompting the transfer of information and technology from the global level down to the community level. Environmental NGOs such as EforE in Thailand act as the catalyst for this this to happen, as they have adopted the global RE discourse on community power production (VSPP) as well as the alternative energy security discourses Moreover, production technology is no longer monopolized by the state only. This can be observed by looking at how the situation has evolved from the state approaching the community (Mae Kam Pong) for the VSPP project, to the communities (Mae Jo, Ban Sam Ka) approaching the state for the authorization of their VSPP projects. The alternative discourses of energy that are being supported by some government, some environmental NGOs, and implemented by some local communities are contesting the current state's mainstream energy security discourse.

The state-local relationship on the local and operational level also highlighted dynamics as explained above that the central and local governments possess significantly different interests.

In interactions with the local government, although the communities are supported by the outside with production technology, knowledge, and funding that may equip them with more negotiation power on the central level (approval process), local governments cannot be ignored in the sense that they act like gatekeepers for local agenda to get to higher consideration. For example, in the Ban Sam Ka case, permission from the RID and RFD are still needed to obtain the DIW's factory

approval. Personal relationships that government officers have with local people manifested in a blurred boundary between officials and non-official can make a great difference in the acceleration of the process as well. In asking for construction permission from the TAO, the enterprise leader was at that time a TAO member and he insisted that his actions were necessary for example he alter some details in permission document so that it met the time requirement (Mae Jo Enterprise Leader, Interview, 2 July 2014)

In the actual operation process, the issue of bribery is another big issue where government officers have repressive power over VSPP developers. Private VSPP developers with capital usually expect to gain more than a million Baht a month on each VSPP project (private developers can generate up to 100 times (10 megawatt) the output of the case studies' capacity). In proportion with the income, 50,000 Baht extra costs is considered part of the setup cost, therefore they pay the amount to avoid complications (EforE expert, Interview, 21 July 2014). Thus, bribery has become a norm in the approval process, which is highlighted for reform. However, in Mae Jo where they were pressured to pay, the bribery issue was addressed by EforE, which facilitated the negotiation to exempt the project from paying bribes.

Co-management of natural resources is a discourse that the state and local community see differently. In the eyes of the local community, it is seen as beneficial for them to manage their environment that has economic value to them, whereas the state sees it as a form of territorial control with less cost. For instance, the Mae Jo community has co-management system with RID over in Mae Lerm dike where their micro-hydropower plant is located. RID gives them authority to open the sluice gate as they like. The authority gave them freedom to release water for their power generation which they can manage in relation with the farming water. RID is lending VSPP operator's hand to manage the water while the dike area is still RID asset. Similarly to Ban Sam Ka's community forest, the community thinks it can earn their livelihood from looking after the forest, but state has not yet given up all authority over the territory by avoiding the establishment community forest law (Ornphrom, 2012).

4.3.2.2 Community-Private Sector

Table 10 Community-Private Sector Power Relations

Community-Private Sector (corporate CSR) Power Relations			
	Mae Kam Pong	Mae Jo	Ban Sam Ka
Corporate CSR provide fund	-	Thaioil provided 59.5%	-SCG provided 59.2% of funding -Community gathered 18.5%
Corporate provided technology	-	-	EGAT-Feasibility study, customized generator
Voluntary actions to gain trust	-	-	SCG and EGAT selected the area as their "nearby community trust building"
Community provides implementation of its project	-	Through the participation of the community, firms have outputs to present	

Private firms (Thaioil Group, SCG EGAT) participated in environmental governance through their CSR program out of the interests explained in 4.2.3. The relationship between the firms and the communities can be seen as a trade-off

relationship. The biggest benefit firms give to communities is the funding, and in EGAT's case, essential technology. In return, the firm will expect to gain trust from the nearby area they have strategically selected as well as the CSR project output they need to reflect their company image.

The community provides the resources for actual implementation necessary for output reports. The fact that the community chosen to be the implementer for private firm actually advertises them. For example, SCG advertises by telling the story about the local community empowerment work they are engaged with through television commercials. Ban Sam Ka was selected to be in the commercial scene promoting SCG's values.

4.3.2.3 Community- Civil Society

Table 11 Community-Civil Society Power Relations

Table 1: Community-Civil Society Power Relations			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
CS provide knowledge	-	EforE provided technical/legal support	-Community network initiated the project -EforE provided technical/legal support
CS translated RE-related state agenda to local implementation	-	CS advocated "Community Energy" discourse	
Community has resources for actual implementation	-	Community has personal capacity and water that the micro-hydropower generator can operate	

Environmental NGOs (EforE and local community) mutually benefit each other, as occurred when CS transferred the from RE-related agenda governments regarding community energy. In turn, the community gained more cooperation from various governments by referring to this line of support. In addition, EforE provided technical/legal assistance and support. In the Ban Sam Ka case, the community network helped initiate the community VSPP project and acted as the information hub.

In return the communities provide resources and manpower to as community VSPP model for future reference. In becoming a pilot project promoted by civil society actor(s), the communities can build their reputations. For example, if Ban Sam Kha wanted to become knowledge hub for community energy, CS actor(s) could bring together a network of experts and an audience for their message.

4.3.2.4 Power Relation between Community-Civil Society-Private against State

Table 12 Community-Civil Society-Private Sector against State

Community-Civil Society-Private Sector vs. State			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
State is in control with funding knowledge and authority (energy security created by state)	MoE funded and implement Mae Kam Pong VSPP project-TAO possess it in names	-	-
Private sector has the organizational capacity to bargain with state	Networks of firms are essential in modern production nowadays. They possess bargaining power via decisions on “where and how to invest” that affect state’s response		
Private possesses the knowledge/capacity to deal	Private firms generally know how to produce with less externalities and actions to solve		

with environment externalities	environmental problems.		
CS has power through activism	-	Advocacy against bribery (so-called norm)	
CS presented contested knowledge to state (counter discourse on energy security through renewable energy)	-	Promoting human security aspect of energy security through community energy discourse	
Community has the local organization to run the project	Community Cooperative stopped operating VSPP. (strike)	-	
Community is supported and empowered by private CSR and CS	-	Community member can negotiate with state guided by alliance members	

There are great differences between cases where there are partnerships within the operation and the cases that don't. This is because the non-state actors (Private firms and civil society actors) empowered the communities, giving them more negotiating power.

In the bigger picture, network of private firms are the essence of today's market-based economy. The decisions firms have to invest in certain business will influence state policymaking, economy, and the political environment. Moreover, firms, especially ones that produce environmental externalities, are equipped with knowledge and technology to produce in ways that directly deal with the problems simply by altering the way they produce. Even though networks of firms are powerfully influence state income and policymaking, to avoid counter-policy and activism, they also need to act symbiotically with the state by demonstrating trust-building actions. One strategy that SGC implemented was to reproduce the

"sustainable livelihood development" discourse that the Thai state currently actively supports. In this case, community support via CSR projects for Mae Jo and Ban Sam Kha reflect how "good firms" create a positive environmental impact. Communities with the backing of firms that have good reputation to the government therefore receive more credit, which can achieve more state cooperation. The communities gain more negotiation power not only due to better funding but also because they are sponsored by state-approved firms with good reputations.

Civil society actors generally gain more power either though advocacy against state's policy, action by introducing counter knowledge or discourse, or promoting state-authorized actions. As demonstrated in the case study, environmental NGOs such as EforE advocate against the state's mainstream energy security discourse in favor of the alternative local energy production discourse. They are backed by the RE department in the MoE (DEDE), but they remain neutral enough to criticize the actions of other MoE-related agencies. During the procedures where the problems of bribery occurred, they advocated against the unjust actions of government officials by pointing out the importance of community VSPPs as future power production models, and emphasized that the projects were in the interests of big name bureaucrats on higher levels (EforE expert, Interview, 21 June 2014). Therefore civil society actors in this case partially gain legitimacy and authority from the state, which is then transferred to local communities. Local communities, in this way, were empowered not only from the technical knowledge and legal assistance, but they also received more negotiating power through transferred legitimacy from the state via a civil society actor.

This is in contrast with the Mae Kam Pong project, where the partnership with the non-state actors was not found, and the community was significantly deprived of power. The ultimate control of the state is clearly seen. A prominent example is the possession of the VSPP project, which in Mae Kam Pong was put under state (TAO) name, whereas the other two projects belong to the communities, which directly affects the destination of the income. As a result of a partnership, the two communities were able to register the asset under the community enterprise

name, because of the legal assistance from EforE. Nevertheless, in order to resist state's power, Mae Kam Pong was able to launch a strike as a form of resistance, leading to the suspension of the project operation to date. This signified dynamics within state-local relationship as described by "the weapon of the weak"[31].

However, the empowerment of the community by both non-state actors against state cannot guarantee that the project can successfully operate, because Mae Jo is the only case that is able to operate and run, while the other two are still in the negotiation process. Comparing non-partnered Mae Kam Pong and the empowered Ban Sam Kha, the future for Ban Sam Kha is brighter.

[31] James Scott (1985) explained that subordinate groups resist in ways similar to those of to peasants. His argument is opposing Gramscian's idea about hegemony that the everyday resistance of subordinate's shows they are not submissive to the domination.

4.4 Power Model in the Three Case Studies

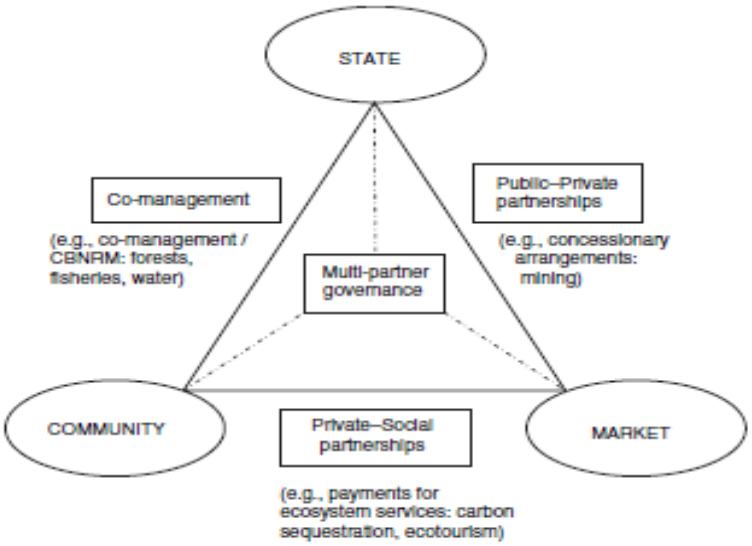

Figure 2 Multi-partner governance

Figure 18 Multi Partner Governance, Reproduced from Young

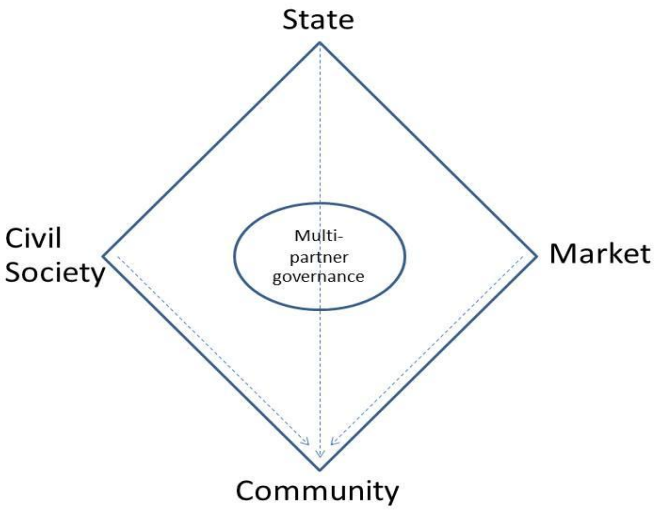

Figure 19 Adapted Power Model for the Study Case

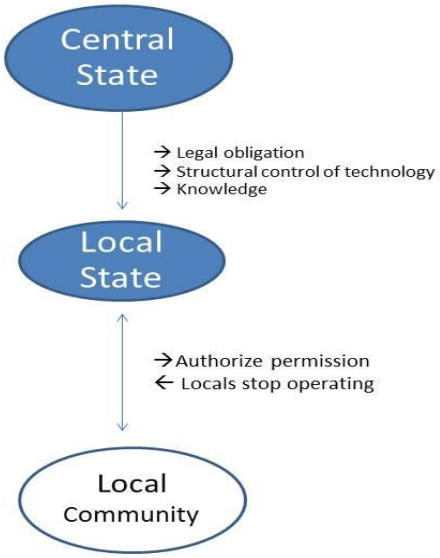

Figure 20 Mae Kam Pong Power Relation Model

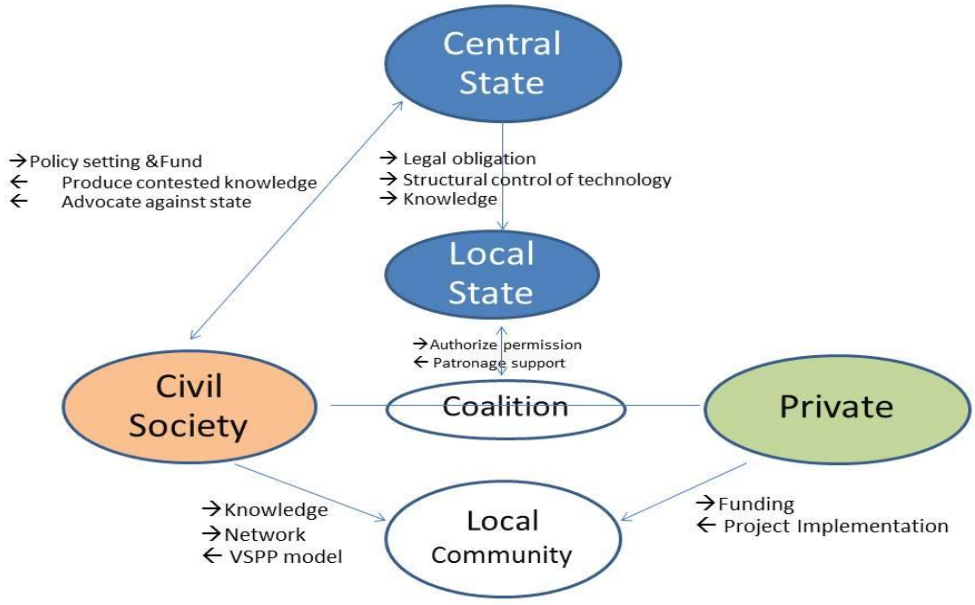

Figure 21 Mae Jo Power Relation Model

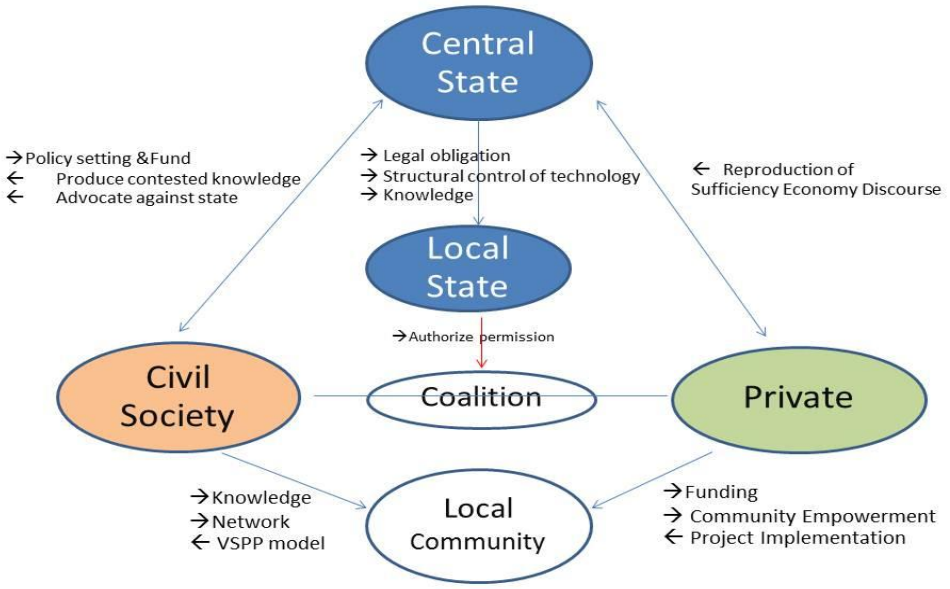

Figure 22 Ban Sam Kha Power Relation Model

4.5 Conclusion

The case studies illustrated some of Thailand's first community VSPP projects that had a hybrid governance model throughout the setup and the operation process and one that has no non-state partnership. With different interests, actors are incentivized to perform differently but ultimately aiming for the same goal, which is the success of the community VSPP projects. As for power relations, some dynamics of power relationships can be seen within the same agencies (e.g. central-local government), same level of operation (e.g. local state- community) different agencies (firms/civil society – community) and different levels and agencies (community/civil society/ firm VS states). The case studies highlighted the phenomenon of non-state actors from various sectors coming together and forming a platform of governance in contrast to conventional state-led governance. The formation of partnerships empowered the communities, and at the same time has influenced the emergence of a counter discourse towards energy security in the way that emphasizes local production and the distribution of production opportunity to local areas, as opposed to the conventional concept.

The new conceptualization of energy security with regards to the human security aspect emerged from this bottom-up empowerment process involves the creation of local job opportunities, income generation, distribution of production technologies to social sectors and the creation of local platform of environmental governance as well as having a green attitude on the local level as a result of community-initiated power project.

The more actors involved in the partnership, the more risks can be shared and overcome. However, it might be too early to conclude that the hybrid governance model for community VSPPs is successful and should be replicated.

CHAPTER V
SUCCESS AND CHALLENGES WITHIN THE ESTABLISHING PROCESS OF VSPP

5.1 Introduction

The study of successes and challenges in each phase of the setup of community VSPP project allows deeper understanding so that further replication can be considered. This chapter will answer the third research question "What are the supporting and undermining factors contributing to the successes and challenges for the community VSPPs in obtaining VSPP approvals and contracts, as well as operating the VSPPs. The chapter will explicitly describe successes and challenges that the working teams of the three communities encounter in each phase. Each phase is divided into: 1. Planning initiation, 2. Partnership formation, 3. Procurement and construction, 4. Approval process approach, and 5. Business operation. A comparison study can show the differences between state-community partnership such as in Mae Kam Pong versus non-state actor partnerships in Mae Jo and Ban Sam Kha.

5.2 Step 1: Success and Challenges in Step 1; Initiating Planning

5.2.1 Success in Initiate Planning

Table 13 Successes in Planning Stage

Step 1: Initiate Planning			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Motivator	DEDE	Community leaders see Mae Kam Pong	Community leader from Community Network

Awareness of the environment and sustainable livelihood	Community promotes Community-Based Tourism	Ultimate goal for the project was for forest conservation	Micro-Hydro Power plant was a representative of water management practice
Incentivized by profit	To create income to circulate in the CBT business	To invest in forest conservation	To share among members that invest
Acknowledgement and acceptance of local member	All local members are acknowledged through public hearing forum		
Insightful and strong leadership	Phromintrara	Tongbai Prasarn	Ja Chai and Kru Srinuan
Participation from local member	Locals are members of cooperatives	Locals helped build the infrastructure	Members invested in the project
Enabling natural resources/ geographical property	The locality has a geographically feasible characteristic for the project to allocate.		

Initial planning was the most crucial process as good planning can contribute to the success of the projects. From the three case studies, some success factors can be identified. First of all, good communication from the motivators to the communities is important for explaining the benefit that the communities can obtain and the costs and risks they have to bear. Apart from MKP's case, where the DEDE had explained to the community the benefits of the VSPP project, MJ and BSK had communities with the leaders conveying their aspirations to members (MJ: after a study tour to Mae Kam Pong, BSK after a forum discussion with community network).

"When we saw Mae Kam Pong's Micro Hydro project, we knew that our area also has the potential. I don't want the water to be wasted when they can actually make money" (Mae Jo Ban Din Leader, Interview, 1 July 2014)

The factor that the idea of Community VSPP was easily approved by local members was related to the fact that community members were aware of the community's promotion of the environment and a sustainable livelihood. This is because strong and insightful leadership played a big part in the encouragement. They were also aware of the urge for the community to generate income for the communities' activities.

"*When our third Micro-Hydro was turned to VSPP project, I was hoping it would create so much income to compensate for our declining income from the our first and second projects that would circulate in our activities" (MKP community members, Interview, 5 July 2014)*

Community members have the attitude that by contributing to the communities' activities, they will get benefits in return. And VSPPs project are one project that they think will generate more income to the communities for the purposes the community wants. Local participation is the biggest contributing factor as some financial, labor and material investment are provided by the locals.

"The project looks like it can make a lot of money, and buying shares I can get dividends at the end of the year. Also I trust our leader, that whatever they bring into the community will be beneficial to us" (Ban Sam Kha community member, Interview, 25 August 2014)

VSPPs from Micro-Hydro technology couldn't have been successful if there are no geographically feasible locations for the generator to run in their area. There are quite a number of mountainous areas in the North of Thailand which the micro-hydropower generators are appropriate to locate.

5.2.2 Challenges in Initiating Planning

Although the biggest challenge based on these case studies is the fact that the communities lack of funding, technical and legal experts promoted their VSPP operation. Those internal challenges have been settled by cooperation with the project partners.

However, external challenges are identified as; 1. The uncertainties in policy support, 2. Challenges posed by government officers, 3. The challenges caused from the administration process. Nevertheless, controversial issues involving government procedures for approvals not only hamper the three case studies' operation; they undermine the overall community VSPP scheme.

5.3 Step 2: Successes and challenges in the Formation of Partnerships

5.3.1 Successes in the Formation of Partnerships

Table 14 Successes in the Formation of Partnership

Step 2: Formation of Partnerships			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Funding Partners see the importance of support to RE	-	Thaioil CSR supported RE project	SCG see Micro-Hydro project as community empowerment
NGO interest to advocate about community VSPPs	-	EforE has been working in cooperation with Thaioil for years	EforE is interested in the facilitation of the setup
Funding conditions were	-	Common ground was found	

well-studied		between funder and community	
Institutionalized community for the operation	Setup of cooperative	Setup of community enterprise	Setup of community enterprise

Successful formation of the partnership the three case studies illustrated consisted of "internal preparedness" within the community that merged with "partner with the same interests". Mae Kam Pong, whose project was primarily administrated by DEDE, didn't interact with any firms or civil society, while Mae Jo and Ban Sam Kha did. But one thing in common for the three cases was that they institutionalized themselves (in the form of cooperatives or community enterprises) in order to legally prepare for the project's administration. The formation of these groups that are valid as juristic persons signified "unity of the community" as registrations of cooperatives required some evidence of active group activities such as members, tracking of expenditures and income, lists of active activities etc. Similarly, registering as community enterprise required solid proposals of the project specifying members, budgets, expected income, activities etc. These active activities showed communities' readiness.

The urge for the private firms to participate greatly contribute to the success of the projects, as the firms are the major source of funding for Mae Jo and Ban Sam Kha. The Thaioil CSR program took into account the issue of renewable energy as its one of their CSR criteria, which are education, community, renewable energy. (Thaioil, 2014)

> *"Each year we have around 100 million baht for CSR budgets and countless projects are proposed for our support. Therefore selection of project is highly competitive. However, the site in Mae Jo was selected as we see the importance of the project for sustainable development of the community and RE development in community level as a model. The community itself is very enthusiastic. We are really strategic in supporting a project. We must consider the success rate of the community first too. In other words, we see if the*

community has the capacity or not "(Thaioil CSR officer, Interview, 15 July 2014)

SCG viewed the project as a tool for the community capacity building they have been promoting. They encouraged the community to actively plan, raise funds, implement and solve problems by themselves before giving extra supportive advice.

"We have been supporting Ban Sam Kha for their natural resource management and community capacity building for almost a decade. When they proposed this project to us, we instantly encouraged them. But first, they had to help themselves first by raising funds, the rest would be taken care of by us. We really emphasize the process of bringing together ideas and solving problems locally. If that was nicely done, I considered it successful. The output isn't that important." (SCG CSR officer, Interview, 26 August, 2014)

In terms of funding condition, a common ground could be found under acceptable conditions that both the community and CSR program agree on. For instance in Mae Jo, the loan from the MoE was to be paid back with no interest, but the grant from Thaioil has no repayment requirement. In Ban Sam Kha, the grant from SGC must be paid back in the form of funding to another similar project once the project starts making a profit. Both parties agreed on the conditions.

Forming a working team with EforE for Mae Jo and Ban Sam Kha was a key success factor, as this NGO was really determined to take part as the projects are seen as an important model for their reference. EforE, which has been working with the Thaioil CSR program for years had proposed the Mae Jo case for ThaiOil grant. And it isn't an overstatement to conclude that without the help of EforE, the community would have had a harder time during the approval process.

5.3.2 Challenges in the Formation of Partnership

The essence of partnership formation was the negotiation to find common ground every partner could agree on. In the case of Mae Kam Pong, the partnership

between DEDE and the community was unclear. Thus the negotiation regarding the costs and benefits for the community was not clearly discussed. The outcome was that the Mae Kam Pong community did not benefit from the project as much as they had expected, as eventually the asset came under government ownership. This ultimately not because of a failure of communication between DEDE and the community, but rather a failure of communication between the state agencies themselves which failed to cooperate.

> *"DEDE said they didn't know coordinating with government authority was this difficult. DEDE wasn't very sure of how to legally administrate the, so eventually the best solution was to transfer it to TAO's administration" (Mae Kam Pong plant technician, Interview, 12 July 2014)*

The other two sites found no difficulties in the negotiation process with their partners except in minor issues such as proposal writing, which requires official writing skills.

5.4 Step 3: Successes and Challenges in Procurement and Construction

5.4.1 Successes in procurement and construction process

Table 15 Successes in Procurement and Construction

Step 3: Procurement and Construction			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Production items developed by specialized agents	DEDE developed generators	EforE outsourced to an engineering company	EGAT developed a generator
Local participation in the process (finance, labor	Locals put in 40% of	Locals helped build adobe	Local bought shares

force)	construction and labor costs	clay house/a local rented a piece of land that has title deed	

As regards the procurement process of engineering items, one success factor was the fact that the procurement was done under the supervision of experts. In Mae Kam Pong, the case was overall handled by the DEDE, which had a separate technology development department In Mae Jo, EforE has its own engineering officers who can negotiate with the outsourcing company to produce suitable generator. In BSK, the EGAT offered engineering-related studies as well as assembly of the generator to get a special sale price.

In the procurement and construction process, one major observation is that a high level of local participation in procurement and construction can be seen. In Mae Kam Pong, although management was mainly handled by authorities, locals claimed that they had donated their labor and material using personal fund to the construction, e.g. rock, sand, cement, building tools etc., for dike building (Mae Kam Pong plant technician, Interview, 12 July 2014), In Mae Jo, the second building was constructed due to complications from the changes of plan. With the budget expended on the first building, local members then contributed their labor by help building the adobe house (Ban Din) out of clay, which is a locally found material. Another great contribution by a Mae Jo local during the construction of the second house was that one member decided to rent out a piece of land to the project under her name for 13,000 baht a year.

> *"The piece of land the auntie rented to us was a rectangular shape that cut through her farm land. It is such a great contribution that she rented us her land, even though it was an ugly cut…" (Mae Jo Ban Din Leader, Interview, 1 July 2014)*

In Ban Sam Kha, local members could participate by buying shares. According to an interview with one farmer, he bought shares valued around 13,000 Baht. When asked about his annual income, it was around 18,000Baht. He explained that the amount was gathered from his family members as well as his own savings of around 6,000 baht (Ban Sam Kha community member, Interview, 25 August 2014). This shows the great contributions local members have to the project.

5.4.2 Challenges in the Procurement and Construction Process

Table 16 Challenges in Procurement and Construction

Step 3: Procurement and Construction			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Construction sites changed due to land use dispute	-	Second building was built	
Additional funding required due to changes of plans	-	The project was fined	

Construction and procurement was generally begun after the authorities granted approval for construction (TAO for construction approval/DIW for factory operation approval). The delay from approval, especially the RN.4 from DIW, delayed the construction process as well as affecting the change of plans and proposal. As explained in Chapter 3, Mae Jo needed to reconstruct another building on another piece of land they rented via private title deed. The challenge was that reconstruction of the second building was over budget. But Mae Jo's way of mitigating the problem was that local members participated in the construction of a clay house using local knowledge and material. As for both Mae Jo and Ban Sam Kha, both were fined by the DIW for constructing the factory-building prior to the approval of RN.4. It is apparent that, the approval processes really affected the process of construction, where a change of plans that entails extra cost.

5.5 Step 4: Success and Challenges in the Approval Application Process

5.5.1 Successes in the Application Approval Process

Table 17 Successes in the Approval Process Approach

Step 4: Approval Process Approach			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Close cooperation with the state	DEDE can easily deal with government agencies	EforE has a close relationship with state	
Close relationship with local governments		Local members are in touch with government officials	
Negotiation for exemption from bribery	-	EforE negotiated for exemption from bribery	-
Funding conditions were well-studied	-	MJ learned from MKP	

When comparing the success of the approval process in the Mae Kam Pong case, managed by officials (DEDE) and the two that were managed by private actors (MJ and BSK). it can be seen that the approval process was quicker and less problematic in Mae Kam Pong as DEDE could issue official letters to local and other related agencies to more easily get cooperation. However, with the support of EforE, negotiation power was increased. Approaching the government for approval is the most challenging part in the setup of a project. It delays of all other process, as will be elaborated later. However, Mae Jo and Ban Sam Kha managed to overcome some challenges by studying lessons learnt from the Mae Kam Pong case, such as utilizing

personal relationships within the negotiating process, negotiating for exemption from bribery.

5.5.2 Challenges in the Application Approval Process

Table 18 Challenges in the Approach for Approval Process

Step 4: Approach for Approval Process			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Delay in the process (waiting period is long)	✗	✔	✔
Bribery requests	✗	✔	✔
Unpleasant attitude from government officers	✗	✔	✔
Government officials' attitude towards cooperation in non-mainstream practices	✗	✔	✔
RN.4 from DIW was identified as troublesome	✗	✔	✔
No cooperation toward common understanding between government agencies	✔	✗	✗

Most challenges are encountered when approaching the government for approval. As MKP did not participate in approaching the government, they were unable to provide any feedback. However, in talking to Mae Jo and Ban Sam Kha representatives, these challenges were readily apparent.

First of all, the communities explained that waiting for the documents to be processed was time consuming. A delay on one document could affect the processing of another. For instance, after the long-term purchasing contract was granted by the

PEA, the project was obliged to begin operation within 90 days. However, in both MJ and BSK case, waiting for the RN.4 from DIW to be established took longer than 90 days. The projects had to apply for a contract extension and risk cancelation (MJ: twice, BSK: in the processing of the second application). Documentation processing takes at least 30, and as many as 90 days to complete. If there are mistakes in a document, it needed to be returned for correction, and then has to repeat the same waiting process. (Moe Jo's plant Technician (1), Interview, 3 July 2014) Observers have condemned some departments such as ERC the government for inadequate personnel in their approval departments (EforE expert, Interview, 21 July 2014). ERC was criticized for unnecessary budget spending in other departments, when it should have been directed to the approval department.

Secondly, bribery was another significant topic that came up during the research. Mae Jo was pressured by some officials to pay bribes as the officials claimed that the project would have environmental effects and unless they paid the "fee", the project couldn't be approved. In response, a group of community members argued that it would be the villagers themselves implementing the project; they wouldn't do anything to pollute their environment, on which their agriculture relies.. Additionally, a Micro-Hydro project doesn't produce environmental externalities at all (Mae Jo's community member, Interview, 5 July 2014). As a community enterprise, the project's budget was limited and they could not afford to pay the extra amount, therefore they relied on EforE negotiation for exemption, which was successful.

One small but irritating issue interviewee brought up was the unpleasant attitude from government officer. One interviewee from Mae Jo said;

> *"When we would go to the office to bring them additional documents, they would always present an unwelcoming face to us, as if our issues were a burden to them*" *(Wai Jo's group leader, Interview, 5 July 2014).*

This attitude on the part of government officials was presumably because the issue the community requested gave the impression of extra work for them, as the request wasn't a conventional, mainstream practice e.g. request for permission for extension of the waterway, request for approval letter from RFD etc.

From the interview, the two case studies confirmed the nation-wide controversial issue about the issue of RN.4 for VSPP developers from the DIW. The issue has been brought to public attention that the RN.4 issue lacks transparency and it affects the progress of the development of the VSPP industry in general. In Mae Jo, the DIW didn't allow the VSPP plant to operate on public land; the project was fined and its location was moved, as explained in 3.3. BSK experienced a similar situation with the DIW over the RN.4 issue, and during the process of finding a solution. The RN.4 is a serious issue that obstructs community VSPP setup process and needs to be addressed.

5.6 Step 5: Successes and Challenges in the Business Operation

5.6.1 Successes in the Business Operation

Table 19 Successes of the business operation

Step 5: Business Operation			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Project could sustainably operate financially	✗	✔	✗
Project created hybrid governance platform for the communities	✔	✔	✔
Project indirectly contributed to conservation of the environment and to water management	✔	✔	✔

The status of business operation can point out success. Only one out of two can currently operate and receive income, while other two are still postponed. However, success indicators do not only include the ability to operate and the income generation capacity, as the projects' ultimate goal was aimed for community's sustainable activities. Therefore, other indicators such as the environmental and social benefits the project generated must be taken into consideration of the concept of success.

In terms of economic success, Mae Kam Pong and Ban Sam Kha have suspended their projects; therefore income can't be created (although MKP had gain around 500,000Baht after one year in operation). By contrast, Mae Jo is now receiving around 13,000 bath of income per month. Currently, they are hiring two technicians who operate the sluice gate with monthly salary of 5,000 Baht each. Initially, the community committee planned that around 30% of the amount of money would cover the operating expenses for two technicians and some engine oil. Some 20% would be saved for their annual reforestation activity, and forest ritual ceremony. The other half will be used to pay off debt. But currently, 77% of the income goes towards technician's salaries. It is clearly not enough for future community projects, which include the compost center, welfare for members, and increased benefits for the enterprise members, unless the project can manage to gain more from careful water management.

The economic benefits haven't met expectations, but are enough for sustaining the operation without external support. Despite the challenges, the project has set up a systematic platform for community governance. Apart from Mae Kam Pong and Ban Sam Kha, which already have established environmental groups (MKP: coop income goes to forest conservation, BSK: water resource management group), Mae Jo created "Wai Jo", the juvenile group, which was the product of systematic steps towards sustainability in terms of continuity across generation. The formation tightens the bonds between generations and keeps young educated personnel in the village for further operation. The youth group provides the main activists for implementing forest

conservation related activities, as younger generations can easily be empowered and can persuade others to join. Prior to the project, forest conservation activities were made possible by personal finance or donation and casual volunteer. Additionally, through the Micro-Hydro power project, water resources are managed by the locals in cooperation with government agencies, which meets agricultural and power generation needs better than if the government manages the resources. The project thus created a platform for systematic natural resources management in the locality.

In brief, the case studies showed that different forms of partnerships could bring about different benefits. Direct interaction with state, as in Mae Kam Pong, offered promptness in implementation and was less troublesome in terms of coordination between agencies. The two case studies showed that partnership between different partners with different incentives help overcome challenges that others can't towards the achievement the same mutual goals while still mutually benefit both partners. The projects exist because of precise combination of the firm leadership of the community in negotiating with local state agencies, preparedness of participation, technical and other expert supports from civil society actors, and the funding from firms' CSR programs. A Micro-Hydro project is not solely an income generation project; it signifies as a local development project that brought a systematic resource management platform to communities. Although ultimately some projects are still pending, the non-economic successes were still achieved during the process.

However, to replicate these projects on a national scale, a whole new paradigm of policy strategy must be considered because many restrictions. Before a diffusion pattern could be seen, challenges should first be identified. The following section will elaborate the points of challenge which community electricity projects must confront.

5.6.2 Challenges in the Business Operation

Table 20 Challenges within the Business Operation

Step 5: Business Operation			
	Mae Kam Pong	Mae Jo	Ban Sam Kha
Project operation is pending due to state restrictions	✔	✘	✔
Inadequate profit to pursue other proposed plans	✘	✔	✘
Replicability to other community is a challenge	✔	✔	✔

Currently, two of the projects didn't succeed in the operations due to restrictive regulation by government agencies (as explained in Chapter 4; MKP with the TAO's budgetary issues, and BSK with RID's extended construction restriction). The only one that can operate is Mae Jo, however Mae Jo's operation can generate adequate income to sustain current operation but not to make enough profit to serve other plan of projects they intended to conduct from the profit. Mae Jo intended that the profit from the project would be used to build a compost factory. Current income could only pay for two technicians' salaries with some savings for their intended forest conservation activities, but not enough for bigger projects. Such small scale projects as the VSPPs of these three communities can be studied by interested communities in the future, but further replication on a mass scale can be difficult as government regulations still don't facilitate the setup process. The reasons can be given as lack of state policy support, a legal process that is too rigid, and corruption in the approval process. These will be explained in detail.

5.7 Analysis

From the breakdown of the details of the challenges above, most challenges come down to the interaction with government agencies. The challenges can be categorized into three points: lack of government policy support, a rigid legal process and lack of transparency within the approval process. Each point will be elaborated in details.

5.7.1 Lack of Policy Support

There are currently five different energy plans in Thailand that were written separately by different departments with little coordination during the writing process, which cause the plan to compete more than complement each other (Tongsopit, 2012). The 2010 Power Development Plan specified low deployment of Renewable Energy, and it still emphasizes conventional generation. However, the Renewable Energy Development Plan sets a target for 25% of total energy consumption to be supplied by renewable energy sources by 2020. The fact that REDP wasn't an essence in Thailand's long-term PDP, there are inconsistencies reflected in many action policies such as in the subsidies program, in action plans among the different agencies involved, and in an inadequate amount of public advertisement and education to promote replication in local communities.

In the interview with the director of the ERC's approval department, the attitude toward the development of community VSPPs was expressed as

> *"As regards the investors that come to VSPP business, everyone is welcome as long as they are qualified to invest according to general VSPP regulations" (ERC Approval Director, Interview, 18 July 2014).*

When special allowance or support towards community VSPP was requested, no special treatment was expressed.

One perspective in electricity generation on the policy level was expressed by Mr. Phongsak Ratapongpaisarn (Ratapongpaisarn, 2013) that in terms of the increasing demand of electricity, a site development plan according to the PDP 2010 is essential. Energy from renewable sources may not satisfy the demand due to high production costs (monetary and social costs) as well as high commercial prices which would threaten the ability of the state to provide cost-efficient and adequate power to the people. The future of Thai energy security would also be threatened due to the environmental activism for the constructions of new power plants. According to Phongsak,

> *"We have to accept that our production capability is declining. The old power plants are reaching the end of their lifespans, and the construction of new ones is suspended due to environmental-activism… Many critics are hoping to see sources from Renewable Energy being used. Let me give you an example referring to the production of 40,000 megawatts —an equivalent amount of the expiring coal-fired power plants. If we want to replace them with RE sources, for example, with solar energy, we have to build 10 megawatt plants in 4,000 sites and environmental and land problems will follow. As regards the price, in contrast to the current electricity price of 3-4 baht per unit, electricity produced from RE sources will cost around 8-12 Baht per unit or at least three fold higher. Not only is the price costly for household consumption but also for industrial production. Thailand's economy is now depending on production. To freeze the price at 3-4 Baht three solutions are most suitable; 1.coal-fired sources 2.Nuclear technology 3. Mega Hydro Power sources…As regards Hydro Power plants in Thailand, it is not an overstatement to say that Thailand isn't geographically suitable for such production as water sources are too small and dikes were mainly design for agricultural purposes…"*

Phongsak is looking at the issue from the eye of state with the interest to provide sufficient and cost-efficient power. But this attitude could undermine the development of future RE plans, especially if micro-hydropower plants are not

considered important and reliable in the share of power production in the next 20 years.

In brief, policies in the regards of RE productions are unclear, resulting weak advocacy towards RE production especially in local level. Most importantly, lack of determination towards RE production in decentralized scale result unwelcoming attitude from approval authorities. Additionally, bad cooperation among related agencies within the approval process could bring complications to VSPP developers.

5.7.2 Rigid Legal Process

It can be argued that legal process is too rigid for community VSPPs to attain approvals, because the government applies the same requirements for every applicant, even though community VSPP developers have restrictions, mainly regarding funding, project capacity, land issue and narrow interpretation of regulations in the bureaucratic system.

Land was one of the most troublesome issues for the Mae Jo Micro Hydro project due to a rigid legal process. In the regards to requirements for the Factory Operation Approval (RN.4), land type is an issue for consideration. That is, the land needs to have a private land title deed. Prior to filing the application with the DIW, building to house the factory was built in an area claimed to be public land (belonging to RFD). The DIW explained that under its restrictions, factories cannot be situated in a forest area, therefore the RN.4 cannot be granted unless the building is built in land area with a title deed. Consequently, a new building was constructed from adobe clay (the area's signature building material), in an area with a private land title deed rented from a community member.

> *"…The project was almost called off many times due to this land issue. We were lucky that Ms. Ta (land owner was generous enough to let us use her land even though she now cannot grow crops on it. I didn't know that dealing*

with government regulations was this complicated and tiresome, but problems were there to be solved…" (Mae Jo Ban Din Leader, Interview, 1 July 2014)

The land issue was identified as the biggest barrier imposed by state regulations. On top of that, the DIW explained to the community that factory operations are generally not allowed in registered forest areas to avoid pollution that can damage the forest and communities down-stream. However, the community didn't agree because they claimed that they were actually conserving the forest and the project had no environmental impact as proved by experts. EforE experts argued that it is very likely that Micro-Hydro project, which generally involve dikes in remote villages, to be situated in registered forest area and that the state should be flexible if it want these model projects to be replicable. From interviews with the community and the ERC, it can be observed that state applies the same standard for every applicant. The ERC claimed that it can grant approvals to anyone as long as the legal process was correctly done. In this case the community had to register as a juristic person, and follow official procedures including possessing the correct land type (ERC, 2014).

In the case of Ban Sam Kha, the RID director claimed that the approval for the extended construction of the water way was above his decision-making level (ERC Approval Director, Interview, 18 July 2014). Similarly, Mae Kam Pong's conflict with the TAO regarding the redistribution of budget according to the OAD regulations highlighted that bureaucratic regulations enforce rigid procedures and allow no room for creative development.

It can also be concluded that energy-related agencies failed to seek cooperation from unrelated agencies. For example, RID, whose main responsibility is to manage irrigated water for agriculture, may not be concerned with water for electricity production. However, if energy agencies made an effort to identify their objective, mutual understandings would facilitate actual implementation and more collaboration. This is commonly identified as a challenge within government

agencies, yet this issue has a significant impact on the effectiveness of Thai's bureaucratic system.

5.7.3 Transparency within the Approval Process

When investors enter the electricity generation industry, they must obtain the following documents: a long-term purchasing contract from the PEA to apply for the adder program[32], electricity generation approval from the ERC, construction approval from the local TAO, factory approval from the Department of Industrial Work, and Controlled Energy Approval from the DEDE . In order to operate, every VSPP must apply for these approval documents according to ERC's guideline. . According to an interview with the director of the ERC approval department, the ERC claimed that the challenges for every approval process for VSPPs, especially for community projects, are the community's lack of funding, structural conditions that don't comply with the law, and bribery within the approval process. Although the director seemed hesitant to acknowledge the last point, it was confirmed by the community. The communities not only found the procedures complicated, they also faced complications during the approval stage caused by bad faith administration.

In a couple offices the community approached, they experience attitudes of ignorance and denial. In addition to poor service, they were tricked into paying extra money in fees on top of the application fee in order to pursue the application process. The DIW officer explained that the project may cause environmental impact and the community received the impression that bribery could accelerate the procedures; however, they did not pay the bribe even though they wanted the process to move forward. For the ERC, it was almost a custom for developers of VSPPs to pay bribery to proceed. An EforE expert spoke from his observation that most VSPP developers were private companies, which had capital prepared for uncontrollable extra costs

[32] The adder program is a RE production subsidized by Thai government to mainly incentivizes Small Power Producer and Very Small Power Producer developers. The rate for subsidization is different due to the type of energy, whereas today's most expensive rate of subsidy is from solar farm.

stemming from the approval process. He further explained that this has become a standard norm for VSPPs to get approval without their application being held up, and for government officials to make money.

> *"...Private developers with big capital can make millions of baht of income a month; to pay only 50,000 Baht in exchange for the convenience is tiny in proportion to the income, and the cost was expected beforehand..." (EforE expert, Interview, 28 July 2014)*

As explained earlier, Mae Jo was pressured to pay around 50,000 Baht extra for the troublesome approval, EforE helped by using their network negotiations to avoid the payment, as the EforE founder, Dr. Piassavas Amranand realized how important the community could be as a model for future community VSPP projects.

The bribery has become a norm in the approval process. Most private VSPP choose to pay because their production capacity is a lot bigger than what communities can produce. In proportion with their expected income, the bribery was a tiny sum of money. This signifies double standard within the process.

The above challenges illustrate the hardships faced by a community enterprise in developing a VSPP project in general. Varieties of problems stemmed from both internal sources, such as lack of funding and technical/legal expertise, and external sources, such as from government regulation and corruption. The solutions to these cases were formulated on a case-by-case basis. It will be difficult for other communities to develop VSPP projects for their enterprise unless state addresses the problems and eases some regulation (e.g. transparent approval procedure) as well as systematically promote others (funding, legal technical advice).

5.8 Conclusion

The successes and challenges in the three community VSPP projects were studied in order to obtain an understanding of the process of set up and operation in a deeper level. Contributing factors to success included a combination of community preparedness, good partnership, and successful negotiation with state agencies. In addition, although there's not enough evidence that community VSPP projects from the three case studies can become greatly economically profitable, the success regarding the social aspect (a project is the means for community capacity building, formation of governance sub-group) and the environmental aspect can be seen (Micro-Hydro project is the end product of good water governance, project's expected profit goes to environmental conservation activities).

The challenges, however, were primarily encountered at the stage of the approach to state agencies. Community VSPPs represent potential electricity production from renewable resource schemes that state should seriously consider amending and easing regulations so that community investors find the policy environmental enabling to come into business. It can be concluded that the difference between Mae Kam Pong state-community partnership and non-state-community partnership is that, although partnership with the state provides advantages in term of negotiation, partnership with the state can be a hegemonic relationship where the state controls most resources. However, being in a partnership with non-state actors with a good relationship with the state can enhance the community's negotiating power, though success is not guaranteed. However, at the peak of success, shares and benefits among members of the community can be expected.

CHAPTER VI
DISCUSSION AND CONCLUSION

6.1 Introduction

This last chapter will provide a wrap-up of arguments and claims for previous chapters. The chapter will begin by raising discussion and debates over the future of community engagement in VSPP business, e.g. replicability of the current case study projects, models introduced by energy experts, policy amendment, and addressing constraining issues imposed by state. Following that, conclusions of each chapter will be presented. Finally, the chapter will end with recommendations for future research.

6.2 Discussion

6.2.1 Replicability of the Project

From the study, it is doubtful that the three projects are replicable, as there are still constraints during the setup process and the economic benefit hasn't proven to be fully sustainable. Although it seems as if the projects are ideal as model projects for community power production, replicability is doubtful as the formation of partnership are unique.

> *"...I'm glad that our project is finally able to operate. But if I knew that the setup would have this many problems, I wouldn't have started it. For example, the funding and the process gave us a headache. I hope the other communities who have the same value as ours can learn from us, but I must say it's not easy, unless the governments understand and support us more..."(Mae Jo Ban Din Leader, Interview, 1 July 2014)*

Moreover, EforE officer who supported the setup of the project itself has expressed that;

> *"..Although the projects are still small and not profitable, it is important that we supported them, because if there were no pioneering projects, there would be none in the future. I see the model as really important. As regards the existing projects, I think the communities have enough capacity to improve and sustain the project well. We are keeping an eye on them…" (EforE expert, Interview, 28 July 2014)*

ERC raised the issue of sustainability during the interview that the models are too idealistic for the moment and can't be replicable at the present time;

> *"…Everyone can come into the VSPP business if they are qualified. There is no difference whether developers have community configuration or not. But I see that these projects are pilot projects, and I see a lot of them fail. These projects are more like experimental ones that would stop if the funders stop funding. The replicability should be considered if it's a government project..." (ERC approval director, Interview, 18 July 2014)*

The various opinions expressed by those involved show that the projects are still immature and may not be easily replicable unless they receive a lot more attentions from various governance actors e.g. communities themselves, NGOs, private CSRs and most importantly the state.

6.2.2 More Green Investment to Boost RE Generation

In the eyes of state, the model is not as efficient, economic wise, as the current centralized model. And considering the capacity of the population as the whole, Thai people in the rural areas where decentralized model is required may not be ready to initiate or support such idea. To shift from a centralized model to a decentralized one, production infrastructure and its systems need to change, and this takes a long time. Structural change is not easy in Thailand's case, as the Power

Development Plan (PDP, 2010) was designed for the development of "centralized production" 20 years in advance. Therefore electricity generation using RE sources should gradually be advocated together with mainstream technology development. However, to kick start, government needs to make a big contribution by investing in the business to pave the way for a good business environment. Korea is a good case study for governmental support for green business in its Green New Deal (Barbier, 2010)[33] scheme. Korea is trying to establish itself as global environment leader, and is investing billions of dollars into mega green technology infrastructure (mainly in energy sector i.e. electricity) to support investment in other green business. The idea of massive investment not only provides facilitating infrastructure but is also an economic intervention. For example, massive funding for procurement of certain devices, such as solar cell devices, can bring down the commercial price of the product. The idea is – in accordance with the market mechanism whereby popular use of a certain product allows competition into the business – competition brings technology advancement and cost-efficiency. The government is the key actor who should be playing the role to trigger the market mechanism. If Thailand's government is sincere in the promotion of RE, there should be more spending from the government sector.

6.2.3 Government Support through Build Operate Transfer (BOT) Model

The community VSPP model may seem too ambitious for a sudden change looking from state's energy security perspective. The promotion of similar kinds of

[33] Global green new deal: The concept of Global Green New Deal (GGND) is supported by UNDP. It emphasizes the importance of government fiscal stimulus towards green business. They urge the government to spend at least 1% of it GDP (or more due to the level GHG emission) to incentivize to investment in many sectors, including energy, which is a major part. This concept also points out the relationship of the spending and the resulting increase in employment rate of those engaging in the green business as a way to tackle poverty and inequity problems. The approach is holistically promoting greener environment ranging from water management, forest conservation, green technology and so forth. But to focus on the guided investment in energy sector includes energy conservation, fuel-efficient vehicles and clean energy, resource recycling (fuel from waste product). South Korean is an explicit example of country adopting and implementing GGND, and the immediate output of the investment is the concrete increase in employment. The approach is compromising (not possible-do you mean a compromise with the neo-liberal economy?) to the neo-liberal economy and is an incremental option to take.

decentralized model is however essential in terms of the strengthening of human security as well as the alternative discourse of energy security at the same time. Therefore, the government should continue and, in addition, intensify the support for renewable energy production. A compromise step should be taken. One model was proposed by an EforE expert (Interview, 28 July 2014) that should be easily adopted. The model is called the Build-Operate-Transfer (BOT). BOT is a model in which there is a high involvement of private sector investment. That is, the private sector with a large amount of capital is the main investment actor in contractual relationships with the government for a certain period for private investors to make appropriate profit before transferring the asset to government administration. This model can currently be seen in many business sectors, e.g. transportation, telecommunication etc. This model is applied for community VSPP business in the One Tambon One Megawatt solar energy proposal by the previous government, where community could be engaged in the operation. BOT is a model that has the potential to gain local engagement in RE business, but it can lessen the local community's decision-making power against private firms. Therefore the BOT contract between the community, state and private firms should be designed to fairly benefit each actor without placing the cost on the environment.

6.2.4 Reforms for the BOT Model to Diffuse

After Thailand's 2014 coup d'état, The National Council for Peace and Order (NCPO)[34] has taken charge of the government-related administration. One of NCPO agendas during their term which they promised before allowing the next election is the "Reform Agenda in every sector including energy". A draft for reforms in the energy sector was proposed by EforE. As regards community VSPPs, EforE supported the BOT model in the One Tambon One Megawatt solar power proposed by the previous government but added that the scheme should take the issues of transparency and accountability seriously. EforE pointed out that the scheme might

[34] In April 2014, due to the coup d'etat, the NCPO was in charge of all government-related administration.

have conflicts of interest in the process of procurement and division of interests during the operation. EforE criticized that the procurement of solar panels technology might be monopolized by a group of private providers in close relations with the government, and the profits would be divided between private investors, and government officers but not the community. EforE proposed that the government should take part in forming fair contracts between the three sectors in such a way that it incentivizes private sector enough for them to invest. The procurement process should be fairly distributed, the local community providing production input e.g. land, labor should get fair benefits, and at the same time not trade off so much environmental cost and the government can tax in a fair rate. BOT is a potential model through which the community can engage in electricity production.

6.2.5 Community Energy through Local Energy Exchange

A pro-renewable energy expert, Dr. Sopitsuda Tongsopit (Energy Research Institute expert, Interview, 19 October 2014), shared another perspective. He suggests that the future model of community energy should be in the direction of promoting an increase in competition from the private sector (local community actor) in the business through which they are able to exchange energy production among themselves.

> *"... Communities who have capacity should be able to produce and exchange among themselves. The benefit of this would be that, if communities are producing for domestic use and exchanging with other communities efficiently, competition would be created which would affect the business operation of dominating actors such as the EGAT and PEA. However, the challenges would be that communities have to create a network of micro grids[35] and the technology would be rare and expensive at the early stage. In*

[35] Micro Grid(Galvinpower, 2012): Micro Grids are modern, small-scale versions of the centralized electricity system. They achieve specific local goals, such as reliability, carbon emission reduction, diversification of energy sources, and cost reduction, established by the community being served. Like the bulk power grid, smart microgrids generate, distribute, and regulate the flow of

the future, if these communities' projects advance from piloting to commercial scale, technologies should be less expensive. The chance of the actual phenomenon may be little as changes in infrastructure should take time and the dominant companies in the business wouldn't easily allow competitive environment. The ability for adoption to occur at an accelerate rate depends on many factors, one of which is the policy support …" (Energy Research Institute expert, Interview, 18 October 2014)

This perspective is a similar model in many countries in Europe, where there is competition within the electricity business and consumers can choose their producers. However, in the case of Thailand, the compatibility of products from community actors should be considered, as the quality will be difficult to improve to the level where it is able to compete with state's enterprise (EGAT/PEA/MEA).

6.2.6 The Downside of RE Production for Thailand's Macro-Economic System

The decision for the support of renewable energy production in developing countries has a negative on macro-economic impact to consider. For example, land acquisition for either solar farms, wind farms, or other land-intensive technology can affect land use in terms of agriculture. In countries such as ones in Africa (Blue Energy, 2012) where land can't be utilized for agri-business-related production, mass energy production for export is therefore a business to consider. In this debate on whether decentralize electricity production is suitable for Thailand, opposition would suggest that Thailand is an agriculture-based country; land use of such production would deplete crop production. Nevertheless, it is possible to make counter argument that today's agricultural land use compared to the profit it makes isn't as efficient as the land use for industrial sector[36]. Therefore, turning land into energy (electricity)

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electricity to consumers, but do so locally. Smart microgrids are an ideal way to integrate renewable resources on the community level and allow for customer participation in the electricity enterprise. They form the building blocks of the Perfect Power System.

[36] According to "5 Inconvenience truths about Thai's agricultural sector, Aug 2013" https://infogr.am/5-Inconvenient-Truths-of-Thailands-Agricultural-Sector Accessed: 24 Oct 2014

production to support industrial sector should be more efficient (economically). My position on this issue is that Thailand still has room for the development of decentralized VSPP business. And the development could be designed in such a way as to not to alter the previous pattern of agricultural land use, but promote production as a byproduct of it e.g. the electricity from rice-husk biomass technology in rice milling business, micro-hydro power plants in the agriculture-community near water streams. Therefore VSPP project development should go hand in hand with sustainable agriculture production. Unlike in Laos, which is positioning itself to be "the battery of Asia" and its production strategy has shifted so that power production is emphasized over agriculture production, Thailand still claims the position of Asia's leading rice production country.

6.3 Addressing Limitations during the Approval Process

As clarified in Chapter 5, major limitations are identified as follows 1. Internal capacity of the community 2. Government administrative limitations. The latter is contributing to major challenges, and the state should address the problems. First of all, the attitude of the state is important (in this case, energy-related policymakers). It is essential that the state see the importance of the delegation of production power to the private sector, especially local community actors.

6.3.1 Government's Top-Down and Bottom-Up Approach

An opinion from Dr. Tongsopit (Interview, 18 October 2014) suggested that state should exercise a two-way strategy to promote community energy (electricity): a top-down and bottom-up approach. The top-down approach refers to policies supporting community electricity generation, which includes market intervention e.g. feed-in tariff and adder programs, green investment, etc. Some of these are already reinforced, but to promote the engagement of community actors, the state should

manipulate economic policy in particular way. For example, currently the feed-in-tariff program is designed to more heavily subsidize certain areas and technologies. For instance, the biggest subsidies go to the three most southern provinces, and in terms of technology, solar power is the most heavily subsidized. In similar way, the feed-in-tariff program should be designed so that it incentivizes community actors to engage. Moreover, providing supplies will help actors access equipment for example, equipment leasing scheme through financial bank e.g. solar roof etc., investment subsidies or "equity investment" to support developers on the community level (Monthol, 2014). The bottom-up approach refers to participant (community actors) capacity building. The state should provide trainings towards the importance of community participation in the overall concept of energy security. Once communities are prompted to participate mentally, physical facilities should also be provided, e.g. access to proper funding, technologies and expertise. In Dr. Tongsopit's perspective however, Thailand's RE production situation is improving every year as the "reliability rate" [37] of RE is increasing every year. (Tongsopit, Interview, 18 October 2014)

6.3.2 Collaboration among State Agencies for Policy Consistency

On the policy level, renewable energy production should be consistent. All plans that were written by different departments setting different goals should be integrated. The level of sincerity to address the renewable energy target can be demonstrated through serious cooperation between different state agencies, especially non energy-related ones. In the setup process, there are a number of non-energy related agencies e.g. the RID, DIW, DPT, RFD etc. Frequent agency meetings for collaboration should create understanding between those unrelated agencies regarding the energy targets, and also should foster trust and good collaboration between agencies in the future. In fact, the agency responsible for the application for VSPP approval, for instance the ERC, should initiate "one stop service" for VSPP applicants. The idea of "one stop service" would be for the ERC to collaborate with

[37] Reliability Rate – The rate in which renewable energy sources can be used to meet energy demand instead of conventional commercial fuels

other unrelated agencies for permission, and so that the approval process is to be run by government officials (ERC) instead of private actors. This way, the process could become more time and cost efficient. This idea of close cooperation to facilitate the setup of a renewable energy unit will address two of the problems: 1. Cooperation among state agencies, and 2. Rigid administration process in unrelated agencies. The latter is addressed because the agencies can refer to state's agenda more easily. That is to say, once unrelated agencies understand the agenda objective, it should be easier to interpret the situations as they arise.

6.3.3 Amendment of Rigid Rules and Regulations

Nevertheless, some rules and regulations should be amended. As explained in Chapter 5, the RN.4 issued by DIW was identified a troublesome document. After the NCPO's energy reform agenda was announced, Dr. Piyasawas Amaranun, the EforE director, was appointed to the PTT executive board and the head of the energy reform agenda. He gave a speech at the seminar entitled "Thailand's Truth for Energy Security" to support the cancellation of the RN.4, saying:

> *"Currently (2014), Thailand's Renewable Energy production is growing at a slow rate, currently at 5% out of the 25% 2020 target rate. This is mainly because of the restriction caused by government agencies especially the constraint posed from the approval of the DIW RN.4… Therefore if the state would like the RE rate to accelerate, it is important that the state address this problem. The action plans are, for example, reconsidering the approval process in the manner that it facilitates applications, reconsidering approvals for energy business to holistically allow any form of operation, and most importantly the cancellation of the RN.4 document. The reason is that the RN.4 overlaps with other regulatory documents for factory operation that electricity producer must primarily apply. The issue of RN.4 will only make the process more complicated and moreover will allow corruption to occur. I see this as one major constraint for business developers" (Thai Post, March 2014)*

In the draft proposal for Thailand's RE development (2014), EforE proposed to NCPO, apart from the amendment for the RN.4 document, a few more recommendations for government regulation to be amended that should be enacted, for example, amending article 48 of the Energy Operation Act, so that business operators can get approvals without authorization according to the DIW's Factory Control Act, and dissolving the RE development committees which causes complications more than facilitation etc(Monthol, 2014).

6.3.4 Addressing Corruption Problems

With regards to corruption problems, Dr. Piyasawas also commented further in "Thailand's Truth for Energy Security" seminar (2014) that:

> *"..If we want transparency in the energy business sector, I propose that the political sector should get involved as little as possible and increase participation from the private sector in executive decision making in influential energy firms. The reform should be done by allowing the public to voice opinions and at the same time serve as a check and balance. If there were still actions taken by political sectors as there are now, the reforms will be difficult." (ThaiPost, 2014)*

Dr. Piyasawas' point of view addressed the concerns over the distorted energy structure that is greatly entangled with influence from political sector. He pointed out the importance of public voice and participation on the executive level. If the community VSPP agenda is voiced through this procedure, it will receive more attention and eventually result in the amendment of restricted regulations and the overall attitude towards the emergence of community actors in energy business.

As the result, Dr. Piyasawas is in the process of drafting a new regulation to enable energy developers to avoid the application for the RN.4 document by classifying small RE (electricity) business as different from other factory operations, and therefore not under DIW jurisdiction. If the future of the RE (electricity) business

is as promising as planned, the emergence of community actors in VSPP business should be more wildly adopted.

To wrap up, the key action plan should be incorporated in the reform agenda which includes 1. Complicated government-enforced regulations should be amended. 2. Explicit goals for RE support should be set 3. Complication due to the lack of accountability and transparency in state agencies and officers should be addressed and reformed 4. RE using a top-down and bottom up approach should be promoted.

6.4 Conclusion

Studying the emergence of hybrid environmental governance by taking Thailand's community VSPPs as case studies allows us to study the dynamics of different incentives that interplay within the partnerships. In this case, communities with green values are essential actors who either approach or are approached by the state to promote their environmental development policy. The state is the main actor when governance issues are raised. Different state segments are incentivized differently. The central state (policy-making level) on one hand is interested in secure electricity production with centralized technology for cost efficiency, whereas on the other, the renewable energy-related departments are driven by green values and as such, promote decentralized production of renewable energy. Other non-energy-related government agencies (e.g. RID, RFD, DIW) on the administrative level are obliged to only do their assigned task which may not support VSPP projects. Private firms are superficially incentivized by profit, but having learnt that firms care about community empowerment through CSR programs show that firms have more complicated interests – company image and customer preferences. Civil societies, as seen in the case studies, work both with the state to advocate their RE targets, and at the same time against the government agencies that obstruct the setup process by raising concerned issues from the research they produce from state's agenda.

As stated above that different actors are attached with them different incentives. Within the state itself, "plurality of actions" can be seen as different

segments of authority, which have different motivations and different interpretation towards the "energy security discourse". Although the plurality of state policy and action might appear to undermine the direction of electricity development plan in Thailand, the existence of this plurality allows the state to pursue its own development as well as international pressure. To illustrate, the central state (high officials, government and ministries) are concerned mainly with securing adequate and cost-effective provision of energy to citizens, while at the same time it has to maintain its position in the international community by showing concern for an urgent agenda on the promotion of Renewable Energy.

Analyzing the interpretation of "energy security" from different perspectives could bring about different meanings. The central state's perception of energy security focuses around stability in provision of energy (in this case electricity), which is linked to economic security and that may affect state security if it is not addressed. However, the emergence of hybrid environmental governance shows that the state is no longer the only determining actor. Private firms and civil society (and local community actors) are approaching the state for a paradigm of development that may or may not conform to state's policy. In the facilitation process of community VSPPs demonstrated in the three case studies, non-state actors are introducing a new conceptualization of "energy security" that mostly focuses around the socio-economic outcome of energy projects for wider range of people. New perspectives for energy security brought up by the new actors of governance emphasize decentralized production process in the energy industry. Two different views of "energy security" can be reflected in the physical output, such as the traditional state's view, which is reflected in conventional mass-scale, centralized production e.g. Mega Hydro-Power projects or coal-fired plants. By contrast, the proposed view is reflected in small-scale, local based production from renewable sources. In the community VSPP context, production power is delegated to small-scale developers, particularly local communities, for local revenue generation, which places the emphasis on a human security agenda. VSPP projects also have the potential to generate energy for adequate consumption in reference to national economic security, if the idea were adopted more broadly. Moreover, resources for production input

would be utilized by locals to decrease dependency on commercial fuel imports. In short, the emergence of hybrid environmental governance fosters an alternative reconceptualization of "Energy Security" that emphasizes human security in terms of the sustainable development of local communities through various means.

Community VSPP projects such as ones in the case studies demonstrate the rise of communities with "green value" that initiated their renewable energy projects to raise revenue to implement their "green activities". The indicators of success were assessed not only in terms of the economic sustainability of the projects, but also the environmental and social aspects. It can be concluded that although it is too soon to claim the economic success of the three projects, not only the direct impact to their environment, social empowerment platforms that provided direct benefits in terms of local capacity building were also successfully established during the process of implementation. The major contribution to the successes of the projects was the collaboration non-state actor work to gain from state, as partnerships were formed to bare risks and provide benefit that other can't. Private firms provided funding under their CSR value (renewable energy promotion, local capacity building). Civil society actors provided technical expertise, and also acted as a bridge between policymakers and local implementers. Both actors saw the potential in the community man-power and the resources held by the communities, so the communities provided implementation to fulfill civil-society's interest for their future reference.

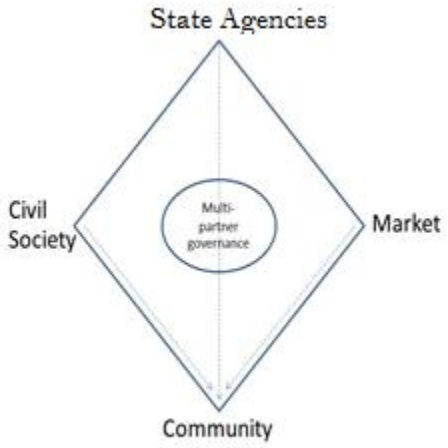
Challenges identified during the setup process in the community VSPP case studies were primarily caused by; 1. Community capacity itself and state actors; 1. Inconsistency in policy support; 2. Rigid legal process due to poor cooperation among government agencies and 3. Transparency problems on the administrative level. First, the energy plans devised by different agencies do not coordinate. Second, due to tight restrictions in the bureaucratic system, executive decision-making authority on the local administrative level is not granted by the central level. Extraordinary authorization beyond local officers' responsibility may not be settled on the local level. One the one hand, tight practice according to the defined job content is considered "good performance" for a lower ranking government official,

but on the other hand rigid interpretation of practice (where interpretation can be adjusted to benefit locals) undermines creativity in development projects. Third, the transparency problem within the approval process was identified as a challenge in the process. Bribery in the granting of approval documents is considered to be the norm for any VSPP applicant. The problem was more serious in the case of the community VSPP as they are "piloting a project" with limited budget, in contrast to private firm developers who anticipate the cost and include it in their application budgets.

Although it is too soon to conclude that the three projects from the case study are replicable as it is difficult for other interested communities to come into such business and whether or not they have the potential. Moreover, the partnerships the communities formed are unique and there are no standard solutions for the problems they faced. However, there are still hopes that community actors can engage in the VSPP business by the introduction of the One Tambon One Megawatt program under the BOT model, as well as structural change involving an increase of public participation in decision-making and a reconsideration of amendments to restrictive regulations.

In brief, hybrid governance facilitates the emergence of community actors in VSPP businesses, as partnerships between non-state actors and the communities lends more negotiating power to the communities in relation to state agencies. The comparative case studies showed the benefits of the participation of non-state actors in the governance of Community VSPP. For example, when the state-led VSPP project in Mae Kam Pong was confronted with a dispute with state agencies, the community had no negotiation alternatives, other than putting the operation on hold as a form of resistance. By contrast, the support of EforE and the private CSR program funding for the Mae Jo and Ban Sam Kha projects enabled the community to own the production assets and gave them decision making authority. Mae Jo has been successfully operating for a number of months since February 2014 and Ban Sam Kha has high potential to successfully negotiate with state agencies.

The formation of private sector-civil society-community partnerships introduces a new conceptualization of national energy security that places the emphasis on the wellbeing of locals, in contrast with the state's national energy security concept. However, it is important to highlight that that the state is still very powerful, given that it has the authority to authorize and set the development agenda. Thus, although there has been a rise in the number of private sector development project initiatives, the cooperation and support of the state are still essential.



The result of the study demonstrate that hybrid governance in the formation of community VSPPs allows communities to initiate energy projects, as well as empower them during interactions with state agencies regarding the electricity generation agenda. At the same time, organizations partnering with communities, such as private firms and NGOs, can pursue their interests through their support of these VSPP projects. However, hybrid governance in community VSPP projects is still a phenomenon that occurs very uniquely. In order for the models of Mae Jo and Ban Sam Kha to diffuse and become commercialized, existing concept that bring many sectors together into environmental governance such as the BOT, as discussed above, should be advanced in the field of hybrid environmental governance.

6.5 Recommendations for Future Study

- I would like to encourage researchers who are interested in community energy production to produce continuous research about the impact community VSPP projects have on local communities and future replicability of the projects. In the case of communities who receive advice and learn from these pioneering projects, research can be done to confirm replicability.
- Likewise, in the event that One Tambon One Megawatt or projects of a similar kind were to actually be implemented, the formation of partnerships along this model could be studied to see future feasibility. Step-by-step guidelines could then be created to guide communities with green values to come into the business.
- With regards to decentralization of electricity production, quantitative study could be done to see the possible positive and negative impact, if Thailand's production pattern were to totally shift from a centralized to a decentralized model. It is important to have more research in this field.
- More hybrid environmental governance formation should be studied with other kinds of development projects e.g. water governance, mitigation of pollution, etc. Further comparative study with this thesis could be done.

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APENDIX

List of Interviewees

	Schedule	Interviewee	Gender
1.	1. July, 2014	Mae Jo Ban Din Leader ,	F
2.	2. July, 2014	Mae Jo Enterprise Leader,	M
3.	3. July, 2014	Mae Jo Plant Technicians (1),	M
4.	3 July, 2014	Mae Jo Plant Technicians (2),	M
5.	4 July, 2014	Mae Jo's TAO,	M
6.	4 July 2014	Mae Jo's Local PEA	M
7.	5 July 2014	Mae Jo community member	F
8.	5 July 2014	Wai Jo's group leader	F
9	5 July, 2014	Mae Jo plant's land owner	F
10.	12 July, 2014	Mae Kam Pong community leader	F
11.	11 July, 2014	Mae Kam Pong plant technician	M
12.	13 July, 2014	Mae Kam Pong cooperative member	F
13.	15 July, 2014	Thaioil Group CSR officer	F
14.	17 July, 2014	ERC approval officer	F
15.	18 July, 2014	ERC approval director	M
16.	21 July, 2014	EforE expert	M
17.	23 August, 2014	Ban Sam Kha community wise person	M
18.	24 August, 2014	Ban Sam Kha community leader	F
19.	25 August, 2014	Ban Sam Kha village headman	M

20.	25 August, 2014	Ban Sam Kha community member	M
21.	25 August, 2014	Ban Sam Kha plant technician	M
22.	26 August, 2014	SCG CSR officer	M
23.	19October, 2014	Energy Research Institute expert	F

VITA

Thita Orn-in was born in Trat province of Thailand in 1988. She obtained a B.A. in Liberal Arts from Chulalongkorn University in 2012. Her background in working with Japanese's development projects supported by the Japan International Cooperation Agencies (JICA) encouraged her to explore more on development agendas. She pursued her study in the international development studies in the faculty of Political Science, Chulalongkorn University in 2014. The study had convinced her to work in the field of sustainable development especially on environmental politics.