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REVIEW OF LITERATURE

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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

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- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

THE COLLECTIVE ACTION OF 'GOTONG ROYONG' SOCIETY IN ELECTRICITY INFRASTRUCTURE DEVELOPMENT IN REMOTE ISLANDS

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ABSTRACT

The research aims to reveal the electricity infrastructure development in remote islands, specifically in Sumenep Islands, Madura Indonesia. The research uses qualitative approach because the development phenomenon is holistic in nature. Initial informant is chosen based on purposive sampling and continued with snowball sampling. Research findings show that: (1) electricity infrastructure limitation has caused negative effects on society's welfare; (2) government and private sector has failed to cooperate in electricity infrastructure development; (3) lack of society's resources; and (4) strong social capital within the society. Those conditions drove the society in the research location to provide electricity infrastructure on their own through "gotong royong" activity. The success and sustainability of "gotong royong" activity is facilitated by strong social capitals, including: (1) actors' rationality tends to altruistic or sympathy; (2) the institution (rules of the game) is made in a simple and informal way and mutually agreed; and (3) actors have strong social interdependence. Recommendation for government to facilitate collective action of "gotong royong" in electricity infrastructure development is by providing supporting infrastructure.

KEYWORDS
collective action, social capital, gotong royong.

I. INTRODUCTION

Economic development is a development process aimed to achieve long-term economic growth along with institutional system improvement. The economic development is indicated by the increase of population welfare. Institutional system improvement, in the other hand, is indicated by improvement on such aspects as rule of the games and players implementing the rules (Arsyad, 2010).

Infrastructure has strategic role in the development process as social overhead capital stimulating all developmental sectors. Every infrastructure is interrelated as substitution or complementary. The availability of one infrastructure will influence either directly or indirectly the functionality of other infrastructure in sequence (OECD, 2006). Therefore, infrastructure development should be conducted in integrated and sustainable way.

NKRI (Unitary State of the Republic of Indonesia) is an archipelago nation with 13.478 islands, 1.340 tribes, 546 languages and various and abundant natural resources (Google, February 28, 2013). Instead of improving society's welfare, local autonomy has increased poverty among the society due to social gap, isolation and infrastructure facilities limitation. At remote islands, the government and private sector has failed to cooperate in infrastructure development. It is related to the limited governmental budget, non-conducive investment and actors' moral hazard (Agu, 2009 and Rohima, 2013).

However, the solution is there for the failure of cooperation between government and private sector. Currently, many infrastructures developments are funded through donation from certain parties as individual or through association; although the free riders are still exist (Miller, 1997). Social interdependency and natural resources scarcity are incentive for a community or group to have a Mutually Beneficial Collective Action/MBCA in order to solve such issues as public good supply and shared resources management. Collective action by a community facilitated by strong social capital will decrease the transaction cost in monitoring and rules implementation due to the interdependence among community's members. In making a decision, an individual will not only consider the cost of resources utilization for him/herself but also the expectation of other individuals in his/her community on how someone should behave. It is related to social character within village and coastal communities. The social characters include interdependence, expectation of individual behavior and norms of reciprocity. The existence of social sanction or customary sanction can suppress the incentive to break the rule or to be a free-rider. Kimbal's research (2012) showed the role of social capital on the success and sustainability of economic activities in Pasar Blante Kawangkoan North Sulawesi.

Based on the background, the research is focused on the phenomenon of society's collective activity of "*gotong royong*" in electricity infrastructure development in Sumenep Islands Madura, which is a remote location.

II. LITERATURE REVIEW

1. RATIONALITY OF COLLECTIVE ACTION OF "GOTONG ROYONG"

Gotong royong or *ghutong rojhung* or *majjama' manenkki* or *sitatabangan* is one of forms of Mutually Beneficial Collective Action (MBCA), which is the cultural heredity of Indonesian society and is manifested in all aspects of life including electricity infrastructure development in Sumenep Islands Madura.

A collective action of *gotong royong* is a rational action since every individual has different strengths and weaknesses; therefore, they will need to cooperate for mutual benefit and to complement each other (Miller, 1997; Ritzer, 2009). Actors with *gotong royong* rationality and supported by good moral (altruistic and sympathy) of productive and efficient behavior will create social capital with positive implication to the success and sustainability of the collective action. On the other hand, a rationality supported with moral hazard (egoistic and opportunistic) of un-productive and inefficient behavior that lead to tragedy of the commons will create social capital with negative impact on the success and sustainability of the collective action (Hausman, 1993). A group of heterogenic collective action has potential to have bigger moral hazard because there are tendency that everyone will feel more comfortable with people who have similarity and wanted to cooperate with them. For example, one free rider will trigger the emergence of another free rider.

2. SOCIAL CAPITAL AND COLLECTIVE ACTION OF *GOTONG ROYONG*

The success and sustainability of collective action of *gotong royong* is influenced by the cognitive and structural aspects of social capital. The cognitive aspect is the mental process (consciousness internalization) toward norms, values, attitudes, beliefs, etc. The internalization will influence the moral of MBCA's actors in terms of trust quality, solidarity, cohesiveness, cooperation, generosity and else. Those morals are called the dynamic factors. The final output of internalization process is ideas or expectations toward collective behavior to achieve collective benefit. Cognitive social capital is manifested in form of civic culture and has influencing characteristic. Therefore, social capital within this category is called predispose social capital since it influences people to do MBCA. Another characteristic of this social capital is intrinsic or hardly observed. The structural aspect of capital social is a building block on how the social capital is constructed. Therefore, social capital according to structural aspects, reverse to cognitive social capital, has extrinsic or observable characteristic. However, both aspects of social capital have similar output, which is ideas or expectations leading to MBCA. Structural social capital is in form of network, group or other interpersonal relationships. The dynamic factors are horizontal and vertical relationships. Structural social capital is manifested in form of social organization to facilitate MBCA. Therefore, social capital within this category is called assets. Both aspects of social capital will bring ideas or expectations leading to MBCA behavior. Cognitive social capital influences the community to do MBCA and structural social capital facilitates the MBCA. Cognitive and structural social capitals will be effective if it is supported by complementary interaction between formal and informal institutional (Dhesi, 2000 and Uphoff, 1999 in Yustika, 2008).

3. AGENCY THEORY

Agency theory is a relevance theory in analyzing infrastructure development in Sumenep Islands Madura. According to Lupia & McCubbins (2000) in Zainuri (2010), agency theory is a theory rooted from the synergy of economic, sociology and organizational theories. Agency theory consists of two actors, principal and agent. Principal is individual or group who carries the final risk of an activity. Agent is individual or group who has been given the authority or assigned to do the job from the principal. Principal makes implicit or explicit contract with agent in hoping that agent will act or do the job as stated by the principal. Principal delegates the authority to agent. The delegation is happened when principal choose the agent to act based on principal's interest.

The main principle of agency theory is cooperation between a party who give the authority (principal) and the one who receive it (agent) in form of contract. The implication of the theory tends to cause opportunistic behavior by the agent and harm the principal. To minimize the damage on principal, a simple agency model assumes two options on contract, which are: (1) behavior-based contract is when principal monitors agent's behavior, and (2) outcome-based contract is when principle provides incentive to motivate agent to achieve principal's interest. Theorists stand on the proposition that when there is cooperation between principal and agent, the damage on principal occurs because agent most likely will give priority on his/her own interest (egoistic/self-interest).

II. RESEARCH METHOD

The research used qualitative approach. This approach is more appropriate in order to find out the meaning of social phenomenon, emotional and one's experience in economic context. A qualitative research is based on unique and complex problems. It does not look for generalization but a specific truth in certain location or context and is holistic in nature (it views research object, in this case *gotong royong*, as a whole unit inseparable from other aspects). The research focused on the meaning behind an empirical non-sensual (noumena) and non-nomothetic (measurable and statistical) fact/phenomenon.

The research is limited to find out the institutional of collective action of *gotong royong* on the supply and utilization of electricity infrastructure in Sumenep Islands Madura Indonesia. Research location was chosen by considering the appropriateness o the location to the research theme. For islanders who live in isolated and remote islands, *gotong royong* is the most effective and efficient option in infrastructure supply and utilization because support from external parties cannot be expected.

Data in this research was the social reality on *gotong royong* institutional in the supply and utilization of electricity infrastructure. Source of data was key informants or people who are considered to have information on the researched phenomenon (Miles, 1992). Initial informant was chosen based on purposive sampling and continued with snowball sampling. Other source of data were observation on an event and study on relevant documents. Analysis and data collection was conducted all together to get conclusion.

III. RESULT AND ANALYSIS

1. EFFECT OF LIMITED INFRASTRUCTURE

Sumenep Regency is located in the easternmost of Madura Island. It consists of land and islands. The location of the islands is isolated from the capital city of Sumenep Regency and is bordered with Borneo, Sulawesi and Bali Islands. This condition has implication on the characteristic of the islanders who are heterogeneous (multi-ethnic) dominated by Madura and Bugis ethnics. There are relatively no issues caused by the heterogeneity since both ethnics, Madura and Bugis, share some characteristics. Both Bugis and Madura people are (1) Muslim, (2) uphold the self-esteem; (3) hard work ethics; (4) having wander culture; (5) strong kinship; (6) strong ethnicity bound; and (5) strong cooperation culture (Rifai, 2007 and Alimudin, 2006).

The islands area consist of nine sub-districts, 84 villages and 126 islands with area of 946,53 km^2 or 45% of Sumenep Regency area. The sub-districts in the islands area are Masalembu, Sapeken, Kangayan, Arjasa, Raas, Nonggunong, Gayam, Talango and Giligenting. Of the 126 islands, 48 are populated and the remaining 78 islands are not populated. Total population of Sumenep Regency is 297.505 and 103.530 households with average member of family is 2 – 3 people/household. Population density in all sub-districts is relatively low (less than 1000 people/km^2) because most islands are not populated. Sex ratio in all sub-district is less than 100, means that there are more women than men (BAPPEDA, 2009; BPS, 2010).

The large number of unpopulated islands indicates that most of natural resources potential in Sumenep Island are not optimally utilized, especially marine and fishery resources. Field finding also indicated that infrastructure limitation has caused less people outside the islands who visit or live in the islands. At the same time, local society who is Madurese and Bugis ethnic has wander culture and high work ethics. It is rare to find an adult male in productive age live in the island since most of them has been wandered to other regions or even abroad. Population in this area is dominated by elders, women and children.

Infrastructure has a role as social overhead capital stimulating development in all sectors. Every infrastructure is interrelated either as substitution or complementary. Infrastructure limitation in Sumenep Islands Madura influences, directly or indirectly, other infrastructures malfunction. Generally, this limitation has implication on the low level of society's welfare indicated by low quality of life and high living cost.

The low quality of life is indicated by the low number of households having infrastructure facilities. The number of households having electricity facility from the state power firm (PLN) is 15% and 2% having clean water facilities from PDAM (state-owned water company). Premium, oil and diesel agent from Pertamina is only available in two sub-districts and Telecommunication from Telkom is only 2%. Those facilities extend only to capital city of the regencies and their surrounding villages and not for other isolated villages. The condition is exacerbated by the limited ground transportations, bad roads, no public transportation and street lighting, and limited sea transportation to small and isolated islands.

High living cost is indicated by household's average expense for basic infrastructure up to Rp. 2.000.000 per month, which includes: (1) electrical bill of Rp. 75.000 – Rp. 350.000 per month; (2) clean water of Rp. 450.000 – Rp.750.000 per month, average clean water per day is 10 gallon costing Rp.1500 per gallon in rain season and Rp.2500 in dry season; (3) ground transportation ranging from Rp. 300.000 – Rp. 900.000, average gas requirement per day is 1 liter with price ranging from Rp. 10.000 – Rp.30.000 per liter; (4) sea transportation between nearest islands is around Rp. 25.000 per day or Rp.750.000 per month; and (5) cost of telecommunication. Those expenses is not included the expenses for consumptions and other expenses.

This high living cost and low quality of live is negatively impacted the Human Development Index (HDI) in the islands. HDI, in general, is lower in the islands than in Sumenep Regency. The average HDI of Sumenep Regency is 68.90, educational index (EI) is 72.67, life expectancy index (LEI) is 65.08 and purchasing power index (PPI) of 68.94. Whereas, the average of HDI in Sumenep Islands is 67, 28, EI of 69.21, LEI of 63.55 and PPI 61.73. The low PPI is mainly related to the low efficiency and productivity of household and company's economic activities. The low EI and LEI is related to the less optimum educational and health facilities function.

2. THE FAILURE OF GOVERNMENT, PRIVATE SECTOR AND SOCIETY'S COOPERATION

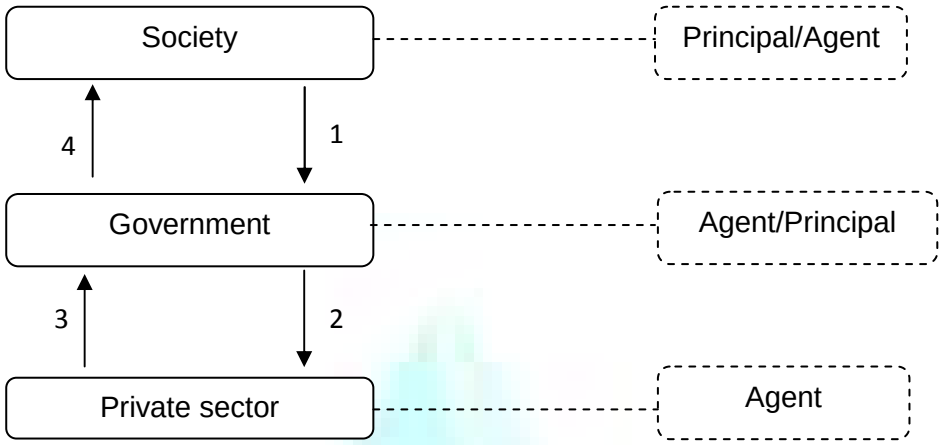

Figure 1. The Implementation of Agency Theory on Infrastructure Development

The implementation of agency theory on infrastructure development in Sumenep Islands Madura is presented in Figure 1. There are three actors in the cooperation: (1) society (principal and agent); (2) government (agent and principal); and (3) private sector (agent).

The cooperation among three actors consists of four stages: (1) society as tax payer delegates the authority to use their tax money to the government (agent) to finance infrastructure development; (2) government (principal) delegates their authority for infrastructure development to private sector (agent) through auction; (3) private sector (agent) reports their work result in infrastructure development to the government (principal); and (4) the government (principal) delegates their authority for infrastructure utilization to the society (agent).

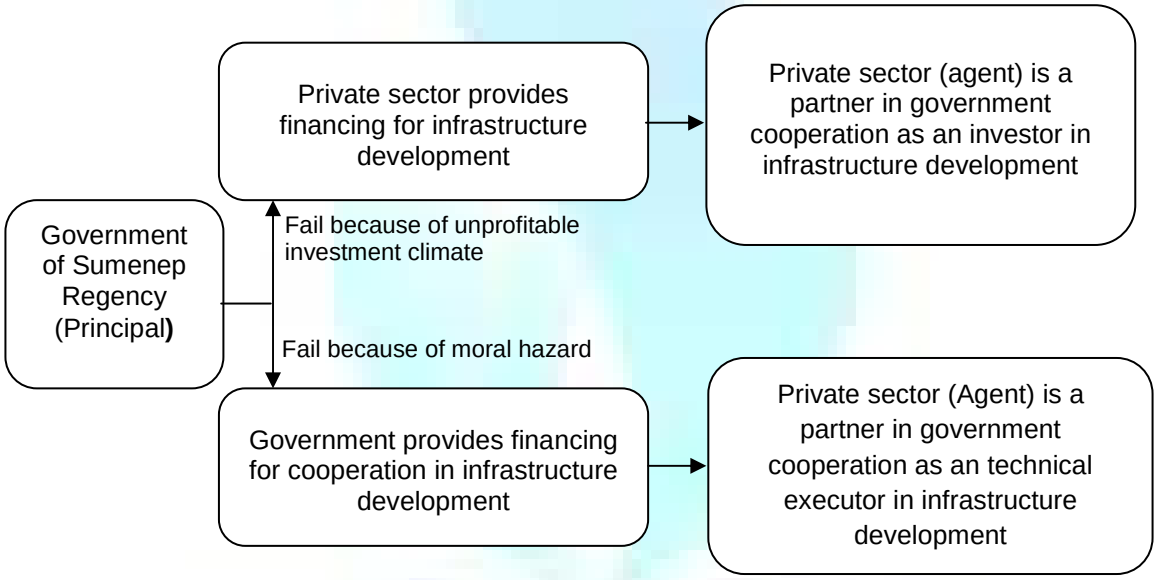

Figure 2. Cooperation between Government and Private Sector in Infrastructure Development

Cooperation between government and private sector in infrastructure development in Sumenep Islands Madura took place in two forms. First, government (principal) gave authority to private sector (agent) as an investor in infrastructure development. The private sector (agent) provided fund for infrastructure development. The cooperation failed because investment climate in Sumenep Island Madura is not profitable. Second, government (principal) gave authority to private sector (agent) as technical executor for infrastructure development. The government (principal) provided fund for infrastructure development. The cooperation failed because of government (principal) and private sector's moral hazard.

Based on the assumption of agency theory, all actors in infrastructure development tend to do moral hazard when they act as an agent. However, in time, both principal and agents cooperate to do moral hazard in form of corruption, collusion and nepotism. The government has potential to do moral hazard since they have double roles as both agent and principal.

Due to various factors, societies in Sumenep Island Madura were encouraged to provide electricity infrastructure on their own by conducting collective action *"gotong royong"*. Among those factors are (1) electricity infrastructure limitation that raised negative multiplier effect on society's welfare; (2) failure on government and private sector cooperation in electricity infrastructure development; (3) lack of society's resources; and (4) strong social interdependence.

3. RATIONALITY OF COLLECTIVE ACTION OF *GOTONG ROYONG*

Gotong royong is an Indonesian term means working together to achieve mutual goals, which is help each other and ease each other burden. *Gotong royong* is a hereditary Indonesian culture and it has manifested in all tribes in Indonesia. Every tribe has its own term for *gotong royong*. Madura tribe calls it *ghutong rojhung*. Bugis tribe, on the other hand, calls it *majjama' manenkki* or *sitatabangan*. Even though it has different term in each tribe, the purpose is the same. It is expected that through *gotong royong* society will have high tolerance to others within different religion, race, tribe, and so on. Therefore, it is important for *gotong royong* to be preserved as a unifying factor in heterogeneous society. Other activities conducted with *gotong royong* in the daily life of societies in Sumenep Islands include harvesting, making and fixing boats, fixing fishing nets, sea fishing, building houses, wedding, funeral, cleaning the village, and building mosques and other public facilities. Hence, it can be stated that the internalization of cultural norm of Bugis and Madura tribes is a cognitive aspect social capital influencing the rationality of actors of collective act of *gotong royong* in Sumenep Islands that tends to be altruistic / sympathy. In addition to culture, internalization of Islamic norm is another cognitive aspect social capital influencing the rationality of *gotong royong* actors in Sumenep Islands. As religious

society, one of motivations for *gotong royong* in electricity supply is to perform Islamic rules. Islamic precept recommends its member to give priority to collective prayer and it is also implemented in all aspects of life including electricity supply. The collective prayer itself should be conducted based on consciousness, willingness, and good intention from the actors for their own good or others' (altruistic/sympathy rationality).

Moreover, the implementation of economic and social rationality concepts is also influencing the rationality for collective action of *gotong royong* that tends to be altruistic/sympathy. *Gotong royong* is one of forms of Mutually Beneficial Collective Action (MBCA) aimed to gain economic and social profit. In economic context, *gotong royong* will increase efficiency and productivity of economic activities. In social context, *gotong royong* will increase social capital to facilitate social interest of its actors, such as social status improvement, political support and else. Society's and political figures in Sumenep Islands are those who have active participation in various collective action of *gotong royong*.

4. THE INSTITUTIONAL OF COLLECTIVE ACTION OF GOTONG ROYONG

Field findings indicate that there are six patterns of electricity supply in Sumenep Islands. Each pattern has different actors and rules of the game as the following description.

PATTERS 1 (ONE)

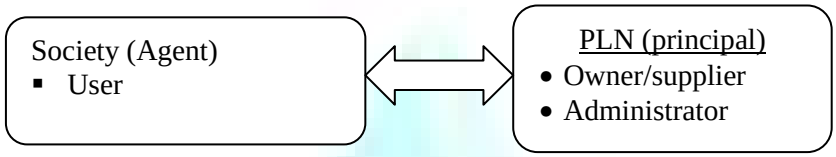

Figure 3. Pattern 1 (One) of Electricity Supply in Sumenep Islands Madura

Pattern 1 (one) is the most ideal pattern with two actors: PLN (principal) as electrical supplier and society (agent) as user. This is an ideal pattern because it provides the cheapest national electricity base rate and the safest for 24 hours electrical service. Pattern 1 can be found only in Talango Sub-District because it is the nearest place to the land with adequate supporting infrastructure facilities. This 24 hours electricity service in Talango Sub-District began in 2000. The rule of the game of PLN service in Pattern 1 in the islands is similar to that of the land. Moral hazard cases involving the society mostly are about illegal connections and delinquent bills, which is very detrimental for PLN. Therefore, PLN has changed their payment system from post-paid into pre-paid. Both payment systems have similar charge but it is more profitable for PLN because it can prevent moral hazard. The average of electrical pulse (*token*) with capacity of 900 watt for 24 hours services is Rp. 75.000,-/household/month.

PATTERN 2 (TWO)

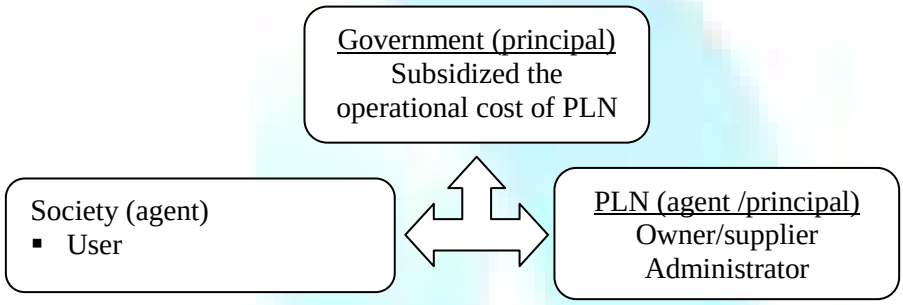

Figure 4. Pattern 2 (Two) of Electricity Supply in Sumenep Islands Madura

Pattern 2 is a cooperation between three actors: (1) government (principal), (2) PLN (agent and principal), and (3) society (agent). Government acts as facilitator providing subsidy to help PLN's operational cost in the islands. PLN acts as electricity supplier and administrator. Society acts as user for electricity provided by PLN.

High operational cost and low income from electricity user has caused the government to cover PLN's loss with subsidy. Without government's subsidy, PLN would have to close their operation in the islands due to high operational cost and low national electricity base rate. According to Mulyono, PLN's manager, PLN can provide electricity service without government's subsidy if government's regulation supports them to apply electricity rate based on the operational cost in each location. PLN service using Pattern 2 has extended to 15% of households in 8 sub-districts or 43 villages. The villages are those that reachable and located around the sub-district's capital city, including: 11 villages in Arjasa Sub-district, one village in Kangayan Sub-district, one village in Sapeken Sub-district, eight villages in Nong Gunong Sub-districts, 10 villages in Gayam Sub-districts, four villages in Giligenting Sub-districts, and eight villages in Talango Sub-districts; whereas, no electrical service from PLN in Raas Sub-district.

Up until now, Pattern 2 has been susceptible to conflict due to society's moral hazard such as illegal connections and delinquent bills, which is very detrimental for PLN. The ongoing loss is ended by PLN decision to discontinue post-paid electricity service and change it into pre-paid system. This pre-paid system for electricity service only reaches three sub-districts, Talango, Giligenting and Sapeken. Other five regencies are using post-paid system with rolling blackout or several hours' service every night.

PATTERN 3 (THREE)

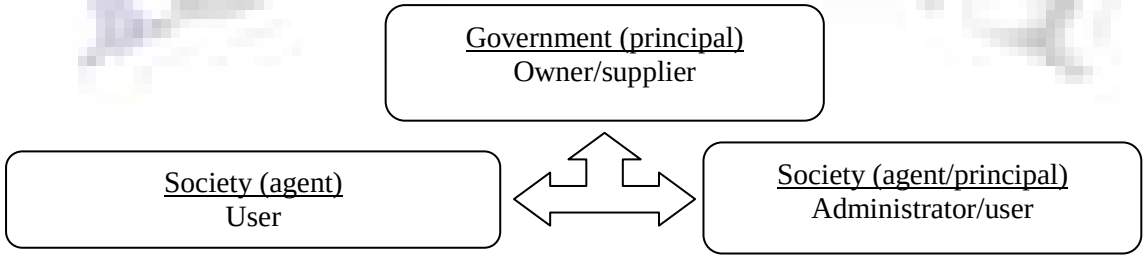

Figure 5. Pattern 3 (Three) of Electricity Supply in Sumenep Islands Madura

Pattern 3 is a cooperation between government and islanders with three actors: (1) government (principal); (2) administrator society (agent and principal); and (3) user society (agent). The government has shown its commitment on electricity infrastructure development in Sumenep Islands by giving assistance in form of PLTD (Diesel Power Station) to the society through sub-district government. Since the assistance is limited, only few people are able to have benefit from the program, especially those who live in sub-districts' capital city. The uneven distribution for PLTD assistance has created conflict in the society.

The sub-district government, then, gives the authority to manage PLTD to the society. In each sub-district, the society will from groups of 30-50 people based on PLTD capacity. Some people, then, selected by the members of group to be PLTD administrators. In this case, the administrators are also the users. The administrators act as coordinators in running the organization related to the agreement on the rule of the game, service hours, service rate, bill payment, PLTD maintenance, PLTD operational, electrical connection supervision to avoid moral hazard conducted by member or free rider.

The use of PLTD in-group is more efficient since the cost is shared. However, it has some disadvantages, among other: (1) the utilization is limited since it should be share with other users; (2) less safety since the administrator is not professional people; (3) higher labor cost for operational, maintenance, supervision and collecting payment from users; and (4) high potential for conflict and fraud by administrators and users.

Pattern 3 is susceptible to conflict because moral hazard of the administrators and users. Without good supervision, the administrators were less discipline in performing their duties to operate and maintain PLTD in accordance with the rule. Therefore, the PLTD is often damage and malfunction, and it has shorter economic life. The same goes for user, without supervision they use the opportunity to make illegal connections and delay the bill payment, which is detrimental and put other users in danger. Administrators and users' moral hazard lead to loss caused by high operational cost and low income. The ongoing moral hazard has caused malfunction on PLTD and electricity blackout.

The failure in PLTD management by society was found in Masalembu Sub-district. In 2001, Masalembu Sub-district received PLTD aid from the Sumenep Regency Government and East Java Province Government. In 2001, PLTD management was handed over to the society in a group. PLTD management by the society has failed because it is not supported by professional human resources to operate and maintain the PLTD and moral hazard from user who made illegal connection and delay the bill payment. Users and administrators were blaming each other whenever PLTD broke. In turn, the PLTD cannot function because of the damage and the operational has experienced loss. Due to the failure, PLDT management was returned to the local government in 2009.

PATTERN 4 (FOUR)

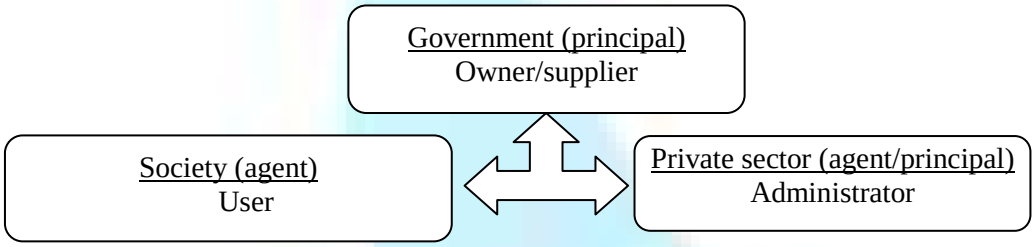

Figure 6. Pattern 4 (Four) of Electricity Supply in Sumenep Islands Madura

Pattern 4 (Four) is the result of pattern 3 (three) failure. The actors on Pattern 4 are: (1) government as the owner/supplier of PLTD (principal); (2) private sector as the administrator (agent and principal); and (3) society as the user (agent).

The government followed up the failure of PLTD management by society by auctioning PLTD management to private sector. The private sector who won the auction will be determined as PLTD management in the islands. In Masalembu Sub-district, CV Angkasa Surabaya won the auction. During 2009 – 2012, there was no problem in the management. However, in 2012, the PLTD began to broke and has caused high operational and maintenance costs. The damage has forced the management to do rolling blackout and provide electricity service for 2 – 3 hours/night. The bill for users, however, was remained the same as previously before the PLTD broke, which is around Rp. 200.000 – Rp. 350.000/month/household. The condition lasted for months. It created conflict between the user society and CV Angkasa as the management. The user are forced to pay the bill to get electricity connection.

The condition continued until in November 3, 2012, the regent of Sumenep Regency came to Masalembu. During the visit, the society and member of provincial council (DPRD) from Masalembu demanded the government to draw the authority for PLTD management from CV Angkasa and give the management to PLN that is considered more professional. PLN, however, is not willing to provide the electricity because of the loss. Following are dialogue between KH. Busyro Karim (Regent of Sumenep), Darul Hasyim (member of DPRD Sumenep from Masalembu Island), Mulyono (PLN Manager in Sumenep Regency) and Hairul (society's representative from Masalembu).

Society	"People in Masalembu have been experienced blackout for months because one of PLTD managed by CV Angkasa has malfunctioned. We are also object for the high electricity bill charged by the management to us because we have to pay the same bill whilst we did not get the electricity. We ask the government to give the management to PLN."
DPRD	"I want to ask to Regent to fulfill the demand. People in Masalembu do not receive electricity service; however, they are still willing to pay the bill because they do not want their electrical connection being cut.
Regent	"The government has given maximum effort by giving PLTD to be managed by the society; however, it was failed. Then, the PLTD management was handed over to the private, and it failed too. Now, the society wants to have electricity service provided by PLN. I think I will turn to Mr. Mulyono as PLN Manager in Sumenep Regency to answer the question."
PLN	"Thank you Sir. Basically, PLN is ready to provide electricity in the islands, with some condition: (1) everyone in the islands willing to be pre-paid electricity customers; (2) facility for pre-paid electricity pulse (token) refill should be available; (3) there are no illegal connection; and (4) there will be special rate or special subsidy for isolated and unreachable islands area. All of those requirements should be fulfilled because PLN has been experienced huge loss due to high operational cost and low income from the customer. The high cost is related to highe fuel cost and other equipments; whereas, low income is related to the many illegal connections, users who in debts and PLN obligation to apply national electrical base rate (TDL) that unsuitable with operational cost in the islands.

The requirements mentioned by PLN indicate the rationality of PLN when giving electricity service in Sumenep Islands. Any electricity service demand that is not economically feasible will be rejected.

PATTERN 5 (FIVE)

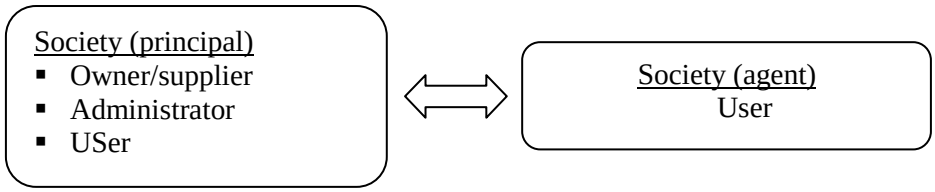

Figure 7. Pattern 5 (Five) of Electricity Supply in Sumenep Islands Madura

Pattern 5 (five) consists of two actors, owner society (principal) and user society (agent). The failure of government and private sector in providing electricity in the islands has forced the society in the islands to provide their own electricity by conducting collective action of *gotong royong*. Electricity service through the collective action of *gotong royong* has fulfilled ±85% of households' requirement in Sumenep Islands that spread in nine sub-districts and 84 isolated villages. Table 1 shows six stages conducted to provide electricity using Pattern 5 which is through *gotong royong*.

TABLE 1: STAGES IN COLLECTIVE ACTION OF *GOTONG ROYONG* TO PROVIDE ELECTRICITY IN SUMENEP ISLANDS MADURA

Stages	Activities
1	Societies in the islands make sure that they are no longer able to count on electricity facilities from external parties (government and private sector)
2	Societies in the island who live in a group in close neighborhood have initiative and agree to provide electricity on their own by conducting collective action of *gotong royong*
3	The group of collective action of *gotong royong* consists of two actors, the generator's owner (principal) and the lessee (agent). The generator's owner is people who are wealthy and have high social status. The lessee, in the other hand, is people who live near the generator's owner. Therefore, the generator bought should be based on the owner's ability or the lessee's requirement.
4	Before buying the generator, all actors create the rule of the game (institutional) that should be mutually agreed. The rules including (1) actors' right and obligation; (2) sanction for actors who break the rule; and (3) service technique, consists of: installation network installment, service duration (hour), rate, time to pay, and electricity voltage allocation. The rate can be changed based on operational cost fluctuation, especially the fuel price.
5	Principal will buy the generator, equipments and install the electricity installation network for all users.
6	Service technique will include service operational, generator maintenance, network supervision, and payment collection. Service security is not guaranteed because it has not supported by professional and certified workers as regulated on Minimum Service Standard. Networking supervision and payment collection are conducted regularly to prevent moral hazard of illegal connection and delayed payment.

Source: Primary data processed, 2012

Pattern 5 (five) has some advantages, among other: (1) relatively better maintenance and supervision for it managed by generator's owner and assisted by some workers; (2) more efficient in cost since it is shared; and (3) relatively small potential of conflict and moral hazard because actors' rationality tend to be altruistic/sympathy, principal and agent have strong social interdependency, and all rules of the game are mutually agreed. However, it also has some disadvantage: (1) security is less guaranteed because it is not supported by professional human resources; (2) the electricity utilization is limited because it should be shared with other lessees; (3) high cost on labor for operational, maintenance, supervision on illegal connection and payment collection from users; and (4) it still has potential of conflict and moral hazard.

Based on the field findings, the capacity of generator mostly used by the society is 900 watt and 2200 watt. The average price of the generator is Rp. 3.000.000 for 900 watt and Rp 8.000.000 for 2200 watt. On average, each household receives electricity service between 50-100 watt. Many households only use one or two lamps with 5 or 10 watt capacity without any television. Therefore, generator with capacity of 900 watt can be used for 10-20 households and the 2200 watt can be used by 30 – 50 households. Different rates and service hours are found in several locations, especially in Sapeken Sub-district. Based on service hour duration, there are four groups of collective action of *gotong royong*, as the following description:

Group 1. Electricity service for 3 hours per night from 18.00 – 21.00 WIB (Western Indonesian Time) is found in Sapangkur Kecil Island in Sapeken Sub-district. PLTD with capacity of 900 watt, on average, can provide service for 13 households with various rates: (1) three lamps is Rp. 35.000/month; (2) two lamps and TV is Rp. 55.000/month.

Group 2. Electricity service with 5 hours duration per night is found in Salarangan and Paliat Islands in Sapeken Sub-district. In Salarangan Island, the duration is from 18.00 – 23.00 WIB with various rate: (1) 10 watt lamp is Rp. 15.000/lamp/month; and (2) one 10-watt lamp and TV is Rp. 60.000/month. There are six Solar Power Stations (PLTS) in Salarangan Island provided by Sumenep Regency Government. The uneven distribution for PLTS is the source of conflict among the societies. In Paliat Island, 1 unit of PLTD from government's aid and 30 PLTD from individual who rented them are available. The service duration is between 17.00 – 22.00 WIB with various rates: (1) 10 watt lamp is Rp. 1.500/lamp/day; and (2) one 10-watt lamp and TV is Rp. 2.500/day. The electricity bill is paid directly to the owner every five or ten days.

Group 3. Electricity service with duration of 6 hours per night is found in Pagerungan Kecil, Sadulang Besar, Sadulang Kecil, Saular, Sitabok, Sabuntan and Saredeng Islands Sapeken Sub-district. The duration is from 18.00 – 24.00. The rate varies for every island: Pageringan Kecil Island is Rp. 240.000/month; Sadulang Besar and Sadulang Kecil Islands is Rp. 15.000/lamp/month for 5-watt lamp and Rp. 17.500/lamp/month for 10-watt lamp; Saular Island is Rp. 100.000/month for lamp and TV and Rp. 50.000/month for lamp only; Sitabok Island is Rp. 130.000/month for lamp and TV; Sabutan Island is Rp. 15.000/lamp/month for 8-watt lamp; and Saredeng Island is Rp. 100.000/month for three lamps and TV.

Group 4. Electricity service with duration of 10 hours per night is found in five sub-districts, (1) Giligenting, (2) Raas, (3) Sapeken in Sapangkur Besar, Saur, Saseel, Sepanjang Islands; (4) Arjasa in Sagubing and Mamburit Islands; (5) Kangayan in Bungin Nyarat, Saobi and Sapapan Islands; (6) Gayam; (7) Nong Gunong, and (8) Masalembu in Karamian and Masakambing Islands. The duration for the service is from 17.00 – 05.00 am WIB. At midnight, from 00.00 – 02.00 am, the electricity is off because the generator should rest. The rate in Sapeken Sub-district Sapangkur Besar Island for two lamps and TV is Rp. 95.000/month; in Saur Island is Rp. 35.000/lamp/month for 10-watt lamp, Rp. 45.000/month for two 10-watt lamps, and Rp. 85.000/month for three lamps and TV; in Saseel Island is Rp. 30.000/lamp/month; and Sapanjang Island is Rp. 30.000/lamp/month for lamp only. In Raas Sub-district the rate for 10-watt lamp is Rp. 25.000/lamp/month and for TV is Rp. 50.000/TV/month; whereas, in Arjasa Sub-district in Sagubing and Mamburit Islands is Rp. 25.000/lamp/month for 6-watt lamp and in Kangayan Sub-district in Bangun Nyarat and Saobi Islands is Rp. 15.000/month for 5-watt lamp. In Sapapan Island, the rate is Rp. 20.000/lamp/month for 5-watt lamp and Rp. 48.000/month for TV. In Arjasa, rolling blackout is conducted every 10 days.

TABLE 2: CALCULATION FOR GENERATOR COST

Duration of Service	Cost for Generator owned and used by Individual (Rp/household/month)		Cost for Generator Owned and Used by Individual and Rented to Others (Rp/household/month) Assumption: 100 watt/household		
	Cost Calculation		Rate Calculation		Rate applied in Pattern 5
	900 watt	2200 watt	900 watt	2200 watt	
5 Hour	3,692,000	6,927,667	410,222	337,621	75.000 -150.000
6 Hour	4,430,400	8,413,200	492,267	405,145	150.000 – 200.000
10 Hour	7,384,000	14,355,333	820,444	675,242	300.000 – 450.000
24 Hour	14,768,000	29,210,667	1,640,889	1,350,485	

- PLN bill using national electricity base rate (TDL) with capacity of 900 watt and 24 hours service is Rp. 75.000/month/household in average
- Assumption: All cost is calculated in detail based on maintenance regulation with fuel price of Rp. 20.000/l

Source: Primary Data (processed), 2012

Table 2 shows that the cost for electricity for 2200 watt generator is more efficient than that of 900 watt. PLN electricity rate is the cheapest compare to all other patterns because: (1) PLN uses national electricity base rate, which is very cheap; (2) PLN uses PLTD (big scale generator), which is more efficient; and (3) PLN is supported by professional human resources. The rate for pattern 5 (five) implemented in the islands, however, is cheaper compare to other electricity rates calculated. This cheaper rate is related to several factors: (1) the generator's owners have double motivation – economic and non-economic - influencing their rationality that tend to be altruistic/sympathy and less care about detail cost calculation; (2) strong social interdependency between the owners and lessees; (3) the owners are unable to calculate all operational and maintenance cost in detail, including the fluctuated fuel price; and (4) the owners do not follow the regulation on generator operational and maintenance. Owners and lessees are bounded by simple and semi-formal cooperation contract based on mutual agreement. Social capital between owners and users is the main factor determining the success and sustainability of the cooperation.

PATTERN 6 (SIX)

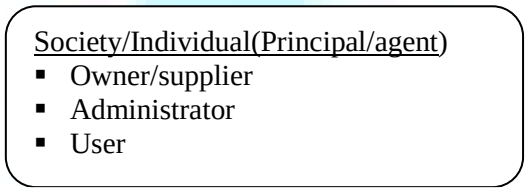

Figure 8. Pattern 6 (Six) of Electricity Supply in Sumenep Islands Madura

Pattern 6 (Six) is the simplest pattern because it has one actor. The owner is also the administrator and user because one household has one private generator and it is not rented to others. Pattern 6 (Six) has disadvantage as the owner has to bear the high operational cost. The advantages, however, are many: (1) it improves social status; (2) bigger using capacity in accordance with the generator's capacity; (3) longer economic life since the maintenance is guaranteed; and (3) no conflict potential with others. Many households who have the private generator and do not rented them do not use the generator due to huge operational cost (see Table 1).

5. CONCLUSION

Infrastructure limitation in Sumenep Islands Madura has caused negative multiplier effects on society's welfare. The failure of government and private sector cooperation in infrastructure development has encouraged the society to do collective action of *gotong royong* to provide electricity as shown in Pattern 5. The success and sustainability of collective action of *gotong royong* has been facilitated by strong social capitals, which are: (1) actors' rationality who is altruistic/sympathy with mutual beneficial motivation; (2) semi-formal, simple and mutually agreed rules of the game, (3) lack of society's resources; and (3) social interdependency among the actors. With the success of collective action of *gotong royong* in electricity supply in Sumenep Island, there are two recommendations for government's policy: (1) the government will facilitate society's collective action of *gotong royong* to provide other infrastructures unable to be provided by the government and private sector; and (2) the government should be more focused on limited budget for infrastructure supply unable to be provided by private sector or society using collective action. In turn, it can create a complementing and mutually beneficial cooperation between private sector, government and society.

GLOSSARY

Term	Description
Holistic	A school of thought stated that social reality (fact) has dual characteristics and cannot be separated.
Tragedy of Commons	A group of individual who are competing to use shared resources for personal gain without regard to interest of others.
Principal	An individual or a group of people or organization who has the biggest interest and authority in an activity. The principal gives the authority to the agent.
Agent	An individual or a group of people or organization who receives the trust or the authority from the principal to achieve principal's interest.
Altruistic/ Sympathy	One of human characteristics that put weight on others' interest or the good of his/her fellow men than his/her own interest; a personal interest that beneficial to others' interest.
Egoistic/ Opportunistic	One of human characteristics that put weight on personal interest than others' interest; a personal interest that detrimental to other's interest.
Rationality	One of human characters that always choose the best and most beneficial option for one's personal interests among other options.
Moral Hazard	Behavior that deviates from the prevailing norms that benefit themselves and harm others.
Gotong royong	*Mutually Beneficial Collective Action (MBCA)*

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