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Social acceptance to geothermal development in Indonesia

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Abstract

This article examines the relationship between the strengthening quality of socio-cultural life elements (SCL) and the issue of social acceptance to geothermal power plant (GPP) development, focusing on the GPP project in Baturraden, Central Java, Indonesia. This study uses a qualitative approach with the data collection method based on the results of the survey and SEM analysis. As a result, the mission of creating a balance in economic, environmental, and social interests as understood in a sustainable development paradigm becomes a necessity. In conclusion, through the co-existential state engagement, social support in the GPP development will be more easily achieved.

Keywords: Geothermal, Social, Acceptance, Role, Development.

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Aceptación social al desarrollo geotérmico en Indonesia

Resumen

Este artículo examina la relación entre el fortalecimiento de la calidad de los elementos de vida sociocultural (SCL) y el tema de la aceptación social al desarrollo de la planta de energía geotérmica (GPP), centrándose en el proyecto GPP en Baturraden, Java Central, Indonesia. Este estudio utiliza un enfoque cualitativo con el método de recolección de datos basado en los resultados de la encuesta y el análisis SEM. Como resultado, la misión de crear un equilibrio en los intereses económicos, ambientales y sociales como se entiende en un paradigma de desarrollo sostenible se convierte en una necesidad. En conclusión, a través del compromiso coexistente del estado, el apoyo social en el desarrollo de GPP se logrará más fácilmente.

Palabras clave: geotérmica, social, aceptación, rol, desarrollo.

1. INTRODUCTION

The use of geothermal energy for power generation (Geothermal Power Plant/GPP) is seen as a promising source of renewable energy (BERTANI, 2016). However, in the initial phases of its development, the GPP project is beset with several challenges particularly social opposition. Therefore, the development of GPP is considered slower compared to other renewable energy sources (BERTANI, 2016).

Indonesia has a vast potential for geothermal sources. The government has devoted its political support for the GPP development to achieve the national energy mix policy targetting renewable energy role to 23% in 2025 (BENIGHAUS & BLEICHER, 2019). However,

several social cases associated with national GPP projects support the argument that severe social issues remain (CHONG, 2015). The recent case in point is that in which local people are opposed to the GPP project in Baturraden, in which the geothermal operational areas have reached 75.82% of the protected forest area in Mt. Slamet.

This article aims to analyze the effects of the variables of structure, process, and culture as elements of socio-cultural life (SCL) towards social acceptance, and based on that, to develop a social acceptance model of the Baturraden GPP development. The structure variable includes several indicators such as power relations between the state and people, a set of legal frameworks, infrastructures, budget, and private sector influence. Process variable includes several indicators such as protests, social actions, social discourses, and choice of interest articulator media, and cultural variable includes several indicators like value system, customs/tradition, and beliefs. Meanwhile, the social acceptance variable refers to several indicators such as attitude/perception, knowledge, and trust.

2. MATERIAL AND METHOD

This study uses a qualitative approach with the data collection method based on the results of the survey and SEM analysis. Survey samples were taken from households' representatives in the five villages affected in the project that was determined randomly and through the Slovin formula. With the number of household population

(N) of 6,605 people from five sample villages were taken and with a 90% confidence level, the following number of samples was obtained with a value of N= 6.605, then n = N/(1+N e^2)= 6.605/(1+6,605 x $0,1^2$)= 98,51≈99. Using the SEM analysis, the number of samples was rounded up to 100 respondents. Details of the number of respondents in the five villages are: n1 Karangtengah= 2268/6605x100= 34.33≈34 respondents; n2 Karanglo= 943/6,605x100= 14.27≈14 respondents; n3 Kalisari= 1,225/6,605x100= 18.55≈19 respondents; n4 Cikidang=819/6,605x100=12.40≈ 12 respondents; and n5 Sambirata=1,350/6,605x100= 20.44≈20. The construct validity will be done by testing the value of convergent validity by looking at the critical ratio value of >1.96. Meanwhile, construct reliability was made by testing the value of composite reliability with a target value of the cut-off-point 0.70. Inferential statistics was directed to obtain the inter-variables relationship through SEM analysis (BATAC & DUGAN, 2015).

The number of survey respondents is very diverse, namely aged 17 to 25 years, 4%; ages 26 to 34 years, 13%; ages between 35 to 43 and ages between 44 to 52 years old, 32%; ages between 53 to 61 year 16%, and ages above 61 years as much as 3%. Thus, the majority of respondents were in the age range of between 34-43 years and 44-52 respectively as much as 32% followed by those aged between 53-61 years as many as 16%, ages 26 to 34 years as much as 13%, range age of 17-25 years is 4%, and those aged over 61 years are 3%. In terms of sex, respondents consisted of 76% men and females as much as 24%. As seen from education, all respondents had an education level at the

elementary school level to S-1/D-4. There were 48% of respondents educated at the level of high school, followed by junior high school level of 21%, elementary school level of 15%, D1-D3 of 13%, and D-4 graduates of 3%. Meanwhile, based on the type of profession, the highest percentage of respondents who work in other sectors reached 39%, self-employed as many as 20%, traders and private employees respectively by 11%, the farmer/rancher by 10%, and government employees/military/police officers as much as 9%. As for the distribution of the questionnaire are based on the number of households, 40% of respondents were taken in Karangtengah Village, followed by 19% in the villages of Sambirata, 16% in Kalisari, Karanglo 14%, and Cikidang by 11%.

The survey respondents were taken randomly to representatives of affected households in the five affected villages. In the first part, respondents were asked to describe their attitude towards the issue of social acceptance seen from SCL aspects. Structural aspects include several indicators, namely power relations, legislation/regulation, infrastructure, budget, and nonstate power. Processual aspects include several indicators, namely protest actions, social discourses, and choice of media as aspirations channel. Cultural aspects include indicators such as value system, customs/habits, and beliefs. Meanwhile, aspects of social acceptance include several indicators, namely attitudes/perceptions, understanding, and trust. In the second part, respondents were asked to provide answers to open questions related to SCL aspects and issues of social acceptance, and whether in general, the community accepts or opposes the project. These results

were then determined categories of social acceptance in the GPP project and finally to extrapolate the results of the literature study, direct observations and interviews to develop a social acceptance model in the GPP development (HUIJTS, MOLIN & STEG, 2012).

3. RESULTS AND DISCUSSION

The results of the survey showed respondents' responses to questions related to structural aspects as follows: 8% of the respondents strongly agreed; 36% agreed; 34% neutral; 20% disagreed, and only 2% strongly disagreed. Respondents' response to the open question whether the GPP project has been run in accordance with the laws and regulations or not, also showed as follows: 23% of respondents said there is compliance; 20% of the respondents were neutral; 17% believed there is no compliance with the law, and the majority of respondents constituting (40%) did not respond. The wide size of the respondents who did not answer at least confirmed the low level of public knowledge on the legislation related to the GPP project. Also, this also shows the low outcome of socialization (DEJESUS, 2010).

Concerning the processual aspect, it showed that 3% of the respondents strongly agreed; 34% agreed; 36% were neutral; 26% of respondents disagreed, and only 1% strongly disagreed. Respondents' response to the open question indicated that for the first question whether the respondents were given ample opportunity to express their

aspirations, 43% of the respondents said they had not been given any opportunity; 32% did not answer; 14% confirmed they had given opportunity, and 4% were neutral. Meanwhile, as for the second question on what needs to be done by the government/developer, 45% of respondents answered that they needed socialization; 31% of each respondent answered the developer needed to provide compensation and were more concerned with the demands of the local communities in the impact management (BROCKELSBY, 2013).

In contrast to the structural aspect, the results of the survey related to the processual aspects show that the affected community felt disadvantaged due to impacts experienced directly like damage to agricultural land, fisheries, home industries, disruption of clean access. Subjective parameters include the length of the process and the small value of compensation, lack of trust in the developer or government in the resolution of impacts (KEMENTERIAN, 2015). Meanwhile, results related to the cultural aspect showed that 15% of respondents strongly agreed, 47% agreed, 23% remained neutral, 15% disagreed, and 0% strongly disagreed. The data indicated that the cultural aspect also plays a role in the context of social acceptance in the GPP development in Baturraden.

Quantitatively analyzed by the SEM test, with a benchmark value of Chi-square, c.q. (p-value)$\geq$0.05; RMSEA$\leq$0.08; RMR$\leq$0.05; GFI$\geq$0.90; and AGFI$\geq$0.80, model feasibility test (Goodness of Fit), matches the data collected in the field (Table 1). In general, the four constructs also have received reliability levels of>0.70, which is 0.70723 for constructs of Structure, 0.70202 for constructs of Process,

0.70143 for construct of Culture, and 0.92 to construct of Social Acceptance. The cumulative effect of the variable of Structure on the variable of Social Acceptance was 76.7%. The cumulative effect of the variable of Process on the variable of Social Acceptance was 46.9%, and the cumulative effect of the variable of Culture on the variable of Social Acceptance was -30.8% (Figure 1).

A culture aspect or variable of Culture has a direct, meaningful, but negative effect on the Social Acceptance variable. From the theoretical perspective, this result has shown that the higher the society ties (embeddedness) with the socio-cultural values, the lower the level of social acceptance would be, particularly in the initial stages of development. In the views of Karl Polanyi's, this means that societal embeddedness with the socio-cultural values reflects a limitation of non-economics on any economic activity (BECKERT, 2007). From an empirical perspective, this condition also shows the beginning of the loosening of the socio-cultural systems of the affected community so that they tend to be pragmatic in responding to the GPP project (LPPSLH, 2017). As an illustration, interviews with a number of respondent informants indicated that the momentum of the impact of GPP project as a means to obtain direct economic benefits for people who were on the edge of the mountain slopes, through selling access to springs for water needs for the other villages affected by the project with funding for road hardening (Interviews). Thus, the tendency of people in this sub-village to rate this momentum is blessing. The same case was the function done at the momentum of the 1st Sura (Suran) celebration (Interviews). Besides, weak ecological and cultural vision

in responding to the GPP project is also due to the weakening of beliefs in specific customary values in responding to disasters.

The absence of socio-cultural figures also reinforces this analysis, as well as Wolsink view of the pattern of movement of the U-curve model in social issues. Moreover, Polanyi's embeddedness conception means that with lower levels of the affected communities' embeddedness make social issues more manageable (BECKERT, 2007).

Table 1: Fit Model Test

No.	Indicator	Value	Criteria	Remark
1	Chi-square	0.159	P-value ≥0.05	Fit
2	RMSEA	0.048	≤0.08	Fit
3	RMR	0.033	≤0.05	Fit
4	GFI	0.914	≥0.90	Fit
5	AGFI	0.857	≥0.80	Fit

This case reflects an imbalance between the fulfillment of social development and sectoral development (BRUNDTLAND, 1987). Therefore, the identification of the level of influence of every SCL aspect on social acceptance in the GPP project in Baturraden affirms that all three SCL aspects namely; the structure, process, and culture do influence the social acceptance in the GPP project with different levels of influence. Analysis of the social acceptance issues will be discussed and then concluded with the development of a social acceptance model in the Baturraden GPP project.

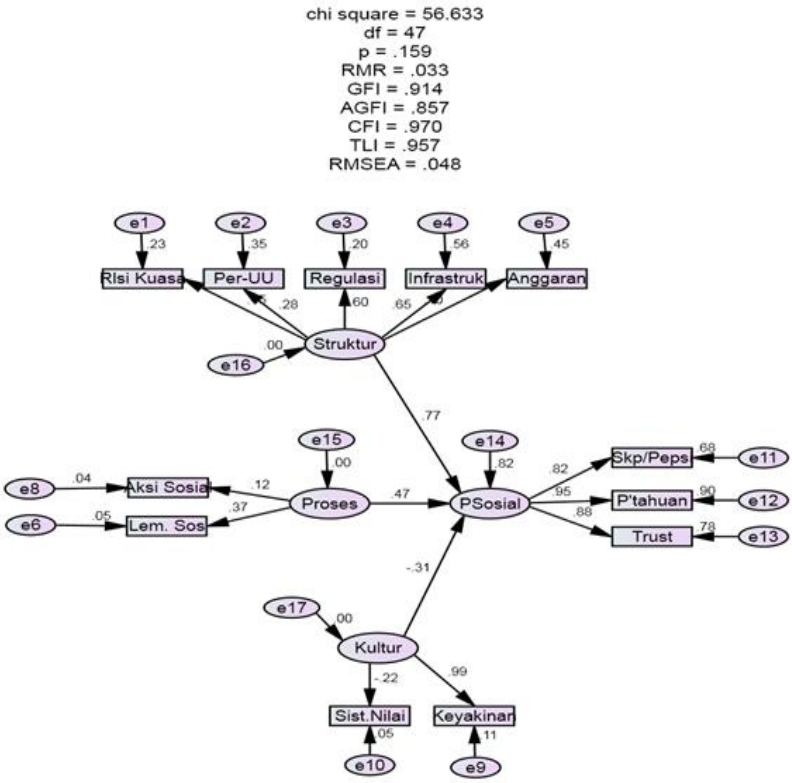

Figure 1: Structural Model of Social Acceptance in the GPP Project

From the survey results and the theoretical perspectives, the structural model of social acceptance in the Baturraden GPP project will be more comprehensive if supported by strengthening the role of the state variable as a rechstaat and kulturstaat institution (Figure 2). This variable can be a fourth variable of the research findings that affect the effectiveness of the social acceptance management in the project. The role of a kulturstaat institution is defined as the role of providing needs under socio-cultural development of the community to

strengthen social interaction, comfort, security and order, and other cultural needs. The linkage of the SCL aspects' variable, and strengthening the role of the state is strengthening the previous studies.

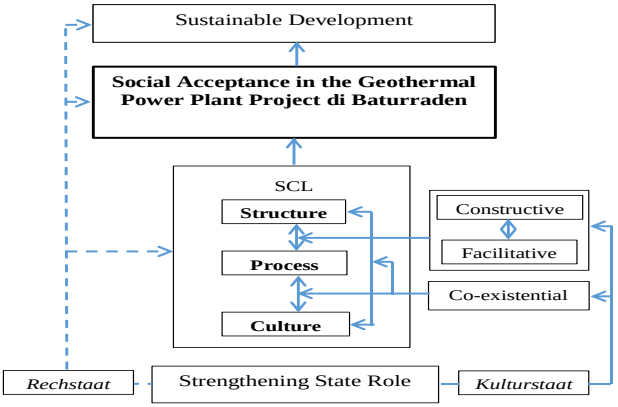

Figure 2: Structural Model of Social Acceptance in the GPP Project.

Researchers define the strengthening role of the state as guardianship role of the state in each phase of the GPP project with higher levels of government engagement constructively and facilitatively on the interplay between structural and processual aspects, as well as co-existentially on the interplay of the SCL aspects to encourage social consensus. Constructive and facilitative engagement may refer to efforts to encourage a social transformation, and at the same time encouraging a change in attitude/perception, understanding, and trust that will create a conducive situation to encourage social consensus (GOODSON, 2008). Locally, the

involvement here the writers termed as ngelus [stroking] and ngawal [guardianing] strategy. Meanwhile, co-existential involvement is interpreted as a role to preserve the existence or hold back the erosion of the socio-cultural values of the community so that it can co-exist with sectoral development activities.

Seen in the different context of the relationship between the GPP project and the effort to improve the quality of SCL aspects as the primary foundation for socio-cultural development and sustainable development, the project that ultimately receives social support can also be used to measure the quality of the SCL aspects to achieve an equitable and inclusive sustainable development. The GPP existence is considered to affect the aspects of power relations patterns that are in line with the needs of sectoral development values that are increasingly inclusive, participatory, and respect for human rights.

A different analysis occurs in how far the existence of the project can improve the quality of cultural aspects. With the opening of the socio-cultural values of the people in the affected villages, the absence of cultural figures, the relative weakness of the ecological vision of the community, and media/information technology exposure, the existence of the GPP on cultural aspect is the potential for strengthening the values of societal pragmatism. However, in a positive sense, the impact is, for instance, the potential for strengthening public attitudes or awareness of the importance of economic valuation for every environmental loss and destruction of socio-cultural values, and raising awareness of the importance of socio-cultural values along with the living social institutions in society.

Thus, strengthening the role of the state through its co-existential involvement becomes relevant, to ensure there is no degradation of socio-cultural values so that these values can live side by side with the objects of sectoral development. Thus, the mission of creating a balance in economic, environmental, and social interests as understood in a sustainable development paradigm becomes a necessity.

4. CONCLUSION

Three aspects of the SCL play a role to encourage social acceptance in the GPP project in Baturraden with varying degrees of influence. Strengthening the role of the state becomes the variable that can also affect or encourage social acceptance in the project. The analysis is in line with the sustainable development paradigm that puts the balance of interests among social, economic, environmental aspects. Thus, together with the variables of structure, process, and culture, the variable of strengthening the role of the state also becomes a critical element in social acceptance management. Through constructive and facilitative state engagement, a shift in attitude/perception, understanding, and trust of the community can be achieved so that the state can manage conflict resolution properly. Through the co-existential state engagement, social support in the GPP development will be more easily achieved. Positioning the importance of improving the quality of SCL aspects to encourage social acceptance also has relevance if it is analyzed in reverse; that is, the

relationship of the influence of the existence of the GPP to efforts to improve the quality of the SCL aspects themselves. Thus, its relevance to the sustainable development agenda can be found.

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