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Cooperative ESIA Engagement in Pursuit of Sustainable Geothermal Power: Case Study of Ulubelu Units 3 & 4 Geothermal Power Project, Indonesia

Abstract:

The international best practice standards and guidelines for Environmental and Social Impact Assessment (ESIA) for large infrastructure projects are well documented. This paper argues that cooperative working between the specialists undertaking the impact assessment, the developer and third parties (e.g. government) is critical to ensure that: measures are developed to meet these standards; communities understand and engage with the project; accurate assessment is made of environmental and social effects; and, that practical actions are identified and implemented to manage predicted effects and share the benefits of the project with local communities. This argument is supported by the case study of the ESIA for the Ulubelu Geothermal Power (Units 3&4) Project in South Sumatra, Indonesia, which met World Bank (WB) Safeguard Policy compliance requirements enabling the project to be granted finance approval in 2011. The paper focuses on the Social Impact Assessment (SIA) components of the ESIA which was guided by benefit sharing approaches. The key topics covered are: 1) negotiating land acquisition to avoid the need for expropriation; 2) equitably sharing employment benefits through meaningful consultation and disclosure; 3) Mitigating community health impacts in relation to Hydrogen Sulphide emissions; and, 4) participatory community investment planning in pursuit of sustainable development. In conclusion, the common theme that runs though all of the examples in this case study is that Projects and ESIAs should be developed holistically and with a spirit of cooperation among all stakeholders involved.

Introduction

This paper presents the case study of the Environmental and Social Impact Assessment (ESIA) undertaken for the Ulubelu Units 3 & 4 Geothermal Power Project (the 'Project') in Indonesia, with a particular focus on the Social Impact Assessment (SIA) components and the benefit sharing approach adopted. This paper argues that multi-faceted stakeholder engagement and cooperative working between ESIA practitioners project financiers, developers, local communities and third parties (e.g. contractors, government) is critical for sustainable geothermal power development that benefits the regional and national economy, as well as protecting the environment and improving the well-being of local project affected communities.

Background to the Ulubelu Units 3&4 Geothermal Power Project

Indonesia's geothermal power potential is estimated at 27 GW which constitutes approximately 40 percent of global geothermal resources. However at present there is only 1,200 MW of installed capacity of geothermal power in Indonesia which is less than four percent of the total national geothermal resource. In recognition of this unrealised sustainable energy potential coupled with current and projected power shortages in Indonesia, leading International Financial Institutions and Export Credit Agencies are providing finance as well as regulatory, social and environmental management assistance to the Government of Indonesia and national developers to develop Indonesia's geothermal power resources.

In 2010 Mott MacDonald Ltd. (a global consultancy firm) was appointed by Pertamina Geothermal Energy (PGE), a subsidiary of the Indonesian national oil company PT Pertamina (Persero), to undertake an Environmental and Social Impact Assessment (ESIA) prepared to meet World Bank environmental and social safeguard requirements for the Ulubelu Units 3&4 geothermal power project. Included within this scope was the provision of capacity building services to PGE to enhance the developer's ability to successfully address environmental and social impacts and issues on an ongoing basis throughout the lifetime of the Project and to

apply to other future projects. When complete the Project will contribute to Indonesia's energy security through the provision of 110MW of sustainable geothermal power.

In accordance with WB standards, the Project was classified as a 'Category A' project meaning that there are likely to be significant environmental and social impacts that require a detailed ESIA and extensive public consultation and disclosure.

Social impact assessment (SIA) and benefit sharing approach

In addition to World Bank and other international best practice guidance, the SIA approach drew on the concepts of leading SIA academics and practitioners. Following the work of Vanclay (2002, 2003), the SIA was seen as a mechanism which could be used to assess and manage adverse and beneficial social impacts of the project, broadly defined as changes to: people's way of life; their culture; their community; their political systems; their environment; their health and well-being; their personal and property rights; and, their fears and aspirations.

The SIA was informed by the 'benefit-sharing' approaches described by Roquet et al. (2002), Égré et al (2008), Trembath (2008) and Haas and Tung 2007, amongst others. Efforts were made to move beyond the minimum requirement to mitigate adverse impacts, to exploring opportunities for directing monetary or non-monetary benefits back to the project affected communities in the hope of contributing positively to community development processes.

Negotiating land acquisition to avoid the need for expropriation

This project is a good example of how successfully achieving negotiated settlements in the process of land acquisition can avoid the need for expropriation (forced purchase in the 'public interest') which can result in costly delays to the Project and create tension between the developer and the project affected communities.

One of the first tasks of the ESIA was to review PGE's existing land acquisition process. PGE began acquiring land for the construction of project facilities in 1997 and by the time the ESIA commenced 46.4 hectares (out of a total of 60.2 hectares) had already been acquired. This was mostly farmland and the Project has not resulted in any physical displacement of households. Mott MacDonald reviewed these activities and found that PGE's approach was to pursue negotiated settlement on the premise of 'willing-buyer, willing-seller'. All of the land up to this point had been acquired through negotiated settlement with no expropriation required.

ESIA Consultation activities with farmers who had sold land to the project revealed they had received greater than market value and were satisfied with the transactions which they saw as an economic development opportunity for their households. Many of them used the money to purchase additional farmland and equipment and were able to increase productivity as a result. One farmer reported that he had been able to purchase an area of land three times the size of the land he had sold to the project and others reported benefits such as housing improvements and business start-ups as a result of the money received. In cases where negotiations between the developer and owners failed, the developer was able to redesign elements of the project (for example by moving the location of the wellhead) and purchase alternative land. Some of these households that did not reach agreement with PGE expressed regret later at the missed opportunity.

Engagement and consultation with project affected persons (PAPs) formed an integral part of the approach to land acquisition in order to fully document land and assets to be acquired, to negotiate prices and to consider the concerns of PAPs. This approach was critical in ensuring that PAPs were fully informed about their rights and entitlements throughout and it fostered a sense of mutual trust between the communities and PGE.

A Land Acquisition and Resettlement Policy Framework (LARPF) was developed by the Project for inclusion in the ESIA documentation to provide a framework for future land acquisition in accordance with evolving Indonesian law and World Bank Operational Policy 4.12 on Involuntary Resettlement.

The SIA concluded that because the land acquisition had been negotiated between the developer, local leaders and affected households, this had resulted in a potentially negative

project impact becoming a beneficial impact for the project affected people who were able to purchase greater areas of farmland to enhance their livelihoods.

Equitably sharing employment benefits via meaningful consultation and disclosure

This Project demonstrates how meaningful consultation, disclosure and community engagement that is well planned and implemented from the outset of an ESIA process can be used to identify existing social issues and tensions and determine appropriate and accepted solutions. Ultimately this can result in more equitable benefit sharing with local communities, for example in relation to transparent disclosure of employment opportunities.

The first step in the ESIA process was the development of a Public Consultation and Disclosure Plan (PCDP) to identify the different stakeholder groups and the most appropriate ways of engaging with them throughout the ESIA process and the future lifecycle of the project. The PCDP was informed by Vanclay's (2003) international principles for SIA which identify that working with stakeholders to maximise positive outcomes is as important as focusing on minimising harm from negative impacts. The consultation activities were designed to engage stakeholders on the full range of environmental and social impacts whilst recognising that the human elements of the SIA are different from the environmental elements. which are affected less by project rumours, insinuations and perceptions.

PGE and Mott MacDonald implemented the PCDP early within the ESIA process holding community consultation events and interviewing village leaders, project affected households and other key community and government informants. These activities immediately revealed that despite the good intentions of PGE to employ local people, significant tensions existed both among local villages (and between villages and PGE) as a result of perceptions of inequitable distribution of earlier project employment opportunities and the preferential treatment of certain villages over others. It became clear that this was a problematic barrier to fostering the support of local communities necessary for the Project if it was to be successful.

As a direct outcome of ongoing consultation with communities, four key measures were developed by Mott MacDonald and PGE to address the perceptions of preferential recruitment: disclosure of a recruitment policy to all surrounding villages through the village leaders stating that local people would be prioritised and that there would be equitable opportunity based on merit across villages; use of village employment committee meetings to ensure dissemination of information and transparency of process; provision of training for un-skilled and semi-skilled skilled jobs by contractors to enable local people to take advantage of opportunities; and disclosure of job descriptions to directly affected communities including required skill levels, indicative timeframes of recruitment and likely duration of contracts. This last measure is seen as being of particular benefit to those who wished to work on the Project, but who also had to make provision for other important livelihood commitments such as planting or harvesting, or other important seasonal considerations. Providing people with accurate and timely information allowed them to make informed, sustainable choices in line with their existing livelihoods, especially in cases where the project related employment opportunities were temporary.

The creation of employment opportunities is one of the key benefits for local communities in the development of large scale infrastructure projects such as this. As well as increased income security, it gives people the opportunity to improve their skills base and employability in the future. This was particularly the case for this project situated in a social context of high baseline unemployment. For these reasons there is high demand for these opportunities, and therefore the developer has a responsibility to ensure that employment and other Project benefits are shared equitably to avoid social tension. This project shows that meaningful and well planned ESIA consultation and disclosure activities can achieve this objective.

Mitigating community health impacts in relation to Hydrogen Sulphide (H2S) emissions

Environmental and social impacts are too often considered in isolation from each other in ESIAs. However it is usually poor and vulnerable project affected people who suffer first and suffer the most from adverse environmental impacts (Ageyman et al., 2003). One key example of this can typically be seen in geothermal power projects as a result of increases in levels of hydrogen sulphide (H_2S) in the ambient air, which can pose a risk to human health.

This project demonstrates how consideration of H_2S air quality impacts and potential mitigation must be closely integrated with social and community considerations, in this case potential health and resettlement impacts. Furthermore, it exemplifies how solutions to cumulative impacts must be sought through collaboration with third parties who are also partially responsible for impact avoidance and mitigation.

H_2S occurs naturally within the steam that is extracted from underground and in geothermal areas it is released into the air through naturally occurring 'vents' called fumaroles. After extracted steam has passed through the power plant turbine it is cooled and the residual vapour, which contains hydrogen sulphide, is released into the air through cooling towers. The World Health Organisation (WHO) reports that, at moderate concentrations, H_2S can irritate or damage the eyes, and at extremely high concentrations the central nervous and respiratory systems can be compromised resulting in death. The potential impacts of hydrogen sulphide emissions were therefore a key focus of the ESIA; the remit of which was to consider impacts on people employed within the project sites and people working in nearby agricultural areas and residential areas.

A computer programme was used to model the behaviour of emissions of H_2S from the cooling towers and predict what the resulting atmospheric concentrations would be. As only limited well test results were available, the modelling was based on conservative assumptions about the level of H_2S in the cooling tower emissions. Provisions have been made for revised modelling to be undertaken at a later date when further data are available. However, the modelling based on the conservative assumptions indicated that, at some locations, concentrations were close to or slightly above the level deemed safe by the WHO in residential areas (the WHO sets its level as being 100 times smaller than the level at which eye irritation may occur). At some locations this was a result of the cumulative impacts of emissions from Ulubelu units 3&4 and Ulubelu units 1&2 which had started development earlier as a separate but nearby project by a different developer.

Careful consideration was given to various options aimed at avoiding impacts on community health. The first option explored was the physical displacement of the households nearest to the power station site. However, it was concluded that this would have been contrary to principles of avoiding resettlement that underpinned the aforementioned LARPF and negotiated settlement would have been much more dificult to achieve than had been the case for the land acquisition already undertaken for the Project. Expropriation may have been required through the courts of Indonesia with associated elaboration of detailed resettlement action plans. As a result, this option was discounted and engineering solutions were sought.

The final solution involved incorporation of technical mitigation to reduce the level of H_2S within the vapour emitted from the cooling towers. This was coupled with a comprehensive hydrogen sulphide monitoring and health data collection programme, both of which would provide a check that the control measures were working. Such an approach was only possible due to cooperative working between the air quality and social ESIA specialists, the developer and their technical advisors. In addition, because the predicted H_2S concentrations were as a result of cumulative impacts from Ulubelu 3&4 and Ulubelu 1&2, the H_2S control measures and monitoring programmes were developed in the context of a Joint Agreement between PGE and the developer of Units 1&2 which committed them to designing the two projects in such a way that the WHO standards would be met.

Establishing the Joint Agreement between PGE and the other developer was key to managing hydrogen sulphide impacts and is an example of how cooperative working with third parties is also vitally important for projects like this. PGE has subsequently acquired and installed monitoring equipment and initial results of the 'baseline' (i.e. pre-project conditions) monitoring indicate that existing hydrogen sulphide levels are very low.

Participatory community investment planning in pursuit of sustainable development

This project shows how in accordance with the ideas of Esteves (2008) and Esteves and Vanclay (2009), one key method for enhancing and sharing project benefits is through use of the SIA to inform corporate community investment activities.

During the SIA process PGE's corporate CSR programme was reviewed to reveal the following objectives: establishing harmonious relationships with communities; contributing to addressing social problems within the communities; and building the company's image and reputation. PGE's approach to achieving these goals was through investment in education, health, environment, community infrastructure and livelihoods.

The ESIA consultation identified that investment in water infrastructure and improvements to road infrastructure particularly had significant benefits for community and household well-being. The presence of a local water supply saved significant amounts of time in the collection of drinking water from rivers and time spent travelling to river to wash themselves and clothes. This has gender equality benefits as it is women who perform these activities and whose time is often most constrained by domestic chores, child rearing and agricultural and other economic activities.

Road improvements were regularly cited by consultees as another significant time saving benefit as access to markets by vehicles is made available or improved, facilitating trade in agricultural produce and access to important health, education and other social services and facilities that are not available in the villages. Greater access to markets is expected to enable farmers an opportunity to generate income and grow their businesses.

Despite these successes the SIA concluded that that the effectiveness of PGE's community investment budget allocation process could be improved. At the time of undertaking the ESIA, community investment budgets were derived following formal requests from village administration offices, without any proactive outreach activities by PGE to assess community needs. To improve this process, Mott MacDonald recommended to PGE through the SIA and informally, that the process of budget allocation be made more transparent and that PGE become more proactive in development community investment plans in a participatory manner.

As was concluded in relation to sharing employment benefits, the Project's experience of community investment shows that community engagement and disclosure of opportunities is critical to ensure that community investment is aligned local plans and priorities whilst at the same time considering equity. This engagement can result in partnerships between developers and communities, for example, although paid for by PGE, the community drinking water distribution equipment was installed and maintained by community members to ensure clean drinking water for all areas of the village. This exemplifies how local people can assume some of the responsibility for implementing community investment programmes, following initial inputs from a project, at a relatively minimal cost to the developer.

Concluding comments

This paper has used the case study of the Ulubelu Units 3&4 ESIA to present lessons learnt that can be used to inform best practice for future geothermal power projects in relation to assessing and managing environmental and social impacts through the undertaking of an ESIA. Specific challenges and approaches covered relate to land acquisition, consultation, employment, community health and H_2S mitigation and community investment. Mott MacDonald, PGE and the World Bank have all expressed great satisfaction at the outcomes of the ESIA process and believe the lessons learnt will prove invaluable to future geothermal projects.

In conclusion, the common theme that runs though all of the examples in this case study is that Projects and ESIAs should be developed holistically and with a spirit of cooperation among all stakeholders involved. A multidisciplinary approach is required to consider the interrelations between engineering, economic, social and environmental factors, but also to consider the needs, interests and roles of different stakeholders at different spatial scales (e.g. global and community). This is both in terms of how the Project may impact them, how they can contribute to its success, and finally, what the barriers are to effective engagement and to enabling each party to add value and maximise benefits.

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