



Energy security and hydropower development in Malaysia: The drivers and challenges facing the Sarawak Corridor of Renewable Energy (SCORE)

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ABSTRACT

This article investigates the drivers and challenges associated with the Sarawak Corridor of Renewable Energy in Malaysia, or SCORE, on the island of Borneo. SCORE constitutes a multi-hundred billion dollar infrastructure development plan in Sarawak, one aiming to achieve US\$105 billion of investment and to build 20,000 MW of hydroelectric dams along a 320 km corridor crisscrossing 70,000 square kilometers. Based largely on primary data collected through site visits, original field research in Sarawak, and more than eighty research interviews, the article identifies the genesis of SCORE, its expected benefits, and challenges with implementation encountered to date. The article begins by describing its research methods and then summarizes four sets of anticipated benefits discussed by respondents associated with SCORE: industrialization, energy security, equitable development, and spillover effects. It then dives into a longer discussion of the technical, economic, political, legal and regulatory, social, and environmental challenges facing the project. The article concludes by offering implications for those wishing to promote other large-scale, energy infrastructure projects throughout the world.

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1. Introduction

This article investigates the drivers and challenges associated with the Sarawak Corridor of Renewable Energy in Malaysia, or SCORE, on the island of Borneo. SCORE constitutes a multi-hundred billion dollar infrastructure development plan in Sarawak, one aiming to achieve US\$105 billion of investment and building 20,000 MW of hydroelectric dams along a 320 km corridor comprising more than 70,000 square kilometers. The article begins by describing its research methods and then summarizes four sets of anticipated benefits discussed by respondents associated with SCORE: industrialization, energy security, inclusive development, and spillover effects. It then dives into a longer discussion of six types of challenges facing the project. Technical challenges range from lack of supporting infrastructure to dam excavation and construction. Economic challenges include cost overruns, financing difficulties, and uncertainty concerning power purchase agreements for hydroelectricity. Political challenges involve hubris, claims of corruption, and low political literacy. Legal and regulatory challenges encompass oppressive legal statutes, lack of a national energy policy, and lawsuits. Social challenges range from boom and

bust towns to community relocation and resettlement. Environmental challenges include deforestation, greenhouse gas emissions, and downstream impacts from aluminum smelting and heavy manufacturing. The article concludes by offering implications for those wishing to promote other large-scale, energy infrastructure projects throughout the world. The importance of the article is threefold.

First, and for Malaysian central planners, SCORE is part and parcel of a key development strategy for the country. It is prized as being a component of both the Ninth Malaysia Plan (2006–2010) and the Tenth Malaysia Plan (2011–2015), the main planning documents that guide national development policy, as well as the National Mission and the Third Industrial Master Plan [1]. Interview respondents that we spoke to mentioned that “Prime Ministers themselves travel overseas to try and raise investments for development corridor projects like SCORE, they are a key part of Malaysia’s development agenda” and that “SCORE is integral to Malaysia’s intent to move from a middle-income economy to a high-income economy.” The State Secretary of Sarawak, Amar Wilson Bayadandot, has publicly stated that “SCORE is the biggest and most important development plan that has ever been undertaken by the Sarawak Government” [1]. Investigating the drivers behind SCORE, the benefits it hopes to bring, and the challenges it encounters are essential towards better understanding the diverse pressures and interests related to Malaysian energy policy and

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planning. Yet to date, no academic research has explored the detailed mechanics of SCORE.

Second, and for scholars and planners in other countries, development projects like SCORE are becoming what one interview participant called “an increasingly common part of the energy landscape as planners seek to build energy systems and meet development goals at the same time.” Our field research revealed that to date policymakers within Southeast Asia, such as Brunei, Cambodia, Indonesia, Laos, and Thailand, have visited Sarawak to learn about the applicability of SCORE to their own countries, as well as leaders outside the region from Bahrain and India. Another respondent indicated that:

If it materializes, SCORE can be replicated in other countries around the world, a useful model wherever development is needed, whether it is along the Mekong Delta and in the rivers of Myanmar to the Amazon Basin or Africa.

Tracing the complexities of such large-scale energy projects is therefore necessary to learn if their benefits outweigh their costs as well as if they should be replicated or scaled up in other countries and regions.

Third, our study is innovative in its application of a mixed methods approach which includes textual analysis through a literature review in addition to primary data collected from research interviews and site visits. These interviews involved months of preparation and then expensive, time consuming, and cumbersome travel into the interior jungles of Borneo and then intensive translation from a variety of local languages into English. Moreover, some of the tribal leaders we interviewed come from cultures under the threat of extinction, meaning our study has archival value since it preserves their thoughts on a pressing public policy issue. In essence, it was difficult collecting this data, and the data involved extremely hard to reach communities, adding value to our piece beyond the typical implications related to Malaysian energy planning and energy development.

2. Case selection and research methods

We selected SCORE for analysis because it typifies a type of “mega” energy infrastructure project now being promoted on the grounds of economic development. Such projects attempt to merge together energy supply, technological innovation, and market development goals, backed by a “cluster” model that sees bigger and more capital intensive projects as achieving better economies of scale and enhanced competitiveness [27]. Yet energy mega-projects also carry with them a unique suite of risks or barriers that must be overcome, including geopolitical tensions, lack of technical expertise, corruption, returns on investment, and accountability [28–32], making them a fascinating object of study.

To explore the drivers, benefits, and barriers to SCORE, we relied first on original data collected through research interviews along with site visits and field research, supplemented with a review of the academic and policy literature.

The authors conducted 85 semi-structured, open-ended, grounded interviews with participants from 37 institutions involved with SCORE over the course of March 2010 to July 2010. Those interviewed were selected to ensure a representative sample of stakeholders including:

- Engineering and construction firms such as Alstom Hydro, Sarawak Hidro, and Snowy Mountains Engineering Corporation;
- Government ministries at the federal level, including the Board of the National Economic Advisory Council, the Economic Planning Unit at the Prime Minister’s Department, the Public Private Partnership Unit at the Prime Minister’s Department,

the Ministry of Energy, Green Technology and Water, and the Ministry of Natural Resources and the Environment;

- Regulatory agencies at the state level, including the State Planning Unit of the Sarawak State Government, Sarawak Rivers Board, Natural Resources and Environment Board Sarawak, and the Regional Corridor Development Authority;
- Energy companies and electric utilities, including Petronas, Sime Darby, Tenaga Nasional Berhad, Sarawak Energy Berhad, and Syarikat SESCO Berhad (formerly the Sarawak Electricity Supply Corporation);
- Human rights organizations including the Bar Council of Malaysia, Human Rights Commission of Malaysia (SUHAKAM), and Suara Rakyat Malaysia (SUARAM);
- Research institutes and civil society organizations, including the Centre for Environment, Technology, and Development Malaysia, Friends of the Earth, International Rivers Network, Universiti Malaysia Sarawak, and World Wildlife Fund International.

Although the authors would normally reference these interviews explicitly, we have declined to do so for this article, due to the request of participants, ethical guidelines at the authors’ university, and the sensitive nature of SCORE in Malaysia. (Some opponents of SCORE have allegedly been beaten or even killed, making us extremely sensitive about the identity of our participants; one whistleblower, Ross J. Boyert, was even found dead in a hotel room with a bag tied around his head [26]).

What we are permitted to reveal is a list of the institutions interviewed, provided in Appendix 1, as well as details of the interview process. Interviews lasted between 30 and 90 mins, and participants were asked four questions: “What are the primary drivers behind SCORE?”; “Whom will be its key beneficiaries?”; “What are some of the challenges facing it?”; and “What general lessons for public policy and energy policy can we take away from SCORE?” Participants were not prompted for responses and were permitted to answer as long (or as detailed) as they wished. The authors selected open-ended, semi-structured and grounded interviews so that they could develop additional lines of inquiry as the interview progressed. The research was “grounded” in the sense that we commenced our project without any preformed hypotheses [2].

To get the perspective of those involved with building and operating parts of SCORE infrastructure, mainly hydroelectric dams, the authors conducted site visits of one operating dam, Batang Ai, as well as two under construction, Bakun and Murum, depicted in Figs. 1–3. To get input directly from the communities affected by SCORE, the authors spoke with community leaders, tribal elders and ordinary villagers from longhouses in Asap, Bakun, Upper Bakun, Danang Murum and Lubok Antu, including Uma Badeng, Long Lawen, Long Wat, Nepi Pasir, Rumah Kelap, and Uma Daro. These villages included settlements of the Bukitan, Iban, Kayan, Kenyah, and Penan tribes. We had the advantage of having simultaneous translation into local tribal languages and dialects as well as the national Malaysian language, or *Bahasa Melayu*, for the entirety of our visits.

3. The genesis of SCORE

As some readers of this journal will already know, Sarawak is one of the two states that make up East Malaysia on the tropical island of Borneo. These two states are separated by the South China Sea from Singapore and West Malaysia, and Sarawak is by far the largest state in the country with more than 120,000 square kilometers. Sarawak, as part of one of the world’s 17 mega diverse countries, is known for its rich natural heritage replete with more than 8000 unique types of flora and 20,000 species of fauna,

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