Research article

Evaluation of Environmental Factors Influencing Revocation of Bauxite Mine Development in the Solomon Islands

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Abstract Wagina Island, a small island within the Solomon Islands chain, is located in the South Pacific Ocean, 1700 km northeast of Australia. Wagina Island has an area of 110 km^{2,} with 60% of the island (48 km^2) containing an economically viable quantity of bauxite. The Solomon Bauxite Limited (SBL) mining company was granted a prospective license over Wagina Island in 2011 and development consent in 2013. In 2018, the residents of Wagina opposed the development of the bauxite mine. In 2019, the Landowners Advocacy and Legal Support Unit (LALSU) within the Solomon Islands Public Solicitors Office (PSO) represented Wagina Island residents in 2018. The Solomon Islands Environment Advisory Committee (EAC) convened in 2018 for the first time since the 1998 introduction of the Environment Act 1998. All grounds presented by LALSU were upheld by the EAC, providing a historic defeat for the bauxite mine development. This study focuses on evaluating the environmental factors that influenced the revocation of the bauxite mine development. The EAC decision was based on: '(i) legislative procedures for public consultation and publication of the Environmental Impact Statement (EIS) were not followed; (ii) the EIS did not meet legislative and regulatory requirements; (iii) the decision to issue a development consent is inconsistent with the Convention on Biological Diversity and the Declaration on the Rights of Indigenous Peoples; and (iv) the unacceptable impacts to the environment, to the residents of Wagina and their livelihoods and on nearby islands and marine environment.' The decision was a win for the Wagina people and the environment of the Solomon Islands, incorporating an independent legal appeals process and building environmental law capacity in the Pacific region.

Keywords Bauxite, impacts, landowners, legislative procedures, environmental law

INTRODUCTION

The Solomon Islands are located in the South Pacific Ocean, 1700 km from Australia (Fig. 1). The Pacific Ocean's islands have 'evolved from a range of geophysical attributes and geological interactions observed in the Pacific linear chains of volcanic islands on the Nazca, Cocos, and Juan de Fuca (Gorda) Plates either by mantle plume or propagating fracture origin, atolls, uplifted coralline reefs, fragments of continental crust, obducted portions of adjoining lithospheric plates, and islands resulting from subduction along convergent plate margins' (Neall and Trewick, 2008).

The presence of bauxite in the Solomon Islands has been known since the 1940s. Prior exploration by Australian companies in the early 1970s identified extensive areas of bauxite mineralization in various Solomon Islands, which were proposed for the potential development of economic deposits (Pacific Bauxite, 2018). Interest in bauxite deposits has increased significantly due to the demand for the alumina industry in China and the Asia-Pacific region. Bauxite in the Solomon Islands is predominantly the preferred gibbsite (low-temperature trihydrate) type of mineralization and typically occurs as discontinuous pockets that fill depressions within the uneven karst surface of the uplifted Pleistocene coral limestone basement (Pacific Bauxite, 2018). The depth of bauxite deposits is variable because the surface above the deposits is uneven. Bauxite deposits are

distinguished from fern clearings by common tropical flora. These pockets are removed by mining and may prevent villagers from practicing alternative agriculture.

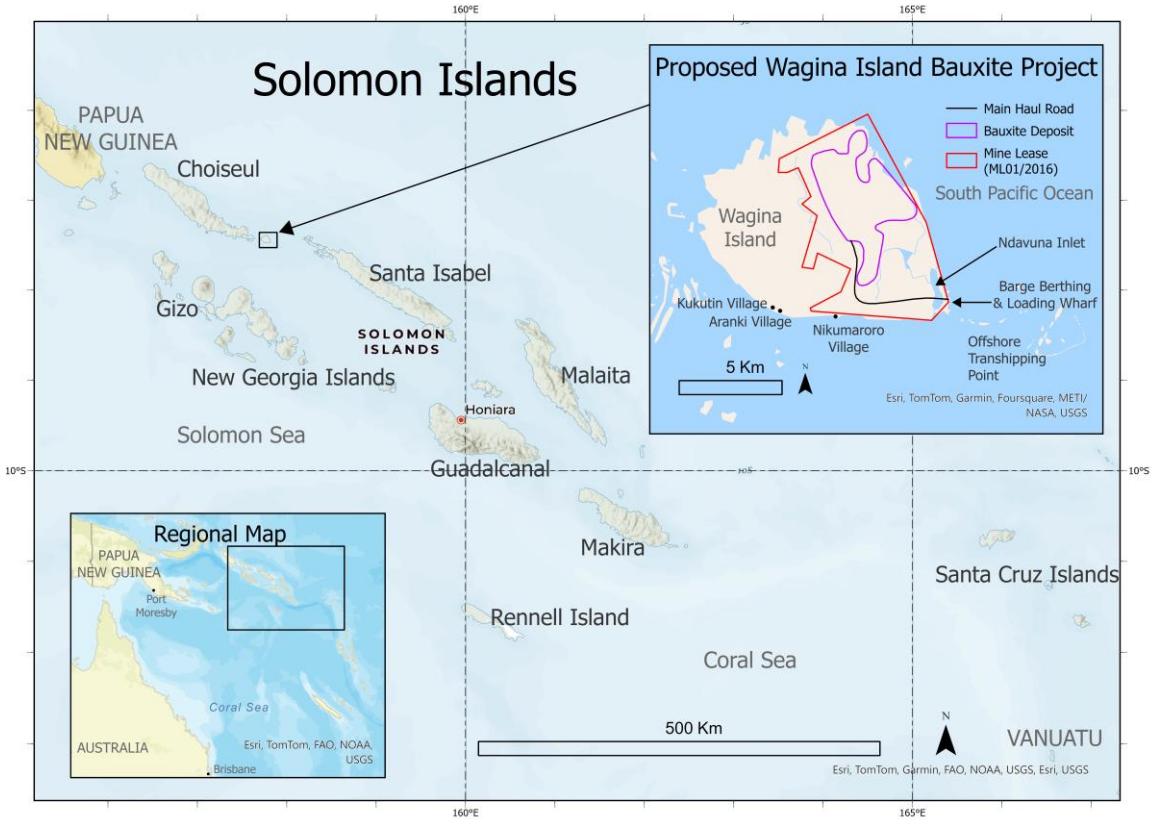

Fig. 1 Location of the Solomon Islands and the proposed Wagina Island bauxite project

The Noro Bauxite Project on New Georgia Island was identified as having substantial tonnages of material with grades of 40%–45% total aluminum oxide (Al2O3) and 5%–10% total silicon dioxide (SiO2), and the grade is economically favorable (Pacific Bauxite, 2017). The Nendo Bauxite project on Santa Cruz Island has potentially high-grade bauxite mineralization with grades of 41.2%–45% total Al2O3 and 4.1% total SiO2 (Pacific Bauxite, 2017). In addition, confirmation of grades planned to develop mining activity on the West Rennell Island Bauxite Project with resources of 30.1 million tons (Mt) at 46.9% Al2O3 and 3% total SiO2 had received mining approval (Pacific Bauxite, 2017). The mining company Solomon Bauxite Limited (SBL) was granted a prospecting license for Wagina Island in 2011 and development consent in 2013 (EDO NSW, 2019).

The Solomon Islands *Environment Act* 1998 and Regulations of the Environment Regulations 2008 (National Parliament, 1998) provide the basis for issuing a decision for development consent and examination of the Environmental Impact Assessment (EIA). The EIA deals with pollution impacts from soil erosion, water pollution, marine pollution, loss of animals/plants, and social/cultural impacts, and is submitted to the Director of Environment and Conservation, Ministry of Environment, Brazil. The Minister holds a public meeting where people can attend and write letters of objection to the director. The Environmental Advisory Committee (EAC) considered any appeal matter for the minister.

In 2018, Wagina elder Tebukewa Mereki led an appeal by residents of Wagina Island opposed to developing the bauxite mine, coincident with the first stages of mining development (EDO NSW, 2019). The EAC considered the appeal matter for the Minister of Immigration. Tebukewa Mereki believed that the right of the people of Wagina to live peacefully on their island outweighed any promised economic or development benefits. When the mining company arrived at Wagina nearly a decade earlier with a proposal to mine 60% of the island, the former president of the Lauru Wagina Council of Women, Teuaia Sito, and a group physically stopped the machines that were landed on

site behind this island. They did not want mining on the island. In 2019, the Landowners Advocacy and Legal Support Unit (LALSU) within the Solomon Islands Public Solicitors Office (PSO) represented the Wagina Island residents' appeal in 2018. The EAC convened in 2018 for the first time since the 1998 introduction of the *Environment Act* 1998 (EDO NSW, 2019). The EAC case was between Tebukewa Mereki on behalf of the residents of Wagina (Appellant) and the Director of the Environment and Conservation Division (Respondent, with seven committee members). The Barrister for Appellant Trevor Wallwork, the Public Solicitors Office, Barrister-at-Law (Victorian Bar, an admitted legal practitioner in the Solomons), Solicitor for Appellant William Kadi, The Public Solicitors Office, and Solicitor for Respondent Daniel Damilea, Attorney General's Chamber (EDO NSW, 2019).

Enforcement under the *Environment Act* 1998 involves criminal offences. The Belo Belo case (2007) heard in the High Court (Hearing June 8, 2007; Date of Ruling 18 and June 27, 2007) is an example of action taken by the court (High Court of Solomon Islands, 2007). The Applicants were Nathan Kera, Ronald Kitu, and Agnes Lodge Limited, and the respondents were the Attorney-General representing the Director of Environment and Conservation, the Ministry of Environment, the Belo Belo tribe, Rupasi Murray, and CIP International. The case concerned logging on Belo Island, Roviana Lagoon, Western Province, within the New Georgia Islands (see Fig. 1). A 'Logging License' was issued in March 2006, but no Development Application was made to the Ministry of Environment under the Environment Act 1998 due to Legal Issues. The Court found that 'the responders were wholly obliged to comply with the provisions of the Act as it affects developers' and reflected that the parties were to consider both rights and responsibilities.

OBJECTIVE

This study evaluated the environmental factors that influenced the revocation of the bauxite mine development on Wagina Island and demonstrated the validity of the environmental and legal processes that were applied in the Solomon Islands.

METHODOLOGY

The small island of Wagina (Fig. 1), also referred to as 'Vaghena', is part of the Solomon Islands, located in the South Pacific Ocean, and has an area of 110 $km^{2,}$ with 60% of the island (48 km^2) (EDO NSW, 2019). The 2000 people of Wagina people originally came from their ancestral home, the Southern Gilbert Islands (now part of Kiribati). In the 1930s, the United Kingdom moved these people to the Phoenix Islands because of land shortages and overpopulation. In the early 1960s, the United Kingdom uprooted these people again and moved them over 3000 km to Wagina because of extensive droughts and British Nuclear testing in neighboring atolls. At Wagina, they began a new life and became seaweed harvesters for food, cosmetics, and fertilizers.

Wagina Island contains an economically significant quantity of bauxite. A proposed mining tenement would remove 2000 hectares (ha) of virgin forest and displace 2000 residents (EDO NSW, 2019). The removal of 150 truckloads of bauxite/day would continue for 20 years and have environmental impacts on water quality, air quality, ecology, and the marine environment. It could also affect residents who rely on the sea and land for their existence. This study focuses on evaluating the environmental factors that influenced the revocation of the bauxite mine development. Details of the '(i) legislative procedures for public consultation and publication of the Environmental Impact Statement (EIS) were examined; (ii) whether the EIS met legislative and regulatory requirements; (iii) if the decision to issue a development consent is inconsistent with the Convention on Biological Diversity and the Declaration on the Rights of Indigenous Peoples; and (iv) the unacceptable impacts to the environment, to the residents of Wagina and their livelihoods and on nearby islands and marine environment'. The residents were represented by a legal officer from LALSU, an Australian barrister, and four scientific experts.

RESULTS AND DISCUSSION

The appeal to the EAC by the residents of Wagina was related to the decision of the Director of the Environment and Conservation Division to grant development consent under Section 24 of the Environment Act to SBL on September 2, 2013. The Director's decision was inconsistent with the Act, and the Director did not comply with his obligations to provide notice of the development application before the 'Development Consent' was granted. The Environmental Impact Statement dated December 2012 (GREENPAC, 2012) and a Supplementary Report dated June 2013 ("Supplementary Report") were prepared on behalf of SBL, and together, these are the "EIS."

Expert advice was provided to the Wagina community (Vaghena Bauxite Project) on August 21, 2017, as follows (Noller, 2017):

A) Did the EIS contain sufficient information to adequately assess the environmental impacts of the Project, as it relates to any potential environmental contamination and associated impacts? Response 1 was that 'the EIS lists the key issues but appears to not follow the procedure required by the Government for proper submission of the EIS nor to provide sufficient detail on controlling issues to the point that the project can be considered to have the capacity to deliver adequate control to prevent impact from the mining operations'; and Response 2. 'Comparison with the Environment Act Section 23 requirements shows' in 22 items listed in Table 1 that many details were not included in the EIS.

B) What, if any, are the potential sources of contaminants from the project, and what, if any, is the risk of these contaminants impacting the local environment and the local community? Response 3 states that 'The source of contaminants is the bauxite and overburden from mining. This material is collectively soil or dirt, which can be dispersed as sediment if not retained on the mining lease or held in the ponds. Sediment may smother and affect biota such as macro-invertebrates and sea grasses by excluding light and oxygen, and Response 4 was 'However, the bauxite may also contain trace metals and arsenic, but the extent of these trace elements has not been established for this project in the EIS.' If sediment fines are held in still water ponds and become reduced (lack of oxygen), the trace elements may be released into the solution. If discharged, they may be taken up by biota. Response 5 states that 'Hydrocarbon spills and sewage leakage are also problems that commonly arise from such mining activities. These are difficult to avoid unless the project operation is sufficiently planned.

C) Does the Project, as approved, include all reasonable steps to minimize any risk of environmental harm from contamination? Response 6 that 'The EIS does not currently provide sufficient detail to minimize risk of environmental harm from contamination and needs to provide additional detail as indicated in (a) on controlling issues generated by the project operations to give confidence that adequate control to prevent impacts can be delivered'. And Response 7, that 'In addition, there are significant natural issues that the project needs to show can be dealt with. These are the effects of earthquakes on the stability of mine features, potential for longer-range volcanic activity, loss of topsoil from monsoon rain and cyclones, including ponds to retain sediment in the event of breaching, and the significance of annual rainfall of 3000 – 5000 mm. Bauxite contains approximately 35% moisture, which means that it is unlikely to dry completely (or not for very long). Wet sediment tends to stick to larger rocks and accumulates in waterways. Eroded sediments can be trapped by mangroves; therefore, any removal of mangroves will reduce the efficiency of sediment removal.

D) Provide any further observations or opinions that you consider relevant, considering the circumstances of this matter. Response 8 was 'The effect of sediment from bauxite mining on carrageenan seaweed production may be an issue for continuing farming on Wagina Island. Currently, there is insufficient detail available for local marine farmers to understand whether sediment from bauxite mining will restrict carrageenan seaweed growth.

The EAC decision was based on: (i) legislative procedures for public consultation and publication of the Environmental Impact Statement (EIS) were not followed; (ii) the EIS did not meet legislative and regulatory requirements; (iii) the decision to issue a development consent was inconsistent with the Convention on Biological Diversity and the Declaration on the Rights of Indigenous Peoples; and (iv) the unacceptable impacts to the environment, to the residents of Wagina and their livelihoods, and on nearby islands and the marine environment (EDO NSW, 2019).

Table 1 Comparison with Environment Act Section 23 requirements

(a) The EIS does not contain a full description of the objectives of the prescribed development. The EIS is set out like a proposal for such a project application without much supporting detail. There is very little background detail available to refer to in the EIS.
(b) There is no detailed analysis of the need for the prescribed development. There are predictions of the value of the bauxite planned to be mined.
(c) There is no indication in the EIS of the consequences of not carrying out the proposed development.
(d) The EIS does not include sufficient adequate information and technical data to allow assessment of the impact of the prescribed development on the environment.
(e) No reasonable alternatives to the prescribed development are described.
(f) The environment that is likely to be affected by the prescribed development or (alternatives) is not described because of the lack of currently available data.
g) Following on from (f), there is little capacity to assess the actual or potential impact(s) on the environment.
(h) The reasons for the choice of the prescribed development are not given, apart from the established detail from earlier exploration work that the bauxite does not have undesirable minerals that complicate later extraction.
(i) The period of identified expected impacts is not given.
(j) The local geographical boundaries of the impacts of bauxite are not defined.
(k) Methods of predicting and assessing respective impacts through the lifetime of the project are not given.
(l) Justification of the prescribed development in terms of environmental, economic, cultural, and social Considerations are only partly given or not given at all.
(m) The likely impacts or consequences of implementing the prescribed development in the EIS, including for energy, it is not given.
(n) Measures to prevent or reduce significant adverse impacts and enhance beneficial effects, and an account of their likely success, with estimated costs are not given in the EIS.
(o) The residual impacts, which cannot be mitigated or can only be mitigated partially, are not described in the EIS.
(p) The proposed monitoring and reporting schemes, with estimated costs, are either not described or are not adequately described in the EIS.
(q) The safeguards or standards for the protection of the environment to be adopted or applied, including their implementation, monitoring, and reporting are proposed, but their cost-effectiveness is not described and assessed.
(r) An account of the impact on the environment of any of a series or programme of similar development (whether implemented or not) over a period is not given.
(s) The sources and references of information used during the preparation of the EIS are given to the extent that they are described.
(t) A site survey report concerning National Heritage items or traditional artefacts is given.
(u) It is not clear if further matters specified by the Director are addressed in the EIS.
(v) Based on a lack of details, a complete summary printed on a separate page is not given.

Source: Noller, B.N. 2017. Expert Advice, Vaghena Project. 21 August 2017

The residents were represented by a legal officer from LALSU, an Australian barrister, and four scientific experts who emphasized the 'grave deficiencies of the environmental impact statement. The decision was a win for the Wagina people and the environment of the Solomon Islands, incorporating an independent legal appeals process and building environmental law capacity in the Pacific region (EDO NSW, 2019).

The immediate effect of mining bauxite is the effective removal of usable soil for any future agricultural activity, including tree recovery of bauxite deposits, which is variable, as the surface above the deposits is uneven. Bauxite deposits are distinguished from fern clearings by common tropical flora. These pockets are removed by mining and may prevent the development of alternative agricultural practices by villagers.

An additional issue related to environmental effects was identified earlier on water quality, air quality, ecology, and the marine environment. The *Environment Act* 1998 states that EIAs deal with pollution impacts from soil erosion, water pollution, marine pollution, loss of animals and plants, and social and cultural impacts in the Solomon Islands. Small island countries, such as the Solomon

Islands in the South Pacific Oceanic region, were identified as having common needs for regulatory and research requirements arising from limited economic resources. The Secretariat of the Pacific Regional Environment Program (SPREP), a regional organization established by the Governments and Administrations of the Pacific, was established in 1993. SPREP has 21 Pacific Island member countries and territories and five metropolitan ones. The strategic direction for SPREP is set out in its Strategic Plan (www.sprep.org). With the Solomon Islands, there are regular reports on country environmental issues and State of Environment Reports (SPREP, 2019). These reports provide a good picture of the current environmental status and conditions in the Solomon Islands.

CONCLUSION

This study evaluated the environmental factors that influenced the revocation of bauxite mine development. All grounds presented by LALSU were upheld by the EAC, providing a historic defeat for the bauxite mine development. The importance of the case was its implications beyond Wagina, providing a model for other rural communities that feel powerless against companies with government-issued mining or logging services.

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