



Affirmative Investigation –
Solomon Islands – Tina River Hydropower Development Project
Site visit: August 2016
Report prepared by: LJohnston, USAID/E3

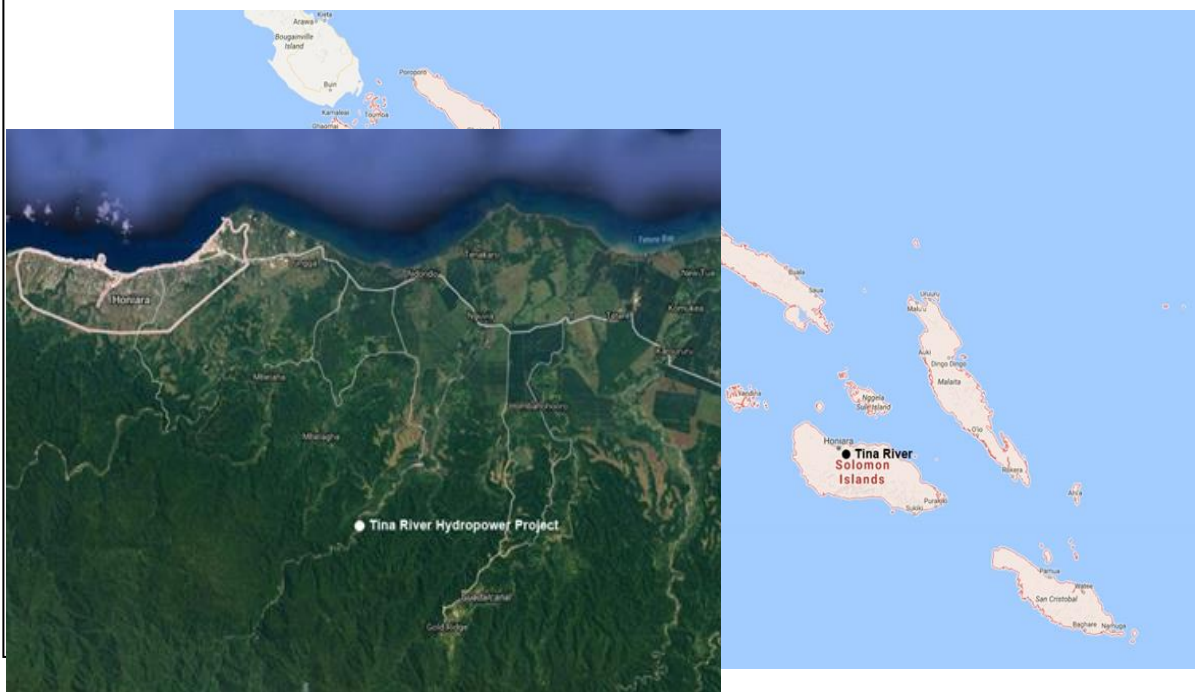
Project: Tina River Hydropower Development Project

Safeguard Category: A

Projected Cost: est. \$ TBD

Proposed Board Date: TBD (Spring 2017)

Current Status: The Tina River Hydropower Development Project is in its early stages of development by the Solomon Islands Government (SIG). The World Bank Group (WBG), with other donors, has supported the SIG through transaction advisory services, and financial and technical assistance to the Tina River Hydropower Development Project Office, located in the Ministry of Mines, Energy and Rural Electrification. After an international tender process, Korea Water Resources Cooperation and Hyundai Engineering consortium (K-Water) secured the bid to develop the Tina River Hydropower Development Project as a build-own-operate-transfer (BOOT) scheme with ownership transferred to the SIG after 30 years. The Power Purchase Agreement between K-Water and the Solomon Islands Electricity Authority is expected to be signed by the end of October 2016. The environmental and social impact assessment (ESIA), completed in 2014, was updated and released to the public on August 15, 2016. K-Water will need to submit its ESIA directly for SIG for approval. The Land Acquisition Livelihoods Restoration Plan was also released on August 15, 2016. The Ministry of Environment submitted a proposal to the Green Climate Fund as part of the overall financing for the project due to its potential to offset diesel gas emissions.



Executive Summary

The International Financial Institutions Act (IFIA), Title XIII, Section 1303(a)(1), requires the United States Agency for International Development (USAID) to review multilateral development bank (MDB) project proposals to determine whether the proposals will contribute to the country's sustainable development. Proposals that are particularly likely to have substantial adverse environmental and social impacts are candidates for an affirmative investigation under Section 1303(a)(3) of the IFIA. Projects subject to an affirmative investigation are identified based on reviews that look for potential impacts on the environment, natural resources, public health and indigenous peoples. USAID's Bureau for Economic Growth, Education, and Environment (E3) leads the affirmative investigation process in consultation with the Department of the Treasury, the Department of State, and other relevant federal agencies. USAID's intent is to conduct these site visits early in the process of project preparation to provide recommendations aimed at improving the environmental and social aspects of the project prior to presentation and vote at the respective MDB Executive Board of Directors meetings. If not classified, the information collected during the affirmative investigation is made available to the public.

USAID has concluded that the Tina River Hydropower Development Project requires an affirmative investigation. This affirmative investigation focused on the Tina River Hydropower Development Project (HDP). The World Bank Group (WBG) and other donors have supported the Solomon Islands Government (SIG) through transaction advisory services, and financial and technical assistance to the Tina River HDP Project Office in the Ministry of Mines, Energy, and Rural Electrification. The WB is expected to present the project to the Board of Directors in Spring 2017. The objective of this affirmative investigation is to provide project-specific recommendations for the Tina River HDP that address potentially significant environmental and social impacts and propose mitigation measures.

The WBG posted the Environmental and Social Impact Assessment (ESIA)¹ and the Land Acquisition Livelihoods Restoration Plan (LALRP)² on the WBG website on August 15, 2016, just prior to USAID's visit (August 18-31, 2016). To produce this trip report in a timely manner, USAID has not completed its in-depth review of the ESIA and the LALRP. As warranted, following complete review of the ESIA and LALRP, and when new information becomes available, recommendations contained in this report may be revised and an updated report issued.

Findings of the site visit include:

1. ***Customary land-related disputes related to economic benefits are a common issue in the Solomon Islands.*** Logging and, more recently, mining, land access agreements have fractured community cohesion and leadership to a degree that the norms of traditional

¹ <http://documents.worldbank.org/curated/en/768061471430569820/pdf/SFG2374-EA-PI61319-Box396302B-PUBLIC-Disclosed-8-15-2016.pdf>

² <http://documents.worldbank.org/curated/en/832721471415550419/pdf/SFG2369-REVISED-RP-PI61319-Box396302B-PUBLIC-Disclosed-8-19-2016.pdf>

decision making have been undermined.^{3,4} In many cases, there is no correlation between the agreement reached by landowners and logging companies and its implementation. There are very few, if any, opportunities for landowners to remedy the discrepancies between the agreement and its implementation.⁵ The root cause of these problems is reported to result from how the agreements were negotiated and implemented.⁶

Gold Ridge mine is located in a catchment adjacent to the Tina River HDP and many of the landowner tribes involved in the Gold Ridge mine are also key landowners involved in the Tina River HDP. A wide range of stakeholders referenced the mine as empowering a few key individuals and entrenching disempowerment for the majority. Discussions found that landowners routinely blocked access to the mine site largely due to dissatisfaction with the implementation of the land acquisition agreements.

- 2. Tina River HDP is making a significant effort to identify and engage customary land owners to avoid customary land-related disputes.*** Development of either private or public sector projects on customary land is extremely complicated due to Solomon Islanders' strong ties to their territory. Land plays a central role in their concept of identity and many landowners never fully accept the permanent alienation of their traditional land. Landowners have made demands for additional compensation or return of land even when land agreements have been negotiated and implemented using formal legal and customary channels and procedures.⁷

Due to landowners' deep connections to customary land and prior experiences in the logging and mining sectors, Tina River HDP has adopted the underlying principle of "no loss" with respect to the project-affected landowners and communities. Under this principle, the Tina River HDP Project Office ensured that landowners were appropriately identified and become active participants in the project. This approach necessitates continuous cycles of interaction and consent over the life of the project to maintain community support rather than a one-off consent process.

- 3. The SIG has designed the Tina River HDP to provide development and capacity building opportunities prior to, and during, project construction.*** In addition to the customary landowners who will be compensated for the sale of their land under the process agreement,⁸ there is a broader group of stakeholders living in the project area that

³ Land and Conflict in the Pacific Region, http://www.forumsec.org/resources/uploads/attachments/documents/LMCM%20I_I%20COMPLETE.pdf

⁴ The Political Economy of the Transition from Logging to Mining in Solomon Islands. D. Porter and M. Allen. Australian National University (2015)

⁵ World Bank Justice Delivered Locally (2013) <http://documents.worldbank.org/curated/en/353081468308114790/Justice-delivered-locally-systems-challenges-and-innovations-in-Solomon-Islands>

⁶ World Bank Justice Delivered Locally (2013); Porter and Allen (2015)

⁷ Land and Conflict in the Pacific Region

⁸ The Land and Titles Act provides the compensation framework for land acquisition. The process agreement is a customized instrument that adds on top of that an agreement to pay royalties (1.5%), income from land lease, and some signing fees. Therefore, the process agreement provides additional benefits above and beyond payment for

is not included under the process agreement. Given the history of land-based conflicts, the SIG is committed to signaling to this group of stakeholders that they will not be left behind in the development of this project and that their living conditions will improve. It is planned that the SIG's initial investments in these communities will be expanded upon through a proposed WB-managed trust fund grant. This grant would finance a stand-alone social development project, managed as a complementary project with the Tina River HDP. Although the grant proposal is still in the concept stage, it is expected that its main elements will be to: 1) establish the institutional arrangements and capacity for beneficiary communities to effectively manage a Fund comprised of benefit-sharing revenues from the Tina River HDP, 2) improve community infrastructure, and 3) support human resource development.

4. ***Some community members continue to have concerns and questions about the Tina River HDP.*** Although the Tina River HDP Project Office has been engaging with land owners and other project-affected communities since at least 2011, some community members continue to have outstanding questions about the project. Issues raised during the USAID meetings ranged from the safety of the dam to potential impacts on their livelihoods as a result of their dependence on the Tina River and surrounding forests to meet their daily needs.
5. ***Solomon Islands Electricity Authority (SIEA) is broadening its energy resources beyond diesel to solar and co-generation.***⁹ SIEA is committed to reducing the company's dependence on diesel fuel. SIEA is present in nine provinces and developing mixed generation capacities with solar power. SIEA has purchased four hectares (ha) of land near Honiara for a solar farm. Currently SIEA has installed one megawatt (MW) on 1.5 ha, with future plans to install additional panels to increase capacity up to four MW. The Honiara grid has the capacity to handle more than four MW of alternative energy sources. SIEA will purchase electricity from Tina River HDP at an annual rate, independent of the amount of electricity generated.
6. ***Government institutions are relatively young and ministries have limited capacity given their responsibilities.*** As the Solomon Islands only gained independence in 1978, government institutions are still developing their capabilities to address their broad mandates and the enormous geographical areas under their responsibility.
7. ***An independent Dam Safety Advisory Panel has been engaged early in the Tina River HDP process.*** As a requirement of OP/BP 4.37,¹⁰ the Tina River HDP Project Office contracted three international independent dam safety experts to provide ongoing advice on technical aspects of the project. They have been involved in preparation of the Geotechnical Baseline Study and provided advice on the final preferred location of the dam

the purchase of land. The process agreement provides the written consent of the identified Core Land Tribes to proceed with a statutory acquisition process.

⁹ SIEA is responsible for generation, transmission and distribution.

¹⁰ World Bank Safeguard Policy on Dam Safety

<https://policies.worldbank.org/sites/ppf3/PPFDocuments/090224b0822f8f35.pdf>

site. The panel will continue to advise the Project Office and the SIG through contracting, construction and initial operations.

8. ***The Tina River upper catchment is undisturbed primary montane forest with unique biodiversity. At least 75 percent of known species are endemic.*** The Mt. Popomanaseu region, which includes the forest catchment and lowland valleys of the Itina River, is on UNESCO's Tentative List of World Heritage Sites for its unique biodiversity. Although several institutions have been conducting biodiversity surveys in the area, parts of the area still have not been surveyed and more species are likely to be identified. The primary montane forest of Tina River's upper catchment is part of the largest, contiguous montane forest in the South Pacific.

The Tina River HDP has the potential to significantly impact the upper catchment through the modification of the aquatic and riverine ecosystems. The project's access road will increase the presence of human, invasive and feral species in the upper catchment and the proposed development of reservoir fisheries (to mitigate the project's socio-economic impacts) would increase the number of people entering the area and will have implications for how the upper catchment and the reservoir are managed to mitigate increased access. Depending on the species, reservoir fisheries could also impact aquatic biodiversity.

9. ***Invasive and feral species are major threats to the biodiversity of the upper Tina River catchment.*** The access road and increased human movement will result in increased access to the upper watershed for invasive and feral species. Invasive species have demonstrated the ability to outcompete native species, resulting in eventual population extermination. Feral cats are reported to be present in the upper catchment, presenting a known significant impact on ground-dwelling mammals and bird species.¹¹
10. ***The majority of the fish species in the Solomon Islands depend on 'ridge-to-reef' migratory corridors to complete their life cycle.*** The loss of the 'ridge-to-reef' migratory corridors through disruption of surface water connectivity and in-stream habitat degradation can significantly impact aquatic species.¹²

From the confluence of the Tina and Toni rivers, the river becomes the Ngalimbiu River, which discharges into Tenaru Bay, forming an important habitat for the Tina River aquatic species that must reach the sea as part of their life cycles. It also provides a temporary feeding habitat for marine species that enter the mouth and lower reach of the river.

The Tina River HDP and SIG have identified the issue of aquatic species passage both upstream and downstream and environmental flows as critical project impacts that need to be successfully mitigated.

¹¹ <http://www.nature.com/articles/ncomms2380>; <http://www.environment.gov.au/system/files/resources/34ae02f7-9571-4223-beb0-13547688b07b/files/cat.pdf>

¹² <http://www.int-res.com/abstracts/esr/v16/n3/p261-272/>

Based on the above findings, the following recommendations are proposed:

- 1. Provide consistent communication and realistic information to stakeholders on the timeline for project development.** Despite the outreach the Tina River HDP Project Office has done to date, there are still perceived gaps in communication and information sharing with communities. This recommendation is based on limited discussions with Tina River HDP stakeholders and experience from other site visits to MDB-financed hydropower projects. The questions raised during discussions highlight how critical it is for communities to understand the complexities of developing a hydropower project of this size. With the public release of the ESIA and LALRP, the Tina River HDP has an opportunity to assist K-Water in the development of a community consultation and participation plan and re-engage communities on the pre-project investments the SIG is undertaking.
- 2. Establishing the Tina River upper catchment as a protected area.** It will be critical for the long term viability of the Tina River HDP to protect the supply of water from the upper catchment and avoid economic undertakings (e.g., mining, logging) that would negatively impact the area and counteract the Tina River HDP's mitigation measures. With the support of the WBG and other donors, the Ministry of Environment should re-engage with the Uluna-Sutahuri tribe as a major customary landowner in the upper catchment and begin the process of designating the upper catchment as a protected area under customary ownership. Since the Uluna-Sutahuri tribe is already included under the Tina River HDP process agreement, the potential of providing benefit shares upstream of the reservoir to maintain the watershed should be explored.

Another option to explore would be using the Forests Act to declare all areas of the upper watershed above 400 meters altitude as a forest reserve. This would legally prevent any timber licensing in those areas, and does not require landowner consent. The success of designating the upper watershed as either a Protected Area or forest reserve would require the SIG to cancel the exploration and mining tenement leases in most, if not all, of the Tina River upper catchment.

Prior to respective MDB board dates for project financing, a commitment with corresponding timeline and resources should be included as part of the proposed project for the establishment of the upper catchment as a protected area, declaring areas above 400-m altitude as a forest reserve and cancellation of the exploration and mining tenement leases.

- 3. Expand baseline data and monitoring of fisheries and other indicators (e.g., riverine birds, human fishing effort) in and above the reservoir.** This recommendation is intended to support Tina River HDP's assessment of the effectiveness of the fish transfer and survival rates of their proposed mitigation measures during project operations. The monitoring efforts will also provide information to help determine the extent and impacts of increased access to the upper catchment by human, invasive and feral species and the information necessary to propose further adaptation measures or identify other stakeholders to cooperate with to mitigate impacts.

4. **Expand biological baseline data and monitor the mouth of Ngalimbiu River.** Due to the critical importance of this area for aquatic species, more detailed baseline data¹³ should be collected and subsequently monitored during all phases of the project. This additional data and monitoring would complement the ESIA recommendation to monitor for heavy metal/pesticide toxicity. Expanding the baseline data and monitoring efforts could provide important information that the project could use to determine potential causes of impacts downstream of the project and help inform adaptive management measures. It is recommended that the same monitoring program be conducted on the Toni River to serve as a control for construction and operation of the Tina River HDP and verify assumptions in the ESIA.

Because the Gold Ridge mine lease overlaps with the middle section of the Toni River watershed, and overlays much of the Tina/Ngalimbiu River watershed near the Tina/Toni river confluence, it will be important for the SIG to cancel the mine lease in this section to avoid future cumulative impacts.

5. **Support SIG monitoring efforts of the Tina River HDP through engagement of specific SIG ministries, community members and other resources.** It will be important to engage both the Ministry of Environment and the Ministry of Forest given their ability to provide key support for environmental monitoring during construction and operation of the Tina River HDP. Ministries should commission and coordinate monitoring efforts, including ones where community members' participate. Early efforts by Tina River HDP to work with the community on water quality monitoring could be expanded.
6. **Develop a robust program during operation phase to prevent the spread of invasive and feral species into the upper catchment.** It will be important for the Ministry of Environment and the Ministry of Forest to engage customary landowners to develop an invasive species strategy and management program comprising the following elements: prevention; early detection and rapid response; control and management; and rehabilitation and restoration. The program should be implemented as soon as possible in coordination with Tina River HDP.
7. **Additional environmental and social recommendations.** USAID technical staff are continuing to review the ESIA and the LALRP. The review will assess whether the following elements have been considered and addressed:
 - Assessment of environmental flows of water;
 - Selection of representative aquatic species to gain a better understanding of their life cycles and habitat requirements;
 - Mitigation measures for aquatic species during construction;
 - Mitigation measures for controlling sediment during construction;

¹³ Additional baseline data would include a survey of the estuary, including species beyond fisheries, collect core sedimentation samples to identify the majority of taxa, assess nutrient flow, calculate the river flow at the delta, sedimentation and fishing effort.

- Assessment of cumulative impacts of increased sediment during construction combined with sediment due to rain and small-scale logging practices;
- Assessment of ecosystem services;
- Assessment of geology and impacts of headrace tunnel on water systems;
- Assessment of seismic activity potential risks to the Tina River HDP;
- Assessment of climate change impacts on the Tina River HDP;
- Establishment of fisheries management plan for the Tina/Ngalimbiu River watershed and Tenaru Bay; and
- Financial provisions for decommissioning the Tina River HDP with concurrent river and habitat restoration measures.

Purpose of the Affirmative Investigation

The International Financial Institutions Act (IFIA), Title XIII, Section 1303(a)(1), requires USAID to review MDB project proposals to determine whether the proposals will contribute to the country's sustainable development. Proposals that are particularly likely to have substantial adverse environmental and social impacts are candidates for an affirmative investigation under Section 1303(a)(3) of the IFIA. Projects subject to an affirmative investigation are identified based on reviews that look for potential impacts on the environment, natural resources, public health and indigenous peoples. USAID/E3 leads the affirmative investigation process in consultation with the Department of the Treasury, the Department of State, and other relevant federal agencies. USAID's intent is to conduct these site visits early in the process of project preparation to provide recommendations aimed at improving the environmental and social aspects of the project prior to presentation and vote at the respective MDB Executive Board of Directors meetings. If not classified, the information collected during the affirmative investigation is made available to the public.

The objective of this affirmative investigation is to provide project-specific recommendations for the Tina River HDP for addressing potentially significant environmental and social impacts, including mitigation measures or project alternatives.

Methodology

An affirmative investigation is a three-step process involving information collection, analysis, and development of recommendations. Typically, USAID/E3 gathers information based on available literature, observations made during the site visit to various project areas, and semi-structured interviews with stakeholders and projected-affected communities.

As part of this affirmative investigation, USAID/E3 staff conducted a visit to the proposed Tina River dam site, including areas downstream of the dam site. The team met with the Tina River Project Office, WBG, Asian Development Bank (ADB), civil society organizations, researchers, and project-affected stakeholders.

Informal meetings were held with women from two communities. An independent translator translated the discussions from Pijin to English.

The comments in this report reflect the views of those interviewed. USAID has not substantiated these views. In all cases, the name and affiliation of stakeholders is withheld. Recommendations are a synthesis of site visit observations, discussions and available environmental and social documentation available at the time of the site visit. When additional information becomes available, USAID will review and revise recommendations, as warranted and issue an updated report.

General Background

Previously a UK protectorate since the 1890s, the Solomon Islands is a relatively new country with self-government achieved in 1976 and independence in 1978. The Solomon Islands

consists of eight major islands and more than 900 smaller islands. Approximately 90 islands are inhabited. The country's capital, Honiara, is located on the island of Guadalcanal, which has the greatest population and economic activity.

The majority of Solomon Islanders are ethnically Melanesian (94.5 percent), Polynesian (3 percent) and Micronesian (1.2 percent). The number of individual languages listed for Solomon Islands is 75. Of these, 71 are living and 4 are extinct. Of the living languages, 69 are indigenous and 2 are non-indigenous.¹⁴

Between 1998 and 2003, a low-level conflict locally referred to as the "tensions" emerged as a result of grievances between the local Guadalcanal landowners and migrants predominately from the highly-populated island of Malaita drawn to Guadalcanal by economic opportunities. The tension and associated civil unrest has abated under the authority of the Regional Assistance Mission to the Solomon Islands, but has not been completely resolved.¹⁵ The site of Tina River hydropower project is close to Honiara, so communities in the Tina River HDP area were affected by the "tensions" and remain sensitive.

The Solomon Islands has the lowest income per person of any Pacific Island country and ranks among the lowest in the Human Development Index among the Pacific countries. This is compounded by the fact that the Solomon Islands is vulnerable to climatic environmental events, including cyclones, flooding, earthquakes and tsunamis, which have contributed to serious loss of life and livelihoods.

About 87 percent of land in the Solomon Islands is held as customary land. Customary land ownership is integral to tribal structures resulting in complex, tiered owner arrangements between tribes and sub-tribes. Customary land ownership provides a social safety net for tribes. Loss of control over long-held territories is perceived as a break with the group's ancestors and a loss of economic well-being for future generations. The only land that is not under customary land ownership is land that was obtained by the British when the Solomon Islands were a protectorate. Land ownership is a significant source of conflict at all levels of society. Landowners have made demands for additional compensation or return of land even when land agreements have been negotiated and implemented using formal legal and customary channels and procedures. Consequently, this pattern of land disputes has inhibited public and private sector investment and development in the country.

The biodiversity of Solomon Islands is of global importance. The country has been recognized as a "Centre of Plant Diversity," counting 4,500 species of plants of which 3,200 are indigenous.¹⁶ BirdLife International has categorized the Solomon Islands as an "Endemic Bird Area" with the "highest number of restricted range species in any Endemic Bird Areas" of the world. The latest surveys have identified 223 bird species, of which 82 percent are endemic and two extinct. The number of mammal species is higher than in any other Pacific island

¹⁴ <http://www.ethnologue.com/country/SB>

¹⁵ Regional Assistance Mission was created in 2003 in response to a request for international aid by the Governor-General of Solomon Islands

¹⁶ Convention on Biological Diversity - Solomon Islands - Country Profile

region. Due to the high diversity of saltwater fish and coral species found in coastal and marine areas, the Solomon Islands have been placed under the Bismarck Solomon Seas Ecoregion¹⁷ and the Coral Triangle. Over the years, the Solomon Islands have experienced an overall decline in biodiversity. Sixteen plant species are already listed under the IUCN Red List¹⁸ as threatened; 20 out of 53 known mammal species are threatened. Biodiversity supports ecosystems which perform a large role in preventing the occurrence of extreme natural events, such as flash-flooding, which can cause considerable human and economic losses.

The Solomon Islands predominant reliance on diesel energy has resulted in very high costs of electricity and low access rates. Overall access to electricity varies from location to location and ranges from more than 60 percent in Honiara to less than five percent in many of the outer islands. Electricity costs in the Solomon Islands are among the highest in the world. The average retail tariff is about US\$ 0.82/kWh compared to averages of US\$ 0.06/kWh in Vietnam and US\$ 0.12/kWh in the United States.¹⁹ The SIG is planning to reduce electricity costs by diversifying production sources, moving away from reliance on diesel generation to hydropower and solar.

Tina River Hydropower Development Project (HDP)

The Tina River HDP is one of three national priority development projects for the SIG. The project was initially identified in 2006. The WB, in cooperation with the International Finance Corporation (IFC) Advisory Services²⁰ and other donors, provided financing for the feasibility studies with continuing support to the SIG through transaction advisory services; financial and technical assistance to the Tina River HDP Project Office under the Ministry of Mines, Energy and Rural Electrification, in addition to facilitating SIG's access to concessional financing for the project.

The Tina River is formed from the convergence of three rivers: the Mbeambea, the Voraha and the Njarimbisu rivers which drain a watershed of 115 km² and collects a dense fan-like network of fast flowing streams from the Mt. Mbutohaina-Mt. Popomanaseu ridge. The Tina River catchment is approximately 150 km² with the upper catchment comprised of undisturbed montane forests and aquatic ecosystems. The Tina River joins the Toni River below the dam site, to form the Ngalimbiu River which flows through a coastal plain before discharging into the Iron Bottom Sound on Guadalcanal's north coast.

The Tina River HDP consists of a 53 meter high dam with a 3.3 km headrace tunnel to the powerhouse. The reservoir formed from the dam will extend upstream approximately 2.6 km. Initially the powerhouse will have three turbine units each with five MW capacity allowing for a maximum discharge of about 18 m³/s and a minimum discharge of about 2.4 m³/s. The 5.4 km

¹⁷ The Bismarck Solomon Seas Ecoregion covers Northern New Guinea, Papua New Guinea and Solomon Islands (up to the Makira province)

¹⁸ The IUCN Red List of Threatened Species, founded in 1964, is the world's most comprehensive inventory of the global conservation status of biological species.

¹⁹ <http://www.projects.worldbank.org/PI52779?lang=en>

²⁰ IFC assisted the SIG as the Transaction Advisor with the international tendering process for a project developer.

river stretch between the dam and the powerhouse will have an environmental flow of 1 m³/s. It is expected that the spillway will release flood water on average 20 percent of the time when the inflow is higher than 18 m³/s. The project is expected to operate as a peaking facility.

Other project components include an access road to the dam and powerhouse sites, an approximately 23 km transmission line to the Lungga power station, and several quarry sites located in the proposed reservoir area.

The project will be developed as a build-own-operate-transfer (BOOT) scheme with ownership transferred to the SIG after 30 years.²¹ Korea Water Resources Cooperation and Hyundai Engineering consortium (K-Water) was selected as the Independent Power Producer (IPP) through a transparent and competitive tender process supported by the IFC. SIEA will purchase the electricity at a fixed rate regardless of the amount produced.

The project area, consisting of over 30 villages and hamlets, is located in customary lands of the indigenous Malango people of the Bahomea district, who own and occupy the core land area; the indigenous people of the Malango district, some of whom are customary 'shareholders' in the core area, the 'settler' Guale people in the Bahomea district²²; the indigenous coastal Ghaobata people of the Guadalcanal Plains and 'squatters'. The Tina Core Land Company (TCLC)²³ will own the Core Area, including the access road from Managakiki Village to the powerhouse and dam site. The project will not require physical resettlement. However, there will be 'economic displacement' as some access and activities will be impacted (e.g., small-scale timber milling). (Project map is in Annex I).

The project is expected to be presented to the WB board of Executive Directors in the Spring 2017. The WB is considering providing project financing; in addition to providing technical assistance to the SIG to monitor and support project implementation. The IFC is considering financing part of K-Water's participation. The ADB was recently asked by the SIG to consider financing the project and is undergoing their own due diligence of the project and associated documents. The Australian High Commission is considering financing the project's access road and is also conducting their due diligence process as required under the Australian Environmental Protection Act.

Findings of the site visit include:

- I. ***Customary land-related disputes related to economic benefits are a common issue in the Solomon Islands.*** Logging and, more recently, mining, land access agreements have fractured community cohesion and leadership to a degree that the norms of traditional decision making have been undermined.^{24,25} In many cases, there is no correlation between

²¹ The life expectancy of the project is 100 years.

²² These settlers are largely indigenous Talise-speaking people from the Weather Coast of Guadalcanal and do not have customary ownership rights in the project area, though have been granted usufruct rights to certain areas by Bahomea customary owners.

²³ The company is a joint venture between the customary landowners and the SIG.

²⁴ Land and Conflict in the Pacific Region

the agreement reached by landowners and logging companies and its implementation. There are very few, if any, opportunities for landowners to remedy the discrepancies between the agreement and its implementation.²⁶ The root cause of these problems is reported to result from how the agreements were negotiated and implemented.²⁷ For example, both mining and logging sectors have been found to have improperly influenced landowners or government and elected officials through cash inducements while providing little benefit to the majority of the indigenous landowners and communities.²⁸

Gold Ridge mine is located in a catchment adjacent to the Tina River HDP and many of the landowner tribes involved in the Gold Ridge mine are also key landowners involved in the Tina River HDP. A wide range of stakeholders referenced the mine as empowering a few key individuals and entrenching disempowerment for the majority. Discussions found that landowners routinely blocked access to the mine site largely due to dissatisfaction with the implementation of land acquisition agreements.

2. ***Tina River HDP is making a significant effort to identify and engage customary land owners to avoid customary land-related disputes.*** Development of either private or public sector projects on customary land is extremely complicated because of Solomon Islanders' strong ties to their territory. Land plays a central role in their concept of identity and many landowners never fully accept the permanent alienation of their traditional land. Landowners have made demands for additional compensation or return of land even when land agreements have been negotiated and implemented using formal legal and customary channels and procedures.²⁹

Due to landowners' deep connections to customary land and prior experiences in the logging and mining sectors, Tina River HDP has adopted the underlying principle of "no loss" with respect to the project-affected landowners and communities. Under this principle, the Tina River HDP Project Office ensured that landowners were appropriately identified and become active participants in the project. This approach necessitates continuous cycles of interaction and consent over the life of the project to maintain community support rather than a one-off consent process.

As part of the process for identifying customary land owners and obligations of the land owners to other tribes, the Tina River HDP developed an indigenous terrain map of the core project land.^{30, 31} The core project land was acquired by the signing of the process

²⁵ D. Porter and M. Allen 2015

²⁶ WB Justice Delivered Locally (2013)

²⁷ WB Justice Delivered Locally (2013); Porter and Allen (2015)

²⁸ D. Porter and M. Allen (2015)

²⁹ Land and Conflict in the Pacific Region

³⁰ The indigenous terrain of a region is defined as an understanding of the specific area articulated in terms of the indigenous peoples themselves, their knowledge systems, social arrangements, and cultural values. THRDIP Indigenous Terrain Mapping Report 2011

³¹ Core land is defined as the area required to provide all things necessary for the construction and operation of the project, including the concrete dam, reservoir, headrace tunnel, power station, access road and transmission lines.

agreement (August 2014) with initially four identified tribes (Kochiabolo, Roha,³² Buhu-Garo and Viurulingi) as determined by the Commission of Lands under the Lands and Titles Act (1970).³³ A fifth tribe,³⁴ the Uluna-Sutahuri, was further determined by the Commission of Lands as a customary owner of the land on the right bank of the proposed reservoir. The Uluna-Sutahuri tribe was included in the process agreement and compensation negotiations. The Tina River HDP provided funds for a legal representative through the Landowner's Advocacy and Legal Support Unit of the Public Solicitor's Office, to deliver independent legal support to each tribe during the negotiations of the Process Agreement.

The process agreement includes provisions for the tribes to receive 1.5 percent royalty and under a joint-venture agreement, the SIG returned to the tribes 50 percent ownership in the acquired land through the Tina Core Land Company.³⁵ Under this agreement, K-Water will lease the land with revenue going to both the tribes and the SIG. At the end of the life of the project, the land will go directly back to the tribes.

As part of the process agreement, the Tina River HDP Project Office registered all land owners, men, women and children, and provided each with separate bank accounts for their compensation payments. The only transactions that are allowed from the children's accounts are for school fees. However, children will be able to access their account once they reach age 18. Other financial obligations including long term customary obligations to other tribes were taken into account during negotiations of the process agreement.

- 3. The SIG has designed the Tina River HDP to provide development and capacity building opportunities prior to, and during, project construction.** In addition to the customary landowners who will be compensated for the sale of their land under the process agreement,³⁶ there is a broader group of stakeholders living in the project area that is not included under the process agreement. Given the history of land-based conflicts, the SIG is committed to signaling to this group of stakeholders that they will not be left behind in the development of this project and that their living conditions will improve. It is planned that the SIG's initial investments in these communities will be expanded upon through a proposed WVB-managed trust fund grant. This grant would finance a stand-alone social development project, managed as a complementary project with the Tina River HDP. The estimated number of beneficiaries of the grant is 6,000 people (1,100 households) consisting

³² In June 2016, the Roha tribe received S\$6.9 million from the Solomon Islands Government as the first in a series of benefits agreed with the core landowning tribes under the Process Agreement. <http://www.tina-hydro.com/6793/government-hands-over-6-9-million-to-roha-tribe-for-tina-hydro/>

³³ The Lands and Titles Act regulates the process of acquiring customary land and converting it into registered land.

³⁴ All five tribes are descendants from the female lineage that originated from the mountainous interior and settled in their current locations.

³⁵ The Tina Core Land Company has not been established yet.

³⁶ The Land and Titles Act provides the compensation framework for land acquisition. The process agreement is a customized instrument that adds on top of that an agreement to pay royalties (1.5%), income from land lease, and some signing fees. Therefore, the process agreement provides additional benefits above and beyond payment for the purchase of land. The process agreement provides the written consent of the identified Core Land Tribes to proceed with a statutory acquisition process.

of the residents of the Malango and Bahomea cultural areas of the Malango Ward, including the five land owning tribes who are signatories to the process agreement as well as other Malango and Bahomea tribes and official 'settlers'. Although the grant proposal is still in the concept stage, it is expected that its main elements will be to: 1) establish the institutional arrangements and capacity for beneficiary communities to effectively manage a Fund comprised of benefit -sharing revenues from the Tina River HDP, 2) improve community infrastructure, and 3) support human resource development.

4. **Some community members continue to have concerns and questions about the Tina River HDP.** Although the Tina River HDP Project Office has been engaging with land owners and other project-affected communities since at least 2011, some community members continue to have outstanding questions about the project. Issues raised during the USAID meetings ranged from the safety of the dam to potential impacts on their livelihoods since they depend on the Tina River and surrounding forests to meet their daily needs.

Topics/questions raised from the two meetings with community stakeholders include:

- a. Dam safety – Community members' greatest fear is that the dam will break if there is an earthquake or significant weather event. Although the Project Office has shown communities pictures of the dam, some of the members of the community continue to have concerns about dam failure and felt that the Project Office did not fully inform them of the disadvantages of the dam. Although the Project Office advised them that the best company will build the dam so there should be no problems, they are still concerned because they do not know what to expect. Problems with leakage and overflow of the Gold Ridge tailing dam has also caused community members to be concerned about dam safety.³⁷
- b. Project benefits – including employment. Project staff has discussed project benefits but it is unclear to some community members what type of benefits they will receive or when the benefits will be received.
- c. Livelihoods – Some community members are still looking for answers about the project. A number of the discussants expressed that they do not know whether the project will bring good or bad experiences. Several members said they were sad since they believe their lives will change. They have been told that the dam is a better option compared to mining or logging. The women that the team spoke with have not been told about the various stages of the project, its timeline, or what the community should expect. The lack of information has raised unwarranted concerns as some members were aware of the access road survey and believed that its benefits were going to another community. The women are extremely interested in job opportunities from the project and potential possibilities of training.
- d. Consultations – The women expressed a desire for separate meetings to discuss the project. From their perspective, the men have already signed the project agreements, so there is nothing they can do. They do not feel they can express their concerns in a mixed consultation meeting.

³⁷ <http://www.sbs.com.au/news/article/2016/04/08/major-tailings-dam-spill-solomon-islands-disaster-gold-mine>

- e. Tina River – The community reports that the Tina River is for cooking, drinking, cleaning, watering poultry, swimming and transport of logs and crops. The Tina River is unpredictable with heavy rain in the upper catchment and flash flooding which has changed the river bed and also eliminated riverside garden areas. Flash floods have resulted in landslides, and logs and large rocks being brought down the river channel. Flooding has also replenished gardening plots. The Tina River is also mined for gravel extraction. Over time, due to heavy rainfall events and flash flooding, the course of the Tina River has significantly changed.
- f. Fishing – The community reports that there used to be more fishing in the river. Today, the fish are less abundant and only the children fish as sport. In one community, inhabitants reported that they eat fish daily, but that the fish are getting smaller compared to the past and that there are less shellfish.
- g. Forest – The forest around the Tina River is used by area residents to hunt wild pig, collect vines and material for building homes, and is a source of food and medicinal products.
- h. Small-scale timber milling - Logging and milling is a source of income for men. There is concern that the reservoir and reduced water levels will impact their ability to log and float timber down the Tina River. They used to mill timber in the core area, so this source of income will be impacted. Project staff has discussed the dam and low water flows and how this could impact their ability to float timber down the Tina River.

5. ***Solomon Islands Electricity Authority (SIEA) is broadening its energy resources beyond diesel to solar and co-generation.***³⁸ SIEA is committed to reducing the company's dependence on diesel fuel. SIEA is present in nine provinces and developing mixed generation capacities with solar power. SIEA has purchased four hectares (ha) of land near Honiara for a solar farm. Currently SIEA has installed one megawatt (MW) on 1.5 ha, with future plans to install additional panels to increase capacity up to four MW. The Honiara grid has the capacity to handle more than four MW of alternative energy sources. SIEA will purchase electricity from Tina River HDP at an annual rate, independent of the amount of electricity generated.

6. ***Government institutions are relatively young and ministries have limited capacity given their responsibilities.*** Since gaining independence in 1978, Solomon Islands government institutions are still developing their capabilities to address their broad mandates and the enormous geographical areas under their responsibility. For example, the Ministry of Environment's duties range from ESIA review of projects under the Environment Act to fulfilling the country's responsibilities under international agreements, e.g., United Nations Framework Convention on Climate Change and the Convention on Biological Diversity.

7. ***An independent Dam Safety Advisory Panel has been engaged early in the Tina River HDP process.*** As a requirement of OP/BP 4.37,³⁹ the Tina River HDP Project Office

³⁸ SIEA is responsible for generation, transmission and distribution.

³⁹ World Bank Safeguard Policy on Dam Safety
<https://policies.worldbank.org/sites/ppf3/PPFDocuments/090224b0822f8f35.pdf>

contracted three international independent dam safety experts to provide ongoing advice on technical aspects of the project. They have been involved in preparation of the Geotechnical Baseline Study and provided advice on the final preferred location of the dam site. The Panel will continue to advise the Project Office and the SIG through contracting, construction and initial operations.

8. ***The Tina River upper catchment is undisturbed primary montane forest with unique biodiversity. At least 75 percent of known species are endemic.*** At an altitude below 600 m, undisturbed primary lowland forest is the predominant habitat. Starting at 600 m, the Tina River upper catchment is undisturbed primary montane forest. The montane forest will not be directly impacted by the Tina River HDP.

The Tina River upper catchment is characterized by mountainous terrain, with peaks ranging from 800 meters above sea level (masl) to 2300 masl. Approximately 60 percent of the catchment is higher than 800 masl. The Tina River headwaters (270 masl), which are comprised of the junction of two main rivers: Vohara River and Mbeamea River and a minor tributary: Njarimbisu River, and the Becho River, a tributary of the Vohara, located further upstream.

UNESCO has identified the Mt. Popomanaseu region of Guadalcanal Province on its Tentative List of World Heritage Sites.⁴⁰ The Mt Popomanaseu region includes its nearby forest catchment and lowland valleys of the Tina River. The lowland riverine forests and montane forests, which make up this site, are intact. According to UNESCO, this site offers the best chance of conserving representative, distinctive and unique biodiversity. This area has outstanding biodiversity and a high proportion of endemic plants and wildlife (up to 75 percent of known species are endemic). The proposed World Heritage Site area supports the largest contiguous area of montane forests in the country. Because only limited surveys have been carried out, it is suspected that many of its species have not yet been identified. The American Museum of Natural History's Department of Conservation and Biodiversity has been active in carrying out biodiversity surveys in this region for several years.

Since the underlying principle of the Tina River HDP is "no loss" this implies the need to preserve access options to the upper catchment for landowners, with corresponding implications of how the catchment and the reservoir are managed. Increased access into the area via the access road and potential emergence of the dam and reservoir as destinations in and of themselves, with the potential for reservoir fisheries, will require intense efforts to protect the upper catchment from the encroachment of humans as well as invasive and feral species entering into the upper catchment.

The Ministry of Environment and the Tina River HDP Project Office continue to be interested in supporting customary land owners in the upper watershed to establish a protected area or reserve under customary ownership. Within the Protected Area Act, landowners must be in agreement, and studies should be conducted to provide information to landowners so they can make an informed decision. There have been a number of

⁴⁰ <http://whc.unesco.org/en/tentativelists/5416>

discussions with landowners to designate the upper watershed as a protected area. Reportedly, one tribe is particularly interested in moving forward with protecting the upper catchment.

The area proposed for this designation could start upstream from the dam, including the reservoir and the entire upper Tina River catchment, which covers 125km². The main purpose would be to conserve biodiversity and maintain the integrity of the upper Tina River catchment by excluding the area from all logging and mining activities, and other non-traditional uses and actions to prevent increased use of resources (e.g., fisheries) and the spread of invasive and feral species. Activities would need to be managed to prevent over exploitation of the resources - e.g., increased fishing or hunting pressure.

9. **Invasive and feral species are major threats to the biodiversity of the upper Tina River catchment.** The access road and increased human movement will result in increased access to the upper watershed for invasive and feral species. Invasive species have demonstrated the ability to outcompete native species, resulting in eventual population extermination. Feral cats are reported to be present in the upper catchment, presenting a known significant impact on ground-dwelling mammals and bird species.⁴¹
10. **The majority of the fish species in the Solomon Islands depend on ‘ridge-to-reef’ migratory corridors to complete their life cycle.** The majority of fish species in the Solomon Islands depend on the ‘ridge-to-reef’ migratory corridors to complete their life cycle. The two main categories of fish found in the Tina River system are amphidromous⁴² and catadromous⁴³ species. The loss of the ‘ridge-to-reef’ migratory corridors through disruption of surface water connectivity and in-stream habitat degradation can significantly impact aquatic species.⁴⁴

From the confluence of the Tina and Toni rivers, the river becomes the Ngalimbiu River, which flows through a populated coastal plain before discharging into Tenaru Bay. The mouth of the Ngalimbiu River is important habitat for Tina River aquatic species that transit the area to reach the sea as part of their life cycles. It also provides a temporary feeding habitat for marine species that enter the mouth and lower reach of the river. Consequently, the shore along the mouth of the Ngalimbiu River is an important fishing location due to the concentration of adult and juvenile fish species entering its lower section.

About 30 fishermen from Komporo and other coastal villages are working at the mouth of the river. Every month, when full moon and sun meet at the dawning of a day, the fishers

⁴¹ <http://www.nature.com/articles/ncomms2380>; <http://www.environment.gov.au/system/files/resources/34ae02f7-9571-4223-beb0-13547688b07b/files/cat.pdf>

⁴² Amphidromous species move between fresh and saltwater habitats at some point in their lifecycle, other than for the purposes of spawning.

⁴³ Catadromous species live in freshwater as adults, migrate to the ocean to breed and juveniles return to freshwater.

⁴⁴ <http://www.int-res.com/abstracts/esr/v16/n3/p261-272/>

await massive migrations of juvenile fish entering into the river. In the upstream reach, increased catches have been observed during these periods. Apart from juveniles, large specimens of marine forms and eels reaching maturity that migrate to the upper reaches are targeted.

The Tina River drains a larger catchment area and flows faster and carries more sediment than the Toni River. The Toni River is a much smaller river flowing from an elevation of 600 masl⁴⁵ to 200 masl, with a catchment area of roughly 45km² and flows that are one-third that of the Tina River. Surveys conducted for the Tina River HDP ESIA has shown that the Toni River contains more fish which is attributed to its slower flow, providing better habitat for a number of fish species. Community members stated that although there are not many fish in the river now, in the past there were lots of fish. The reduction of fish is attributed to more people fishing and more intense flooding of the river.

Based on the findings, the following recommendations are proposed:

- 1. Provide consistent communication and realistic information to stakeholders on the timeline for project development.** Despite the outreach the Tina River HDP Project Office has done to date, there are still perceived gaps in communication and information sharing with communities. This recommendation is based on limited discussions with Tina River HDP stakeholders and experience from other site visits to MDB-financed hydropower projects. The questions raised during discussions highlight how critical it is for communities to understand the complexities of developing a hydropower project of this size, With the public release of the ESIA and LALRP, the Tina River HDP has an opportunity to assist K-Water in the development of a community consultation and participation plan and re-engage communities on the pre-project investments the SIG is undertaking.
- 2. Establishing the Tina River upper catchment as a protected area.** It will be critical for the long term viability of the Tina River HDP to protect the supply of water from the upper catchment and avoid economic undertakings (e.g., mining, logging) that would negatively impact the area and counteract the Tina River HDP's mitigation measures. With the support of the WBG and other donors, the SIG, specifically the Ministry of Environment, should re-engage with the Uluna-Sutahuri tribe as a major customary landowner in the upper catchment and begin the process of designating the upper catchment as a protected area under customary ownership. Since the Uluna-Sutahuri tribe is already included under the Tina River HDP process agreement, the potential of providing benefit shares upstream of the reservoir to maintain the watershed should be explored.

Another option to explore would be using the Forests Act to declare all areas of the upper watershed above 400 meters altitude as a forest reserve. This would legally prevent any timber licensing in those areas, and does not require landowner consent. The success of designating the upper watershed as either a Protected Area or forest reserve would require

⁴⁵ (masl) - meters above sea level

the SIG to cancel the exploration and mining tenement leases in most, if not all, of the Tina River upper catchment.

Prior to respective MDB board dates for project financing, a commitment with corresponding timeline and resources should be included as part of the proposed project for the establishment of the upper catchment as a protected area, declaring areas above 400-m altitude as a forest reserve and cancellation of the exploration and mining tenement leases.

3. **Expand baseline data and monitoring of fisheries and other indicators (e.g., riverine birds, human fishing effort) in and above the reservoir.** This recommendation is intended to support Tina River HDP's assessment of the effectiveness of the fish transfer and survival rates of their proposed mitigation measures during project operations. The monitoring efforts will also provide information to help determine the extent and impacts of increased access to the upper catchment by human, invasive and feral species and the information necessary to propose further adaptation measures or identify other stakeholders to cooperate with to mitigate impacts.
4. **Expand biological baseline data and monitor the mouth of Ngalimbiu River.** Due to the critical importance of this area for aquatic species, more detailed baseline data⁴⁶ should be collected and subsequently monitored during all phases of the project. This additional data and monitoring would complement the ESIA recommendation to monitor for heavy metal/pesticide toxicity. Expanding the baseline data and monitoring efforts could provide important information that the project could use to determine potential causes of impacts downstream of the project and help inform adaptive management measures. It is recommended that the same monitoring program be conducted on the Toni River to serve as a control for construction and operation of the Tina River HDP and verify assumptions in the ESIA.

The importance of the Toni River for maintaining healthy aquatic populations is especially important during the construction period and until mitigations measures for aquatic species movement above the dam are determined to be successful, therefore any future development in the Toni watershed should be limited. Because the Gold Ridge mine lease overlaps with the middle section of the Toni River watershed, and overlays much of the Tina/Ngalimbiu River watershed near the Tina/Toni river confluence, it will be important for the SIG to cancel the mine lease in this section to avoid any future cumulative impacts.

5. **Support SIG monitoring efforts of the Tina River HDP through engagement of specific SIG ministries, community members and other resources.** It will be important to engage both the Ministry of Environment and Ministry of Forest given their ability to provide key support for environmental monitoring during construction and operation of the Tina River HDP. Through providing additional support, both Ministries

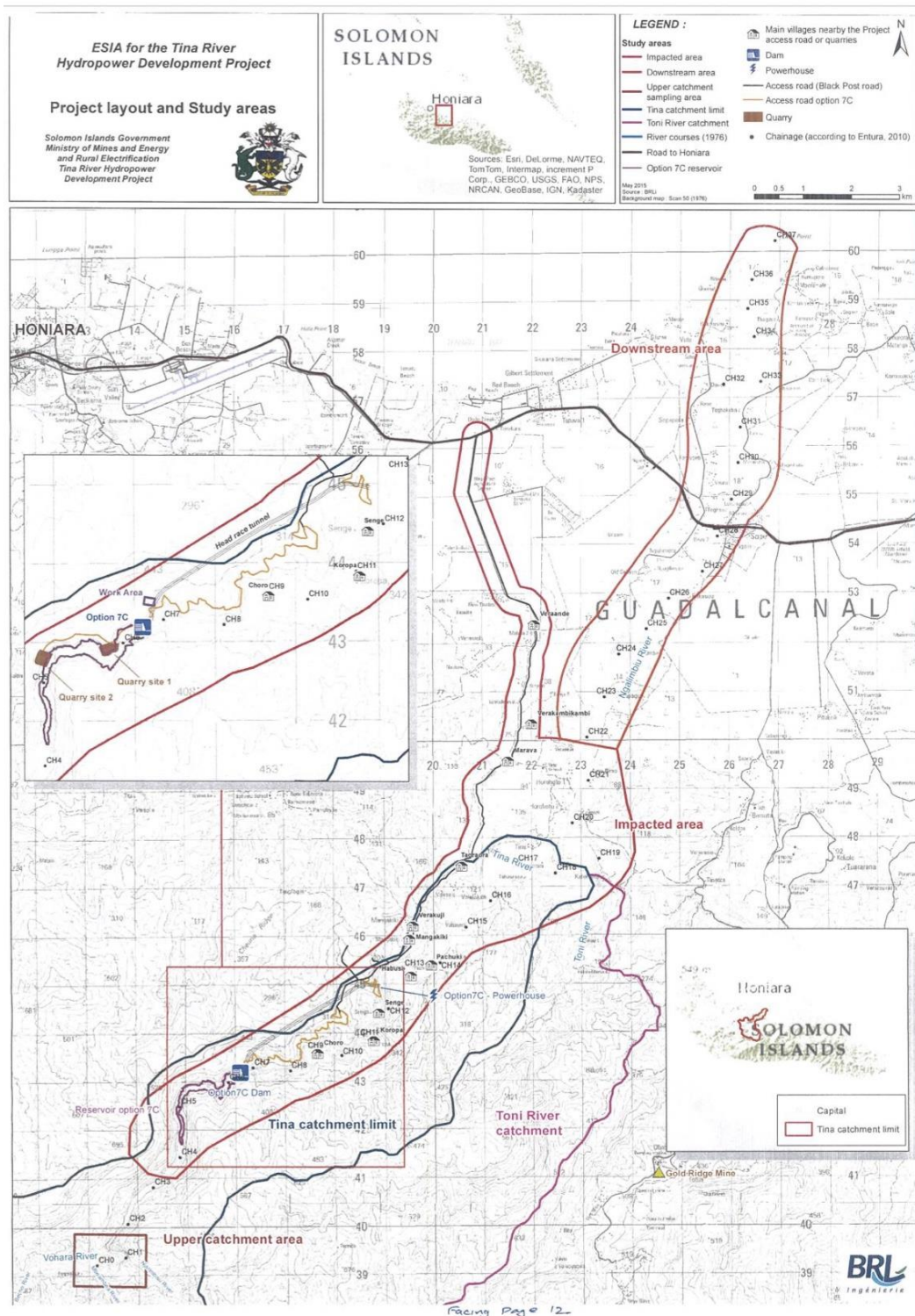
⁴⁶ Additional baseline data would include a survey of the estuary, including species beyond fisheries, collect core sedimentation samples to identify the majority of taxa, assess nutrient flow, calculate the river flow at the delta, sedimentation and fishing effort.

could conduct the monitoring efforts as well as help the community members' participation in monitoring programs. Early efforts by Tina River HDP to work with the community on water quality monitoring could be expanded.

6. **Develop a robust program during operation phase to prevent the spread of invasive and feral species into the upper catchment.** It will be important for the Ministry of Environment and the Ministry of Forest to engage customary landowners to develop an invasive species strategy and management program comprising the following elements: prevention; early detection and rapid response; control and management; and rehabilitation and restoration. The program should be implemented as soon as possible in coordination with Tina River HDP.
7. **Additional environmental and social recommendations.** USAID technical staff are continuing to review the ESIA and the LALRP. The review will assess whether the following elements have been considered and addressed:
 - Assessment of environmental flows of water;
 - Selection of representative aquatic species to gain a better understanding of their life cycles and habitat requirements;
 - Mitigation measures for aquatic species during construction;
 - Mitigation measures for controlling sediment during construction;
 - Assessment of cumulative impacts of increased sediment during construction combined with sediment due to rain and small-scale logging practices;
 - Assessment of ecosystem services;
 - Assessment of geology and impacts of headrace tunnel on water systems;
 - Assessment of seismic activity potential risks to the Tina River HDP;
 - Assessment of climate change impacts on the Tina River HDP;
 - Establishment of fisheries management plan for the Tina/Ngalimbiu River watershed and Tenaru Bay; and
 - Financial provisions for decommissioning the Tina River HDP with concurrent river and habitat restoration measures.

ANNEX I

Figure 2-1 Map of project area



(Map obtained from the Tina River HDP ESIA, August 2016)