

## PERFIL DE PROYECTO (PP)

### COSTA RICA

#### I. DATOS BÁSICOS

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      |                            |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------|
| <b>Nombre del Proyecto:</b> | Programa de Desarrollo Eléctrico - Proyecto Hidroeléctrico Reventazón (PHR) - Segunda Operación individual bajo la Línea de Crédito Condicional para Proyectos de Inversión CR-X1005                                                                                                                                                                                                                                                                                                                    |      |                            |
| <b>Número del Proyecto:</b> | CR-L1049                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      |                            |
| <b>Equipo de Proyecto:</b>  | Carlos Trujillo (INE/ENE) y Jorge Mercado (INE/ENE), Jefes de Equipo; Alejandro Melandri (INE/ENE); José Ramon Gómez (ENE/CCO); Enrique Rodríguez (ENE/CCR); Toshitaka Takeuchi (INE/ENE); Arturo Alarcón (INE/ENE); Marcelo Valenzuela (ENE/CCR); Emmanuel Boulet (VPS/ESG); María Cristina Landázuri (LEG/SGO); Gian Franco Carassale (SCF/INF); Andrés Suarez (PDP/CCR); y Willy Bendix (PDP/CCR); bajo la supervisión de Leandro Alves, Jefe (INE/ENE) y Fernando Quevedo, Representante (CID/CCR). |      |                            |
| <b>Prestatario:</b>         | Instituto Costarricense de Electricidad (ICE)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                            |
| <b>Garante:</b>             | República de Costa Rica                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |      |                            |
| <b>Organismo Ejecutor:</b>  | Instituto Costarricense de Electricidad (ICE)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |      |                            |
| <b>Plan Financiero:</b>     | BID-CO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | US\$ | 175 millones               |
|                             | ICE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | US\$ | 215 millones               |
|                             | Otros cofinanciamientos <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | US\$ | 670 millones               |
|                             | <b>Costo Total del Proyecto</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |      | <b>US\$ 1.060 millones</b> |
| <b>Salvaguardas:</b>        | Políticas identificadas: B.01-OP-710; B.01-OP-704; B.01-OP-102; B1, B.02, B.03, B.06, B.07, B.09, B.11, B.12, B.17 -OP703<br>Clasificación: Categoría A                                                                                                                                                                                                                                                                                                                                                 |      |                            |

#### II. JUSTIFICACIÓN GENERAL Y OBJETIVOS

##### A. El Sector Eléctrico en Costa Rica

- 2.1 El sector eléctrico de Costa Rica se caracteriza por una amplia participación del Estado en los roles de política, planeación y regulación, así como en el de operación. El Instituto Costarricense de Electricidad (ICE) es responsable por el desarrollo de los recursos hidroeléctricos y geotérmicos, por la planificación de la expansión y la operación del sistema interconectado, por la red de transmisión, y por la distribución en la mayor parte del país. La definición de políticas y planes del sector energía es responsabilidad de la Dirección Sectorial de Energía (DSE), adscrita al Ministerio de Ambiente, Energía y Telecomunicaciones (MINAET). La Autoridad Reguladora de los Servicios Públicos (ARESEP) es responsable de la fijación de las tarifas del servicio público de electricidad, de acuerdo con el principio de servicio al costo, entendido como el costo de oportunidad social de largo plazo de los servicios, y considerando criterios de eficiencia económica, equidad social, sostenibilidad ambiental y conservación de los recursos.
- 2.2 Costa Rica ha mantenido una alta participación de energía renovable. En 2009, la capacidad instalada de generación era 2,476-Mega-watts (MW), de los cuales 72% eran renovables y 28% térmicos, fundamentalmente de reserva, para atender una demanda de

<sup>1</sup>

ICE ha solicitado al BID financiamiento adicional mediante una operación *Non-Sovereign Guarantee* (NSG, sin garantía soberana) por US\$200 millones y se espera que otros organismos cofinanciarán US\$470 millones. La elegibilidad de la operación NSG será considerada en un Perfil de Proyecto (PP) separado.

1,467 MW. La generación efectiva fue de 9,235.9-Gigawatts hora (GWh), un 94,5% proveniente de fuentes renovables y un 5,5% de fuentes térmicas. Actualmente ICE y la Compañía Nacional de Fuerza y Luz (CNFL), en la cual el ICE posee 98%, son dueños y operan el 100% de la red de transmisión nacional, y atienden aproximadamente el 80% del mercado de electricidad. ICE es responsable por el planeamiento operativo y la operación del sistema eléctrico nacional. ICE es igualmente responsable por garantizar un adecuado equilibrio entre la oferta y la demanda de la electricidad, para lo cual prepara periódicamente el Plan de Expansión de la Generación Eléctrica (PEG).

- 2.3 Costa Rica tuvo un crecimiento económico sostenido en las últimas décadas, que se reflejó en el crecimiento de la demanda por electricidad. Se estima que la economía creció cerca del 4,3% en el 2010 y continuará creciendo sostenidamente a partir del 2011, generando un rápido crecimiento en la demanda de energía. El PEG 2010-2021 asume una recuperación rápida de la economía, y propone adicionar entre el 2010 y el 2019 una capacidad neta de generación de 2.000-MW, 92% en energía renovable, para atender un crecimiento de la demanda de electricidad de 5,3% por año a partir del 2011. Los proyectos más importantes considerados en el PEG son el Proyecto Hidroeléctrico Reventazón (PHR) (305-MW) y el Proyecto Hidroeléctrico El Diquís (631-MW).
- 2.4 **Estrategia del País.** Con base en la situación energética actual de Costa Rica y en el contexto internacional, el Gobierno de Costa Rica (GdCR) ha propuesto una nueva política energética<sup>2</sup>, que en líneas generales mantiene la promoción al uso de energías limpias, a la vez que se concentra en la promoción de la Eficiencia Energética (EE) y el uso de “energéticos locales”, como biodiesel y alcohol, para reemplazar combustibles fósiles importados. Asimismo, esta política energética propone una reorientación de las instituciones del sector energía para hacerlas más competitivas. En el sector eléctrico en particular, se prevé que el ICE continúe con su rol de generador estratégico.
- 2.5 **Estrategia del Banco Interamericano de Desarrollo (BID) con el País.** La estrategia del BID con Costa Rica para el período 2011-2014<sup>3</sup> considera entre sus objetivos para el sector eléctrico el fortalecimiento del marco institucional y regulatorio del sector, así como el apoyo al desarrollo de la capacidad instalada de generación eléctrica y la consolidación de la sostenibilidad de la matriz energética. Asimismo, la presente operación contribuirá al logro de las metas de “Financiamiento para los países pequeños y vulnerables”, “Financiamiento para respaldar iniciativas sobre cambio climático, energía sostenible y sostenibilidad ambiental”, y “Financiamiento para respaldar la cooperación e integración regionales” del Noveno Aumento General de Recursos (GCI-9)<sup>4</sup> del BID.
- 2.6 **Experiencia del BID en el Sector Eléctrico de Costa Rica:** La acción del BID en el sector ha estado concentrada en los últimos años en apoyar el proceso de fortalecimiento y modernización emprendido por el GdCR para adaptar al ICE a los cambios en el régimen legal de electricidad y telecomunicaciones, con el fin de que pueda competir en igualdad de condiciones con otros operadores en un mercado regulado, transformándola en una empresa estatal con gobierno corporativo independiente, administrada con

<sup>2</sup> “Hacia un nuevo modelo energético para nuestro país”, MINAET, San José, Costa Rica 7 de julio, 2010.

<sup>3</sup> Estrategia del BID con Costa Rica 2011-2014 - (Documento en preparación).

<sup>4</sup> Informe sobre el Noveno Aumento General de Recursos del Banco (AB-2764).

carácter empresarial. La estrategia apoya una migración gradual del ICE para reducir su dependencia de los financiamientos con *Sovereign Guarantee* (SG, garantía soberana) y se facilite su acceso al financiamiento en los mercados de capitales nacionales e internacionales, en condiciones y plazos adecuados a sus requerimientos. La estrategia incluyó dos operaciones: (i) una *Conditional Credit Line for Investment Projects* (CCLIP, Línea Condicional de Crédito para Proyectos de Inversión) (CR-X1005) por un monto de hasta US\$500 millones, para financiar inversiones del ICE que permitirán recuperar el rezago en el sector eléctrico; y (ii) un financiamiento NSG (CR-L1012) por US\$381 millones destinada a mejorar el perfil de deuda del ICE, mediante la refinanciación de saldos de deuda, el cual ya fue totalmente desembolsado. Además se ha apoyado la participación del ICE en el proyecto regional: Sistema de Interconexión Eléctrica de los Países de América Central (SIEPAC).

- 2.7 Con cargo a la línea CCLIP CR-X1005 y conjuntamente con el establecimiento de la misma, en el 2007 se aprobó una Primera Operación individual por US\$250 millones (CR-L1009) para cooperar en la ejecución del Programa de Desarrollo Eléctrico 2008-2011<sup>5</sup>. La ejecución de la primera operación individual avanza satisfactoriamente, el desempeño del Organismo Ejecutor no se ha deteriorado y se prevé que se alcancen sus objetivos. Al 31 de enero del 2011 se ha desembolsado el 6,3% y se ha comprometido el 46,1% del financiamiento. El ICE y el Ministerio de Hacienda de Costa Rica<sup>6</sup>, han solicitado al BID una Segunda Operación individual bajo la línea CCLIP CR-X1005 para financiar inversiones del PHR, proponiendo una estructuración financiera que pueda captar una porción importante de recursos de financiamiento NSG, incluyendo un préstamo adicional del BID, como se plantea más adelante. El financiamiento del Proyecto PHR es consistente con el Objetivo de la Línea CCLIP CR X1005 y está incluido en el plan de inversiones del Prestatario para el sector de electricidad.

## B. Objetivos y Resultados Esperados

- 2.8 El objetivo de la presente operación es contribuir a atender el crecimiento de la demanda de energía eléctrica, manteniendo niveles adecuados de calidad, confiabilidad y costo, mediante el financiamiento del PHR.
- 2.9 El PHR se localiza en la cuenca media del Río Reventazón, 8-kilometros (km) al suroeste de Siquirres (Provincia de Limón, costa atlántica). El diseño del PHR incluye la construcción de una presa de 130-metros (m) de altura, un embalse de 8-km cuadrados (km<sup>2</sup>) de superficie, un túnel de desvío y la construcción de la casa de máquinas. El PHR involucra un desvío del río de 4,2-km. El PHR tendrá una capacidad instalada de 305,5-MW, incluyendo 13,5-MW en una mini-central al pie de presa que aprovechará el caudal de compensación del río de 15m<sup>3</sup>/s. La generación media anual es de 1.572,8-GWh, incluyendo la planta principal y la mini-central. El factor de planta promedio es de 0,59. EL ICE ha iniciado la construcción del PHR en Septiembre del 2009 y a la fecha lleva un avance ponderado del 15%. La meta es que el PHR entre en operación en enero del 2016.
- 2.10 **Estructura de Financiamiento.** El ICE ha estimado que el costo total del PHR, incluyendo provisiones para escalamiento y costos financieros es de US\$1.060 millones. El ICE presentó al BID una solicitud de financiamiento del PHR, dividiendo la misma en

<sup>5</sup> Contrato de Préstamo 1908/OC-CR declarado elegible para desembolsos en julio 24 del 2010.

<sup>6</sup> Comunicación del Ministerio de Hacienda DM-4025-2010 del 17 de Noviembre del 2010.

dos porciones: (i) un financiamiento SG bajo la Línea CCLIP CR-X1005 a ser otorgado al ICE, objeto de este PP; y (ii) un financiamiento NSG por US\$200 millones (PP separado). Para la ejecución del PHR se propone que una porción sea ejecutada directamente por el ICE, y una segunda sea ejecutada utilizando la figura de un Fideicomiso. Esta última figura presenta importantes ventajas desde el punto de vista financiero (poder recuperar un monto mayor del costo por medio de las tarifas) y de ejecución de la obra. La misma ha sido utilizada con éxito en varios proyectos de generación en el pasado (Garabito, Angostura y Las Pailas). La contrapartida local será provista por el ICE, y se estima en US\$215 millones. El financiamiento del remanente de recursos necesarios para completar el PHR, se obtendría a través de préstamos al Fideicomiso por aproximadamente US\$470 millones. En conversaciones preliminares varias instituciones han manifestado su interés en participar en el financiamiento.

### III. SALVAGUARDIAS AMBIENTALES Y SOCIALES Y ASPECTOS FIDUCIARIOS

- 3.1 **Aspectos Fiduciarios.** El ICE tiene amplia experiencia con préstamos previos del BID al sector eléctrico, empezando en los años 60. El ICE ha mostrado ser una institución madura, con una capacidad sólida de ejecución de proyectos y programas complejos, administrando programas de financiamiento externo. Aunque no se prevén riesgos importantes para la ejecución, se contratarán los servicios de consultoría de una firma (Ingeniero Independiente) para revisar el estudio de factibilidad del PHR, con particular énfasis en los aspectos relativos a las características de diseño de la presa; la estimación de costos y presupuesto del PHR; el esquema de ejecución y paquetes de licitación; el avance en los trabajos u obras ya realizadas o en curso por parte ICE.
- 3.2 **Impactos Ambientales y Sociales.** La Evaluación de Impacto Ambiental (EIA) del PHR (sin incluir la línea de transmisión) fue presentada y aprobada por la Secretaría Técnica Nacional Ambiental (SETENA) en el 2009. Una *Environment and Social Strategy* (ESS, Estrategia Ambiental y Social) ha sido elaborada sobre la base de la información disponible en el EIA. El PHR ha sido clasificado como de categoría A de acuerdo con la Política de Salvaguardias Ambientales y Sociales (OP-703).
- 3.3 Además de los efectos típicos y los riesgos asociados a las obras civiles para la construcción de un gran proyecto de infraestructura, los principales impactos ambientales y sociales y riesgos se refieren a: (i) los posibles efectos adversos directos en los hábitats naturales y en particular sobre las especies de peces migratorios que se encuentran en el área de influencia del PHR; (ii) los posibles efectos directos e indirectos (cambios en la hidrología y el régimen de los sedimentos) aguas abajo de casa de máquinas y en la costa norte y sur de la desembocadura del Río Reventazón, en particular, en el Parque Nacional Tortuguero, un destino internacional de ecoturismo y importante área de anidación de caguamas y tortugas verdes de mar; (iii) los posibles efectos sociales adversos asociados con la adquisición de tierra a gran escala (aunque no se espera desplazamiento físico), y los efectos directos de la construcción del PHR y el funcionamiento de las actividades de ecoturismo en la zona (rafting); y (iv) los impactos acumulativos relacionados con el funcionamiento de las centrales hidroeléctricas de Angostura, Cachi y PHR. La Política de Gestión del Riesgo de Desastres (OP-704) también se ha disparado en relación a la altura de la presa, la capacidad de almacenamiento del embalse, y la actividad volcánica y posibles deslizamientos de tierra en la zona del embalse.

- 3.4 Los principales impactos ambientales y sociales y los riesgos no son suficientemente evaluados en el EIA y se requiere: (i) la realización de otros estudios de evaluación de impacto (por ejemplo modelización de los efectos aguas abajo, los impactos acumulativos); (ii) desarrollo de planes de gestión adicionales (por ejemplo, adquisición de tierras y el plan de trabajo); y (iii) el análisis más a fondo durante la evaluación de la operación. Además, aunque las actividades previas a la construcción están actualmente en curso, aún no se han desarrollado Planes detallados de Gestión Ambiental y Social (PGASs) para la construcción. De un análisis preliminar<sup>7</sup>, el ICE parece tener buena capacidad interna y un fuerte compromiso para hacer frente a estos impactos ambientales y sociales y los riesgos en línea con las mejores prácticas internacionales.

#### IV. ASPECTOS ESPECIALES

- 4.1 Como se informó al Directorio Ejecutivo del Banco cuando se aprobaron el establecimiento de la Línea CCLIP (CR-X1005) y la Primera Operación bajo dicha Línea, se anticipa que para esta Segunda Operación también será necesaria una excepción a la Política de Garantías Requeridas al Prestatario (OP-303) relativas al aporte local y a la debida ejecución del proyecto en vista que la República de Costa Rica solo garantizará las obligaciones de pago del préstamo, incluidos interés y comisiones.
- 4.2 Se anticipa igualmente que será necesario solicitar una dispensa para presentar esta Segunda Operación individual bajo la Línea CCLIP CR-X1005 para la aprobación del Directorio Ejecutivo, por no haberse alcanzado aún los porcentajes requeridos de desembolso o compromiso establecidos como criterio para procesar una segunda operación individual bajo una línea CCLIP con un mismo Organismo Ejecutor en un mismo sector (GN-2246-4).
- 4.3 Un aspecto especial de la estructuración del financiamiento NSG, es que sea necesario para el Fideicomiso tener acceso a hacer uso de los activos financiados al ICE con esta Segunda Operación individual, para lo cual debido a la cláusula de compromiso sobre gravámenes, podría llegar a ser necesario que el Prestatario constituya al mismo tiempo un gravamen que garantice al BID, en un pie de igualdad y proporcionalmente, el cumplimiento de las obligaciones que el Prestatario asumirá en el Contrato de Préstamo.

#### V. RECURSOS Y CRONOGRAMA

- 5.1 En el Anexo V se detalla el cronograma con los hitos que permitirían que la fecha de aprobación del Borrador de Propuesta de Préstamo por el *Operation Policy Committee* (OPC) sea a fines del primer semestre del 2011, a fin de completar la preparación del PHR y ser consistentes con las expectativas del Prestatario. El mismo anexo especifica los costos administrativos de preparación del PHR los cuales ascienden a US\$60.648, que incluyen US\$30.648 destinados a misiones y US\$38.000 destinados a consultorías de apoyo a la preparación del PHR, Las actividades de Evaluación Técnica y de Ingeniería; Estudios Ambientales Complementarios; Evaluación de Mercado y Análisis financiero; y revisión del Plan de Acción de Gobierno Corporativo serán incluidas en un Insumo Operacional como parte de la elegibilidad de la operación NSG.

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<sup>7</sup>

Visita de enero de 2010, y discusiones con el equipo ambiental del ICE que está trabajando en el PHR.

**Costa Rica**

**Segundo Préstamo Línea CCLIP Programa de Desarrollo Eléctrico**

**Proyecto Hidroeléctrico Reventazón - PHR**

**(CR-L1049)**

**Anexo I**

**Matriz de la Efectividad en el Desarrollo**

**Para Uso Interno del Banco**

## SAFEGUARD POLICY FILTER REPORT

This Report provides guidance for project teams on safeguard policy triggers and should be attached as an annex to the PP (or equivalent) together with the Safeguard Screening Form, and sent to ESR.

1. Save as a Word document. 2. Enter additional information in the spaces provided, where applicable. 3. Save new changes.

|                            |                                        |                                                         |
|----------------------------|----------------------------------------|---------------------------------------------------------|
| <b>PROJECT<br/>DETAILS</b> | <b>IDB Sector</b>                      | ENERGY                                                  |
|                            | <b>Type of Operation</b>               | Conditional Credit Line for Investment Projects (CCLIP) |
|                            | <b>Additional Operation Details</b>    |                                                         |
|                            | <b>Investment Checklist</b>            | Power Thermal                                           |
|                            | <b>Team Leader</b>                     | Alves, Leandro Feliciano<br>(LEANDROA@iadb.org)         |
|                            | <b>Project Title</b>                   | Proyecto Hidroelectrico Reventazon                      |
|                            | <b>Project Number</b>                  | CR-L1049                                                |
|                            | <b>Safeguard Screening Assessor(s)</b> | Boulet, Emmanuel Andre<br>(EMMANUELB@iadb.org)          |
|                            | <b>Assessment Date</b>                 | 2010-12-08                                              |
|                            | <b>Additional Comments</b>             |                                                         |

|                                                    |                                                |                                                                                                                                                                  |                                                |
|----------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| <b>SAFEGUARD<br/>POLICY<br/>FILTER<br/>RESULTS</b> | <b>Type of Operation</b>                       | Loan Operation                                                                                                                                                   |                                                |
|                                                    | <b>Safeguard Policy Items Identified (Yes)</b> | Potential disruption to people's livelihoods living in the project's area of influence (not limited to involuntary displacement, also see Resettlement Policy.)  | (B.01) Resettlement Policy– OP-710             |
|                                                    |                                                | Activities to be financed in the project area are located within a geographical area or sector exposed to natural hazards (Type 1 Disaster Risk Scenario).       | (B.01) Disaster Risk Management Policy– OP-704 |
|                                                    |                                                | The operation itself has a potential to exacerbate hazard risk to human life, property, the environment or the operation itself (Type 2 Disaster Risk Scenario). | (B.01) Disaster Risk Management Policy– OP-704 |

|  |  |                                                                                                                                                                                                                                                             |                                                 |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
|  |  | The Bank will make available to the public the relevant Project documents.                                                                                                                                                                                  | (B.01) Disclosure of Information Policy– OP-102 |
|  |  | The operation is in compliance with environmental laws and regulations of the country where the operation is being implemented (including national obligations established under ratified Multilateral Environmental Agreements).                           | (B.02)                                          |
|  |  | The operation (including associated facilities) will be screened and classified according to their potential environmental impacts.                                                                                                                         | (B.03)                                          |
|  |  | Consultations with affected parties will be performed and considerations of their views will be taken into account.                                                                                                                                         | (B.06)                                          |
|  |  | The Bank will monitor the executing agency/borrower's compliance with all safeguard requirements stipulated in the loan agreement and project operating or credit regulations.                                                                              | (B.07)                                          |
|  |  | Environmental or culturally sensitive areas, defined in the Policy as critical natural habitats or critical cultural sites in project area of influence (please refer to the <a href="#">Integrated Biodiversity Assessment Tool</a> for more information). | (B.09)                                          |
|  |  | Conversion of Natural Habitats in project area of influence (please refer to the <a href="#">Integrated Biodiversity Assessment Tool</a> for more information).                                                                                             | (B.09)                                          |
|  |  | The operation has the potential to pollute the environment (e.g. air, soil, water, greenhouse gases...).                                                                                                                                                    | (B.11)                                          |
|  |  | The operation is already <a href="#">under construction</a> by the Executing Agency or the Borrower.                                                                                                                                                        | (B.12)                                          |

|  |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |
|--|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
|  |                                            | Suitable safeguard provisions for procurement of goods and services in Bank financed projects may be incorporated into project-specific loan agreements, operating regulations and bidding documents, as appropriate, to ensure environmentally responsible procurement.                                                                                                                                                                                                                                                               | (B.17) |
|  | <b>Potential Safeguard Policy Items(?)</b> | No potential issues identified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |
|  | <b>Recommended Action:</b>                 | <p>Operation has triggered 1 or more Policy Directives; please refer to appropriate Directive(s). Complete Project Classification Tool. Submit Safeguard Policy Filter Report, PP (or equivalent) and Safeguard Screening Form to ESR.</p> <p>The project triggered the Disaster Risk Management policy (OP-704).</p> <p>A more limited and specific Disaster Risk Assessment (DRA) may be required (see Directive A-2 of the DRM Policy OP-704). Please contact a Natural Disaster Specialist in VPS/ESG or INE/RND for guidance.</p> |        |
|  | <b>Additional Comments:</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |

|                         |                                                |                                             |
|-------------------------|------------------------------------------------|---------------------------------------------|
| <b>ASSESSOR DETAILS</b> | <b>Name of person who completed screening:</b> | Boulet, Emmanuel Andre (EMMANUELB@iadb.org) |
|                         | <b>Title:</b>                                  |                                             |
|                         | <b>Date:</b>                                   | 2010-12-08                                  |

## SAFEGUARD SCREENING FORM

This Report provides a summary of the project classification process and is consistent with Safeguard Screening Form requirements. The printed Report should be attached as an annex to the PP (or equivalent) and sent to ESR.

1. Save as a Word document. 2. Enter additional information in the spaces provided, where applicable. 3. Save new changes.

|                        |                                        |                                                         |
|------------------------|----------------------------------------|---------------------------------------------------------|
| <b>PROJECT DETAILS</b> | <b>IDB Sector</b>                      | ENERGY                                                  |
|                        | <b>Type of Operation</b>               | Conditional Credit Line for Investment Projects (CCLIP) |
|                        | <b>Additional Operation Details</b>    |                                                         |
|                        | <b>Country</b>                         | COSTA RICA                                              |
|                        | <b>Project Status</b>                  |                                                         |
|                        | <b>Investment Checklist</b>            | Power Thermal                                           |
|                        | <b>Team Leader</b>                     | Alves, Leandro Feliciano<br>(LEANDROA@iadb.org)         |
|                        | <b>Project Title</b>                   | Proyecto Hidroelectrico Reventazon                      |
|                        | <b>Project Number</b>                  | CR-L1049                                                |
|                        | <b>Safeguard Screening Assessor(s)</b> | Boulet, Emmanuel Andre<br>(EMMANUELBA@iadb.org)         |
|                        | <b>Assessment Date</b>                 | 2010-12-08                                              |
|                        | <b>Additional Comments</b>             |                                                         |

|                                       |                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                |
|---------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <b>PROJECT CLASSIFICATION SUMMARY</b> | <b>Project Category:</b><br>A      | <b>Override Rating:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Override Justification:</b> |
|                                       |                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Comments:</b>               |
|                                       | <b>Conditions/ Recommendations</b> | <ul style="list-style-type: none"> <li>Category "A" operations require an Environmental Impact Assessment or a Strategic Environmental Assessment (see Environment Policy Guideline: Directive B.5 for EIA and SEA requirements) and at least two consultations with affected parties.</li> <li>These operations will require an environmental assessment (EA), normally an Environmental Impact Assessment (EIA) for investment operations, or other environmental assessments such as a Strategic Environmental Assessment (SEA) for programs and other financial operations that involve plans and policies. Category "A" operations are considered high safeguard risk. For some high</li> </ul> |                                |

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|  |  | <p>safeguard risk operations that, in the Bank's opinion raise complex and sensitive environmental, social, or health and safety concerns, the borrower should normally establish an advisory panel of experts to provide guidance for the design and/or execution of the operation on issues relevant to the EA process, including health and safety. However, these operations will also establish safeguard, or monitoring requirements to address environmental and other risks (social, disaster, cultural, health and safety etc.).</p> <ul style="list-style-type: none"> <li>• The Project Team must send to the ESR the PP (or equivalent) containing the Environmental and Social Strategy (the requirements for an ESS are described in the Environment Policy Guideline: Directive B.3) as well as the Safeguard Policy Filter and Safeguard Screening Form Reports.</li> </ul> |
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| SUMMARY OF IMPACTS/RISKS AND POTENTIAL SOLUTIONS | Identified Impacts/Risks                                                                                                                                                                                                                      | Potential Solutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | The project will or may require involuntary resettlement and/or economic displacement of a minor to moderate nature (i.e. it is a direct impact of the project) and does not affect indigenous peoples or other vulnerable land based groups. | <b>Develop Resettlement Plan (RP):</b> The borrower should be required to develop a simple RP that could be part of the ESMP and demonstrates the following attributes: (a) successful engagement with affected parties via a process of Community Participation; (b) mechanisms for delivery of compensation in a timely and efficient fashion; (c) budgeting and internal capacity (within borrower's organization) to monitor and manage resettlement activities as necessary over the course of the project; and (d) if needed, a grievance mechanism for resettled people. Depending on the financial product, the RP should be referenced in legal documentation (covenants, conditions of disbursement, project completion tests etc.), require regular (bi-annual or annual) reporting and independent review of implementation. |
|                                                  | Minor or moderate conversion or degradation impacts (e.g. through long-range transport of acid pollutants, cooling water uptake and thermal changes) to natural habitats (such as forests, wetlands or grasslands)                            | <b>Ensure Proper Management and Monitoring of the Impacts of Natural Habitat Loss:</b> A Biodiversity Management Plan (BMP) should be prepared that defines how impacts will be mitigated (roles and responsibilities, monitoring, budget, etc.) and could be incorporated in the ESMP. Depending on the financial product, the BMP should be referenced in appropriate legal documentation (covenants, conditions of disbursement, etc.). Confirmation should be obtained from                                                                                                                                                                                                                                                                                                                                                          |

|  |                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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|  |                                                                                                                                         | competent experts that they are confident that the plan can mitigate impacts and also that the relevant authorities have approved the BMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|  | Conversion or degradation of critical natural habitat is minor to moderate in nature, as confirmed by a specific ecological assessment. | <p><b>Ensure Adequacy of Biodiversity Management Plan (BMP):</b> The borrower should be required to develop a BMP that demonstrates how impacts have been mitigated and what consultation activities are planned. The borrower should confirm that: (a) there are no feasible alternatives acceptable to the Bank; (b) benefits substantially outweigh environmental costs; and (c) mitigation and compensation measures are acceptable by the Bank. In addition this plan should be part of the ESMP. In all situations, impacts to biodiversity should be avoided in first instance (i.e. relocate or reconfigure proposed activities). If avoidance is not possible impacts should be mitigated by restoration, offsetting impacts or other means. Professional support from suitably qualified experts should be sought and confirmation should be obtained that they are confident that the BMP can mitigate impacts and also that relevant authorities have approved the BMP. Require regular (bi-annual or annual) reporting. Require independent audits of BMP implementation and depending on the financial product, the BMP should be referenced in appropriate legal documentation (covenants, conditions of disbursement, project completion tests, etc.).</p> |
|  | Negative impacts on ecosystem services (e.g. water supply or air quality) to other users or habitats are significant in nature.         | <p><b>Ensure Adequate Management Plan:</b> The borrower should be required to consult with local communities and relevant authorities and conservation NGOs and develop acceptable plans (as part of the ESMP). Confirmation should be obtained from competent experts that they are confident that the plan can mitigate impacts. The mitigation plans must define how impacts will be mitigated (roles and responsibilities, monitoring, budget, etc.) and how ongoing consultation (which must include Community Participation and a grievance mechanism) will be implemented. Depending on the financial product, the plans should be referenced in appropriate legal documentation (covenants, conditions of</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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|  |                                                                                                                                                                                                     | disbursement, project completion tests, etc.).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  | Generation of solid waste (such as ash residues and sludge) is moderate in volume, does not include hazardous materials and follows standards recognized by multilateral development banks.         | <b>Solid Waste Management:</b> The borrower should monitor and report on waste reduction, management and disposal and may also need to develop a Waste Management Plan (which could be included in the ESMP). Effort should be placed on reducing and recycling solid wastes. Specifically (if applicable) in the case that national legislations have no provisions for the disposal and destruction of hazardous materials, the applicable procedures established within the Rotterdam Convention, the Stockholm Convention, the Basel Convention, the WHO List on Banned Pesticides, and the Pollution Prevention and Abatement Handbook (PPAH), should be taken into consideration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  | Likely to have minor to moderate emission or discharges that would negatively affect ambient environmental conditions (potentially from air emissions, cooling water intake and thermal discharge). | <b>Management of Ambient Environmental Conditions:</b> The borrower should be required to prepare an action plan (and include it in the ESMP) that indicates how risks and impacts to ambient environmental conditions can be managed and mitigated consistent with relevant national requirements and international standards and guidelines such as the IFC Thermal Power Guidelines (as appropriate). The borrower should (a) consider a number of factors, including the finite assimilative capacity of the environment, existing and future land use, existing ambient conditions, the project's proximity to ecologically sensitive or protected areas, and the potential for cumulative impacts with uncertain and irreversible consequences; and (b) promote strategies that avoid or, where avoidance is not feasible, minimize or reduce the release of pollutants, including strategies that contribute to the improvement of ambient conditions when the project has the potential to constitute a significant source of emissions in an already degraded area. The plan should be subject to review by qualified independent experts. Depending on the financial product, this information should be referenced in appropriate legal documentation (covenants, conditions of disbursement, etc.). |
|  | There are risks associated with                                                                                                                                                                     | Address Community Health Risks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|  | <p>structural elements of the investment (e.g. fuel combustion chamber and cooling ponds), and road transport activities (e.g. increase in heavy vehicle movements, transport of hazardous materials, etc.) which could result in significant health and safety risks to local community.</p> | <p>When structural elements or components are situated in high-risk locations and their failure may threaten the safety of communities, the borrower should commission experts with relevant and recognized experience to conduct a review as early as possible and throughout the design, operation and decommissioning stages of the investment. Where significant road traffic/transport is likely, the borrower should actively manage risks through appropriate training, engagement with affected communities (including Consultation), and controls and oversight (including of third-party contractors as appropriate). The borrower should design, construct, operate and decommission the structural elements of the investment in accordance with good international industry practice and will give particular consideration to potential exposure to natural hazards, especially where the investment is accessible to members of the affected community or where their failure could result in injury to the community. The borrower should also provide a specific plan related to the identified risk(s) and impact(s) (as part of the ESMP) and monitor and report on this plan. Structural elements must be designed and constructed by qualified and experienced professionals and certified or approved by competent authorities or professionals. Depending on the financial product, commitment and agreed actions should be referenced in appropriate legal documentation (covenants, conditions of disbursement etc.). Annual reports should be subject to review by qualified independent experts.</p> |
|  | <p>Project construction activities are likely to lead to localized and temporary impacts (such as dust, noise, traffic etc) that will affect local communities and workers but these are minor to moderate in nature.</p>                                                                     | <p><b>Construction:</b> The borrower should demonstrate how the construction impacts will be mitigated. Appropriate management plans and procedures should be incorporated into the ESMP. Review of implementation as well as reporting on the plan should be part of the legal documentation (covenants, conditions of disbursement, etc.).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  | <p>The project might impact critical cultural sites, or significantly affect non-critical cultural sites</p>                                                                                                                                                                                  | <p><b>Protection of Cultural Sites:</b> Where impacts to critical cultural sites are anticipated, the borrower shall take, acceptable to the project team, measures to mitigate such impacts and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

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|  |  | <p>integrate into the project's ESMP. Where noncritical cultural sites are significantly impacted, appropriate measures to protect, mitigate, or compensate the noncritical cultural sites need to be integrated into the ESMP. Projects likely to encounter chance finds, should develop and implement specific procedures to handle chance finds occurrences, integrated into the project's ESMP. Category A projects should include in their EIA, when applicable, an analysis of the archeological potential of the areas of direct influence, and, as necessary, propose chance find procedures, based on internationally accepted practices.</p> |
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|                         | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Actions                                                                                                                                                                                                          |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DISASTER SUMMARY</b> | <p>The Project should include the necessary measures to reduce disaster risk to acceptable levels as determined by the Bank on the basis of generally accepted standards and practices. Alternative prevention and mitigation measures that decrease vulnerability must be analyzed and included in project design and implementation as applicable. These measures should include safety and contingency planning to protect human health and economic assets. Expert opinion and adherence to international standards should be sought, where reasonably necessary.</p> | <p>A more limited and specific Disaster Risk Assessment (DRA) may be required (see Directive A-2 of the DRM Policy OP-704). Please contact a Natural Disaster Specialist in VPS/ESG or INE/RND for guidance.</p> |

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|-------------------------|------------------------------------------------|---------------------------------------------|
| <b>ASSESSOR DETAILS</b> | <b>Name of person who completed screening:</b> | Boulet, Emmanuel Andre (EMMANUELB@iadb.org) |
|                         | <b>Title:</b>                                  |                                             |
|                         | <b>Date:</b>                                   | 2010-12-08                                  |

## **COSTA RICA-REVENTAZÓN HYDROPOWER PROJECT DRAFT ENVIRONMENTAL AND SOCIAL STRATEGY**

### **I. PROJECT DESCRIPTION REVENTAZÓN**

#### *1.1 Project Location and Background.*

The Inter-American Development Bank (“IDB”, or the “Bank”) has been approached by ICE (Instituto Costarricense de Electricidad, the “Project Company”), a state-owned company, seeking financing for the development of the Reventazón hydroelectric power project including operational infrastructure (collectively, the “Project”) to be located on the Río Reventazón, Province of Limón, on the Atlantic slope of Costa Rica. The Project consists of the construction and operation of a dam and hydropower plant and associated facilities. The Project is located in the administrative districts of La Florida and Siquirres, 7 kilometers upstream of the city of Siquirres, in the canton of Siquirres. The Reventazón basin has an area of 1,739 km<sup>2</sup> and average annual discharge of 149.2 m<sup>3</sup>/s at the dam site. The project nominal capacity is 305.5 MW (gross). The access road to the machine house will extend from the Siquirres-Turiabla highway through the El Coco community. The dam will be built in a gorge of the river at an elevation of 160 meters. Some preparatory works (e.g. access roads, preparation of construction camps) are already underway.

#### *1.2 Project Components and Facilities.*

All major associated infrastructures will be located on the right bank of the river. They include the following main components:

**i) Dam**

The dam will be a rock-fill structure with a concrete face located at approximately 10.075° N, 83.577° W. The dam will be 535m long at the crest and 125m high (including the foundation), with a total volume of 9,850,000 m<sup>3</sup>;

**ii) Reservoir**

The reservoir will have a surface area of 7.59 km<sup>2</sup> and a volume of 118,500,000 m<sup>3</sup> at the design surface elevation of 265 meters above sea level (masl);

**iii) Intake Structure**

The intake structure will be designed for a flow rate of 240 m<sup>3</sup>/s;

**iv) Spillway**

The spillway's maximum design flow is 11,400 m<sup>3</sup>/s, which corresponds to a 10,000 year flood event;

**v) Conduction Tunnel**

From the intake structure, water will be conducted to the surge tank and penstock through an 8.8m diameter tunnel 1,600m in length;

**vi) Surge Tank**

The surge tank will have a height of 51m and a diameter of 27m. Approximately 70% will be below grade and 30% above grade;

**vii) Penstock**

The penstock will extend 973m from the conduction tunnel to the power house and have a diameter which varies from 8.6m to 8.4m;

**viii) Power House**

The power house, a concrete structure located at approximately 10.083°N, 83.552° W, will contain 3 “Francis” type turbines that will generate 95.4 MW each, for a total of 285.6 MW. The net hydraulic head will be 134 m. No specific information was provided on the spillway design.

**ix) Substation**

The substation will be located at approximately 10.082° N, 83.559° . It will step up the voltage coming from the power house from 13.8kV to 230kV.

**x) Associated Infrastructure**

**-Mini Power House** - The Project will discharge an environmental flow of 14.9 m<sup>3</sup>/s through one of the diversion tunnels to the river below the dam. The Project includes a small power house near the base of the dam with a single 13.3 MW turbine to generate power from the environmental flow release before it is discharged to the river;

**-Access Roads**

**-Dike** - To protect the power house from periodic floods of the Río Reventazón, the Project will construct a dike 500 m long and 10 m high;

**-Railroad Tracks**

**-Transmission Line** - The Project will construct a 1.8 km, 230kV transmission line to connect the Project substation to an existing National Grid transmission line between the Moín substation and the Río Macho substation. The Project will also construct a 2.2 km transmission line from the mini power house at the dam to the substation near the main power house. Both transmission lines will have a right of way (ROW) of 30 m (15m to each side of the center line);

**-Cofferdams and Diversion Tunnels** - During the construction of the main dam, two (2) rock-fill cofferdams will be constructed and two (2) diversion tunnels will be installed under the right bank of the river to dewater the main dam construction area. Both tunnels will be 11m in diameter and approximately 1,100 m in length. After the main dam is completed, one diversion tunnel will be used for sediment discharge, and the other will discharge the environmental flow and supply the mini power house. The combined maximum design flow of the tunnels will be 2,700 m<sup>3</sup>/s. The larger of the cofferdams will be built upstream and have a crest elevation of 195 masl. The smaller cofferdam will be built downstream of the main dam site to prevent counter flow of the diverted water, and will have a crest elevation of 170 masl;

**-Quarries** - Four (4) quarries will be developed to supply rock for the Project. The EIA estimates that 10 million m<sup>3</sup> will be needed for the main dam, 1 million m<sup>3</sup> for the cofferdams, 2 million m<sup>3</sup> for aggregate, and 900,000 m<sup>3</sup> for the construction of roads and construction pads.

1.3 *Project Workforce.* It is estimated that Project construction will require up to 2000 workers at the peak of the construction.

1.4 *Project Schedule and Costs.* The construction of the Project started in April 2009. The Reventazón hydropower plant is expected to be commissioned in early 2016 and have a total cost of US\$ 800 million.

- 1.5 *Project Alternative Analysis.* In the first technical study of the project elaborated by el Proceso de Tecnologías de Generación del Centro Nacional de Planificación Eléctrica (CENPE) in 1998, the Reventazón Project was designed with the dam located at a height of 380 meters, a location that was later changed by the CENPE due to the results of a preliminary geological investigation and associated adverse environmental and socio-economic impacts. Subsequent feasibility studies for the Project were developed by CENPE and Proyectos y Servicios Asociados (PySA) in 2003. Several scenarios were tested, based on the confluence of two or three water flows, the Guayabo, Reventazón, and Pacuare Rivers. In total, 8 different development scenarios were evaluated taking into account technical, environmental, and economic criteria. The final design was chosen as it achieved a potential hydraulic head of 275 m with the fewest environmental and social impacts.

## ***II. INSTITUTIONAL AND REGULATORY CONTEXT***

- 2.1 According to Costa Rican law and regulations<sup>1</sup>, an EIA is required for major developments.
- 2.2 An EIA for the Project was submitted to SETENA (the relevant agency), and approved in 2009 (Resolution 1778-2009). The project was declared of national interest in April 2010.
- 2.3 The Project triggers several directives of the IDB's Environment and Safeguards Compliance Policy (OP-703): Directive B.3 (Screening and Classification), Directive B.4 (Other Risk Factors), Directive B.5 (Environmental Assessment Requirements), Directive B.6 (Consultations), Directive B.7 (Supervision and Compliance), Directive B.9 (Natural Habitats and Cultural Sites), Directive B.10 (Hazardous Materials), Directive B.11 (Pollution Prevention and Abatement) and Directive B.12 (Project under Construction). The Project also triggers the IDB's Disaster Risk Management Policy (OP-704). Based on the EIA, it is understood that the Project will not involve involuntary physical displacement of affected people. However, given the extensive land acquisition activities, including acquisition of the reservoir area and right-of-way for the transmission line, the Project may cause economic displacement and OP-710 is therefore triggered.
- 2.4 On the basis of an analysis of the EIA, the risk of non compliance with IDB's applicable environmental and social safeguard policies and directives appears to be low, except for Directive B.9 in relation to insufficient assessment of potential downstream impacts, especially on Tortuguero National Park and on migratory fish, and to a lesser extent, Directive B.6 on public consultation. Also as required by Directive B.12 for projects under construction, if current construction activities are found during the due diligence process not to be in compliance with all applicable provisions of the Environment and Safeguards Compliance Policy, an action plan defining the actions and associated schedule for the timely resolution of such non-compliance will be submitted to the Bank prior to Board approval of the operation

### ***2.5 B.5 Environmental Assessment Requirements***

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<sup>1</sup> General Law on the Environment (*Ley Orgánica del Ambiente No. 7574*), the primary environmental legislation in Costa Rica.

- There is an inconsistency in total project area<sup>2</sup>;
- The social and biophysical areas of influence appear to be properly defined (Figures 5.11 and 5.12 of the EIA) and indicate the area of influence extends to the Atlantic shore. Despite this, the EIA provides little information on the downstream baseline environment or potential downstream impacts. More baseline data are required for each project component in order to evaluate the potential impacts.
- An analysis of the risks associated with dam failure was not included.
- The extent and effects of the area to be flooded is not analyzed and there are at least three different area figures presented in the EIA (6.86, 6.92, and 7.59 km<sup>2</sup>).
- The biodiversity baseline (for example: EIA, Figure 8.1.2) is not focused on the area of influence defined by Figure 5.11, but rather covers a smaller area with limited downstream extent.
- The baseline does not provide dates, coordinates, or descriptions of the sampling locations for terrestrial fauna.
- The available information on resettlement is sometimes contradictory, and no land acquisition plan or compensation plan was available.
- Baseline data used for social study are not detailed and the analysis provided does not describe how the river contributes to the livelihoods of people living in the Project area and downstream. Fishing is not mentioned as livelihood activity; however, it is likely that fishing is at least a partial source of livelihood for people living along the river banks and the coast downstream of the dam site. Also there is no mention about the use of the river for other income generating activities such as white water rafting or other river related recreational activities.

#### *2.6 B.6 Consultation*

Little information is available on the consultation activities and whether they have been adequate for a Category A project. There is a pending Supreme Court case which involves a challenge to the constitutionality of the EIA process as several communities claim they were not consulted.

#### *2.7 B.9 Natural Habitats and Cultural Sites*

The Río Reventazón, despite dams upstream of the Project area, is important for migratory fish species. Besides, there are potential indirect impacts to legally protected areas and endangered or threatened species. The EIA baseline identifies potential impacts of altered sediment transport regimes on endangered sea turtle nesting sites on the coast, but there is no discussion of the present coastal processes and beach depositional regimes or how these may or may not be affected by the Project. The EIA's Area of Direct Influence extends very close to seven protected areas. In addition, the Project could affect archaeological sites (some 37 pre-Columbian archeological sites are in the area). The archeological remains of pre-Columbian settlements on the left bank of the river in the area of indirect influence are considered the most important archeological site in the region and include funeral complexes (Encanto, Krica and San Antonio) and petroglyphs.

#### *2.8 B.12 Project Under Construction*

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<sup>2</sup> It ranges from 986.50 Ha. (*Declaración de Impacto Ambiental*, p. 13) to 1800 hectares (EIA, p. 1061).

As required by Directive B.12, if current construction activities are found during the due diligence process not to be in compliance with all applicable provisions of the Environment and Safeguards Compliance Policy, an action plan defining the actions and associated schedule for the timely resolution of such non-compliance must be submitted to the Bank prior to Board approval of the operation.

### **III. ENVIRONMENTAL AND SOCIAL SETTING AND CONTEXT**

3.1 The Project site is located where the central highlands meet the Caribbean coastal plain. The area of direct influence includes the section of the Río Reventazón and its valley to be flooded by the reservoir and the entire river downstream of the dam to the Caribbean, portions of four other rivers and various smaller streams, lakes, lagoons, and waterfalls. In the area of the dam, Reventazón river runs through a steep sided valley trending S to NNE. The channel is bordered by a floodplain or terrace varying in width from 52 m to 441 m with an average width of 216 m.

With respect to the aquatic ecosystem, the Río Reventazón has been used for hydropower since 1966. The existing Angostura and Cachí dams upstream of the Project site have altered the river's natural ecosystem. The larger of the two, Angostura, at 600 masl with a dam height of 36 m, was constructed in 2000. This dam has altered the river's hydrology and blocks passage to migratory fish species, though the EIA reports that the reservoir is an important area for migratory birds.

3.2 Total Project area inclusive of the water reservoir is of approximately 1,800 hectares. The dominant land uses are crop land and pasture land. An estimated 2000 workers from the area are expected to work for the Project during construction. Though the Project will have certain adverse environmental and socio economic impacts, a net economic benefit for the regional economy is expected as the reservoir may attract tourists and generate business opportunities for the Project area.

3.3 The population in the Project area has diverse ethnic background. The majority consists of Costa Ricans of Afro-Caribbean (mainly Jamaican) and Asian descent that migrated to the area during construction of the railroad from San José to Limón in the 1880s. In 1995, a highway replaced the railroad, and many of the local population relocated to urban areas. In general, the communities on the left bank or north side of the river have fewer economic opportunities as there are no bridges over the Río Reventazón, depriving them of easy access to Puerto Limón, the major urban center on the Caribbean coast.

3.4 The social baseline presented in the EIA was mostly taken from a socio economic analysis done in for Siquirres County Development Plan (*Plan de Desarrollo del Cantón Siquirres 2001-2010*). This study mentions the main socio cultural characteristics, basic services and infrastructure available and the main problems as perceived by local organizations (the Local Development Committee, Community Association for the Environmental Impact Study). Socio economic problems mentioned are: poverty, poor quality of health care; low quality of education, which contributes to a high unemployment rate; lack of paved roads, communal facilities, and telecommunications. On the left bank of

the river the most important economic activity is livestock grazing for beef and dairy products. However, the lack of electricity for refrigeration and the very poor quality of the roads during the rainy season limit commercial potential. In San Antonio, local producers created a dairy product association that buys and sells local dairy products. On the right bank of the river, the main crop is cilantro for export.

*Table 1:* Land use in the area of indirect influence: Junta de Siquirres to Peralta de Turrialba (Cuadro 9.1.2.1, EIA p. 705)

| Land Use                       | Area (Ha) | Percent of Total Area |
|--------------------------------|-----------|-----------------------|
| Villages and infrastructure    | 55.55     | 0.32                  |
| Agriculture and livestock      | 9103.74   | 52.19                 |
| Macadamia                      | 81.38     | 0.47                  |
| Greenhouse                     | 2.83      | 0.02                  |
| Coffee plantation              | 999.45    | 5.73                  |
| Pasture                        | 4012.63   | 23.00                 |
| Pasture with trees             | 3681.73   | 21.11                 |
| Forest plantations             | 325.72    | 1.87                  |
| Forest with natural vegetation | 7120.14   | 40.82                 |
| Regenerating natural habitat   | 611.35    | 3.50                  |
| Water bodies                   | 509.86    | 2.92                  |
| Other                          | 43.5      | 0.25                  |
| TOTAL                          | 17444.14  | 100.00                |

The total Project area mentioned in the EIA ranges from 986.50 ha (Declaración de Impacto Ambiental, p.13) to 1800 ha (p.1061).

The main land use activities mentioned in the EIA in the area of direct influence are crop farming (52% of land use/coffee and macadamia), tree plantations (laurel), and cattle grazing (page 705 EIA PH Reventazón). The main type of land use that will be affected by the reservoir flooding will be grazing.

The table below lists the affected villages in the Project's area of direct influence.

| Canton    | District   | Communities (population)                                                                            |
|-----------|------------|-----------------------------------------------------------------------------------------------------|
| Siquirres | Siquirres  | El Coco (759), Moravia (301)<br>Guayacan (304), Sta. Marta (379), Bajo 52 (369)<br>San Joaquín (89) |
|           | La Florida | La Florida (1359), Lomas (160)<br>El Llano/Casorla (76) Pascua (65) Bonilla (56) San Antonio        |
|           | Alegría    | La Alegría (1487)                                                                                   |

In total, the population of the 14 communities in the direct area of influence represents almost 20% of the total population of the canton of Siquirres which had 31,358 inhabitants in the 2000 census). Updated data is needed to more accurately assess impacts and develop and monitor social programs.

- 3.5 The Río Reventazón is one of the most important rivers for rafting in Costa Rica, but the potential impacts to this industry were not addressed in the EIA. The EIA does not address either potential impacts to the coast from alterations of hydrological and sediment transport regimes, in particular potential effects on Tortuguero National Park, an international ecotourism destination and important turtle nesting area for loggerhead and green sea turtles.
- 3.6 There are several protected areas in the Project's direct area of influence (EIA figure 5.11), Reserva Forestal Cordillera Volcanica Central and Zona Protectora Río Siquirres. Other protected areas close to the Project area: Río Pacuare, Lacustrino Bonilla-Bonillita, and Nacional Cariari. An important National Park is located downstream of the Río Reventazón, at about 27 kilometers from the Project site. The National Park Tortuguero is part of the *Humedal Caribe Noreste*, a RAMSAR protected wetland site of international importance.
- 3.7 Regarding the aquatic fauna, according to the EIA the Río Reventazón has a high diversity and abundance of native fish. There will likely be a significant alteration of erosion and sedimentation regimes in the river downstream of the Project's dam and tailrace. The EIA does not include an analysis of cumulative impact of the Project on the downstream water fluctuation, particularly on the habitat of the downstream National Park Tortuguero, the turtle and coastal mangrove ecosystem. Some important migratory fish species are rapidly becoming extinct like *Joturus pichardi* (Bobo), *Agonostomus monticola* (Tepemechin), *Brycon guatemalensis* (Machaca), some support livelihood as food for local people. The EIA baseline (p. 637) identifies potential impacts of altering sedimentation regimes on endangered sea turtle (leatherback and green) nesting sites on the coast, but these are not addressed in the impacts assessment chapter. The Area of Direct Influence shown on Figure 5.11 of the EIA appears to extent very close to the south end of the Parque Nacional Tortuguero.

#### IV. KEY ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS

- 4.1 Impacts from construction activities, if adequately managed, will be mostly temporary, localized and of limited magnitude. The potential environmental impacts during construction include access road creation and operation; construction camp creation and operation; excavation of the diversion tunnels; opening and operation of quarries; construction of the dam, powerhouse and transmission line. The most likely high risk activities from an environmental perspective are those that could affect water quality in the Reventazón River if not properly managed (e.g. erosion, spoil disposal, accidental spills of fuels and lubricants, and wastewater discharge).
- 4.2 In general the most significant environmental and social impacts and risks will take place during the filling of the reservoir and Project operation. Changes are expected in water flows

and quality downstream of the tailrace. The main impacts of the hydropower facility therefore relate to: (i) flooding of the reservoir area, and direct loss of land and natural habitats; (ii) conversion of a portion of the Río Reventazón from a wild fast flowing river into an artificially controlled lake, with may constitute a loss of habitat for some aquatic species due to changes in hydrodynamic conditions, and alter prevailing conditions of water uses in this section of the river; (iii) reduced flow between the dam and the tailrace which may alter aquatic habitat as well as floodplain forests and other riparian habitats; (iv) barrier effect of the dam and reservoir which may prevent migration of aquatic and terrestrial species in the river and riparian corridor and have indirect impacts on their distribution downstream or upstream of the Project; and (v) the Project will result in altered downstream hydrology and the sediment transport regime, potentially affecting geomorphology and ecosystems along the Caribbean Coast, possibly resulting in erosion of barrier beaches and changes in salinity of estuaries and lagoons as far as Tortuguero National Park.

- 4.3 Such changes in baseline conditions caused by the Project may negatively impact vulnerable, threatened or endangered species identified in the Project's Indirect Area of Influence, in particular downstream. Further analysis should be carried out during due diligence to determine whether: (i) the project could affect critical natural habitats as defined in Directive B.9 of the IDB's Environment and Safeguards Compliance Policy (i.e., it may be highly suitable for biodiversity conservation, crucial for the survival of vulnerable, threatened or endangered species, or critical for the viability of migratory routes or migratory species); and (ii) the construction of the dam and operation of the hydropower facility could involve significant conversion or degradation of this natural habitat through either the elimination of or significant impact on its integrity, or the substantial reduction of its capacity to maintain viable populations of native species. Such analysis will be based to a large extent on the information already available in the comprehensive ecological baseline study, but also requires additional monitoring and modeling activities for the potential impacts downstream. It may be concluded that implementation of additional mitigation measures (e.g., fish passage, recreation of riparian habitat on the margin of the future reservoir) or appropriate natural habitat offsets (e.g., establishment of an ecologically similar protected area downstream and/or upstream of the Project) are required for the Project to comply with provisions of Directive B.9. In addition to ecological impacts, changes in water flows may adversely impact ecotourism uses (whitewater rafting, kayaking and recreational fishing) in the region, and livelihood of local communities. It is understood that the Project intends to compensate for such impacts and to support additional development opportunities. A baseline assessment of broad river use is not included in the EIA nor is there a detailed assessment of potential adverse impacts on livelihoods of local communities, or whether the adequacy of proposed compensation schemes will be commensurate with the impacts. These will be reviewed during the due diligence process.
- 4.4 Since the flooded area of the future reservoir is narrow, potential adverse impacts related to land acquisition activities for the Project are expected to be of limited significance. The EIA mentions that there are some 100 landowners in the future dam reservoir area. Land acquisition plans were not described in the EIA. There are also several families of squatters who invaded the area between Guayacan and San Joaquin in the area of direct influence on the right bank of the river. Another small private business that will be affected by the Project

is the cheese factory (*quesera*) from San Antonio de Pascua. No compensation plans are included in the EIA for the affected population, however it is mentioned that affected person will be given priority in terms of Project construction work opportunities. Further potential impacts of the Project on the livelihoods of local communities and adequacy of compensation schemes will be subject to a detailed review during the due diligence process.

- 4.5 Given the fact that there are already two other hydropower Projects in the river, cumulative impacts are expected. Cumulative effects of hydropower development on the ecological integrity of the watershed may interact with other human disturbances in the watershed, such as deforestation, increasing human population and increasing fishing pressures. The Angostura Dam, one of Costa Rica's largest dams, is located on the Río Reventazón upstream of the Project. Also, water diversions and peak flows associated with the Project could prevent establishment and survival of aquatic biota in upstream and downstream, areas. Further analysis regarding cumulative impacts and risk risks is required.
- 4.6 The dam will flood hundreds of hectares of forest, most likely resulting in emissions of methane and carbon dioxide from the decomposing vegetation. This aspect is not properly assessed in the EIA.
- 4.7 The Project includes a dam that would be classified as large dams as per the International Commission on Large Dams (ICOLD) definition<sup>3</sup>. The Project has potentially significant direct impacts on natural habitats and water uses. As per the IDB's Environmental and Safeguards Compliance Policy, in consideration of the nature of the Project and its potential adverse impacts, the Project has been be classified as a Category A operation.
- 4.8 As per the IDB's Disaster Risk Management Policy, due to its location and sector, the Project is classified as a Type 1 high-risk Project<sup>4</sup>. The Project is also subject to a Type 2 risk scenario (i.e. the Project itself has a potential to exacerbate hazard risk to human life, property, the environment or the Project itself). Adequacy of the Project's Disaster Risk Assessment, including identification of vulnerability to natural hazards, and design of disaster prevention and mitigation measures will be reviewed during the due diligence. The Project is also vulnerable to climate change impacts, in particular to changes in average flow during its expected lifetime, which will be further analyzed during due diligence.

## V. ENVIRONMENTAL AND SOCIAL DUE DILIGENCE STRATEGY

- 5.1 Besides the typical impacts and risks associated with the civil works for the construction of a large infrastructure project, the main environmental and social impacts and risks that will be further assessed during the ESDD are the following:
- Potential direct adverse impacts on natural habitats and particularly on the migratory fish species found in the Project's area of influence. Specifically, the determination of the extent of which construction of the dam and operation of the hydropower plant is likely

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<sup>3</sup> <http://www.icold-cigb.net>: dams higher than 15 meters or higher than 10 meters but with more than 500 meter crest length, or more than 1 million m<sup>3</sup> storage capacity, or more than 2 000 m<sup>3</sup> /s spilling capacity.

<sup>4</sup> Type 1 risk: the project is likely to be exposed to natural hazards due to its geographic location.

to cause significant conversion or degradation of this habitat will require further analysis of its significance for these species and potential impacts on their distributions due to loss of or changes to habitat, including changes in hydrological conditions in the future reservoir, the reach between the dam and the power house where flows will be reduced, and downstream, the barrier effect of the dam, and the likely effectiveness of planned or additional mitigation or offset measures;

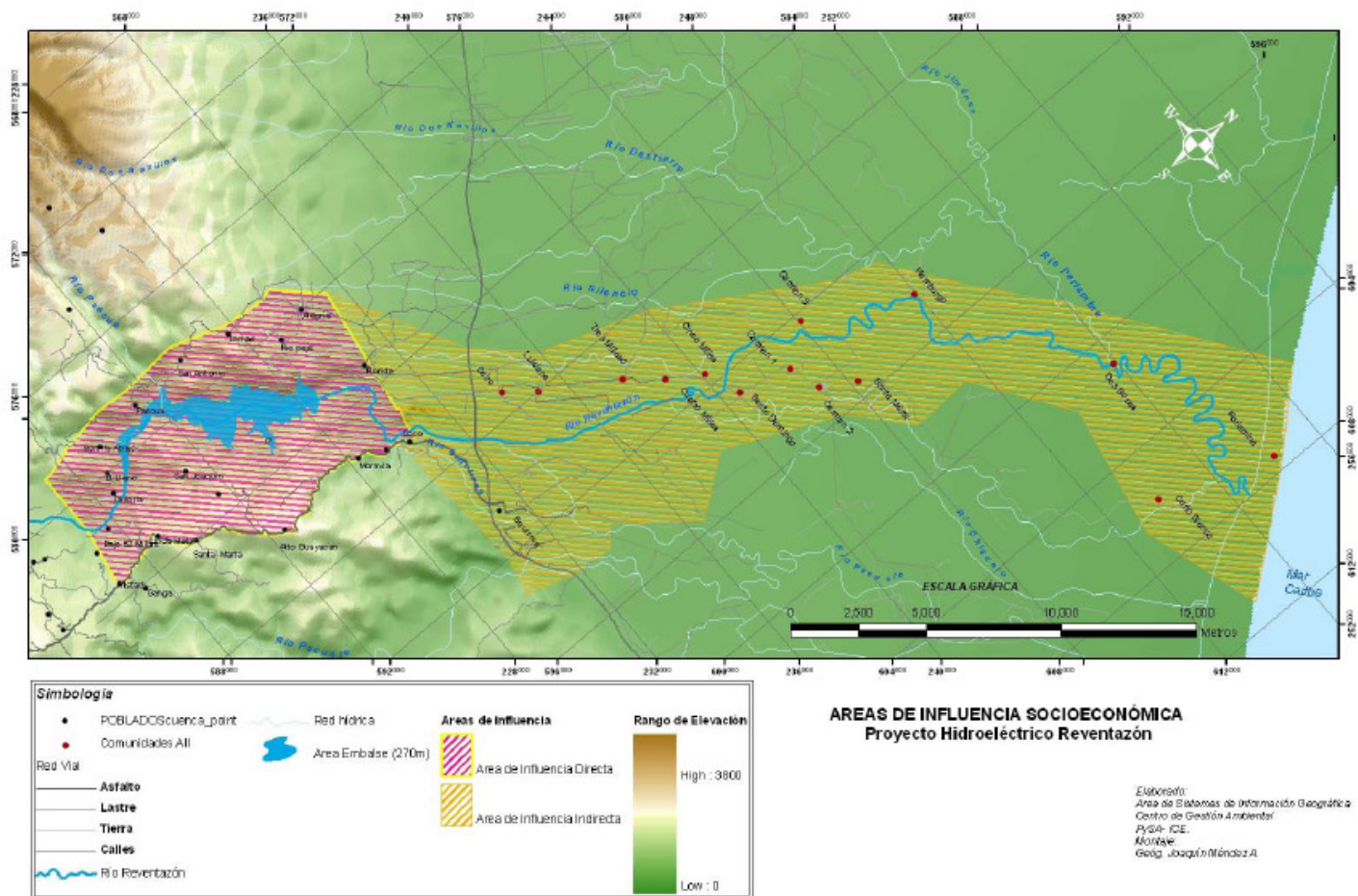
- b. Potential indirect and cumulative impacts on natural habitat downstream and along the coast both north and south of the mouth of the Río Reventazón. Specifically, the altered hydrologic regime may affect hydrodynamics and salinities in coastal lagoons and estuaries, and the altered sediment transport regime may affect coastal geomorphic processes resulting in erosion in certain areas and accretion in others. The Tortuguero National Park and other reserves in the area of influence could be adversely impacted;
- c. Potential adverse socio-economic impacts associated with land acquisition (including for the future reservoir area, powerhouse, ancillary facilities and transmission line), construction activities (e.g. attraction of migrant workers), and adverse effects on ecotourism activities (e.g. rafting, fishing) and related livelihoods, due to alteration of the flow regime, and the adequacy of mitigation and compensation measures;
- d. Identification of Project's vulnerability to natural hazards, and climate change, and assessment of adequacy of Disasters Risk Management Plans;
- e. Estimation of gross and net GHG emissions from the Project;
- f. Further assessment and mitigation strategy of potential cumulative impacts, in particular those related to the simultaneous operation of Augustura, Cachi and Reventazon;
- g. Implementation of appropriate public consultation activities consistent with the requirements of Directive B.6 and verification that views from affected parties have been adequately considered;
- h. Further assessment of the Project's impacts on cultural heritage;
- i. Given that the Project is already well into construction, the ESDD should also include an evaluation of the Project sponsor's and contractor's performance including review of the implemented ESMP, auditor reports, environmental permits granted, supervision reports, record of advances of construction, land acquisition and compensation plans, grievance mechanism and stakeholder engagement processes.

5.2 As part of the Bank's environmental and social due-diligence, the Bank will prepare an Environmental and Social Management Report (ESMR).

## ANNEX

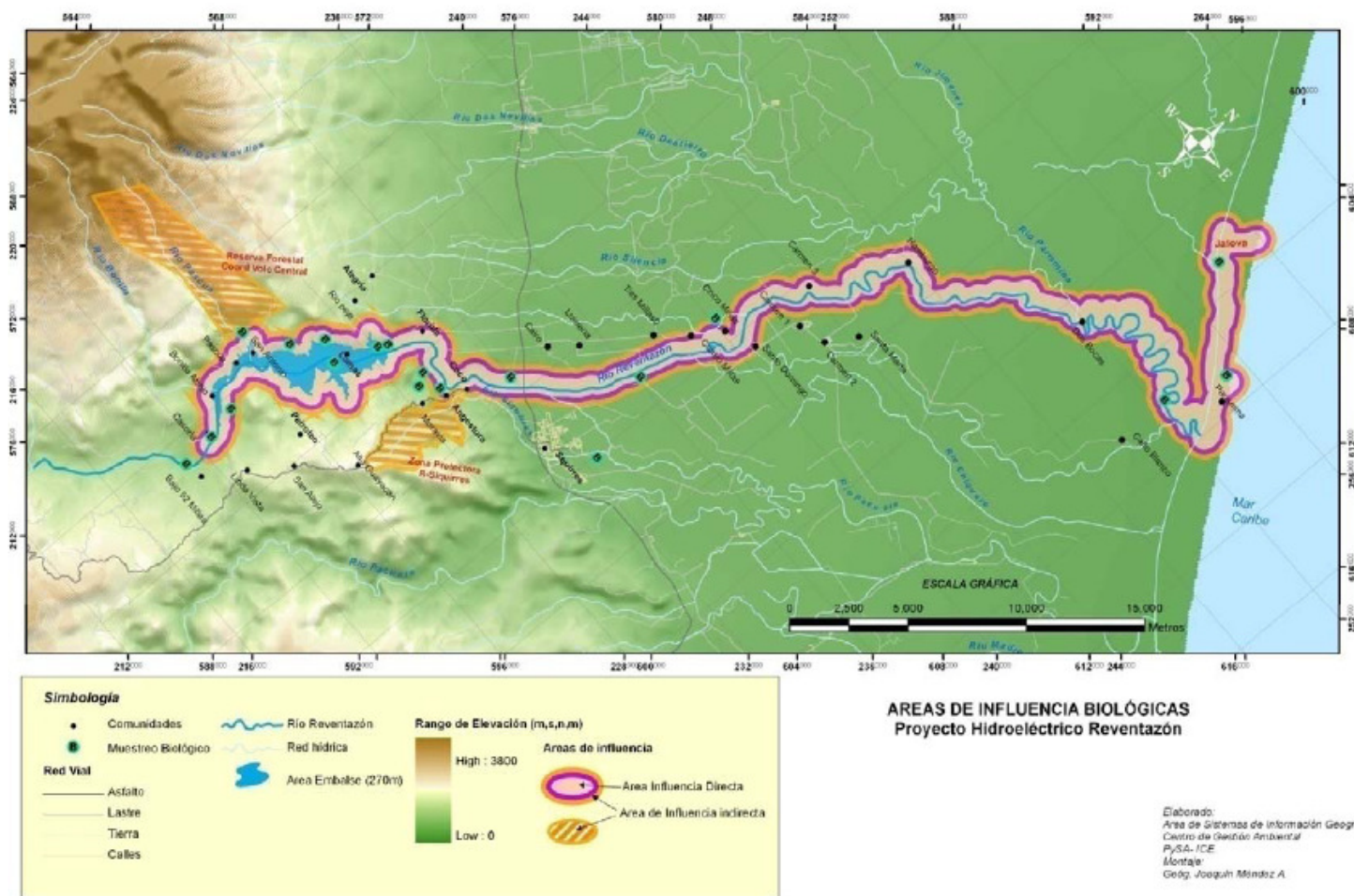
**Figura 5.12**  
**Área de influencia socioeconómica**

Fuente: Centro de Gestión Ambiental (CGA)

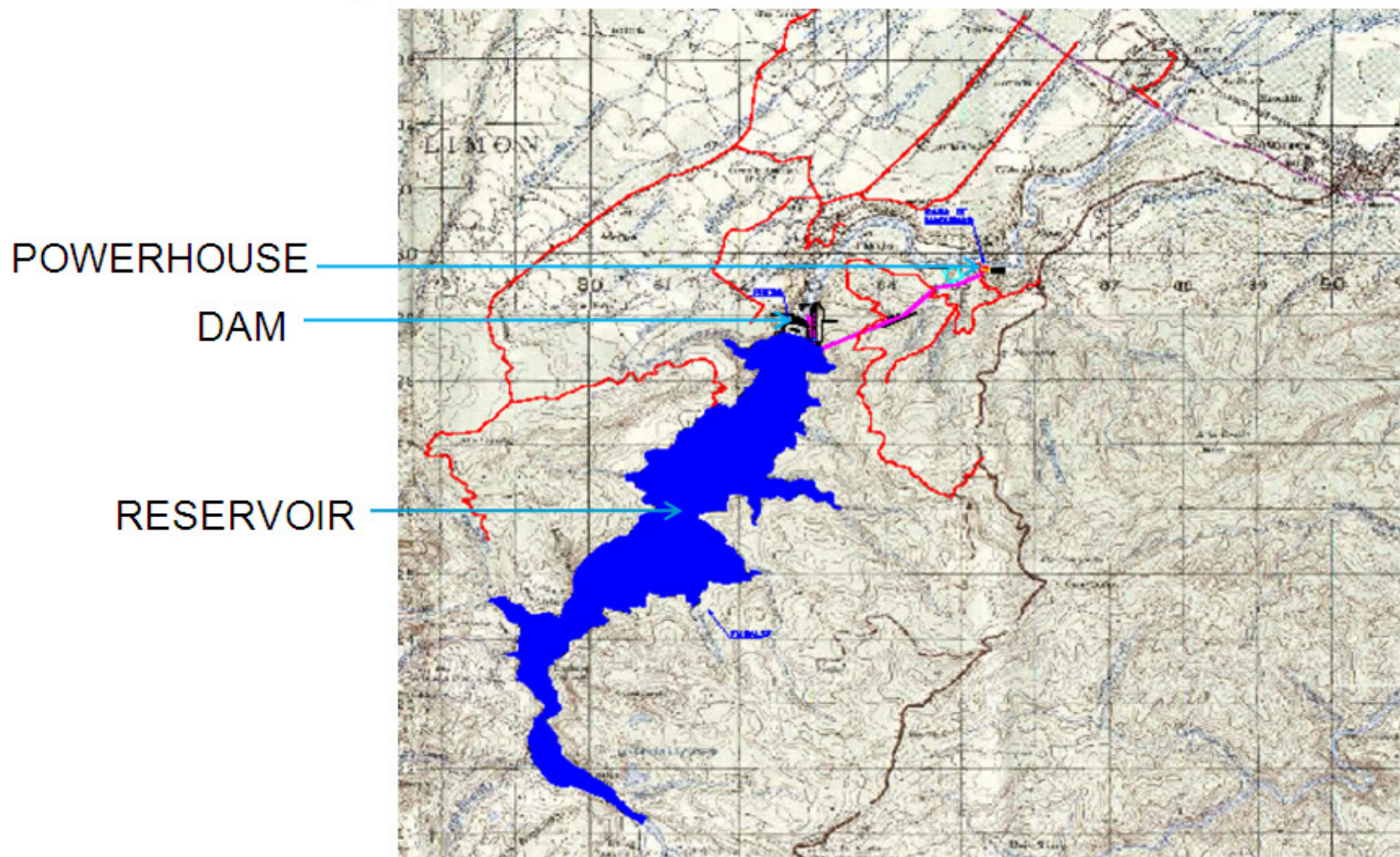


**Figura 5.11**  
**Área de influencia biofísica**

Fuente: Centro de Gestión Ambiental (CGA)



## PROJECT COMPONENTS



**COSTA RICA**  
**Segundo Préstamo Línea CCLIP Programa de Desarrollo Eléctrico**  
**Proyecto Hidroeléctrico Reventazón (CR-L1049)**

**Anexo IV - Índice de actividades y trabajo sectorial ejecutado y propuesto**

| <b>Temas</b>                                   | <b>Descripción</b>                                                                                                                                                                                                    | <b>Fecha</b>    | <b>Referencias y vínculos a archivos técnicos</b> |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------|
| Línea CCLIP – Programa de Desarrollo Eléctrico | Propuesta de línea de crédito condicional (CCLIP) para un programa de desarrollo eléctrico (2008-2014) y para un préstamo individual para el programa de desarrollo eléctrico (2008-2011) – BID – PR-3191, con Anexos | Octubre 2007    |                                                   |
| Estudios Técnicos y Económicos                 | Informe de Factibilidad del Proyecto Hidroeléctrico Reventazón (PHR) – ICE.                                                                                                                                           | Septiembre 2009 | (Numero registro)                                 |
| Estudios de Impacto Ambiental y Social         | Estudio de Impacto Ambiental del Proyecto Hidroeléctrico Reventazón (PHR) – ICE.                                                                                                                                      | Septiembre 2008 | (Numero registro)                                 |
|                                                | Viabilidad Ambiental - Resolución N°1778-2009-SETENA.                                                                                                                                                                 | Julio de 2009   | (Numero registro)                                 |
|                                                | Declaratoria de Conveniencia Nacional e Interés Público de las Obras del Proyecto Hidroeléctrico Reventazón (PHR) – Gobierno Nacional - <i>DECRETO EJECUTIVO N° 35603-MINAET</i>                                      | Octubre de 2009 | (Numero registro)                                 |
| Políticas de Gobierno                          | Estrategia Energética – Presentación - Ministro de Ambiente, Energía y Telecomunicaciones                                                                                                                             | Julio 2010      | IDBDocs: 35453187                                 |
|                                                | Plan de Expansión de la Generación Eléctrica (PGE) 2010-2021                                                                                                                                                          | Septiembre 2009 | IDBDocs: 35453247                                 |
| Análisis del Sector                            | Informe retos y opciones sector electricidad                                                                                                                                                                          | Abril 2010      | IDBDocs: 35453171                                 |
|                                                | Nota sectorial                                                                                                                                                                                                        | Septiembre 2010 | IDBDocs: 35453174                                 |
| Informes de Misión                             | Informe Misión Reventazón                                                                                                                                                                                             | Octubre 2010    | IDBDocs: 35453174                                 |
| Otros                                          | Presentación: Sector Eléctrico de Costa Rica Desafíos y Recomendaciones - División de Energía                                                                                                                         | Julio 2010      | IDBDocs: 35453181                                 |

**Costa Rica**

**Segundo Préstamo Línea CCLIP Programa de Desarrollo Eléctrico**

**Proyecto Hidroeléctrico Reventazón - PHR**

**(CR-L1049)**

**Anexo V**

**Costos Estimados y Cronograma para la Preparación del Programa**

**Para Uso Interno del Banco**