1. Country and Sector Background

The Pacific island countries that will benefit from this project -- Fiji, Papua New Guinea (PNG), Republic of Marshall Islands (RMI), Solomon Islands (SI), and Vanuatu -- face similar, complex development challenges, stemming largely from their small, sparsely-distributed populations and remoteness. Resulting weak economic growth, in a context of relatively high birth rates, has caused high unemployment and hardship. Even those countries that have achieved positive growth in average per capita income have been unable to fully translate this into adequate job creation and poverty reduction.
The World Bank’s assistance strategy for the Pacific Island countries (PICs) is to help them establish a business environment conducive to faster and sustainable economic growth and to higher employment. Access to electricity is one key to growth, but is generally low -- ranging from 10 percent in PNG to over 65 percent in Fiji. Power generation is heavily dependent on diesel, both on and off the main grid, particularly in rural areas. In 2002, the islands’ cost of energy was in the range of 4 to 8 percent of GDP. In 2005, this cost skyrocketed to 12 to 25 percent of GDP – a severe drain on resources and a barrier to growth. Increasing access to electricity and reducing its cost are thus vitally necessary to promote economic growth and to improve the quality of life of PIC households.

Fortunately, the islands have good renewable energy endowments (e.g., solar, wind and hydro) and considerable energy efficiency potential. Hence, renewable energy technologies have become the least cost option for increasing access to modern energy services for rural households and micro and small enterprises (MSEs), and energy efficiency improvements can reduce energy import costs. However, past donor (mainly bilateral) assistance efforts have been technology-focused, fragmented, and have failed to establish efficient and commercially-sustainable energy service delivery systems.

With GEF support, the Pacific Island states are now beginning to strategically address the major barriers to renewable energy development and energy efficiency improvement. The first key steps in that process are the UNDP/GEF Pacific Islands Renewable Energy Project (PIREP) and its follow-up project, the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP).¹ These two regional projects are addressing barriers to renewable energy development in the areas of policy, and regulation and technology standards, as well as helping to increase awareness. This proposed project, which has been developed in discussion with UNDP, will complement them by addressing the two major remaining barriers: (i) the lack of a professional, accessible dealer network to supply and help maintain renewable energy equipment, such as solar PV kits and/or pico hydro units and (ii) the reluctance of local financial institutions to finance renewable energy systems and energy efficiency investments on affordable terms.

These two major barriers are interlinked and mutually reinforcing. There is currently not enough demand for renewable energy equipment for an accessible and highly professional RE equipment dealer network to develop, because the equipment’s high initial investment cost prevents most of the population from purchasing it for cash. Because of the low demand, retailers or renewable energy service companies (RESCOs) do not invest in stocks of SolarPV and/or pico-hydro equipment. Similarly, local banks do not have experience financing such equipment (nor have they explored this option), and hence view loans for renewable energy equipment as very risky and are unwilling to grant them.

¹ UNDP has a regional project under preparation, namely the Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP). It will contribute to the removal of the major barriers to the widespread utilization of RE technologies (RETs). The project covering the PICs is expected to: (i) increase the number of successful commercial RE applications; (ii) expand the market for RETs applications; (iii) enhance institutional capacity to design, implement and monitor RE projects; (iv) increase availability and accessibility of financing to existing and new RE projects; (v) strengthen legal and regulatory structures in the energy and environmental sectors; and, (vi) increased awareness and knowledge on RE and RETs among key stakeholders.
As local stores do not carry renewable energy equipment, customers are unaware of its existence and benefits. During identification of this project, several store owners expressed an interest, and had a sense that there would be considerable demand, but lack of market intelligence prevented them from entering this market. Stores would only respond to mainly donor or government financed bulk purchases and would not stock up for individual sales.

To keep monthly expenses for renewable energy systems the same or less than for fossil fuel options, renewable energy equipment buyers need loan-term loans of at least five to seven years. But the financial institutions are reluctant to make loans of the required length. And, the interest rates charged by banks on the few renewable energy and energy efficiency loans they do make to individuals and MSEs often render them unaffordable.

On the other hand, many local financial institutions are looking for good projects to finance, even in rural areas. For example, the Australian and New Zealand Banking Group Limited (ANZ) have recently initiated rural banking operations in Fiji and Solomon Islands. And, in response to a request for Expression of Interest published on the dgMarket website, ANZ has shown interest in renewable energy lending by its branches and subsidiaries in four of the five countries involved in this project. Similarly, a number of other local financial institutions have indicated strong interest in renewable energy lending, though some, particularly the smaller local institutions, would require significant technical assistance before they would be able to do so.

This proposed project will significantly increase the adoption and use of renewable energy technologies and energy efficiency measures in the participating Pacific Island states by: (i) helping local renewable energy equipment dealers with well-researched market intelligence to expand their businesses and develop their skills and (ii) exploiting the willingness of capable local financial institutions to lend for renewable energy and energy efficiency projects, and removing the barriers to such lending. The project’s proposed mechanism of risk sharing instruments, backed with GEF funds, with targeted financial and dealer institutional capacity building, is calculated to give the required stimulus to the financial institutions and renewable energy dealers without causing them to deviate from their normal business practices or undermining their commercial viability.

2. Objectives

The project aims to significantly increase the adoption and use of renewable energy technologies in participating Pacific Island states through a package of incentives to encourage local financial institutions to participate in sustainable energy finance in support of equipment purchase. The key indicators are:

- number of additional households and MSEs served by modern sustainable electricity services;
- installed new renewable generation capacity by unit and kW;
- utilization of the equipment (in kWh) for the first three years after purchase;
- financial savings realized by switching from non-renewable fossil fuels (such as kerosene, petrol and diesel) and non-reusable batteries (such as alkaline dry cells) to
renewable supply options including Solar PV, pico-hydro and coconut oil-fuelled generators; and
- number of kWh saved due to energy efficiency interventions.

1. Project global environmental objective and key indicators

The global environment objective is to contribute to mitigating climate change through the reduction of greenhouse gas emissions in line with the United Nations Framework Convention on Climate Change. The key indicators are:
- CO₂ emissions avoided;
- investments in sustainable energy supply and in energy efficiency measures; and
- financing provided by local financial institutions for sustainable energy and energy efficiency purposes.

2. Higher level objectives to which the project contributes

The project supports the higher-level sector and country development objectives of the Pacific Island countries, as expressed in the Bank’s Pacific Regional Strategy for FY2006-2009, by contributing to: (i) reducing poverty and increasing the quality of life for those persons living in rural households and (ii) generating sustainable economic growth and employment opportunities. It does so through facilitating increased access to electricity, reducing reliance on kerosene and diesel power generation, enabling income-earning activities, and contributing to the development of micro and small enterprises.

3. Rationale for Bank Involvement

In the Pacific Forum of the Finance Ministers of the Pacific Islands held in Washington, DC in September 2005, several PICs requested the World Bank to provide urgent Bank assistance to expand sustainable energy use and energy efficiency to offset the increased price of oil, which has already had a significant adverse effect on their economies. The Bank and GEF are well-positioned to provide the necessary funds and technical expertise to meet this request, which is consistent with the Bank’s strategy for the Pacific region.²

The proposed project is consistent with GEF Operational Program (OP) Number 5: “Removal of Barriers to Energy Efficiency and Energy Conservation” and OP Number 6: “Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs.” The specific priority is CC-2: Increased Access to Local Sources of Financing Renewable Energy and Energy Efficiency.

The United Nations Development Programme (UNDP), with GEF financing, has under preparation a project entitled Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP), which is also regional in scope. Discussions have been held with

² The countries are covered under the Bank’s Pacific Regional Strategy for FY 2006 - FY 2009.
UNDP to ensure that the proposed SEFP project is complementary to PIGGAREP while also focusing on the Bank’s comparative advantage – innovative financing.

4. Description
The SEFP project consists of four components that together will promote the financing of sustainable energy and energy efficiency investments, as well as the early monitoring of the effectiveness of these investments. The sustainable energy options to be supported under this project are Solar PV, pico-hydro, investments to switch fuel for stationary generating engines from diesel to coconut oil, and technologies focused on improving energy efficiency.

The financing will all originate from local financial institutions that are willing, with support from SEFP, to lend to individuals and MSEs for qualifying investments. The capacity of these banks and non-bank financial institutions to lend to these types of borrower for such purposes will be enhanced by technical assistance offered under SEFP. Further technical assistance will be given to retailers and installers of qualifying equipment, to ensure that they are properly trained in the technologies concerned. SEFP financing support has been designed to reduce to a minimum any distorting effect on financial or commercial markets in the countries of operation. The proposed mechanism of risk sharing instruments, backed with GEF funds, is calculated to give the required stimulus to financial institutions without causing them to deviate from their normal spectrum of loan terms.

The four components of SEFP are presented in Table 1 below:

Table 1: SEFP Project Components

<table>
<thead>
<tr>
<th>Components</th>
<th>Governments and utilities</th>
<th>NGO/EC and IFC parallel financing</th>
<th>Local banks</th>
<th>MSEs</th>
<th>GEF</th>
<th>Total</th>
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<tr>
<td>1. Risk-Sharing Fund and Renewable Energy Investments</td>
<td>19.50</td>
<td>1.50</td>
<td>19.80</td>
<td>1.50</td>
<td>5.20</td>
<td>47.50</td>
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<td>a. TA to Financial institutions</td>
<td>0.20</td>
<td>0.30</td>
<td>0.45</td>
<td>0.95</td>
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<td>b. TA, for Retailers, MSEs and RESCOs</td>
<td>0.20</td>
<td>0.25</td>
<td>1.20</td>
<td>1.65</td>
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<td>c. Develop and update Product Catalogue</td>
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<td></td>
<td>0.30</td>
<td>0.30</td>
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<td>d. Participant Training and Communications</td>
<td>0.75</td>
<td>0.10</td>
<td>0.10</td>
<td>1.40</td>
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<tr>
<td>e. TA for Utilities and Studies</td>
<td>0.20</td>
<td></td>
<td>0.20</td>
<td>0.40</td>
<td></td>
<td></td>
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<tr>
<td>2. TA, Market Surveys and Communications</td>
<td>1.35</td>
<td>0.40</td>
<td>0.35</td>
<td>2.60</td>
<td>4.70</td>
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<td>3. Participant Monitoring</td>
<td>0.40</td>
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<td>0.40</td>
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<td></td>
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<tr>
<td>4. Management &amp; Evaluation</td>
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<td></td>
<td>1.20</td>
<td>1.40</td>
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<td>Miscellaneous</td>
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<td>0.08</td>
<td>0.08</td>
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<tr>
<td>Total</td>
<td>19.70</td>
<td>2.85</td>
<td>20.20</td>
<td>1.85</td>
<td>9.48</td>
<td>54.08</td>
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5. Financing

<table>
<thead>
<tr>
<th>Financing Plan (US$m)</th>
<th>Source</th>
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<th>Foreign</th>
<th>Total</th>
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<tr>
<td>BORROWER/RECIPIENT</td>
<td>19.70</td>
<td>0.00</td>
<td>19.70</td>
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<tr>
<td>Global Environment Facility (GEF)</td>
<td>0.00</td>
<td>9.48</td>
<td>9.48</td>
<td></td>
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<tr>
<td>Borrowing Country’s Fin. Intermediaries</td>
<td>20.20</td>
<td>0.00</td>
<td>20.20</td>
<td></td>
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<tr>
<td>Sub-borrower(s)</td>
<td>1.85</td>
<td>0.00</td>
<td>1.85</td>
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</table>
6. Implementation

The most important partnerships under this project are with the UNDP REP-POR project as well as with the South Pacific Renewable Energy Project (SPREP), which is executing the PIGGAREP project on behalf of UNDP. The project also works together with the EC delegations in participating countries. In Solomon Islands, the EC Micro-Project Programme Phase II will provide parallel financing for pico-hydro and fuel switching for rural training centers and farmers field schools. In RMI, SEFP works together with the EC funded REP-5. In all countries, local NGOs, community groups and Universities have offered their assistance with the implementation of the project (letters of support in the Documents on File). Some foundations in Fiji and in PNG will make financial contributions to the project or provide parallel financing for project related activities.

The technical implementation of the project will be done within each country by the following Executive Agencies (EAs) and Fund Manager:

**Executive Agencies**

- Fiji: Ministry of Energy and Mines (MEM) Department of Energy;
- PNG: PNG Sustainable Energy Ltd. (PNGSEL). This agency is already responsible for implementing the ongoing PNG Teachers’ Solar Lighting Project;
- Solomon Islands: The Central Bank of the Solomon Islands (CBSI); and
- Marshall Islands and Vanuatu: To be selected based on tender process following IFC procurement procedures.

Each EA will enter into a Grant Agreement with the WB to define respective rights and responsibilities, including the grant of funds for local project management by the EA and provision of technical assistance to sustainable energy end-users, equipment suppliers and service companies.

**Fund Manager**

The Fund Manager is in actual fact also an Executive Agent in the terminology used for GEF supported World Bank projects. However, for clarity purposes regarding the structure of the project, this EA is called the Fund Manager. A Fund Manager, which will serve all participating countries, will administer the RSF component of the Project. Following World Bank procurement guidelines, the Australian and New Zealand Banking Group Limited (ANZ) has been selected as Fund Manager. ANZ will become the recipient of funds to constitute the RSF and pay its fees during the initial 10-year project period through a Grant Agreement with the WB, which will establish the rights and responsibilities of the parties.

**Responsibilities of EAs.** The general duties of EAs in each country will be as follows:

- implementation of SEFP in country, including liaison with local PFIs;
• handling all technical assistance procurement in compliance with World Bank and or IFC and local procurement requirements;
• managing all technical assistance contracts; and
• submitting periodic reports on the performance and status of the project components.

To address institutional capacity constraints, such as a shortage of qualified staff, each EA will execute the project through a Management Contract (MC). The MC will be an autonomous unit under contract to and supervised by the EA.

Responsibilities of the Fund Manager. The Fund Manager will be the custodian of the RSF monies, which will be administered in a prudent fashion to provide the financing support for loans by PFiS to SEFP beneficiaries. Administration will include holding the SEFP RSF, making risk sharing agreements with Participating Financial Institutions (PFIs), transferring funds in accordance with such agreements, monitoring commitments, managing the RSF’s foreign exchange exposure, and reporting to WB and IFC. Considering that commitments of RSF resources will be in the local currencies of the participating countries, and that outstanding commitments will change constantly as loan balances are repaid, the Fund Manager’s monitoring and foreign exchange management functions are most important.

Reporting by EAs and Fund Manager. Semi-annual reports on the status of SEFP in each country will be prepared by the EAs. Each EA reports to the respective Implementing Agency. The EAs in Fiji, Papua New Guinea and Solomon Islands report to the task manager in the World Bank. The EAs in Republic of Marshall Islands and Vanuatu report to the task manager in the IFC. The Fund Manager will supply unaudited quarterly reports on the status of the RSF to the task manager in the World Bank.

Details of the above implementation arrangements are presented in Annex 6.

7. Sustainability

Sustainability. Coupled with UNDP’s PIGGAREP project outputs, the access to equipment, information and finance in renewable energy and energy efficiency provided under this project is expected to lead to rapid increases in the use of modern energy services in the Pacific Islands at the individual and the micro and small enterprise levels. Such increases will lead to the establishment of a mature market for renewable energy and energy efficiency in the participating countries.

By working with the private sector to support commercially viable and demand-driven investments with financial support only in the form of risk sharing, facilitating lower interest rates and longer loan tenor, the projects ensures that local FI establish a direct stake in this market. Experience with other housing and micro finance loan schemes suggests that the proportion of loan losses would be modest.

The sustainability of the investments is expected to come from the fact that banks and financial institutions, once they have explored the renewable energy and energy efficiency market with the assistance of the risk sharing guarantee facilities offered under this project, will assess it as being
a sound, viable, and profitable line of business. They will therefore generate lending products to address the market, and lower or eliminate their risk sharing requirements.

**Replicability.** The project is already a partial replication from the *Teachers Solar Lighting Project* in PNG which is providing valuable information 12 months after its start. The basic concept of replacing kerosene and diesel with renewable energy solutions at a monthly cash flow equal to or less than what households and MSEs now pay for their fossil fuel based energy, through a financial intermediation method, is already considered for wide spread replication in Africa. Within each of the countries, replication of this commercial model is facilitated, *inter alia*, through active donor coordination by the Bank and the local governments, with efforts to ensure that donor programs do not disturb the market place through distribution of free Solar PVs and other renewables and that donations are in support of establishing a commercial market.

It is expected that after the first period of five years, banks will have recognized that lending for renewable energy is a profitable product line and will be prepared to lower their guarantee requirements. When guarantee funds are freed up, as loans made during the first period are repaid, it will allow the project to be financed for a second period of five years, inclusive of all GEF and IA supervision and monitoring costs, and will also facilitate the possibility to expand the range of products to include other renewables such as windmills and/or biogas installation.

8. Lessons Learned from Past Operations in the Country/Sector

In the Pacific region, there have been many efforts to develop renewable energy and energy efficiency, but few examples of successful and sustainable development outcomes. One promising example is a small Bank-GEF project in PNG in September 2005. The project’s objective is to catalyze commercial finance from the Teachers Savings and Loan Association to its members for the purchase of Solar PV systems. The project was designed for the delivery of 3,000 units over a period of five years. However when the approved product catalogue, with acceptable Solar Home Systems and the financing package was available, the project received over 7,000 applications in the first six month alone. The following tentative conclusions can be drawn from the limited experience:

- Local financial institutions, such as the Teachers’ S&L Association, are interested in expanding their loan portfolio, and are willing to finance renewable energy systems;
- Teachers and other salaried employees with regular incomes are an attractive group for financial institutions because it is possible to deduct their repayments ‘at source;’ and
- There is considerable real demand among such target groups for renewable energy systems if appropriate finance package is available.

From the unsuccessful experiences, we also draw useful lessons through understanding the reasons for failure:

- Suitable technical and management skills must be available locally. Projects which do not address these long-term training needs have been unsuccessful at least in part due to

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3 In GEF terminology, this is a “Medium-sized Project.”
technical failures resulting in unreliable service. Such failures can be caused by a range of factors including poor system design and installation; lack of maintenance or after sales service; low quality or inappropriate components; lack of end-user training resulting in incorrect operation and maintenance; and use of unproven technologies.

- There is a need to ensure good financial management is in place at the relevant financial institutions. Good outcomes can be compromised as a result of, *inter alia*, a lack of appropriate management and administrative skills and inappropriate ownership models, weak institutional capacity and support, ineffective long-term budgeting, and dependency on politically vulnerable subsidy schemes.

- It is important to carefully consider the ability and willingness of end-users to pay service fees or make loan payments. Failure to match or manage expectations of quality and type of electricity service; poor scheme administration, failure to enforce tariffs, and a lack of affordable finance may all impact the willingness or ability to pay.

- Having relevant cost-benefit information for renewable energy and energy efficiency measures is necessary. Without such info, households and enterprises are reluctant to invest and financial institutions are unwilling to lend. Uncertainty results in weak political drivers for energy development and schemes often fail to deliver cost-effective livelihood benefits.

- Schemes focused on private and/or community ownership have a high rate of success, while projects involving renewable energy installed in public buildings such as schools and hospitals show less successful outcomes.

The recently launched Renewable Energy Toolkit: An Operational Guide for Electric Services (www.worldbank.org/retoolkit) highlights the lessons from renewable energy programs supported by the World Bank, GEF and others. For stand alone renewable energy systems, successful programs have managed to concurrently provide solutions for six core issues during the introduction phase: (i) provide access to finance to overcome high initial cost of systems for end users and service providers; (ii) establish delivery infrastructure to connect the remote and dispersed markets to the often urban based suppliers; (iii) adopt inclusive rural electrification policy to clearly define the roles of grid extension and off-grid options, and ensure a level playing field for the stand alone service providers to fairly compete with traditional utilities; (iv) guarantee minimum quality of (after sales) service to ensure the quality of the products and services; (v) understand customer needs and increase service awareness to know consumers’ ability to pay and offer products that are tailored to consumers’ needs; and (vi) scale up capacity building to rapid increase understanding of the industry’s specifics to all business partners involved. The proposed project has been designed taking these lessons into account.

9. Safeguard Policies (including public consultation)

The technical assistance and investments in Solar PV, pico-hydro and fuel-switching in the project are expected to present minimal environmental risk. Apart from the sealed lead acid batteries in the Solar PV lighting kits, no hazardous materials are involved.

*Solar PV battery disposal risk.* The project was designed to alleviate the disposal risk of these sealed lead acid batteries, which arises for each user when the battery reaches the end of its useful life every three to five years. The initial loan to Solar PV end-users will incorporate an
element dedicated to the purchase of the first replacement battery. Arrangements will be made such that, before the finance for the replacement battery is released by the PFI, the old battery is handed in to the retailer. There are environmental laws in all participating countries which categorize batteries as low hazard waste, but enforcement is patchy or non-existent. Project EAs, using project TA funds, will work with the various national environment authorities to develop Codes of Conduct for battery disposal. In Fiji and PNG, battery disposal is now available on a commercial basis for the recovery of the lead. Solar PV suppliers under SEFP in all target countries will be required to use commercial battery disposal points when available and adhere to officially mandated procedures when in place.

*Low voltage transmission line for pico-hydros.* There is a minimal social risk associated with pico-hydro generators where the end-use for the power is located close, but not adjacent to the site of the generator; in such circumstances, a short low voltage transmission line across the intervening land will be needed. PFIs offering finance supported by the RSF will be required to check that the permission of all users of affected lands has been obtained, in accordance with local practices.

*Indigenous Peoples:* As the vast majority of the intended beneficiaries of the project are indigenous peoples, the project as a whole constitutes the Indigenous Peoples Plan. Both consultation processes and monitoring mechanisms have been well defined and will be carried out as a part of the project.

*Monitoring.* During implementation, a post audit review will be conducted by the Bank and IFC of (i) the management of battery disposal and (ii) agreements to pass transmission cables across neighbors’ land.

<table>
<thead>
<tr>
<th>Safeguard Policies Triggered by the Project</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
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<tr>
<td>Environmental Assessment (OP/BP/GP 4.01)</td>
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<td>Natural Habitats (OP/BP 4.04)</td>
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<td>Pest Management (OP 4.09)</td>
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<td>Cultural Property (OPN 11.03, being revised as OP 4.11)</td>
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<td>Involuntary Resettlement (OP/BP 4.12)</td>
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<td>Projects on International Waterways (OP/BP/GP 7.50)</td>
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