Social Assessment Report of the Fujian Coastal Fishing Harbor Construction Demonstration Project

Xiapu County Ocean and Fishery Bureau (XCOFB)
Fujian Ocean Technical School (FOTS)

September 2013
6. Social Gender and Development ................................................................. 28
   6.1 Introduction to Women in the Project Area .............................................. 28
      6.1.1 Women’s Situation in Fujian Province ............................................. 28
      6.1.2 Women’s Situation in the Project Area .......................................... 28
      6.1.3 Other Women’s Development Initiatives in the Project Area .......... 29
   6.2 Women’s Needs and Expectations ........................................................ 30
   6.3 Impacts of the Project on Women .......................................................... 31
      6.3.1 Positive Impacts ............................................................................. 31
      6.3.2 Negative Impacts ........................................................................... 32

7. Ethnic Minority Analysis ........................................................................... 33
   7.1 Overview of Ethnic Minorities in the Project Area ............................... 33
      7.1.1 Ethnic Composition in the Project Area ......................................... 33
      7.1.2 Ethnic Composition in the Beneficiary Population ......................... 33
      7.1.3 Characteristics of Ethnic Minorities ................................................. 34
   7.2 Participation of Ethnic Minorities in the Project ................................. 34
      7.2.1 Modes of Participation ................................................................... 34
      7.2.2 Needs for the Project ..................................................................... 35
   7.3 Impacts of the Project on Ethnic Minorities ......................................... 35
      7.3.1 Fishing Harbor Components ......................................................... 35
      7.3.2 Training Center Component ......................................................... 35
   7.4 Conclusion ............................................................................................ 35

8. Public Participation .................................................................................... 36
   8.1 Participation at the Preparation Stage .................................................... 36
   8.2 Subsequent Public Participation Plan .................................................... 37
   8.3 Public Participation Mechanism and Strategy ....................................... 38
      8.3.1 Establishing the Fishing Harbor Management Coordination Team .... 39
      8.3.2 Establishing the Fishing Harbor Management Station ............... 39

9. Social Risk Analysis .................................................................................. 41
   9.1 Risks at the Design Stage ...................................................................... 41
   9.2 Risks at the Implementation Stage ......................................................... 41
   9.3 Risks at the Operation and Management Stage .................................... 43

Appendix 1 Distribution Map of the Survey Sites .......................................... 45
Appendix 2 FGD Minutes ............................................................................. 46
Appendix 3 Fieldwork Photos ..................................................................... 50
List of Tables

Table 2-1 Administrative Divisions (2011) ................................................................. 5
Table 2-2 Population and Composition ..................................................................... 5
Table 2-3 Population Birth Rate, Mortality and Natural Growth Rate (2011) .......... 5
Table 2-4 GDP and Composition (2011) .................................................................. 6
Table 2-5 Income and Engel’s Coefficient (2011) ..................................................... 6
Table 2-6 Marine Products, and Marine Aquaculture and Fishing (2011) .......... 7
Table 2-7 Fishery Output by Year ............................................................................ 7
Table 5-1 Typhoon Statistics of Fujian Province ..................................................... 19
Table 5-2 Typhoon Landing Times and Places in Fujian Province ....................... 19
Table 5-3 Losses from Typhoons and Floods in Xiapu County (2009-2012)........... 22
Table 5-4 Fishing Boat Losses from Typhoons in Xiapu County (2009-2012) ....... 23
Table 5-5 Financial Losses from Typhoons in Xiapu County (2009-2012) ............ 23
Table 6-1 Women’s Population in the Project Area (2011) ........................................ 28
Table 6-2 Distribution of Samples by Gender and Age ............................................. 28
Table 6-3 Distribution of Samples by Gender and Educational Level ..................... 29
Table 7-1 Ethnic Composition by Township ............................................................ 33
Table 7-2 Ethnic Composition of Beneficiary Population in the Project Area ......... 33
Table 7-3 Summary of Features of Ethnic Minorities in the Project Area ............... 34
Table 8-1 Summary of Public Participation Activities at the Preparation Stage .... 37
Table 8-2 Summary of Public Participation Activities at Different Stages ............. 38
Table 8-3 Work Plan of the Fishing Harbor Management Station in the Project .... 40

List of Figures

Figure 5-1 Distribution of Typhoon Landing Places in Fujian Province (2007-2012) .... 20
Figure 5-2 Percentages of Landing of Tropical Cyclones in Fujian Province (except Tropical Depression) by Month ................................................................. 20
Figure 5-3 Percentages of Landing of Typhoons in Fujian Province by Month (2007-2012) ........................................................................................................... 21
Figure 5-4 Percentages of Direct Financial Losses from Major Meteorological Disasters to Total Direct Financial Losses in Fujian Province (2012) ....................... 22
Figure 5-5 Organizational Chart for Typhoon Resistance in the Project Area ......... 25
Figure 8-1 Organizational Chart for Fishing Harbor Management .......................... 39
Abbreviations

AH - Affected Household
AP - Affected Person
EMP - Environmental Management Plan
FGD - Focus Group Discussion
FOTS - Fujian Ocean Technical School
FSR - Feasibility Study Report
HD - House Demolition
IA - Implementing Agency
LA - Land Acquisition
M&E - Monitoring and Evaluation
PRC - People’s Republic of China
RAP - Resettlement Action Plan
RIB - Resettlement Information Booklet
RPF - Resettlement Policy Framework
SA - Social Assessment
XCOFB - Xiapu County Ocean and Fishery Bureau
XSAIM - Xiapu County State-owned Assets Investment and Management Co., Ltd.

Units

Currency unit = Yuan (RMB)
US$1.00 = RMB6.33
Abstract

A. Overview of the Project

The World Bank-financed Fujian Coastal Fishing Harbor Construction Demonstration Project (hereinafter, the “Project”) consists of 4 components—fishing harbor facility expansion and upgrading, early warning system upgrading, emergency plan and response system, training center establishment, and project management and implementation support.

The Project aims to reduce the vulnerability of fishermen in the project areas to extreme weather events, protect fishing boats from extremely disastrous weathers, such as typhoons and seasonal windstorms, and reduce fisherman casualties and fishing boat losses in the project area.

B. Purpose and methods of SA

This social assessment (SA) aims to learn all stakeholders’ expectations and needs, and identify the positive and negative impacts of the Project by surveying the current situation of fishing harbor development, fisherman training and early warning in the Project, thereby helping the project owners to take a series of measures in project design and implementation to ensure the extensive participation of the groups concerned, secure opportunities for all stakeholders to benefit from the Project, and maximize the Project’s benefits.

In order to prepare this report, the SA team carried out a series of public participation activities during April 11-20, and July 2013, conducted a field survey in 9 villages, held 10 FGDs, including 4 FGDs with women, involving 86 persons in total, interviewed 43 persons in depth, including fishermen, storeowners, housewives, old people and migrant workers, including 20 women (46.51%), held two stakeholder discussions, and interviewed 18 key informants from XCOFB, water resources bureau, women’s federation, ethnic and religious affairs bureau, and village collectives.

C. Social impacts

Fishing Harbor Components

Positive impacts: 1) reducing wind sheltering costs, fisherman casualties and fishing boat losses, and ensuring the personal and property safety of fishermen; 2) enhancing household wind sheltering capacity by making it easier for male laborers to shelter from wind at home; 3) promoting the orderly conduct of fishery transactions; 4) promoting the development of secondary and tertiary industries, and allowing for the improvement of the local employment environment; 5) promoting the employment of local residents, especially vulnerable groups, to increase their income; 6) upgrading and improving the emergency command center to improve disaster prevention and relief capacity; and 7) accelerating the flow of population to improve people’s quality of life.

Negative impacts: 1) Impacts of LA and HD: 207.5 mu of land will be acquired permanently for the Project, affecting 60 households with 189 persons, with a demolition area of 5420m², affecting 4entities with 15 persons; 3,192.14 mu of state-owned sea area occupied permanently, including275.85mu of aquaculture sea area, affecting 16 households with 59 persons, and 11 fish rafts, affecting 6 households with11 persons; 2) Construction may affect fishery production and regular transactions of aquatic products; 3) Construction and the passage of vehicles may
threaten the safety of local residents, especially old people, children and women, and affect the accessibility and convenience of fishing boats; 4) Noise, dust and waste arising from construction may affect the daily production and lives of nearby residents; and 5) Improper fishing harbor management may prevent the project objectives from being realized.

**Training Center Component**

Positive impacts: 1) Reduce training costs, and improve educational conditions and efficiency; 2) Improve employment and fishery skills of trainees, strengthen the safety of fishing activities, and increase income; 3) Brining more job opportunities and income to nearby residents.

Negative impacts: Construction may pose personal safety risks to the construction staff; on the other hand, the passage of vehicles may threaten the safety of local residents, especially old people, children and women. Impacts of construction on nearby residents and entities include: 1) Noise and dust arising from construction may affect the daily production and lives of nearby residents; 2) Since the construction site is close to the Fujian Freshwater Products Institute, mechanical operation, building material transport, and other construction activities may affect the daily work and lives of its staff during construction.

**D. Social gender and development**

Current situation of women’s development in the project area: Most of them have received junior high school education. They usually do not sail out, but do housework, take care of children and repair fishnets at home. Some of them deal with offshore kelp and laver cultivation, and cook for family members and crews on fishing boats. Their income is low, and their participation in public affairs is less than that of men.

The Project's main impacts on women are: reducing the pressure of wind sheltering of women; facilitating travel and improving quality of life; creating some job opportunities; and threatening their personal safety more seriously than men.

**E. Ethnic minorities**

Ethnic minorities account for a low percentage to the direct beneficiary population of the Project. According to the field survey and interviews, the local ethnic minorities have no significant production and living difference from the Han people, and enjoy the same policies on compensation for LA and HD. The project benefits are available to all ethnic groups, so it is not necessary to develop an ethnic minority development plan or policy framework separately.

**F. Social risks**

(1) At the design stage, the fishing harbors should be planned rationally based on the current situation and future development of the project area to avoid the risk of non-sustainability of the project benefits.

(2) The main risks at the implementation stage include: 1) risk of involuntary resettlement; 2) risk of construction safety; 3) health risk; 4) risk of fishing activities; 5) risk of typhoon; and 6) risk of educational level of trainees of the Training Center.

(3) The main risks at the operation and management stage include: 1) The project objectives cannot be fully realized due to improper fishing harbor management; and 2) Education on typhoon prevention should be strengthened for fishermen.
1. Introduction

1.1 Background and Overview of the Project

Fujian Province is located in southeastern China, with a sea area of 136,000 km², which exceeds land area, and boasts the longest coastline of China, numerous islands, rich marine resources, and a developed marine fishing and aquaculture industry. Xiapu County has a sea area of 29,600 km², accounting for 2/3 of the city’s sea area and 1/5 of that of the province, and a shallow water and tidal flat area of 696 km², 138 harbors of varying sizes and 194 islands of varying sizes. In Fujian Province and Xiapu County, marine fishery economy plays a crucial role in national economy. Xiapu County is increasingly threatened by extreme climates, such as typhoons and seasonal windstorms due to coastline development and global climate change, so it is especially urgent and important to further improve the capacity to resist natural disasters and public emergencies.

Currently, there are numerous fishing boats in Fujian Province. At the end of 2008, there were 61,800 motor fishing boats. However, the existing wind shelters and anchorages in Fujian can only accommodate 54.93% of the fishing boats. During typhoons, some fishing boats can only be anchored in unsafe small natural bays, or have to travel through long distances for wind sheltering, both time and fuel consuming, and risky. The existing fishing harbors are not only small in quantity but also irrational in distribution. The percentage of high-grade, integrated and wind sheltering harbors is low.

In order to optimize the layout of fishing harbors, improve the capacity of disaster prevention and relief of fishery, construct a fishing harbor economic zone, and improve the living standard of fishing zones, the provincial government has developed the Distribution and Construction Plan for Coastal Fishing Harbors of Fujian Province (2009-2018). According to the plan, 167 fishing harbors and 16 sheltering anchorages will be constructed, reconstructed or expanded during 2009-2013, the nearby sheltering rate of fishing boats increased to 83%, and a fishing harbor disaster prevention and relief system, and a regional fishing harbor service system largely established.

The Project complies with the Distribution and Construction Plan for Coastal Fishing Harbors of Fujian Province (2009-2018), and will construct adequate buildings, and improve early warning and disaster emergency response systems to protect fishing boats from extreme weather events, and reduce casualties and fishing boat losses in the project area.

Based on the above background and targets, the Project consists of 4 components—fishing harbor facility expansion and upgrading, early warning system upgrading, emergency plan and response system, training center establishment, and project management and implementation support.

(1) Fishing harbor facility expansion and upgrading

This component aims to protect fishing boats from typhoons and seasonal windstorms. In Xiapu County, 6 fishing harbors will be constructed or upgraded, including a central fishing harbor, a Grade-1 fishing harbor and 4 Grade-2 fishing
harbors, along with breakwaters, jetties, revetments, reclamation, premises, trestles, access roads and other infrastructure.

(2) Early warning system upgrading, emergency plan and response system
This component aims to help the project county upgrade and improve the emergency command center to improve disaster prevention and relief capacity, and further improve dispatching level.

(3) Training center establishment
This component aims to help Fujian Province strengthen marine vocational training on fishery production, boat maintenance and operation, risk evasion, disaster relief for fishermen. In this component, the FOTS Training Center will be funded, including a 3-storied training building, a 5-storeid dormitory building, a fire-fighting drill room, a ship propelling drill room and a standard diving pool.

(4) Project management and implementation support
This component includes: 1) project management consultation; 2) related learning; and 3) visits and capacity training of the project management staff.

1.2 Purpose of SA
The Project aims to reduce the vulnerability of fishermen in the project areas to extreme weather events, protect fishing boats from extremely disastrous weathers, such as typhoons and seasonal windstorms, and reduce fisherman casualties and fishing boat losses in the project area.

This SA aims to learn all stakeholders’ expectations and needs, and identify the positive and negative impacts of the Project by surveying the current situation of fishing harbor development, fisherman training and early warning in the Project, thereby helping the project owners to take a series of measures in project design and implementation to ensure the extensive participation of the groups concerned, secure opportunities for all stakeholders to benefit from the Project, and maximize the Project's benefits. Therefore, the main purpose of this SA is to:

(1) identify the primary stakeholders of the Project, learn their perceptions of and needs for the Project, and collect their comments;
(2) identify and analyze the Project’s impacts on and potential risks to all stakeholders;
(3) strengthen local knowledge and public participation, and propose a fishing harbor management pattern and a public participation strategy suited to local experience;
(4) learn past typhoons’ social and economic impacts, and impacts on fishermen’s lives and production through field survey and secondhand information collection, with focus on typhoon prevention needs, and the improvement of the typhoon prevention strategy and mechanism; and
(5) develop a social action plan to improve the project design, evade project risks and promote the realization of the project objectives through extensive participation and consultation.

1.3 Methods of SA
(1) Literature review: Literature review aims to learn the local social and economic profile, fishing harbor management, and typhoon prevention mechanism
and strategy from secondhand literatures, including: 1) Fujian and Xiapu Statistical Yearbooks 2012; 2) Fujian and Xiapu ocean and fishery typhoon prevention emergency plans; 3) fishing harbor construction standards; 4) annual fishery statistical reports; 5) 2012 civil work reports; 6) outlines and summaries of women’s and children’s development; 7) poverty reduction plans and summaries; and 8) LA and HD policies and regulations.

(2) FGD: FGDs were held to: 1) evaluate positive impacts and potential social risks of the Project; 2) learn the APs’ awareness of, attitudes to and expectations for the Project; 3) learn the social adaptability and inclusion of the Project to current and future local development; 4) promote public participation, and learn the local information sources on the Project and typhoons, and how to improve public knowledge on marine safety and typhoon prevention. The social consultants held 10 FGDs in total (including 4 FGDs with women), involving 86 persons in total. The FGD participants include women, old people, the poor and other vulnerable groups.

(3) In-depth interview: In-depth interviews aims to learn the APs’ production and living conditions, the Project’s impacts on and potential risks to them, and their attitudes to and expectations for the Project. In this SA, in-depth interviews were conducted with 43 persons in 9 villages, including fishermen, storeowners, housewives, old people, heads of aquatic product processing enterprises and migrant workers, including 20 women, accounting for 46.51%.

(4) Stakeholder discussion: Stakeholder discussions aim to: 1) evaluate the stakeholders’ capacity in project design, implementation and M&E, interests in and impacts by the Project (and include them in the participation process on this basis); 2) collect their comments on and expectations for the Project; 3) evaluate the APs’ needs, social impacts and possible social risks, and incorporate effective measures to avoid or mitigate such risks proposed by them into the project design, thereby maximizing the positive impacts and reducing negative impacts.

The primary stakeholders of the Project are: 1) the groups directly and indirectly affected by the Project, including males, females, low-income groups, etc.; 2) government authorities concerned, including the owners, implementing agency (IA), XCOFB, water resources bureau, health bureau, women’s federation, ethnic and religious affairs bureau, civil affairs bureau, agriculture bureau, etc. Two stakeholder discussions have been held, where representatives of the APs and agencies concerned expressed comments on and reasonable expectations for the Project.

(5) Key informant interview: Key informant interviews are designed to learn the current situation of participation of the stakeholders in the Project, and their comments and suggestions on the Project and the social action plan. 18 key informant interviews were conducted with key informants from XCOFB, the water resources bureau, health bureau, women’s federation, ethnic and religious affairs bureau, and affected villages.

1.4 Key Concerns of SA

According to the terms of reference of consulting services, this SA will describe the overview of social and economic development of the project area, analyze typhoon impacts on the project area, and develop and implement a typhoon prevention program; identify the primary stakeholders, and analyze their needs and impacts; identify the Project’s potential positive and negative impacts, and potential
social risks; analyze the development of local women, the Project's impacts on them and their needs for the Project; analyze the situation of local ethnic minorities, and the Project's impacts on them; analyze how to involve the stakeholders in the Project effectively, and propose a public participation plan; and incorporate social factors related to the fulfillment of the project objectives in the project design, and propose measures to avoid or reduce negative impacts.

According to the field survey, the key social concerns of this SA are:

1. Impacts of typhoons on local fishermen, including historical disasters, and their needs and expectations for the Project
2. Typhoon prevention mechanism and program: learning local experience in typhoon prevention, and improving the early warning system
3. Social impacts: learning impacts on the stakeholders, especially on vulnerable groups
4. Fishing harbor management pattern: identifying the stakeholders’ needs and comments to improve the fishing harbor management pattern
5. Public participation strategy: ensuring the participation of fishermen and local vulnerable groups
2. Overview of the Project Area

2.1 Natural Conditions and Administrative Division

Fujian Province is located in southeastern China, with a land area of 124,000 km² and with a sea area of 136,000 km², where mountainous and hilly area accounts for 90% of its land area. The province governs 9 cities, 26 municipal districts, 14 county-level cities and 44 counties.

Fuzhou City is the capital of Fujian Province, with a land area of 12,000 km², and governs 43 sub-districts, 99 towns, 47 Xiangs, 494 communities and 2,390 villages.

Xiapu County is located in eastern Ningde City, with a land area of 1,489.6 km² and a sea area of 29,592.6 km², and governs two sub-districts, 12 townships, 292 villages and 23 communities.

Table 2-1 Administrative Divisions (2011)

<table>
<thead>
<tr>
<th>Division</th>
<th>Sub-districts</th>
<th>Townships</th>
<th>Communities</th>
<th>Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>7194</td>
<td>33270</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Fujian Province</td>
<td>173</td>
<td>929</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Fuzhou City</td>
<td>43</td>
<td>146</td>
<td>494</td>
<td>2390</td>
</tr>
<tr>
<td>Ningde City</td>
<td>12</td>
<td>112</td>
<td>164</td>
<td>2136</td>
</tr>
<tr>
<td>Xiapu County</td>
<td>2</td>
<td>12</td>
<td>23</td>
<td>292</td>
</tr>
</tbody>
</table>

Source: statistical yearbooks 2012

2.2 Population

In 2012, Fujian’s resident population was 37.48 million, including 18.21 million females, accounting for 48.58%, 22.34 million urban residents, accounting for 59.6%, and 3.09 million people aged 65 years or above, accounting for 8.23%. Fuzhou’s registered population was 6.5527 million, including 3.1816 million females, accounting for 48.55%; and an urban registered population of 1.9206 million, accounting for 29.31%.

In 2011, Xiapu County’s registered population was 532,562, including 252,468 females, accounting for 47.4%; and an urban population of 176,620, accounting for 33.2%. The percentages of female and urban populations were lower than the national, provincial and municipal averages. See Table 2-2 and Table 2-3.

Table 2-2 Population and Composition

<table>
<thead>
<tr>
<th>Division</th>
<th>Population (0,000)</th>
<th>By gender (0,000)</th>
<th>By household registration (0,000)</th>
<th>Old population (0,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Females</td>
<td>Percent (%)</td>
<td>Urban</td>
</tr>
<tr>
<td>China</td>
<td>135404</td>
<td>66009</td>
<td>48.7</td>
<td>71182</td>
</tr>
<tr>
<td>Fujian Province</td>
<td>3748</td>
<td>1821</td>
<td>48.58</td>
<td>2234</td>
</tr>
<tr>
<td>Fuzhou City</td>
<td>655.27</td>
<td>318.16</td>
<td>48.55</td>
<td>414.78</td>
</tr>
<tr>
<td>Ningde City</td>
<td>284</td>
<td>137.87</td>
<td>48.6</td>
<td>143.7</td>
</tr>
<tr>
<td>Xiapu County</td>
<td>53.2562</td>
<td>25.2468</td>
<td>47.4</td>
<td>17.6620</td>
</tr>
</tbody>
</table>

Source: national economic and social development statistical bulletins 2011 (China, Fujian, Fuzhou and Ningde); Xiapu Statistical Yearbook 2012

Table 2-3 Population Birth Rate, Mortality and Natural Growth Rate (2011)
### 2.3 Social and Economic Development

In 2011, Fujian’s GDP was 1.741021 trillion yuan, in which the added value of primary industries was 161.061 billion yuan, accounting for 9.2% and up 4.2% year-on-year, that of secondary industries 916.754 billion yuan, accounting for 52.7% and up 16.4%, and that of tertiary industries 663.206 billion yuan, accounting for 38.1% and up 8.6%. The per capita disposable income of urban residents was 24,907 yuan, the per capita net income of rural residents 8,779 yuan, the Engel’s coefficient of urban residents 39.2%, and the Engel’s coefficient of rural residents 46.4%.

In 2011, Fuzhou's GDP was 373.478 billion yuan, in which the percentage and growth rate of primary industries were lower than the national and provincial averages; the percentage of secondary industries was lower than the national and provincial averages, and their growth rate was higher than the national average but lower than the provincial average; and the percentage and growth rate of tertiary industries were higher than the national and provincial averages.

In 2011, the percentage and growth rate of primary industries of Xiapu County were higher than the national, provincial and municipal averages, and its per capita net income of rural residents was higher than the national and municipal averages but lower than the provincial average. See Table 2-4 and Table 2-5.

Source: national economic and social development statistical bulletins 2011 (China, Fujian, Fuzhou and Ningde); Xiapu Statistical Yearbook 2012

### Table 2-4 GDP and Composition (2011)

<table>
<thead>
<tr>
<th>Division</th>
<th>GDP (00m yuan)</th>
<th>Primary industries (00m yuan)</th>
<th>Secondary industries (00m yuan)</th>
<th>Tertiary industries (00m yuan)</th>
<th>Growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Output value</td>
<td>Output value</td>
<td>Output value</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>471564</td>
<td>47714</td>
<td>10.1</td>
<td>220592</td>
<td>43.1</td>
</tr>
<tr>
<td>Fujian Province</td>
<td>17410.21</td>
<td>1610.61</td>
<td>9.2</td>
<td>9167.54</td>
<td>38.1</td>
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<tr>
<td>Fuzhou City</td>
<td>3734.78</td>
<td>325.09</td>
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<td>1737.5</td>
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<tr>
<td>Ningde City</td>
<td>933.71</td>
<td>167.84</td>
<td>18.0</td>
<td>439.54</td>
<td>34.9</td>
</tr>
<tr>
<td>Xiapu County</td>
<td>115.3689</td>
<td>31.4335</td>
<td>27.2</td>
<td>36.8693</td>
<td>40.8</td>
</tr>
</tbody>
</table>

Source: national economic and social development statistical bulletins 2011 (China, Fujian, Fuzhou and Ningde); Xiapu Statistical Yearbook 2012

### Table 2-5 Income and Engel's Coefficient (2011)

<table>
<thead>
<tr>
<th>Division</th>
<th>Per capita disposable income (yuan)</th>
<th>Engel's coefficient (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>China</td>
<td>21810</td>
<td>6977</td>
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<tr>
<td>Fujian Province</td>
<td>24907</td>
<td>8779</td>
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<tr>
<td>Fuzhou City</td>
<td>26050</td>
<td>10107</td>
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<tr>
<td>Ningde City</td>
<td>19314</td>
<td>7756</td>
</tr>
</tbody>
</table>
2.4 Marine Aquaculture and Fishing

In 2011, Fujian’s aquatic output was 6,037,800 tons, including 5,262,035 tons of marine products, accounting for 87.15%. Marine aquaculture area was 2,134,800 mu, the output of marine products was 3,161,489 tons, accounting for 60.06%, and the output of fishing products 2,100,546 tons, accounting for 39.92%. In 2011, Xiapu County’s output of marine products was 306,790 tons, accounting for 99.88% of the aquatic output; among marine products, aquaculture products account for 67.64%. See Table 2-6.

<table>
<thead>
<tr>
<th>Division</th>
<th>Aquatic products</th>
<th>Marine products</th>
<th>Aquaculture products</th>
<th>Fishing products</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Output (ton)</td>
<td>Marine products</td>
<td>Area (mu)</td>
<td>Output (ton)</td>
</tr>
<tr>
<td>Fujian</td>
<td>6037800</td>
<td>5262035</td>
<td>87.15</td>
<td>2134800</td>
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<td>Xiapu County</td>
<td>307158</td>
<td>306790</td>
<td>99.88</td>
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<tr>
<td>Changchun Town</td>
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<td>47293</td>
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<td>57345</td>
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<tr>
<td>Yacheng Town</td>
<td>6625</td>
<td>6552</td>
<td>98.9</td>
<td>13530</td>
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<td>Sansha Town</td>
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<td>28239</td>
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<td>19620</td>
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<tr>
<td>Haidao Xiang</td>
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Source: Fujian Statistical Yearbook 2012; Xiapu Statistical Yearbook 2012

2.5 Output Value of Fishery and Aquatic Product Processing Enterprises

During 2007-2011, the total output value of agriculture, forestry, stockbreeding and fishery, and output value of fishery of Fujian Province were increasing, and the percentage of output value of fishery to the total output value of agriculture, forestry, stockbreeding and fishery remained stable around 27%.

In 2011, there were 28 aquatic product processing enterprises in Xiapu County, with a total industrial output value of 1.23225 billion yuan. During 2007-2011, the percentage of output value of fishery to the total output value of agriculture, forestry, stockbreeding and fishery of Xiapu County was increasing. See Table 2-7.

<table>
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Source: Fujian Statistical Yearbook 2012; Xiapu Statistical Yearbook 2012
3. Stakeholder Identification and Demand Analysis

3.1 Stakeholder Identification

Stakeholders mean individuals or groups who can affect or be affected by the objectives of the Project. According to the field survey and interviews with agencies concerned, the primary stakeholders of the Project include: 1) APs, especially fishermen, including residents living on ports and jetties; 2) aquatic product processing enterprises; and 3) PMO, owners, design agency and other agencies concerned; and 4) government authorities concerned.

(1) APs

The APs are a primary stakeholder, including fishermen near the fishing harbors, residents living on ports and jetties, and villagers near the Training Center. After the completion of the Project, the wind sheltering capacity of the harbors will be stronger, so that boats can take shelter nearby, reducing economic and time costs of wind sheltering in the typhoon season. The improved overall fishing harbor environment also helps to attract more high-grade fish product traders, and increase prices of fish products, thereby benefiting all affected fishermen.

During construction, the transport of building materials will generate noise and dust pollution, and the regional aquatic environment may also change, thereby affecting local aquaculture adversely. Construction will also involve sea area withdrawal, resulting in reduced income and livelihood pattern changes. Although these households and fishermen will be affected temporarily, they will benefit more from the Project in general.

After the completion of the Training Center component, more trainees will come here, thereby promoting nearby catering, accommodation and amusement activities, thereby promoting the employment and income increase of nearby residents. Therefore, these residents will be a stakeholder in the Project.

Generally, the APs’ main needs for the Project are: 1) need for improved fishing harbor wind sheltering capacity; 2) need for fishing harbor management; 3) need for improved fishing harbor infrastructure; 4) need for upgraded typhoon early warning system and emergency plan; and 5) need for typhoon resistance and fishery safety knowledge training.

(2) Aquatic product processing enterprises

There are some aquatic product processing enterprises relying on fishing harbors for transport. ①Most fishing harbors are old, crude, narrow or incapable, affecting local economic development seriously; ②Since the fishery of the project county is very developed, large quantities of marine products have to be transported through fishing harbors. Some aquatic product processing enterprises have to sell aquatic products to other countries and regions via fishing harbors. The insufficient capacity of fishing harbor infrastructure may affect the supply of raw materials of these enterprises and their development.

Therefore, these enterprises expect to facilitate the handling of fishing boats, ensure the continuous supply of raw materials and the timely outward transport of aquatic products through the expansion and upgrading of fishing harbor infrastructure.
(3) PMO, owners, design agency and other agencies concerned

The Fujian PMO has been established under the provincial ocean and fishery department, responsible mainly for directing, coordinating and supervising project preparation and implementation.

The owners are Xiapu County State-owned Assets Investment and Management Co., Ltd. (XSAIM), and FOTS, which are responsible for organizing and managing project construction, and are stakeholders closely associated with the Project. The design agency is Fujian Aquatic Design Institute, and the environmental impact assessment (EIA) is Fujian Academy of Environmental Science. These agencies expect to complete the Project as soon as possible and give play to its benefits through joint efforts.

(4) Government authorities concerned

Government authorities concerned include those related to ocean and fishery, such as the county water resources bureau that is responsible for tidal flat reclamation and seawall construction. In addition, the government authorities related to project construction, LA, HD and resettlement also include the county land and resources bureau, LA and HD management office, etc., as well as village committees. Therefore, they expect to complete the Project successfully, and promote the improvement of local fishing harbor wind sheltering capacity through cooperation.

3.2 Stakeholder Demand Analysis

3.2.1 Survey Process

In order to identify the stakeholders and their needs, the SA team conducted a series of public participation activities for different stakeholders at the preparation stage. These activities aim to provide all stakeholders with opportunities to participate in the Project and share information, learn their expectations and appeals, and the Project's impacts on them, promote the public awareness of the Project, improve the project design based on public feedback, and promote the realization of the project objectives.

(1) APs: The SA team conducted 10 FGDs and 43 in-depth interviews to learn their attitudes to and expectations for the Project, and the Project's impacts on them.

(2) Aquatic product processing enterprises: The SA team interviewed 3 heads and 4 workers of some aquatic product processing enterprises to learn their current situation of fishing harbor utilization, and needs for and suggestions on the Project.

(3) Government authorities concerned: The SA team interviewed 9 village heads/secretaries, and conducted 18 key informant interviews with the owners, IA, XCOFB, water resources bureau, health bureau, women’s federation, ethnic and religious affairs bureau, civil affairs bureau, agriculture bureau, etc. to learn the current situation of local fishery production, typhoon impacts, ethnic composition, their policies and suggestions on the Project. In addition, two stakeholder discussions have been held, where representatives of the APs and agencies concerned expressed comments on and reasonable expectations for the Project.

3.2.2 Needs

Local residents' main needs for the Project are fishing harbor wind sheltering capacity, fishing harbor management, fishing harbor infrastructure, typhoon early warning system and emergency plan, and typhoon resistance and fishery safety
knowledge training.

(1) **Need for improved wind sheltering capacity of fishing harbors**

Natural disasters, such as typhoons and windstorms, occur frequently in the project, posing great risks to the personal and property safety of fishermen. Local fishing households live mainly on fishing and aquaculture, and fishing boats are their basic and most important means of production. Fishing boats are expensive. Once they are damaged by typhoons, etc., fishermen may be unable to repair them or buy new ones, thereby affecting their livelihoods. Therefore, in the typhoon season, wind sheltering at safe and well-equipped fishing harbors is very important for local fishermen.

1) Small number of fishing harbors, and high economic and time costs:
Currently, there are few fishing harbors with good wind sheltering conditions in the project area, so that most fishing boats have to take shelter elsewhere in the typhoon season, which is costly, time-consuming and dangerous.

2) Currently, the capacity of the existing fishing harbors in the project area is insufficient for the wind sheltering demand of fishing boats, and some harbors are silted and cannot berth large boats. This situation is dangerous to both fishermen and fishing boats.

3) Backward fishing harbor infrastructure: Wind sheltering places for non-local fishermen should be improved, such as toilets.

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**Interview with Mr. Lu, Dajing Village, Changchun Town, Xiapu County**

“When ever there is a typhoon, we would take shelter over a long distance, and would spend thousands to tens of thousands of yuan at a time.” However, we have to spend such money for the sake of safety. We just expect a good fishing harbor for fishing boats to be berthed and take shelter, so that we can spend less on this.

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(2) **Need for fishing harbor management**

The improvement of the wind sheltering capacity of fishing harbors relies not only on the construction and upgrading of fishing harbors, but also on their management. If fishing harbor management is inadequate, their effectiveness cannot be fully realized. In the field survey, most respondents think that fishing harbor management is now inadequate or disordered, and expect that management be improved and regulated.

The management of fishing harbor zones includes the release of berth information, coordination of incoming and outgoing fishing boats, and management of anchoring of fishing boats. Some fishermen say that they cannot obtain berth information in the typhoon season, so that when they arrive at a fishing harbor, there is already no berth. In this case, if they have to go to another fishing harbor, they may be faced with a greater typhoon risk.

In the typhoon season, there are many fishing boats of varying models in fishing harbors, so that collision accidents are likely to occur. To this end, fishing boat berthing coordination and management should be strengthened. Some respondents say that the arbitrary anchoring of fishing boats should be controlled.

(3) **Need for improved fishing harbor infrastructure**

Currently, the infrastructure of most fishing harbors in the project area is backward, and there is a shortage of premises, trestles, etc., thereby affecting the
conduct of fishery activities.

1) Narrow, old, scattered and incapable jetties: For example, the jetty of the Beishuang Fishing Harbor is very small and disordered. The jetty of the Sansha Central Fishing Harbor is scattered and has insufficient capacity, thereby affecting local economic development.

2) Insufficient infrastructure: Some fishing harbors lack basic premises, access roads, trestles and other infrastructure.

3) Lack of rational functional zoning: Some fishermen say that jetties have not been rationally zoned in function, and are therefore disordered and inefficient.

(4) Need for traffic accessibility of fishing harbors

The traffic accessibility of fishing harbors is an important factor in determining how effective a fishing harbor is in general. Currently, the access road of the Sansha Central Fishing Harbor is broad and made of earth; the accessibility of the Dajing Grade-2 Fishing Harbor is low; the dual-lane access roads of the Luxia Grade-1 Fishing Harbor and Fenghuo Grade-2 Fishing Harbor are smooth and largely sufficient; and the Beishuang and Wen’ao Grade-2 Fishing Harbors are located on sea islands and accessible by boat.

The respondents expect that the external road connection of fishing harbors be strengthened, and more attention paid to road management and safety so that the overall benefits of fishing harbors are made available to the APs. 1) Road connection: The functioning of the Project is closely associated with road connection, and the respondents expect that the pavement of the access road of the Sansha Central Fishing Harbor be hardened for greater accessibility; 2) Road management: In the busy season of fishery production and trading, there are many vehicles from the outside and roads are easily blocked. The agencies concerned should strengthen road management to keep roads smooth and safe; 3) Road safety: The increasing vehicular traffic is threatening the safety of local residents, especially old people, women and children. The fishing harbor management authority should strengthen control to ensure passenger and vehicular safety.

(5) Need for typhoon early warning system and emergency plan upgrading

To resist typhoons, information on typhoon intensity and routing should be made available to local residents timely. Most respondents can receive typhoon information by means of TV, broadcast, Internet and mobile phone, but such information is not specific and comprehensive enough. If so, the may be unable to cope with difficulties timely and suffer unnecessary losses.

(6) Need for typhoon resistance and fishery safety knowledge training

Typhoon resistance and fishery safety knowledge is a priority and urgent need for
most respondents, because natural disasters such as typhoons and windstorms occur frequently in the project area.

In order to resist typhoon and reduce accidents, not only a sound resistance mechanism should be established and a detailed safety knowledge handbook prepared, but also relevant publicity and training should be given. Such training should be scheduled in the fishing-off season, and be diversified and flexible to combine classroom instruction with live demonstration.

**Interview with Secretary Liu, Fenghuo Village, Sansha Town, Xiapu County**

In the fishing-off season (May-September), the aquatic products bureau would give training in our village, covering fishing, aquaculture, etc.; XCOFB would also offer fishing crew training courses that cover marine rescue and first-aid, etc. These training activities help improve the safety awareness and professional proficiency of fishermen.
4. Social Impact Analysis

4.1 Fishing Harbor Components

4.1.1 Positive Impacts

(1) Reducing wind sheltering costs, fisherman casualties and fishing boat losses, and ensuring the personal and property safety of fishermen

Currently, in the typhoon and windstorm season, since local fishing harbors are unable to provide wind sheltering or their wind sheltering capacity is weak, most local fishing boats are unable to take shelter nearby but have to go elsewhere for wind sheltering. During wind sheltering, large amounts would be spent on sailing, and fishermen’s catering and accommodation. Depending on distance and tonnage, the cost of wind sheltering per time ranges from hundreds to thousands of yuan. During typhoons and windstorms, accidents are likely to occur due to high wind power or untimely response, posing a great risk to fishermen’s personal and property safety. In addition, due to the limited capacity of fishing harbor, some boats are unable to be berthed for wind sheltering.

After the completion of the Project, effective wind sheltering area will be about 1.78315 million m², so that most local fishing boats can take shelter nearby, saving economic and time costs of wind sheltering. Through the construction of breakwaters and other works, the wind sheltering capacity of fishing harbors will be increased, and the safety of fishing boats, and the personal and property safety of fishermen ensured.

**Interview with Mr. Zhu (39 years, living on fishing), Beishuang Village, Haidao Xiang**

Last year, I suffered typhoon losses 3 times, totaling 30,000 yuan. Now, big boats go to Simenqiao and small boats to Luxia for wind sheltering, but sometimes boats cannot enter, and there are risks for both boats and fishermen. A wind sheltering journey takes 2,000-3,000 yuan on fuel along. The fishing harbor should be improved as soon as possible, so that we don’t have to travel long distances for wind sheltering.

(2) Enhancing household wind sheltering capacity by making it easier for male laborers to shelter from wind at home

During typhoons, most male laborers would go elsewhere for wind sheltering by boat, leaving women, old people and children at home. If the personal or property safety of a family is threatened by a typhoon or any other factor, such threat cannot be dealt with timely and effectively due to the lack of male labor. On the other hand, male laborers taking shelter outside and family members staying at home would worry about one another’s personal safety during wind sheltering.

**Interview with Ms Jiang, Beishuang Village, Haidao Xiang**

I live with my husband, son and daughter. My family lives mainly on my husband’s fishing. We support fishing harbor improvement strongly, which will benefit fishermen greatly by ensuring the personal safety of women, children and old people (men can take care of family members at home), and saving costs considerably.
After the completion of the fishing harbor, fishermen can return home for wind sheltering and take care of family members, thereby improving the capacity of families for typhoon resistance.

(3) Promoting the orderly conduct of fishery transactions
Local fishermen do fishery transactions in two modes mainly: Large boats trade on sea or in a harbor zone directly; small boats may trade in market towns or farm produce fairs. Currently, jetties are small and unsound, and the access roads of some jetties are inaccessible, making fishery transport and trading inconvenient, and making it impossible for fishermen to do bulk transactions on jetties.

In the Project, harbor infrastructure will be improved and jetties functionally zoned, ensuring that fishery transactions can be completed on jetties or in harbor zones. With the improvement of access roads, more premium traders will be attracted, increasing prices of fish products. In addition, after the improvement of the harbor infrastructure, local fishermen may establish specialized aquatic associations for joint marketing or processing to enhance market competitiveness. Rational zoning helps ensure the openness, fairness and transparency of fishery transactions, facilitate market regulation, and protect fishermen’s rights.

Interview with Secretary Cheng, Changchun Town Government
Currently, large boats mostly trade on sea directly, while small boats may trade on board. Prices are market-marked and unregulated. An aquatic product association and a laver cultivation association have been established in the town but not in villages.

Interview with the secretary of Fenghuo Village, Xiapu County
The existing jetty is small and unmanageable. Fishermen, traders and workers are crowded on the jetty. After the completion of the Project, the jetty will become larger and more normative, and there will be more traders, driving up prices of fish products.

(4) Promoting the development of secondary and tertiary industries, and allowing for the improvement of the local employment environment
1) During construction, local building materials will be used first, thereby promoting the development of the building material industry, and creating more job opportunities for local residents. In addition, after the completion of the Project, more boats will go to the fishing harbors for wind sheltering or maintenance, thereby driving the development of the fishery material supply and boat repair industries.

2) Currently, aquatic product (laver, dried shrimp, yellow croaker, etc.) processing enterprises are developing rapidly, and transactions of aquatic products are active. Some fishing harbors have become distributing centers of aquatic products. After the completion of the Project, more fresh aquatic products can be processed onshore, and processed products can be transported by sea more easily.

Interview with the secretary of Beishuang Village, Wen’ao Village, Haidao Xiang, Xiapu County
During fishing harbor construction, building materials may be purchased locally. When the harbor is completed, the two shrimp processing enterprises in the villages will be able to expand production, which is beneficial to both the village and villagers.
3) The project area falls into central Asian tropical marine moist monsoon climate, and boasts a beautiful natural landscape and rich tourist resources, attracting numerous visitors, fishers and swimmers every year.

After the completion of the Project, the harbor infrastructure and development environment will be much better, thereby promoting the development of local agritainment sites, scenic spots and guesthouses.

**Interview with Secretary Wu of Dajing Village, Xiapu County**
Now there are over 260 stores, over 20 restaurants, over 30 guesthouses and several supermarkets in our village. Last year, our village received over 20,000 visitors during the National Day holiday and over 100,000 all the year round, with the beach being the main destination. After the fishing harbor and access road are completed, visitors can come here by boat. By then, there may be more tourists.

**(5) Promoting the employment of local residents, especially vulnerable groups, to increase their income**

1) At the construction and operation stages, temporary or permanent jobs will be created, including cleaning, painting and material hauling jobs at the construction, and cleaning, management and other jobs at the operation stage. 40% of these jobs will be first made available to local women, the poor and other vulnerable groups.

**Interview with Stationmaster Yang, Sansha Town, Xiapu County**
There are over 20 local workers working on the Sansha project (Phase 1), doing casual jobs mainly, such as weeding, cleaning and painting, including some women. Aquatic product processing enterprises sell products and obtain raw materials via fishing harbors mainly. The main destinations are Japan, Korea and Taiwan.

2) The Project will drive the development of nearby aquatic product processing enterprises, including shrimp processing and abalone fry cultivation enterprises. Their development will promote the development of aquaculture and increase prices of aquatic products. On the other hand, women and the poor can find jobs at these enterprises.

3) With the improvement of the harbor infrastructure, more visitors will come to the project area for fishing, swimming and sightseeing, thereby promoting the development of local tourist resources and related industries, and creating more job opportunities to local residents.

**(6) Upgrading and improving the emergency command center to improve disaster prevention and relief capacity**

The upgrading of the early warning system, emergency plan and response system will help upgrade and improve the emergency command center to improve emergency response capacity, minimize losses caused by emergencies, protect the personal and property safety of local residents, and promote sustainable economic development.

**(7) Accelerating the flow of population to improve people’s quality of life**
Currently, Beishuang and Wen’ao Villages with the Beishuang and Wen’ao
Grade-2 Fishing Harbors are located on sea islands, where it is inconvenient to transport materials, and local residents rarely go to the county town for shopping and entertainment.

The Project will improve infrastructure and wind sheltering capacity. With the development of trading and sea islands, more commuting and fishing boats will be available, making it more convenient for local residents to go out for shopping, entertainment and study.

With the development of local secondary and tertiary industries, there will likely be more migrant workers, thereby promoting local population flow.

4.1.2 Negative Impacts

(1) Impacts of LA and HD

207.5 mu of land will be acquired permanently for the Project, affecting 60 households with 189 persons, with a demolition area of 5420m², affecting 4 entities with 15 persons; 3,192.14 mu of state-owned sea area occupied permanently, including 275.85 mu of aquaculture sea area, affecting 16 households with 59 persons, and 11 fish rafts, affecting 6 households with 11 persons. The income and livelihoods of these affected households will be affected to varying degrees. The project owners should assist them in livelihood restoration, and pay compensation fees to them timely and fully.

(2) Construction will affect fishery production and transactions of aquatic products.

Machinery operation and material transport during construction will create noise that affect the growth of aquatic products, the driving of fishing boats and offshore fishing activities to some extent, thereby affecting the shipment and marketing of local fish products, and the income of related workers adversely.

(3) Construction will affect the safety of residents and fishing boats.

Construction and the passage of vehicles may threaten the safety of local residents, especially old people, children and women. During construction, especially in the late stage, breakwaters will narrow down marine passages for fishing boats, thereby posing a risk of collision.

(4) Construction will affect the daily production and lives of nearby residents.

Currently, some fishing harbor zones are silted up and the berthing capacity for fishing boats is small. In order to accommodate more boats, especially large ones, the harbor zones have to be dredged, which may pose a risk of secondary pollution, and bring trouble to nearby residents’ daily lives.

Dust, noise and waste arising from construction, transport and sludge piling will also affect the local environment, and residents’ daily lives adversely but temporarily.

(5) Improper fishing harbor management may prevent the project objectives from being realized.

Although the Project offers more wind sheltering places for fishing boats, fishing harbor management is essential to the full functioning of these places, and as important as fishing harbor construction. Currently, there are still many institutional and practical problems in fishing harbor management in the project area, which may prevent the project objectives from being fully realized.

(6) Impacts on local fishermen’s livelihoods
It is found that the main income sources of local fishermen are fishery, agriculture and employment, and their income is stable. The project may affect them in two ways: 1) 44.7 mu of unused land in Dajing Village will be acquired for the Dajing Grade-2 Fishing Harbor, affecting 60 households with 189 persons, and an aquaculture water surface of 275.85 mu affected by sea area withdrawal, affecting 22 households with 70 persons, totaling 86 households with 274 persons; and 2) The construction of the Luxia Grade-1 Fishing Harbor will affect 14 hectares of shrimp ponds in Luxia Village in terms of aquaculture environment and activities.

It has been agreed on with the IAs that construction will be conducted after harvest where possible to minimize impacts on fishermen’s aquaculture income. 11 fish rafts in Wen’ao Village will be relocated, affecting 6 households with 11 persons. These fish rafts are placed temporarily in the project area, and will be relocated for aquaculture. Income will not be affected. For the unavoidable impacts, an RAP has been developed in consultation with the APs, in which detailed compensation and resettlement measures are included to realize income restoration through cash compensation, social security, employment and skills training (see the RAP). In the long term, the Project will improve local fishermen’s resistance to natural disasters, reduce property losses and protect their safety. In addition, the Project will also improve local fishery production capacity greatly, thereby increasing local residents’ income.

For the impact of construction on the water change of shrimp ponds, the IAs will consult with the aquaculture households to coordinate construction with water change. For the impact of construction on the aquaculture environment, the EIA agency has prepared an EMP for prevention. See the EMP for details.

(7) Increased environmental and community impacts from floating population

As estimated by the EIA agency, the Sansha Central and Luxia Grade-1 Fishing Harbors will generate about 100 jobs each, and the other 4 fishing harbor components will generate about 50 each. The Project will need a small labor force, mostly composed of local workers, and will not have any negative impact on local residents’ production and livelihoods. On the other hand, most migrant workers are Han people whose customs are similar to those of local residents, so there is no potential conflict. In addition, since the number of migrant workers is small, there is no need to construct a site camp, and they may lease local unoccupied houses, generating rental income.

In addition, after the completion of the Project, more tourists and aquatic product purchasers will enter the project area, thereby creating additional environmental pressure. In view of this, the EIA agency has prepared an EMP to cope with such pressure (see the EMP); fishing harbor management and construction will be strengthened (see Section 8.3), fishery transactions and community management activities will be regulated to reduce environmental and social impacts.

4.2 Training Center Component

4.2.1 Positive Impacts

(1) Reduce training costs, and improve educational conditions and efficiency

The owner of the Training Center component (FOTS) lacks of training facilities, including those for swimming and rescue, and has to rent such facilities at high rental
rates. In Training Center component, a training building that accommodates 200 trainees at a time will be constructed. This component will further improve the school’s training and living facilities, reduce training costs, expand the scale of enrollment and improve operating efficiency.

(2) Improve employment and fishery skills of trainees, strengthen the safety of fishing activities, and increase income

The Training Center improves employment skills of trainees through fishery skills and safety courses, and enables them to increase income, thereby helping reduce accidents and unnecessary property losses.

### Interview with Principal Lin of FOTS

The courses offered by our school include fishery activities, rescue, etc., and combine classroom instruction with live demonstration. Trainees usually sign up in the fishing-off season, and we can receive about 3,000 trainees per annum. Some of training facilities are leased, including those for swimming and rescue. This training center will reduce training costs, and all graduates can find jobs.

(3) Brining more job opportunities and income to nearby residents

During the construction of this component, nearby residents may increase income by offering catering services and supplying daily necessities. After its completion, with the inflow of more trainees, the development of restaurants, stores and recreational places will be promoted, and more job opportunities created.

### 4.2.2 Negative Impacts

Construction may pose personal safety risks to the construction staff; on the other hand, the passage of vehicles may threaten the safety of local residents, especially old people, children and women.

Impacts of construction on nearby residents and entities include: 1) Noise and dust arising from construction may affect the daily production and lives of nearby residents; 2) Since the construction site is close to the Fujian Freshwater Products Institute, mechanical operation, building material transport, and other construction activities may affect the daily work and lives of its staff during construction.

The owner promises to urge the construction agency to care about construction safety, give safety education to nearby residents, and control dust pollution by sprinkling. However, such negative impacts are temporary.
5. Typhoon Impacts and Resistance

5.1 Typhoon Conditions

5.1.1 Frequency of Typhoons

Due to its special geographic environment and climate, Fujian is frequently hit by typhoons, windstorms, floods and inundations, especially during the typhoon season of July-September. Two on average and up to 5 typhoons would land in Fujian per annum, and 2.95 on average and up to 9 typhoons would affect Fujian per annum, with wind speeds of up to 40m/s.

During 1980-2012, Fujian was affected or hit by 140 typhoons, including 49 landing typhoons and 91 affecting ones. During 2007-2012, Fujian was affected or hit by 26 typhoons, including 10 landing typhoons and 16 affecting ones. See Table 5-1.

During 2007-2012, two tropical cyclones landed in Xiapu County, including a typhoon. See Table 5-2 and Figure 5-1.

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Source: climate bulletins of Fujian Province (2007-2012)
Note: In the “Distribution over time” rows, the numbers in brackets indicate the distribution of typhoons over time.

Table 5-2 Typhoon Landing Times and Places in Fujian Province

<table>
<thead>
<tr>
<th>Year</th>
<th>Typhoon</th>
<th>Landing time</th>
<th>Landing place</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>Sepat</td>
<td>August 19, 02:00</td>
<td>Hui’an</td>
</tr>
<tr>
<td></td>
<td>Wipha</td>
<td>September 19, 02:30</td>
<td>Xiaguan Town, Cangnan County</td>
</tr>
<tr>
<td></td>
<td>Krosa</td>
<td>October 7, 15:30</td>
<td>Shacheng Town, Fuding City</td>
</tr>
<tr>
<td>2008</td>
<td>Phoenix</td>
<td>July 28, 22:00</td>
<td>Donghan Town, Fuqing City</td>
</tr>
<tr>
<td>2009</td>
<td>Morakot</td>
<td>August 9, 16:20</td>
<td>North coast of Xiapu County</td>
</tr>
<tr>
<td>2010</td>
<td>Meranti</td>
<td>September 10, 3:30</td>
<td>Shishi Town</td>
</tr>
<tr>
<td></td>
<td>Fanapi</td>
<td>September 20, 07:00</td>
<td>Gulei Town, Zhangpu County</td>
</tr>
<tr>
<td></td>
<td>Megi</td>
<td>October 23, 12:55</td>
<td>Liú’ao Town, Zhangpu County</td>
</tr>
<tr>
<td>2011</td>
<td>Nanmadol</td>
<td>August 31, 2:20</td>
<td>Jinjiang City</td>
</tr>
<tr>
<td>2012</td>
<td>Saola</td>
<td>August 3, 6:50</td>
<td>Qinyu Town, Fuqing City</td>
</tr>
</tbody>
</table>

Source: climate bulletins of Fujian Province (2007-2012)
5.1.2 Distribution of Typhoons over Time

Tropical cyclones land in Fujian during June-October mainly, with August being the most frequent month, accounting for 36%, followed by September and July, accounting for 30% and 24% respectively. See Figure 5-2.

During 2007-2012, the typhoons landing in or affecting Fujian were focused in July-October, including 10 times in September, 7 times in August and 5 times in October. See Figure 5-3.

![Figure 5-2 Percentages of Landing of Tropical Cyclones in Fujian Province (except Tropical Depression) by Month](image)
5.2 Typhoon Disasters

Fujian’s social and economic development is affected by frequent natural disasters seriously, including typhoons, rainstorms, floods and inundations. In the project area, typhoons or short by intense rains are often associated with mountain torrents, geologic disasters or serious local inundations. Floods are often combined with typhoons, posing a great risk to the personal and property safety of local residents.

5.2.1 Overall Disaster Situation


In 2011, the major meteorological disasters in Fujian resulted in direct financial losses of 1.88 billion yuan and an affected crop area of 139,000 hectares, in which 36% of crop losses were attributed to tropical cyclones. In 2012, the major meteorological disasters in Fujian resulted in direct financial losses of 4.906 billion yuan, especially tropical cyclones, and floods and inundations, in which losses from tropical cyclones accounted for about 32%. Among these tropical cyclones, the 5# strong tropical windstorm “Talim” and 9# strong typhoon “Saola” were the most serious. The “Talim” typhoon affected 102,340 persons and 15,018 hectares of crops, and ruined 120 houses, with direct financial losses of 335 million yuan. “Saola” affected 832,000 persons and 44,390 hectares of crops, ruined 609 houses and damaged 3,198 houses to varying degrees, with direct financial losses of 1.225 billion yuan.
During 2009-2012, typhoons, floods and inundations resulted in an affected population of 244,459 in Xiapu County, and direct financial losses of 692.062 million yuan, in which direct financial losses of agriculture, forestry, stockbreeding and fishery were 489.708 million yuan, direct financial losses of water resources facilities 117.009 million yuan, jetty losses 1.04 million yuan, revetment losses 9.61 million yuan and aquaculture losses 42,768.8 tons. Annual direct financial losses arising from typhoons, floods and inundations were over 200 million yuan during 2009-2012 except 2011. See Table 5-3.

Table 5-3 Losses from Typhoons and Floods in Xiapu County (2009-2012)

<table>
<thead>
<tr>
<th>Item</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affected population</td>
<td>136000</td>
<td>36763</td>
<td>23499</td>
<td>48197</td>
<td>244459</td>
</tr>
<tr>
<td>Direct financial losses (0,000 yuan)</td>
<td>20262</td>
<td>20464.7</td>
<td>2126.8</td>
<td>26352.7</td>
<td>69206.2</td>
</tr>
<tr>
<td>Direct financial losses of agriculture, forestry, stockbreeding and fishery (0,000 yuan)</td>
<td>12819</td>
<td>18094</td>
<td>1796.8</td>
<td>16261</td>
<td>48970.8</td>
</tr>
<tr>
<td>Direct financial losses of water resources facilities (0,000 yuan)</td>
<td>3920</td>
<td>1309</td>
<td>330</td>
<td>6141.9</td>
<td>11700.9</td>
</tr>
<tr>
<td>Jetty losses (0,000 yuan)</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>59</td>
<td>104</td>
</tr>
<tr>
<td>Revetment losses (0,000 yuan)</td>
<td>400</td>
<td>61</td>
<td>94</td>
<td>406</td>
<td>961</td>
</tr>
<tr>
<td>Aquaculture losses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (0,000 mu)</td>
<td>/</td>
<td>1.782156</td>
<td>0.648</td>
<td>1.38</td>
<td>/</td>
</tr>
<tr>
<td>Quantity (0,000 tons)</td>
<td>0.23</td>
<td>2.05588</td>
<td>0.154</td>
<td>1.837</td>
<td>4.27688</td>
</tr>
<tr>
<td>Closed airports and ports</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>7</td>
<td>/</td>
</tr>
</tbody>
</table>

Source: Statistics of the Flood Control Office of the Xiapu County Water Resources Bureau

5.2.2 Typhoon Impacts on Fishing Boats

There are over 60,000 motor fishing boats and 225 fishing harbors in Fujian. However, the existing wind shelters and anchorages in Fujian can only accommodate 54.93% of the fishing boats.

Fishery is a pillar industry of Xiapu County, over 260,000 persons are engaged in fishery activities, and there are 6,239 fishing boats, in which 454 are 60HP or above.
During typhoons, fish carriers and leisure fishing boats also need harbors for wind sheltering, which is a great challenge to the wind sheltering capacity of fishing harbors. Since some fishing boats cannot take shelter effectively, each strong typhoon would result in fishing boat damages and losses, casualties, and property losses, affecting people’s production and lives, and local social and economic development.

Typhoons affect fishing boats in two ways. First, fishing boats may sink or be damaged by typhoons, and economic and time costs may be incurred when boats go to non-local fishing harbors for wind sheltering. During 2009-2012, 55 fishing boats sank and 264 damaged due to typhoons in Xiapu County, with fishing boat losses of 200.77 million yuan and aquaculture boat losses 61.46 million yuan, totaling 262.23 million yuan. See Table 5-4 and Table 5-5.

Table 5-4 Fishing Boat Losses from Typhoons in Xiapu County (2009-2012)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Xiapu County</td>
<td>20</td>
<td>102</td>
<td>12</td>
<td>65</td>
<td>8</td>
<td>41</td>
<td>15</td>
<td>56</td>
<td>55</td>
<td>264</td>
</tr>
<tr>
<td>Changchun Town</td>
<td>3</td>
<td>20</td>
<td>4</td>
<td>18</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>12</td>
<td>12</td>
<td>52</td>
</tr>
<tr>
<td>Sansha Town</td>
<td>4</td>
<td>25</td>
<td>3</td>
<td>16</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>16</td>
<td>14</td>
<td>59</td>
</tr>
<tr>
<td>Haidao Xiang</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>9</td>
<td>6</td>
<td>26</td>
</tr>
</tbody>
</table>

Source: statistics of XCOFB

Table 5-5 Financial Losses from Typhoons in Xiapu County (2009-2012)

<table>
<thead>
<tr>
<th>Item</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses of fishing boats (0,000 yuan)</td>
<td>8414</td>
<td>524</td>
<td>1264</td>
<td>9875</td>
<td>20077</td>
</tr>
<tr>
<td>Losses of aquaculture boats (0,000 yuan)</td>
<td>1862</td>
<td>855</td>
<td>463</td>
<td>2966</td>
<td>6146</td>
</tr>
<tr>
<td>Total</td>
<td>10276</td>
<td>1379</td>
<td>1727</td>
<td>12841</td>
<td>26223</td>
</tr>
</tbody>
</table>

Source: statistics of XCOFB

During typhoons, some fishing boats can only be anchored in unsafe small natural bays, when rollover, collision or dragging is likely to occur.

**Interview with Secretary Wu of Dajing Village, Changchun Town**

There are over 200 fishing boats in our village, mostly of low power. Last year, about 40 boats were seriously damaged by typhoons, and some of them were unreparable. As you know, a boat is worth tens to hundreds of thousands of yuan.

In the typhoon season, many fishing boats have to travel through long distances for wind sheltering, both time and fuel consuming, and risky. Depending on distance and tonnage, the cost of wind sheltering per time ranges from hundreds to thousands of yuan, which is a heavy burden for local fishermen.

**Interview with Stationmaster Yang of Sansha Town**

When there is a force 8 typhoon, fishing boats have to go to a wind sheltering harbor. Some large fishing boats in San’ao Vilalge would go to Shacheng Town for wind sheltering, and the cost per journey is about 4,000 yuan. When completed, the Sansha Central Fishing Harbor will be used for berthing and small wind sheltering. When typhoons occur, boats can go to the Fenghuo Harbor (Phase 2) for wind sheltering for free, thereby saving considerable costs for fishermen.
5.3 Typhoon Prevention Mechanism and Program

The purpose of developing a sound typhoon prevention mechanism and program is to conduct typhoon prevention properly and efficiently, improve emergency response capacity, and minimize casualties and property losses, with focus on fishing boats, fishing harbor jetties, wind sheltering harbors, net cages (fish rafts), nursery grounds, tidal flat aquaculture areas, and fishermen.

5.3.1 Institutional Arrangements and Responsibilities

**Fujian Province**

The Fujian Provincial Government has established the flood and drought control headquarters, which leads provincial flood and typhoon prevention, announces the start and end of typhoon prevention emergency response, holds typhoon prevention meetings, deploys typhoon prevention and disaster relief works, and develops typhoon prevention and disaster relief measures, and organizes an expert team to analyze disaster trends and give opinions.

The working body of the provincial flood and drought control headquarters is the flood and drought control office at the provincial water resources department, which reports flood and disaster information to the provincial government, and provincial flood and drought control headquarters timely, releases information, and handles day-to-day work of the provincial flood and drought control headquarters.

**Project county**

The county government has established a typhoon prevention leading group as the leading body of typhoon prevention, which implements ocean and fishery typhoon prevention plans, inspects safety management and the implementation of preventive measures, and handles public emergencies in fishery typhoon prevention. The leading group governs an office at XCOFB, which handles day-to-day work.

**Townships**

Each township government has established a fishery typhoon prevention working group, headed by the township head, and composed of heads of agencies concerned and village heads, which implements typhoon prevention commands from superior authorities, develops typhoon prevention measures, and coordinates township typhoon prevention work. It governs an office at the township agricultural service center.

**Village committees / grass-root units**

All village committees and grass-root units should establish leading groups under the leadership responsibility system to conduct inspection, attendance and reporting on typhoon prevention, and participate directly in disaster relief under the leadership of the township fishery typhoon prevention working group.

**Sectors / industries concerned**

Sectors / industries concerned may establish their own flood and typhoon prevention measures.
prevention agencies to conduct sector-specific typhoon prevention work.

**Agencies concerned**
The meteorological, water resources, land and resources, and broadcast and TV authorities play an irreplaceable role in deploying and publicizing typhoon prevention work within their own scope of duties.

![Organizational Chart for Typhoon Resistance in the Project Area](image)

5.3.2 Hierarchical and Emergency Response

**1) Typhoon generation stage**
When a typhoon is numbered:
When a typhoon prevention agency receives a typhoon forecast, it should contact the meteorological and flood control authorities timely, closely monitor its position, intensity, direction, speed and trend, and report such information timely.
If such typhoon may affect local fishing boats, typhoon sheltering measures should be taken immediately.

**2) Typhoon message stage**
When the typhoon enters the forecast responsibility area:
1) All typhoon prevention agencies should communicate typhoon prevention arrangements to the ocean and fishery authority, radio station and TV station timely.
2) The ocean and fishery authority should be on duty around the clock, and keep in touch with the meteorological and flood control authorities, and develop a typhoon prevention and resistance program.
3) The meteorological authority should communicate the position, intensity, direction, speed and trend of the typhoon to the typhoon prevention agency, ocean and fishery authority, TV station, etc.
4) The radio and TV stations should broadcast the typhoon message and typhoon prevention arrangements.

(3) Typhoon alarm stage
When the area is to be affected by the typhoon within 48 hours:
1) The meteorological authority should analyze and forecast typhoon trend and dynamics, and communicate them to the ocean and fishery authority, flood control authority, radio and TV stations, etc. for public release.
2) The typhoon prevention headquarters reports typhoon prevention and resistance arrangements to the ocean and fishery authority, radio and TV stations timely to arrange typhoon prevention and resistance comprehensively.
3) The provincial ocean and fishery department should strengthen attendance, and give advice on personnel transfer and wind sheltering to the provincial flood and drought control headquarters timely, and arrange provincial ocean and fishery typhoon prevention work specifically.

XCOFB should further deploy county-level ocean and fishery typhoon prevention work, collect township-level implementation information, strengthen connections with the meteorological and water resources bureaus, and release the latest typhoon alarm information to coastal townships timely.

Coastal township governments should organize the transfer and evacuation of fishing boats, old people, women, children and the sick timely.

Committees of coastal villages should notify sailing boats for wind sheltering timely, ensure their timely return, evacuate personnel and reinforce buildings.

4) The provincial meteorological bureau should release the typhoon early warning signal, latest typhoon alarm, and provincial typhoon prevention and resistance arrangements via the news channel of the provincial TV station. Local radio and TV stations should also release the typhoon alarm and local arrangements timely.

(4) Emergency alarm stage
When the area is to be affected by the typhoon within 24 hours:
1) The meteorological authority should release the typhoon emergency alarm to the public via news media promptly or do this by SMS when necessary, strengthen the frequency of typhoon monitoring and forecast, and report typhoon information to the leading agency hourly.
2) Typhoon prevention headquarters at all levels should strengthen leadership in fishery typhoon prevention, and connections and information transmission with higher and lower authorities.
3) The provincial ocean and fishery department should collect information on returned and nonreturned fishing boats, and evacuated and non-evacuated personnel, and report to the provincial flood and drought control headquarters; organize rescue teams, and prepare rescue materials and apparatus; and take emergency rescue measures when necessary, and report to the provincial flood and drought control headquarters immediately.

The county typhoon prevention authority should give alarm to fish rafts and fishing boats, continue with the safe transfer of personnel, and organize the public security, frontier defense and other authorities concerned to ensure that all personnel have been evacuated. It should also collect information on returned and nonreturned fishing boats, and evacuated and non-evacuated personnel, and report to the ocean
and fishery authority, and typhoon prevention headquarters of the next higher level.

Township typhoon prevention authorities should strengthen attendance, collect,
transmit and report information, and assist the county typhoon prevention authority in
its work.

Village committees should examine wind sheltering and personnel evacuation
strictly. The Fishing Harbor Management Station should organize wind sheltering and
fisherman transfer effectively.

4) The radio and TV authority should release the typhoon emergency alarm to
the public timely.

(5) Release of typhoon alarm stage
When the typhoon has disappeared and will no longer cause losses to fishery
production, the county typhoon prevention headquarters will release the typhoon
alarm, and report this to the flood and drought control headquarters of the next higher
level for reference.

(6) Disaster relief
1) After the release of the typhoon alarm, local governments at all levels should
organize disaster relief and resettlement for local victims, and restore production and
living order as soon as possible.

2) Civil affairs authorities at all levels should transfer disaster relief materials
urgently to help resettle and rescue victims.

3) The radio and TV authority should report disaster resistance and relief work
timely, accurately and positively.
6. Social Gender and Development

6.1 Introduction to Women in the Project Area
6.1.1 Women's Situation in Fujian Province

(1) Female population
At the end of 2011, Fujian's resident population was 37.2 million, including 18.08 million females, accounting for 48.6%, and gender ratio was 105.76:100, in which females aged 0-19 years accounted for 10.42%, those aged 20-59 years for 32.12%, and those aged 60 years or above for 5.84%.

Table 6-1 Women's Population in the Project Area (2011)

<table>
<thead>
<tr>
<th>Division</th>
<th>Gross population</th>
<th>Females</th>
<th>Percent (%)</th>
<th>Gender ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujian Province</td>
<td>37200000</td>
<td>18080000</td>
<td>48.6</td>
<td>105.76</td>
</tr>
<tr>
<td>Fuzhou City</td>
<td>6494105</td>
<td>3149482</td>
<td>48.5</td>
<td>106.19</td>
</tr>
<tr>
<td>Xiapu County</td>
<td>532562</td>
<td>252468</td>
<td>47.4</td>
<td>110.97</td>
</tr>
</tbody>
</table>


(2) Women's education
The consolidation rate of 9-year compulsory education in Fujian is 99%, the gross enrollment rate of the senior high school stage is 96%, and the gross enrollment rate of females at the higher education stage is 50%. The average education length of females in labor-age population is 11.5 years. All these values are higher than the national averages.

(3) Women's employment
In Fujian, female employees account for over 40% of all employees. In the urban accommodation and catering, health, social security and benefit, manufacturing, finance, and education industries, female employees account for 60.9%, 56.7%, 52.1%, 51.3% and 50.1% respectively.

6.1.2 Women's Situation in the Project Area
To learn local women's development and participation in the Project, 4 FGDs were held with women, involving 33 women, 20 women interviewed, accounting for 46.51% of all interviewees, and 53 women involved in the survey, accounting for 41.09% of all respondents.

(1) Age structure
In the sample population, males and females aged 30-59 years account for 73.68% and 71.7% respectively. Among the female samples, those aged 30-59 years account for 71.7%, and those aged below 30 years for 16.98%.

Table 6-2 Distribution of Samples by Gender and Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population</td>
<td>%</td>
<td>Population</td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>12</td>
<td>15.79</td>
<td>9</td>
</tr>
<tr>
<td>30-59 years</td>
<td>56</td>
<td>73.68</td>
<td>38</td>
</tr>
<tr>
<td>&gt;=60 years</td>
<td>8</td>
<td>10.53</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: SA survey
(2) Educational level

In the sample population, the percentage of females having received senior high school / secondary technical school or above education is lower than that of males. Among the female samples, those having received junior high school or above education account for 60.38%.

Table 6-3 Distribution of Samples by Gender and Educational Level

<table>
<thead>
<tr>
<th>Educational level</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population %</td>
<td>Population %</td>
<td>Population %</td>
</tr>
<tr>
<td>Illiterate</td>
<td>3 3.95</td>
<td>3 5.66</td>
<td>6 4.65</td>
</tr>
<tr>
<td>Primary school</td>
<td>23 30.26</td>
<td>18 33.96</td>
<td>41 31.78</td>
</tr>
<tr>
<td>Junior high school</td>
<td>31 40.79</td>
<td>24 45.29</td>
<td>55 42.64</td>
</tr>
<tr>
<td>Senior high school / secondary technical school</td>
<td>13 17.1</td>
<td>5 9.43</td>
<td>18 13.95</td>
</tr>
<tr>
<td>Junior college or above</td>
<td>6 7.9</td>
<td>3 5.66</td>
<td>9 6.98</td>
</tr>
</tbody>
</table>

Source: SA survey

(3) Division of labor by gender

Male laborers are the main force of local fishery production activities. Women usually do not sail out, but do housework, take care of children and repair fishnets at home. Some of them deal with offshore kelp and laver cultivation, and cook for family members and crews on fishing boats. Young women would pick oysters on the beach, and few women work in local enterprises.

Interview with Mr. Zhou, Luxia Village, Changchun Town, Xiapu County

Women account for about half of the labor force of offshore aquaculture, and also participate in fishing activities of fishing boats of less than 60HP that can return within 2 or 3 hours.

(4) Utilization of fishing harbors

Since most sailing fishermen are male laborers, their utilization of fishing harbors is high. Women who utilize fishing harbors include those engaged in offshore aquaculture, going to and from sea islands by boat, and handling aquatic products on jetties. In general, women’s utilization of fishing harbors is lower than that of men. However, due to the inadequacy of fishing harbor infrastructure and the disregard of women’s needs, women are unable to take full advantage of fishing harbors.

(5) Participation in public affairs

The FGDs and interviews show that 30% of local women participate in public affairs, but their participation level is low, and most of them participate because male laborers are sailing out.

6.1.3 Other Women’s Development Initiatives in the Project Area

In the Project, women’s development will be promoted by caring about and meeting their needs at all stages, and conducting relevant initiatives, which have been learned by the social consultants through FGDs.

(1) Special job fair

In 2012, the county women’s federation held a special job fair for women, and helped over 400 women reach intent of employment.
(2) Small-amount startup loan for women
By the end of 2012, the county women’s federation had granted small-amount startup loans totaling 20.56 million yuan, benefiting 333 women.

(3) Practical skills training
In 2012, the county women’s federation organized 3 skills training sessions for over 400 women and labor transfer training for over 100 women.

(4) Protection of women’s rights
In 2012, the county women’s federation conducted extensive publicity on peaceful family building, and the protection of women’s rights and interests through various media.

(5) Women’s home
Women’s homes have been established in all the 315 villages (communities) in Xiapu County, including a province-level women’s home demonstration site, and 16 municipal-level women’s home demonstration sites.

6.2 Women’s Needs and Expectations
At the preparation stage, the IA and social consultants learned local women’s needs and expectations by means of FGD and interview, which is significant for improving the project design, and protecting women’s rights and interests.

(1) Attitude to the Project
All women support the Project, and think it is very necessary and long-expected, because when the Project is completed, fishing boats can take shelter more easily, thereby saving costs, and male laborers can return home for wind sheltering, so that they don’t have to worry about the safety of family members and fishing boats.

(2) Need for improved wind sheltering capacity of fishing harbors
The wind sheltering capacity of fishing harbors is a direct indicator of project benefits, and a great concern of local women. They expect wind sheltering capacity to be improved greatly, so that more fishing boats can take shelter in nearby harbors, and new fishing harbors can resist stronger typhoons and reduce typhoon losses.

(3) Need for job opportunities under the Project
Some unskilled jobs will be created at the construction and operation stages. It is learned that local women have a strong wish for receiving such jobs. Most local women do housework and have enough extra time. By offering catering and living services to the construction staff, women can earn more money. They also expect to get employed after the completion of the Project when fishery transactions are more active. In the Training Center component, some women expect to get trained for further employment in local tertiary industries.

Interview with Ms Meng, Dajing Village, Changchun Town, Xiapu County
The road leading to the harbor is not good. When the road and fishing harbor are improved, more boats will come for sheltering, berthing and trading. I will offer catering services during construction and work there by then. A relative of mine is running a store there, and this store will certainly boom then.

(4) Need for improved fishing harbor infrastructure
The infrastructure of most fishing harbors is incomplete. Due to the lack of
beacons, fishing boats are likely to experience accidents in rainy and foggy days. Some local women deal with the inspection and handling of aquatic products on jetties. Since these jetties are narrow, goods storage and transport is disorderly. Women living on sea islands would go to county town by boat via fishing harbors. Women expect that fishing harbor infrastructure be improved so as to improve their traffic and working conditions.

**Interview with Ms Yang, a jetty worker in Luxia Village, Changchun Town, Xiapu County**

Look! This jetty is too small. Now, more and more trucks are coming to take delivery of goods, and trucks are larger than before. When completed, the jetty should be properly planned and zoned, so that it will not be as disorderly as today.

(5) Need for aquaculture skills training

Aquaculture skills play a vital role in improving fishery efficiency and income. Currently, women in some local fishing households deal with laver, kelp and net cage aquaculture. Most female respondents think they have a preliminary mastery of aquaculture skills, but are unable to cope with new problems or incidents timely, and their participation level in relevant training is low.

Most women expect to attend aquaculture skills training, so that they will not only work themselves, but also supervise aquaculture activities of other family members.

6.3 Impacts of the Project on Women

Although local women will benefit from the Project, they will also suffer negative impacts at the construction, implementation and subsequent operation stages. Measures should be taken based on women’s inputs to eliminate or reduce such negative impacts, and maximize the outputs of women’s development.

6.3.1 Positive Impacts

(1) **Mitigating the pressure of wind sheltering on women**

During typhoons, male laborers of fishing households most go to non-local fishing harbors for wind sheltering, leaving the task of family wind sheltering to women and old people, but they are unable to undertake heavy physical labor.

After the completion of the Project, fishing boats can go to nearby fishing harbors for wind sheltering, and male laborers can return home for wind sheltering, thereby greatly reducing the pressure of wind sheltering of women, and enhancing the capacity of wind sheltering.

(2) **Getting employed in the Project to increase income**

At the construction and operation stages, some unskilled jobs will be created, such as cleaning and painting, which will be first made available to women, the poor and vulnerable groups. In addition, construction will also generate such jobs as restaurant waiters and cleaners.

At the implementation stage, more fishery trading activities will generate more harbor-based job opportunities for women, and the Project will promote the development of sea island tourism and tertiary industries, which will also generate job opportunities for women and increase their income.

(3) **Facilitating travel and improving quality of life**
After the completion of the Project, women traveling via fishing harbors will travel more easily. For women engaged in offshore fishery activities, the improved fishing harbor infrastructure will provide permanent, safe wind sheltering harbors for their fishing boats, and rational fishing harbor planning and management will facilitate their marine operations. On the other hand, with the intensification of fishery trading activities and the development of sea islands, more fishing and commuting boats will be available, improving traffic conditions for women living on sea islands.

(4) Improving the working environment
Currently, some women work on or near fishing harbors, but their working environment is disorderly and poor. With the improvement of jetties and infrastructure, their working environment will be improved, which will be good to their physical and mental health.

Interview with a female jetty worker in Luxia Village, Changchun Town, Xiapu County
Currently, the jetty is quite busy and disordered, especially when many trucks come to buy fish. If the jetty were bigger and better equipped, my job could be easier. In addition, the fishing harbor has to be managed by a specially assigned person, and arrangements made properly for access, loading, unloading and transaction.

6.3.2 Negative Impacts

(1) Disregard of women's needs
Local women mostly do housework, take care of family members and repair fishnets at home, while their contribution to household income is low. As a result, people (including women themselves) often think that women's family status is low, so that women's needs and suggestions are often disregarded at the design, implementation and subsequent operation stages. For example, some women are unable to sign to receive compensation fees for LA because they are not householders; during construction, female workers are excluded or their rights not protected; women’s needs are disregarded in aquaculture skills training.

(2) Construction impacts
During construction, the passage of vehicles, and solid waste and wastewater produced by construction may threaten the personal safety of local women, and affect their traffic convenience, and pose certain risks to women working on harbors, such as temporary change of workplace.
7. Ethnic Minority Analysis

This chapter is written to identify the interactions between ethnic minorities and the Project, minimize the Project’s potential social risks to ethnic minorities, and ensure that all ethnic groups benefit equally from the Project. The concerns of this chapter are: 1) overview of ethnic minorities in the project area; 2) ethnic minorities’ needs for the Project; and 3) the Project’s impacts on ethnic minorities.

7.1 Overview of Ethnic Minorities in the Project Area

7.1.1 Ethnic Composition in the Project Area

According to the 6th national census, Fujian has a Han population of 36.1 million, accounting for 97.8% of its gross population, and a minority population of 800,000, accounting for 2.2%. The She people are the primary ethnic minority that accounts for 1% of gross population, followed by Hui, Manchu and Gaoshan. There are 18 minority Xiangs, a province-level minority economic development zone and 527 minority villages.

Xiapu County governs two sub-districts and 12 townships, including 3 minority Xiangs (Yantian, Shuimen and Chongru She Xiangs), and 52 minority villages. In 2010, the county’s population was 531,468, composed of 7 ethnic groups (Han, She, Hui, Tibetan, Miao, Zhuang and Yao), in which She population was 44,000, accounting for 8.4%.

Table 7-1 Ethnic Composition by Township

<table>
<thead>
<tr>
<th>Division</th>
<th>HHs</th>
<th>Population</th>
<th>Minority population</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xiapu County</td>
<td>156035</td>
<td>532562</td>
<td>47086</td>
<td>8.84</td>
</tr>
<tr>
<td>Changchun Town</td>
<td>17036</td>
<td>58328</td>
<td>2011</td>
<td>3.45</td>
</tr>
<tr>
<td>Sansha Town</td>
<td>13744</td>
<td>42716</td>
<td>1855</td>
<td>4.34</td>
</tr>
<tr>
<td>Haidao Xiang</td>
<td>3566</td>
<td>11220</td>
<td>15</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Source: Xiapu Statistical Yearbook 2012

7.1.2 Ethnic Composition in the Beneficiary Population

There is a small minority population in the direct beneficiary area of the Project, which is composed mainly of She and Zhuang people. These ethnic minorities have immigrated by intermarriage mainly, and have no difference from the local Han people in daily life and customs. Rongqiao Village where the Training Center component is located has no minority population.

Table 7-2 Ethnic Composition of Beneficiary Population in the Project Area

<table>
<thead>
<tr>
<th>No.</th>
<th>Component</th>
<th>Range (village)</th>
<th>Beneficiary population</th>
<th>Minority population</th>
<th>Living together or not?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Beishuang Grade-2 Fishing Harbor</td>
<td>Beishuang</td>
<td>2500</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>Wen’ao Grade-2 Fishing Harbor</td>
<td>Wen’ao, Li’ao</td>
<td>1900</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>Sansha Central Fishing Harbor</td>
<td>San’ao, Wu’ao, Fenghuo</td>
<td>3438</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>Fenghuo Grade-2 Fishing Harbor</td>
<td>Fenghuo, Dong’ao, Xi’ao, Wu’ao, Qingguansi, Qingguanlan</td>
<td>9127</td>
<td>0</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>Dajing Grade-2 Fishing Harbor</td>
<td>Dajing, Zhizhuwang, Doumi, Tingxi</td>
<td>16215</td>
<td>15</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>Luxia Grade-1 Fishing Harbor</td>
<td>Luxia, Xiaojing, Chisha,</td>
<td>13900</td>
<td>20</td>
<td>No</td>
</tr>
</tbody>
</table>
7.1.3 Characteristics of Ethnic Minorities

In the affected villages, ethnic minorities are in small population and live together with Han people, and have little differences in economic, social and political institutions from mainstream society. All ethnic groups speak mandarin Chinese, celebrate roughly the same festivals, and live in harmony. See Table 7-3.

Table 7-3 Summary of Features of Ethnic Minorities in the Project Area

<table>
<thead>
<tr>
<th>No.</th>
<th>Ethnic minority</th>
<th>Key features</th>
</tr>
</thead>
</table>
| 1   | She             | ①History: The She people have the same origin as the Yao people.  
②Language: They mostly speak Hakka and southern Fujian dialect.  
③Belief: 1) hunting god worship; 2) worship of the King of the Three Mountains; 3) snake worship  
④Social organization: The local She people have no special social organization.  
⑤Economy: The local She people show no economic difference from the Han people.  
⑥Other: Many festivals of the She people are the same as those of the Han people. Their ancestral worship days are February 15, July 15 and August 15 in the lunar calendar. |
| 2   | Hui             | ①History: They originated from the ancient Arabic.  
②Language: The local Hui people speak mandarin Chinese.  
③Belief: They believe in Islam and show clear Islamic customs.  
④Economy: They show no major difference from the local Han people in production.  
⑥Other: The Hui people celebrate the 3 major Islamic festivals – Fast-Breaking Festival, Corban Festival and Maulid al-Nabi. |
| 3   | Zhuang          | ①History: They originated from the ancient Baiyue people, and have settled due to war, commerce, marriage, etc.  
②Language: The local Zhuang people speak mandarin Chinese.  
③Belief: natural, ancestral and multi-god worship  
④Social organization: The local Zhuang people have no special social organization.  
⑤Economy: The local Zhuang people show no economic difference from the Han people.  
⑥Other: Many festivals of the Zhuang people are the same as those of the Han people. |

Source: institutional interviews and literature review

7.2 Participation of Ethnic Minorities in the Project

7.2.1 Modes of Participation

The SA team ensures that all local ethnic minorities participate in project decision-making by means of key informant interview and in-depth interview.

(1) Key informant interview: to learn the composition, and social and cultural features of local minority population, and inter-group fusion, identify the Project’s potential impacts on local ethnic minorities, and collect their comments and suggestions

(2) In-depth interview: to learn the production and living conditions, and customs of ethnic minorities and Han people, identify the Project's potential impacts on local ethnic minorities, and collect their comments and suggestions on project design, implementation and subsequent operation
7.2.2 Needs for the Project

The local ethnic minorities have the same needs for the project as other local residents. However, their traditional customs should be respected at the construction and subsequent operation stage to avoid any potential conflict.

(1) **Traditional beliefs**: All ethnic minorities have their traditional beliefs, such as Islam for the Hui people. During construction, external construction workers should respect these traditional beliefs, and avoid verbal and behavioral violations.

(2) **Living and dietary customs**: During construction, technicians and workers of different ethnic groups will work on site, who may differ in diet and living customs from the local She and Hui people. They should respect local customs and avoid any unnecessary conflict.

7.3 Impacts of the Project on Ethnic Minorities

7.3.1 Fishing Harbor Components

The Project's main impacts on ethnic minorities include:

**Positive impacts**: 1) reducing wind sheltering costs of minority fishing households, and ensuring the personal and property safety of minority fishermen; 2) improving the employment environment for minority people by promoting the development of secondary and tertiary industries; and 3) creating job opportunities for minority people at the construction and operation stages to increase their household income.

**Negative impacts**: 1) Construction may affect regular transactions of aquatic products of minority fishing households; 2) During construction, minority fishermen may have difficulty in gaining access to fishing harbors, and their fishing boats may be threatened; 3) Construction may also lead to noise and safety concerns for some minority people.

7.3.2 Training Center Component

Rongqiao Village where the Training Center component is located has no minority population, so there will be no impact on ethnic minorities during construction. At the operation stage, minority trainees coming here can improve fishery skills and safety knowledge, and have more job opportunities.

All minority interviewees support the Project, because the Project can bring long-term benefits to them. The existing negative impacts can be evaded through local regulations and owner-proposed alternatives. For example, the noise and safety concerns for minority people have been addressed in the Environmental Management Plan (EMP). Therefore, the Project’s benefits for minority people are much greater than its negative impacts on them.

7.4 Conclusion

Ethnic minorities account for a low percentage to the direct beneficiary population of the Project. According to the field survey and interviews, the local ethnic minorities have no significant production and living difference from the Han people, and enjoy the same policies on compensation for LA and HD. The project benefits are available to all ethnic groups, so it is not necessary to develop an ethnic minority development plan or policy framework separately.
8. Public Participation

8.1 Participation at the Preparation Stage

Since September 2012, the Fujian PMO has conducted a series of survey, public participation and consultation activities. At the preparation stage, the Bank mission, FSR and EMP agencies, etc. conducted a survey in the project area to learn the APs' needs and suggestions, and improve the project design.

This report is based on FGDs, in-depth interviews, stakeholder discussions, key informant interviews and other public participation activities conducted extensively by the SA Team, involving APs, and heads of agencies concerned, township governments and village committees.

(1) Participation at the preparation stage

1) During October 24-25, 2011, the Foreign Economic Cooperation Center (FECC), Ministry of Agriculture conducted a preliminary survey on the Project in Fujian Province, visited the Sansha Central Fishing Harbor and Songshan Grade-2 Fishing Harbor in Xiapu County, and held an FGD in Xiapu County.

2) On February 28, 2012, the Department of Foreign Capital and Overseas Investment of the National Development and Reform Commission, and the Fujian Provincial Development and Reform Commission conducted a survey on the preparation for the Project in Xiapu County.

3) On August 12-14, 2012, the Bank pre-assessment mission further learned project information through FGD and field visit in Fujian.

4) Since September 2012, project information has been broadcast on a rolling basis on TV.

5) During October 29-November 2, 2012, the Bank identification mission investigated 10 fishing harbors in Xiapu County.

6) During December 24-27, 2012, a preparatory seminar of the Project was held in Hangzhou. 7 Bank experts, and over 60 staff members from the provincial and county PMOs attended the seminar.

7) April 22-27, 2013, the project preparation meeting was held in Fuzhou, involving staff concerned from the Bank mission, agencies concerned, PMOs, and a field survey conducted in Xiapu County.

8) The EIA agency conducted the fieldwork by means of questionnaire and field survey during April-June 2012, and made the first round of disclosure on June 14.

(2) FGD: During April 9-20, 2013, 10 FGDs were held in total (including 4 FGDs with women), involving 86 persons in total, including 33 women (38.37%), to learn the basic situation of the affected villages, and solicit local residents’ attitudes to, needs for and comments on the Project.

(3) In-depth interview: During April 9-20, 2013, 43 in-depth interviews were conducted with local fishermen, storeowners, housewives, old people, heads of aquatic product processing enterprises, migrant workers, etc. to learn local fishery activities, comments on design, implementation and subsequent operation, and needs for typhoon resistance.

(4) Stakeholder discussion: At the preparation stage, stakeholder discussions
were held in the project area, involving men, women, executive agency, IA, PMO, design agency and other agencies concerned.

(5) **Key informant interview:** During April 4-29, 2013, 18 interviews were conducted with key informants from XCOFB, the water resources bureau, health bureau, women’s federation, ethnic and religious affairs bureau, etc to learn local fishery production, typhoon impacts, women’s development, minority composition, attitudes and comments.

<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Time</th>
<th>Venue</th>
<th>Participants</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation stage</td>
<td>Oct. 24-25, 2011</td>
<td>Project area</td>
<td>Officials of the Ministry of Agriculture, and persons responsible</td>
<td>Learning the construction of the Sansha Central and Songshan Grade-2 Harbors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feb. 28, 2012</td>
<td>Project area</td>
<td>National and Fujian Provincial Development and Reform Commissions</td>
<td>Conducting a preparatory survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jun. 12-14, 2012</td>
<td>Project area</td>
<td>Bank pre-assessment mission, heads of agencies concerned, township and village officials, residents</td>
<td>Further collecting project information through FGD and field survey</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Since Sep. 2012</td>
<td>Project area</td>
<td>Local residents</td>
<td>Rolling TV broadcast</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oct. 29 – Nov. 2, 2012</td>
<td>10 fishing harbors in Xiapu County</td>
<td>Bank identification mission, heads of agencies concerned, township and village officials, residents</td>
<td>Learning practical conditions, and discussing project objectives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dec. 24-27, 2012</td>
<td>Hangzhou</td>
<td>Bank experts, heads of Fujian PMO and XCOFB</td>
<td>Training on Bank lending procedure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apr. 22-27, 2013</td>
<td>Affected villages</td>
<td>Bank mission, consulting agency, PMO, IA, township and village officials, APs</td>
<td>Learning the general situation of the project area</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apr. – Jun 2013</td>
<td>Affected villages</td>
<td>EIA agency, agencies concerned, APs</td>
<td>Fieldwork and 1st round of environmental impact disclosure</td>
</tr>
<tr>
<td>2</td>
<td>FGD</td>
<td>Apr. 9-20, 2013</td>
<td>Affected villages</td>
<td>6 FGDs, involving 53 persons, including 7 women (13.2%)</td>
<td>Learning local residents’ needs, attitudes and suggestions</td>
</tr>
<tr>
<td></td>
<td>Women’s FGDs</td>
<td>Apr. 9-20, 2013</td>
<td>Affected villages</td>
<td>4 FGDs with 26 women</td>
<td>Learning women’s needs, attitudes and suggestions</td>
</tr>
<tr>
<td>3</td>
<td>In-depth interview</td>
<td>Apr. 9-20, 2013</td>
<td>Affected villages, fishing harbors</td>
<td>43 persons, incl. fishermen, storeowners, housewives, heads of aquatic product processing enterprises, migrant workers</td>
<td>Local fishery activities, comments on design, implementation and subsequent operation, needs for typhoon resistance</td>
</tr>
<tr>
<td>4</td>
<td>Stakeholder discussion</td>
<td>Apr. 9-20, 2013</td>
<td>Agencies concerned</td>
<td>Men, women, executive agency, IA, PMO, design agency; government agencies concerned</td>
<td>Learning relevant policies and collecting suggestions</td>
</tr>
<tr>
<td>5</td>
<td>Key informant interview</td>
<td>Apr. 9-20, 2013</td>
<td>Agencies concerned, village committees</td>
<td>18 key informants from XCOFB, water resources bureau, health bureau, women’s federation, ethnic and religious affairs bureau</td>
<td>Learning local fishery production, typhoon impacts, women’s development, minority composition, attitudes and comments</td>
</tr>
</tbody>
</table>

8.2 Subsequent Public Participation Plan

In order to maximize the project benefits and evade potential risks, it is necessary to take measures at the construction and operation stages to ensure public participation.

1. During construction, make 30% of unskilled jobs first available to local women and the poor, minimize dust and noise construction, and ensure that the construction staff respect to local cultural and living customs.

2. At the operation stage, the PMO and other agencies concerned should be represented by women. All fishery skills and safety training should be flexible in mode
and time to cater for women’s characteristics and needs.

3. In fishing harbor management, involve local residents in fishing harbor management and supervision, and typhoon resistance by recruiting workers for the Fishing Harbor Management Station so that the public enjoys the equal right of participation.

4. At the construction and subsequent operation stages, project and policy information should be disclosed to the public by various means, and a grievance redress mechanism established to cover on-site inquiry, hotline and Internet.

Table 8-2 Summary of Public Participation Activities at Different Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activity</th>
<th>Description</th>
<th>Method</th>
<th>Participants</th>
<th>Agencies responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation</td>
<td>Project optimization</td>
<td>1) Project identification and site visit; 2) Disclosing project information; 3) Collecting local residents’ comments and suggestions on fishing harbor management, construction safety, etc.; 4) Feeding back such comments and suggestions to the PMO, FSR agency, etc.</td>
<td>FGD; in-depth interview, stakeholder discussion, key informant interview</td>
<td>Local residents, PMO, other agencies concerned</td>
<td>PMO, FSR agency, EMP agency, IA, other agencies concerned</td>
</tr>
<tr>
<td>Implementation</td>
<td>Participation in project construction</td>
<td>1) Coordinating all parties and reporting local residents’ comments; 2) Establishing criteria for unskilled jobs; 3) Supervision the payment of LA and HD compensation fees; 4) Participating in project construction; 5) Establishing a typhoon early warning system</td>
<td>Collection of comments via village committees</td>
<td>Participants in project construction, APs, PMO, IA</td>
<td>PMO, IA Agencies concerned</td>
</tr>
<tr>
<td>Operation</td>
<td>M&amp;E; grievance redress</td>
<td>Establishing a feedback system fro local residents</td>
<td>Complaint hotline, township governments, village committees</td>
<td>PMO village committees</td>
<td>PMO, IA Agencies concerned</td>
</tr>
<tr>
<td>Management</td>
<td>Participation in project maintena nce</td>
<td>XCOFB, the PMOs, township governments, village committees establish a management mechanism jointly.</td>
<td>Publicity, TV, broadcast, Internet</td>
<td>County water resources bureau and APs</td>
<td>IA</td>
</tr>
</tbody>
</table>

8.3 Public Participation Mechanism and Strategy

At the subsequent operation stage, strengthening fishing harbor management and improving management efficiency will promote the maximization of the project impacts greatly, which relies on the extensive participation of local residents, and the incorporation of practical local knowledge into the practice of fishing harbor operation and management. This is necessary for both public participation and sustainable project development.

The local fishing harbors are either managed by an enterprise, or by the Fishing Harbor Management Station under the jointly established Fishing Harbor Management Coordination Team. XSAIM will be responsible for the routine operation and management of the fishing harbors, select management staff based on practical needs, stipulate their duties and pay them accordingly. XSAIM will recruit experienced and conscientious staff members in nearby villages so as to fully involve local residents in the operation, management and supervision of the station, and contribute greatly to public participation, project construction and fishing harbor management.
8.3.1 Establishing the Fishing Harbor Management Coordination Team

The Fishing Harbor Management Coordination Team has been established under the leadership of the county government and XCOFB, with its members from the township governments, township police offices, frontier defense office, meteorological bureau, etc. It is responsible for the coordination of fishing harbor management mainly. The team will hold a joint meeting semiannually to sum up experience and lessons in fishing harbor management, study and develop management plans, and lead and supervise the work of XSAIM.

8.3.2 Establishing the Fishing Harbor Management Station

In order to maximize the project benefits, XSAIM will establish the Fishing Harbor Management Station, which will recruit experienced and conscientious staff members in nearby villages to participate in the whole process of fishing harbor management. The station will work under the direction of the Fishing Harbor Management Coordination Team and XSAIM.

1) **Establishment**

4-8 persons will be recruited for the Fishing Harbor Management Station, with a stationmaster and a deputy stationmaster.

2) **Responsibilities**

The main duties of the Fishing Harbor Management Station are:

1) Conducting the routine management and maintenance of the fishing harbors under the leadership of the Fishing Harbor Management Coordination Team and XSAIM;

2) Disclosing project and construction information by means of broadcast, meeting, announcement, etc.;

3) Assisting XCOFB in publicity and training on fishery skills and safety;

4) Assisting the agencies concerned in arranging fishery transactions during
construction rationally to ensure regular construction;
5) Preparing statistics of fishing harbors, and conducting follow-up monitoring on wind sheltering during typhoons;
6) Establishing a sound fishing harbor management responsibility system;
7) Reporting fishing harbor management to the Fishing Harbor Management Coordination Team and XSAIM, and giving pertinent suggestions.

(3) Work plan
The work plan of the Fishing Harbor Management Station at the design, construction and operation stages has been developed on the basis of public consultation. See Table 8-3.

Table 8-3 Work Plan of the Fishing Harbor Management Station in the Project

<table>
<thead>
<tr>
<th>Stage</th>
<th>Type</th>
<th>Activities</th>
<th>Modes</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Project optimization</td>
<td>1. Disclosing project information; 2. Collecting local residents’ comments and suggestions</td>
<td>Village congress; door-to-door interview</td>
<td>Involving the PMO, IA, FSR agency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feeding back such comments and suggestions to the PMO, FSR agency, XCOFB, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Project construction</td>
<td>1. Assisting the construction agency in disclosing construction information in advance; 2. Supervising project construction and checking for safety risks; 3. Organizing local residents to participate in project construction, and making 30% of unskilled jobs first available to vulnerable groups 4. Assisting the agencies concerned in arranging fishery transactions during construction rationally to ensure regular construction</td>
<td>Site observation; broadcast, TV, Internet; door-to-door notification</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communicating local residents’ comments and suggestions to the owner and construction agency</td>
<td>Institutional FGD; written report</td>
<td>Involving the PMO, IA, construction agency, supervising agency</td>
</tr>
<tr>
<td>Operation</td>
<td>Project management</td>
<td>1. Conducting the routine management and maintenance of the fishing harbors; 2. Preparing statistics of fishing harbors; 3. Establishing a sound fishing harbor management responsibility system; 4. Reporting fishing harbor management to the Management Coordination Team and XSAIM</td>
<td>/</td>
<td>Directed by the Fishing Harbor Management Coordination Team, and township fishery development management office</td>
</tr>
<tr>
<td></td>
<td>Fishery skills and safety training</td>
<td>Assisting XCOFB in publicity and training on fishery skills and safety</td>
<td>Publicity and training</td>
<td>Assisted by XCOFB, flood control office of water resources bureau, etc.</td>
</tr>
</tbody>
</table>

(4) Funds
At the design and construction stages, funds of the Fishing Harbor Management Station will be from the Project; at the operation stage, funds will be provided by XSAIM, and major losses from natural disasters will be covered by government finance.
9. Social Risk Analysis

The Project will undoubtedly generate great economic and social benefits. However, there may still be potential social problems and risks at the implementation and operation stages. Based on adequate communication and consultation with different stakeholders during the field survey, the Project’s potential social risks and corresponding suggestions are as follows:

9.1 Risks at the Design Stage

With the social and economic development of Xiapu County, and the increase of fishery activities, local fishing boats will become increasingly more and larger, and there will be more commuting boats. Therefore, at the design stage, rational planning should be conducted based on the current situation and future development of the project area to ensure that the Project can function as designed in this case.

**Suggestions:** Harbor capacity should be expanded where possible to accommodate more and larger boats for wind sheltering and berthing.

9.2 Risks at the Implementation Stage

1. **Fishermen’s livelihood risk**

The Project will affect fishermen’s livelihoods in terms of involuntary resettlement and construction.

The Project involves permanent LA and sea area occupation. 207.5 mu of land will be acquired permanently for the Project, affecting 60 households with 189 persons, with a demolition area of 5420m², affecting 4entities with 15 persons; 3,192.14 mu of state-owned sea area occupied permanently, including 275.85 mu of aquaculture sea area, affecting 16 households with 59 persons, and 11 fish rafts, affecting 6 households with 11 persons. LA and sea area occupation will affect the APs’ production and livelihoods to some extent. Any excessively low compensation rate, or the untimely or non-transparent payment of compensation fees may result in complaints. The IAs will minimize negative impacts by relocation and construction rescheduling. Unavoidable impacts will also be minimized through cash compensation, property swap and social security. See the RAP.

The construction of the Luxia Grade-1 Fishing Harbor will affect the water change of shrimp ponds, thereby possibly affecting aquaculture income. The IAs will consult with the aquaculture households to coordinate construction with water change. For potential environmental risks, the EIA agency has prepared an EMP for prevention.

**Suggestions:** 1) Reduce risks of LA and sea area occupation by minimizing LA and sea area occupation in project design and implementing, and offering full compensation to the APs; 2) Take income and livelihood restoration measures, ensure that the APs are involved in detailed project design, conduct resettlement in conjunction with local skills training, and compensate for acquired land and occupied sea areas in accordance with state regulations and local policies; 3) The IAs should consult with the aquaculture households to coordinate construction with water change, and implement the actions proposed in the EMP strictly to minimize construction impacts on aquaculture.
(2) Risk of construction safety

Construction safety risks include: 1) Some construction activities will be performed on the sea and are more demanding, workers may be injured or dead if protective measures are inadequate; 2) At the construction stage, fishing boats may have limited access to harbors, and exposed to certain safety risks; 3) During construction, the passage of construction vehicles will threaten the personal safety of local residents, especially old people, children and pregnant women. Since local roads are mostly narrow, they will be inevitably occupied by the transport of building materials, thereby threatening the personal safety of local residents, especially old people and children.

Suggestions: Although construction impacts are temporary, effective measures should still be taken to reduce such negative impacts: 1) Notify construction information to nearby residents and take preventive measures in advance; 2) Avoid overnight construction where possible, observe the nose, dust and vibration standards, take noise and dust control measures, and clean up domestic waste regularly; 3) Set up guidance and safety signs on the construction sites and important roads; and 4) Include construction safety management in the construction contract, and strengthen safety publicity and education for the construction staff.

(3) Health risk

It is known from the local center for disease prevention and control that there is no serious infectious disease in the project area. Although the construction site is under strict hygiene supervision, and there is a reporting and investigation system for infectious diseases, if health management and quarantine is not adequately maintained during construction, infectious diseases like diarrhea and hepatitis are likely to occur.

Suggestions: 1) The construction agency should keep the environment clean; 2) The construction staff should be subject to physical examination before entry into the site; 3) Health monitoring files should be established for the construction staff; and 4) The center for disease prevention and control should give education and publicity on the construction site.

(4) Risk of fishing, aquaculture and trading activities

This risk is shown mainly in the impacts of project activities on fishing, aquaculture and trading activities. 1) Infrastructure construction will make fishing and aquaculture activities of fishing boats, and jetty handling inconvenient; 2) Noise and dust arising from construction may affect nearby fishing and aquaculture activities adversely; and 3) Roads and jetties may be occupied by construction vehicles and building materials, making it difficult for traders to enter trading areas. This will affect the immediate interests of local fishermen.

Suggestions: 1) Apply a sectionalized construction approach, and reserve spaces for handling and transport; (2) Notify construction time information to affected fishermen timely so that they schedule their aquaculture, fishing and marketing activities rationally; (3) Schedule construction rationally and ensure safe construction, preferably during the non-fishing season (from May to September); (4) Conduct environmental supervision and monitoring at the construction stage to learn impacts on aquaculture and fishing activities timely for timely adjustment; (5) Select construction machinery that meets the Noise Control Specifications for Industrial
Enterprises, and take shock and noise reduction measures to mitigate impacts on aquaculture and fishing activities; and (6) Strengthen control over solid waste and dust, and environmental protection facilities.

(5) Risk of typhoon

The project area is frequently hit by typhoons, especially in summer and autumn. Typhoons will threaten project activities and facilities, affect the progress and quality of construction, and endanger the safety of the construction staff and works.

**Suggestions:** 1) Construction should be avoided in the typhoon season (July-September) where possible; 2) Strengthen education and training on typhoon resistance for the construction staff; and 3) The meteorological bureau should release information on typhoon level, route, etc. timely.

(6) Risk of educational level of trainees of the Training Center

Most trainees at FOTS have received junior high school education, which may make it difficult for them to master specialized training courses.

**Suggestions:** 1) Ensure that course contents are comprehensible; and 2) Apply flexible training modes to combine classroom instruction with live demonstration.

9.3 Risks at the Operation and Management Stage

(1) The project objectives cannot be fully realized due to improper fishing harbor management

Although the Project provides a material base for improving local wind sheltering conditions, fishing harbor management is essential to the effective utilization and functioning of these facilities, and as important as fishing harbor construction. Currently, there are still many institutional and practical problems in fishing harbor management in the project area, which may prevent the project objectives from being fully realized.

**Suggestions:** 1) Establish a sound management system; and 2) Involve local residents in fishing harbor management and supervision, and typhoon resistance by recruiting workers for fishing harbor management.

(2) Education on typhoon prevention should be strengthened for fishermen

Although all local fishermen have some knowledge and skills in typhoon prevention and marine safety, most of them have low levels of mastery and expect further learning to improve typhoon prevention capacity in case of emergencies.

**Suggestions:** 1) Strengthen publicity on typhoon prevention. Give publicity on typhoon prevention knowledge to fishermen and their family members during the fishing-off season where possible to improve their awareness of disaster prevention and relief, and self- and mutual rescue capacity; and 2) Apply innovative publicity modes, such as lecture, poster, video and live demonstration.

(3) Floating population may increase and bring environmental pressure at the construction and operation stages.

At the construction stage, some migrant workers will enter the project area. After the completion of the Project, more tourists and aquatic product purchasers will enter the project area, thereby creating additional environmental pressure. In view of this, the EIA agency has prepared an EMP to cope with such pressure. Capacity building in fishing harbor management will also be strengthened to regulate fishery transactions.
and reduce environmental pressure.

**Suggestions:** 1) Comply strictly with the EMP to minimize any potential environmental risk; 2) Establish the Fishing Harbor Management Station, and develop a scientific fishing harbor management program to regulate fishery transactions.
Appendixes

Appendix 1 Distribution Map of the Survey Sites

The villages involved in FGDs and in-depth interviews include Beishuang, San’ao, Fenghuo, Wen’ao, Luxia and Dajing Villages, Xiapu County, and Rongqiao Village, Fuzhou City, as shown below:
Appendix 2 FGD Minutes

FGD 1: FGD with villagers of San’ao Village, Sansha Town, Xiapu County

| Time: | April 12, 2013 |
| Location: | San'ao Village Committee |
| Participants: | 5, including one woman |
| Key points: |
| 1. Typhoons and sheltering |
| 1) Fishing boats would go to a harbor in Shacheng Town, Fuding City (4,000 yuan a time), or Yacheng Town, Xiapu County wind sheltering (3,000 yuan a time, for small and medium boats only) for wind sheltering in case of a typhoon or strong wind. |
| 2) The Sansha Central Fishing Harbor will be used for berthing and small wind sheltering. When typhoons occur, boats can go to the Fenghuo Harbor (Phase 2) for wind sheltering for free (resisting force 13 typhoons, suitable for all boats in Sansha Town). |
| 3) A typhoon early warning base is being built nearby by the provincial meteorological bureau. |
| 2. Project impacts |
| 1) Wind sheltering capacity will be improved, saving costs of wind sheltering for fishing boats. |
| 2) The fishing harbor will be better, making it more convenient for fishing boats to load and unload goods, and promoting the development of local aquatic product processing enterprises; |
| 3) The Project is significant for integrated fishing harbor development. |
| 3. Project risks |
| 1) Traffic accidents are likely to occur during construction; |
| 2) Noise and dust will affect the daily life of nearby residents; |
| 3) Sludge from fishing harbor dredging may be piled without control. |
| 4. Suggestions: The Project should be constructed as soon as possible. |

FGD 2: FGD with villagers of Dajing Village, Changchun Town, Xiapu County

| Time: | April 13, 2013 |
| Location: | Dajing Village Committee |
| Participants: | 6, including one woman |
| Key points: |
| 1. Typhoons and sheltering |
| 1) The village was hit by 5 typhoons in 2012, inundating over 70 mu of paddy rice. |
| 2) When a force 8 or above typhoon occurs, fishing boats have to enter the harbor for sheltering. The existing harbor is too small to accommodate external boats and should be expanded. |
| 3) When a typhoon imminent, village officials would give publicity on safety and flood control. |
2. **Project impacts**
   1) After the completion of the fishing harbor, fishing boats can take shelter nearby, saving considerable costs.
   2) Many non-local people visit here. When the fishing harbor is completed, more visitors will be attracted, thereby promoting the development of local stores.

3. **Public participation**
   1) All fishermen are aware of the Project; 1/3 of the attendees of the village congress are women.
   2) In 2012, two training sessions on fishery skills and safety were given, covering boat driving and repair skills in the form of live demonstration, instruction and handout.

4. **Suggestions**
   1) The Project should progress as fast as possible; 2) Wind sheltering capacity should be as high as possible; 3) Management should be strengthened after the completion of the fishing harbor.

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**FGD 3: FGD with villagers of Beishuang Village, Wen’ao Village, Haidao Xiang, Xiapu County**

**Time:** April 13, 2013  
**Location:** Beishuang Village Committee  
**Participants:** 7, including two women  
**Key points:**

1. **Typhoons and sheltering**
   1) When a typhoon occurs, large boats would travel 4 hours to take shelter in Simenqiao, Changchun Town (3 times in 2012), costing over 2,000 yuan a time, and small boats would travel 2 hours to Luxia to take shelter, costing 300-400 yuan a time.  
   2) The typhoon in 2012 did not cause considerable losses.  
   3) Typhoons are up to force 11 or 12.  
   4) There are red tides and cold waves occasionally, affecting aquaculture.

2. **Fishing harbor construction and management**
   1) When completed, the fishing harbor will accommodate all fishing boats in the village and resist force 12 winds.  
   2) Management: The harbor will be managed by a management committee and an old people’s association.  
   3) Supervision: There is a village affairs supervision committee, with 7 members, including two women.

3. **Public participation:** All villagers are aware of the Project; a village congress was held in 2013 to solicit comments, with 34 attendees, including 10 women; they are willing to input labor at the construction and operation stages.

4. **Women:** Women do not sail out but take care of children, cook and weave nets at home.
FGD 4: Institutional FGD in Sansha Town, Xiapu County

Time: April 12, 2013  
Location: Sansha Town Government  
Participants: 6 participants  
Key points:  
1. **Reason for constructing the fishing harbor**  
   1) When a typhoon comes, the existing fishing harbor is unable to accommodate all fishing boats. It has to be expanded.  
   2) Demand for industrial and economic development: With the ground-breaking of Sansha Industrial Park, the harbor and fishery economy of Sansha Town will be increasingly important, posing a strong need for a better fishing harbor.  
   3) Fishery demand: Fishing boats are increasingly more and larger.  
2. **Harbor functions**: 1) berthing and wind sheltering; 2) shipping (for 100-400 tonners)  
3. **Stockyard**: This stockyard will be available for lease, and rental will be used for fishing harbor management.  
4. **Fishery trading**: Large boats mostly trade on sea directly, while small boats may trade on board. Prices are market-marked and unregulated.  
5. **Jetty infrastructure construction**: navigation channel, sheds, management houses, streetlamps, dining and living places for fishermen, toilets  
6. **Aquatic product association**: An aquatic product association and a laver cultivation association have been established, but not at the village level.  
7. **Ethnic minorities**: The She people have been assimilated to the Han people except that they have their own language.

FGD 5: FGD with villagers of Fenghuo Village, Xiapu County

Time: April 14, 2013  
Location: Fenghuo Village Committee  
Participants: 7, including two women  
Key points:  
1. **Basic information**  
   1) Land: The village has 1,800 mu of land, including 400 mu of cultivated land, woodland and slope land.  
   2) Economy: Only few old people do farm work, and most villagers are fishermen. There are 700 net cages (42 households), 40 mu of kelp (15 households) and 100 mu of laver. Some young villagers work outside.  
   3) Fishing boats: There are 25 high-power fishing boats (>60HP) and nearly 200 low-power ones (<24HP) in the village.  
2. **Typhoons and sheltering**  
   In 2012, the village was hit by 8 typhoons, including 4 major ones (force 10 or above), resulting in almost no damages. When a force 8 or above typhoon comes, personnel have to be evacuated and boats berthed. The village is also affected by cold waves or red tides, which would kill fish and affect net cage aquaculture greatly.
3. **Fishing harbor management**
   The harbor may be managed by the old people’s association after completion.

3. **Training**
   The aquatic products bureau would give fishing and aquaculture training during the fishing-off season (May 1-September 15).

4. **Other**
   1) It is not necessary to dredge the harbor; 2) LA and HD: Resettlement was completed by 2012, affecting 16 households; and 3) Few women sail out.
Appendix 3 Fieldwork Photos

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<tr>
<th>Image</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="image1" alt="Beishuang Fishing Harbor in Wen’ao Village, Haidao Xiang, Xiapu County" /></td>
<td>Beishuang Fishing Harbor in Wen’ao Village, Haidao Xiang, Xiapu County</td>
</tr>
<tr>
<td><img src="image2" alt="Luxia fishing harbor in Changchun Town, Xiapu County" /></td>
<td>Luxia fishing harbor in Changchun Town, Xiapu County</td>
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<tr>
<td><img src="image3" alt="FGD in Fenghuo Village, Sansha Town, Xiapu County" /></td>
<td>FGD in Fenghuo Village, Sansha Town, Xiapu County</td>
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<tr>
<td><img src="image4" alt="Interview with a woman in Wen’ao Village, Xiapu County" /></td>
<td>Interview with a woman in Wen’ao Village, Xiapu County</td>
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<td><img src="image5" alt="Interview with the head of San’ao Village, Sansha Town, Xiapu County" /></td>
<td>Interview with the head of San’ao Village, Sansha Town, Xiapu County</td>
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<td><img src="image6" alt="FGD with the Sansha Town Government, Xiapu County" /></td>
<td>FGD with the Sansha Town Government, Xiapu County</td>
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<tr>
<td>Field survey in the Luxia fishing harbor, Changchun Town, Xiapu County</td>
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<td>FGD with villagers of Rongqiao Village (seat of the Training Center)</td>
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<td>Interview with the principal of FOTS</td>
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<td>Key informant interview at XCOFB</td>
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<tr>
<td>Interview with a female worker at the Luxia fishing harbor in Xiapu County</td>
<td><img src="image5.jpg" alt="Image" /></td>
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<tr>
<td>Typhoon early warning base</td>
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