Socialist Republic of Vietnam

Ministry of Agriculture and Rural Development

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VIETNAM WATER RESOURCE ASSISTANCE PROJECT

SOCIAL IMPACT ASSESSMENT

FOR

CAU SON – CAM SON

Edited September 2003
Social Impact Assessment for Cau Son Cam Son Subproject

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1. INTRODUCTION: THE SCHEME

1. The Cam Son-Cau Son Irrigation Scheme was originally designed in the early 20th century to irrigate about 7,500 ha of land. In 1973, the Government of Vietnam (GOVN) constructed a storage reservoir and extended the irrigation canal system to irrigate about 24,140 ha of land and to drain some 70,000 ha of irrigated area. The designed pump drainage area is about 10,090 ha.

2. The irrigation system of the Scheme comprises the Cam Son Dam across the Hoa River, a weir 41km downstream on the Thuong River, and a vast canal system. The live storage of the reservoir is about 227 m$^3$ million. Five primary canals, 130 secondary canals and 1,582 tertiary canals irrigate some 13,800 ha of land, which is about 57 per cent the designed command area. The scheme is a 'water-surplus' scheme given the incomplete tertiary canal system. However, in several areas of the scheme, especially in its tail-end areas, farmers experience water shortages during the dry season owing to the low conveyance efficiency. Twenty large drainage and irrigation pumping plants serve upland cultivation. In addition, about 200 small private pumping units pump water from the rivers and irrigation canals to irrigate rice lands. Poor irrigation conveyance in the Scheme provides a strong rationale for the proposed irrigation modernization program. With better irrigation supplies, it is possible to increase the cultivated area and to help farmers to use water more efficiently. The Cau Son Irrigation Scheme Exploitation Company (CSISEC) has estimated that after modernizing the irrigation infrastructure, farmers would be able to irrigate 19,000 to 20,000 ha of land, which is an increase of 38 to 44 per cent compared with the current irrigated area in the Scheme.

3. The first phase of the subproject will rehabilitate two secondary canals in the Scheme. The first canal identified is the Y-2 secondary canal in the Yen Lai primary canal command area. The designed command area of the Y-2 is 750 ha, out of which 420 ha (56 per cent) are cultivated by about 2,100 farm households with gravity irrigation. The Y-2 serves Yen My, Xuong Lam, Tan Hung, and Phi Mo communes. It has 34 tertiary. Its total length of the canal is 12 km and it has two branches – one is 7.5 km long, and the other is 4.5 km long. The first branch canal is heavily sedimentsed and as a result, no irrigation water comes along the canal, depriving about 250 ha of irrigable land of their due share of irrigation water supplies. Irrigated agriculture is unstable on the Y-2 canal's command - instability begins with paddy nurseries for which farmers cannot get sufficient water from the canal. In each main cultivation season, irrigation supplies are uncertain, and sometimes fail altogether, especially in the tail-end areas of the command. As a result, most of the affected farmers depend on pumping drainage water and seasonal rains to cultivate their land holdings.

4. The second canal identified is the Nui Sui secondary canal in the Giua primary canal command area. The Nui Sui canal has 25 tertiaries. The designed command area of the canal is 1,250 ha and the actually cultivated area is about 433 ha. About 2,200 farmers depend on these lands for their livelihood. The Nui Sui canal is in the southern downstream end of the primary canal, where frequent water shortages occur. On such occasions, the Giua primary canal can obtain supplementary irrigation water from the Phan Dam primary canal to overcome the shortages. However, unfortunately, the Phan Dam canal water is highly polluted as it gets discharges of polluted wastewater from the Bac Giang Fertilizer
Factory. This water is not suitable for land irrigation. As a result, the Nui Sui canal remains as a water-deficit canal. The irrigation problems in the Nui Sui canal command area can be summarized as follows: During the drought season, there is not enough water to irrigate land, and in the rainy season, farmers cannot cultivate a significant portion (60 per cent) because of floods and water logging caused by rising level of Thuong River.

2. GEOGRAPHY AND LOCAL RESOURCES

5. The Scheme is located in the Bac Giang Province, and will cover two districts, Luc Nam and Lang Giang.

6. The topography of the Scheme can be divided into three sub-areas:

   **Northern area:** Communes in the north lie in hills and mountainous area where farmers find favorable condition for industrial development and livestock rearing.

   **Midland area:** Communes are located in area that it is relatively flat and it has the potential for cultivating economic and orchards as well rice, and short-term industrial plants. Farmers engage in livestock farming to supplement their farming incomes.

   **The Plains:** The flat area in the south includes several communes of Lang Giang district, such as Xuan huong, My Thai, Duong Duc and Bac Giang town. This area is suitable for food-grain production.

7. In the recent past, Vietnam economy has developed steadily and as a result, the average living standards of the people - housing, food security and household income - have also increased.

   **Table 1. Economic development Status in the Area – 2001**

<table>
<thead>
<tr>
<th>District</th>
<th>1998</th>
<th>2000</th>
<th>Development rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agro-forest</td>
<td>Industry</td>
<td>Agro-forest</td>
</tr>
<tr>
<td>Lang Giang</td>
<td>334,039</td>
<td>30,090</td>
<td>358,106</td>
</tr>
<tr>
<td>Luc Nam</td>
<td>413,328</td>
<td>13,624</td>
<td>385,570</td>
</tr>
</tbody>
</table>

   Source: Statistic data in the district, 2001

8. The Scheme is located in an area, which has a typical tropical monsoons climate with high temperature, humidity and precipitation. Annual average temperature is between 23° C - 24°C. The highest temperature is in July, which is about 30°C and lowest is in January, which is 16°C. The total annual rainfall is 1400 to 1500mm, and rainfall pattern is unevenly distributed throughout the year. The rainy season lasts from June to August and accounts for 85 percent of the total annual rainfall. In the dry season, the rainfall averages 25 mm monthly. The Scheme experiences occasional typhoons and hail-storms. Generally, the climate is appropriate for forestry and agriculture, especially for wet rice, peanut, soybean and tobacco.
Table 2: Land Resources Distribution in the Scheme

<table>
<thead>
<tr>
<th>Land Use Pattern</th>
<th>Total Area (ha)</th>
<th>%</th>
<th>Lang Giang district Area (ha)</th>
<th>%</th>
<th>Luc Nam district Area (ha)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total natural land area</td>
<td>49,827</td>
<td>100.0</td>
<td>24,575</td>
<td>100.0</td>
<td>17,380</td>
<td>100.0</td>
</tr>
<tr>
<td>- Agricultural land</td>
<td>28,490</td>
<td>57.1</td>
<td>15,311</td>
<td>62.3</td>
<td>8,584.6</td>
<td>49.4</td>
</tr>
<tr>
<td>- Forestry land</td>
<td>6,428</td>
<td>12.9</td>
<td>2,270</td>
<td>9.2</td>
<td>3,931.1</td>
<td>22.6</td>
</tr>
<tr>
<td>- Residential land</td>
<td>5,596</td>
<td>11.2</td>
<td>1,316</td>
<td>5.3</td>
<td>2,856.1</td>
<td>16.4</td>
</tr>
<tr>
<td>- Special land</td>
<td>7,153</td>
<td>14.3</td>
<td>3,931</td>
<td>16.0</td>
<td>373.1</td>
<td>2.2</td>
</tr>
<tr>
<td>- Waste land</td>
<td>3,988</td>
<td>8.0</td>
<td>1,747</td>
<td>7.1</td>
<td>1,276.4</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Source: Statistic data in the district, 2001

3. SOCIAL ASSESSMENT

3.1. A mixed Population

9. The number of beneficiaries has been calculated to be 642,113 of whom 18,124 will be affected. During the past ten years, the natural birth rate has reduced from 1.9 percent a year in 1991 to 1.05 percent a year in 2000. Population density is 800 persons/km² and the male/female ratio is 51:49. Its urban population is 88,572 persons (14 percent) and rural population is 553,561 (86 percent). The total number of household in the Scheme is 130,174.

10. The majority is belonging to the Kinh ethnic group but there are also ethnic minority people living in the area as shown in table 3 below. The ethnic minorities in Cau Son are living integrated with the Kinh people, and nowhere are they living in groups in which they are the majority.

Table 3. Ethnic Minorities in Luc Nam and Lang Giang

<table>
<thead>
<tr>
<th>District</th>
<th>Total Population</th>
<th>Tay</th>
<th>Tho</th>
<th>Sau Diu</th>
<th>Hoa</th>
<th>Nung</th>
<th>Muong</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luc Nam</td>
<td>68338</td>
<td>2093</td>
<td>54</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3%</td>
<td>0.08%</td>
<td>0.06%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lang Giang</td>
<td>93110</td>
<td>815</td>
<td>0</td>
<td>1263</td>
<td>149</td>
<td>4690</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.9%</td>
<td></td>
<td>1.4%</td>
<td>0.2%</td>
<td>5%</td>
<td>0.06%</td>
</tr>
<tr>
<td>Total</td>
<td>161448</td>
<td>2908</td>
<td>54</td>
<td>1302</td>
<td>149</td>
<td>4690</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>1.8%</td>
<td>0.03%</td>
<td>0.8%</td>
<td>0.09%</td>
<td>2.9%</td>
<td>0.03%</td>
</tr>
</tbody>
</table>

11. The largest ethnic minority group is the Nung who are 5% of the population in Lang Giang district. They are mainly living in one commune, Huong Son, with 4266 people, which is one third (33.7%) of the local population (12646). Otherwise the ethnic minorities are only between 3 and 0.03% of the population. Therefore, the subproject should not trigger the application of the World Bank policy OD 4.20 on Indigenous People, which are based on “groups” living in areas inhabited by ethnic minorities dominated by cultural norms and values different from the majority of the population.
3.2. Income and Assets

12. Income is mainly derived from agriculture (58.2%) but forestry (4.7%) and fishery (1.2%) also plays a role. However, 39.5% of the population is occupied in “other” activities, which is partly due to a relative young population in which large fractions are either infants or attending educational facilities. The “other” category also includes the highest income groups, which are traders and civil servants. Their incomes reach 500,000 VND a year in places such as Dinh Ke and Xuong Giang villages. In other villages such as Luc Nam in the mountains, villagers do not get sufficient income to meet their basic needs (see the part on poverty rates). A questionnaire measured in 2002 the household assets of the people in the subproject showed that some households have motor bicycle, television set, cassette-recorders. Average income of an agricultural household reaches about 200,000 to 300,000 VND a year.

Table 4: Household Assets – Percentage of Households Distribution

<table>
<thead>
<tr>
<th>Motor bicycle</th>
<th>Radio</th>
<th>Furniture</th>
<th>Grinding machine</th>
<th>Bicycle</th>
<th>Television set</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.5%</td>
<td>53.2%</td>
<td>99%</td>
<td>5%</td>
<td>85.6%</td>
<td>38.5%</td>
</tr>
</tbody>
</table>

Source: Survey questionnaire, Sep. 2002

3.3. Education and training

13. During the past ten years, education and skill training in the Scheme have improved as the government paid sufficient attention to these two important services. The construction and operation of pre-schools, primary, middle and post-primary schools in the area demonstrate the impact of this policy. In the Scheme, pupil enrolment is high with kindergarten attendance at 30 percent, pre-school at 60 percent, primary school at 100 percent, and elementary school at 85 percent. In many schools, children who enrolled in classes completed their courses of studies without dropping out. The number of students who enroll in colleges and universities has increased by three fold during the last ten years.

14. Education facilities have also improved during the last ten years. For example, 85 percent of villages and townships have classrooms. Permanent school primary schools buildings are found in 40 percent of villages while all high schools have their own permanent buildings. Curricula of schools have been broadened in recent years by introducing new subjects particularly in social sciences and physical sciences. Moreover, schools are provided with comprehensive hygienic environment and educational landscape. However, a significant portion of schools needs more assistance to recruit and retain teachers. This is particularly true of schools in mountainous and remote areas.

15. Although students have achieved great strides in education, the local adults lag behind because of their limited knowledge of modern technology. Training courses on agriculture and forestry have so far not been regularly held. There is scope of introducing know-how and awareness programs regarding animal husbandry, scientific farming, irrigation management and Integrated Pest Management (IPM).

1 These villages are both located in districts, which will not be affected by the subproject.
Table 5: Educational Facilities: Targets for year 2000

<table>
<thead>
<tr>
<th>Target</th>
<th>Unit</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary schools</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Secondary schools</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>High schools</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Kindergarten and nursery</td>
<td>&gt;200</td>
<td></td>
</tr>
<tr>
<td>Primary School pupils</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Secondary School pupils</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>High School pupils</td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td>Primary School Teachers</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Secondary School Teachers</td>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>High School Teachers</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistic data in the district, 2001

3.4. Health Care

16. In the Scheme, health care for local residents has also received proper attention by the Government. It has invested in primary medical stations at the village level and at least one in two stations has a medical doctor. In hamlets and mountainous villages, there are health workers who attend to day-to-day health needs of the people. In each district, there is a medical center with hundreds of staff, including doctors. For example, there are 26 medical centers in Lang Giang District, two pharmacists, a group of preventive medical workers and three surgeries. Each medical center has 150-200 beds at an average of 1,000 person/bed and on average there is a doctor for about 5,000 residents.

Table 6: Health Care development Targets for 2000

<table>
<thead>
<tr>
<th>Target</th>
<th>Unit</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number of clinic station</td>
<td>Building</td>
<td>8</td>
</tr>
<tr>
<td>General hospital and regional medical clinics</td>
<td>House</td>
<td>48</td>
</tr>
<tr>
<td>Clinic station in commune and township</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Total of sick-bed</td>
<td>Bed</td>
<td>1,200</td>
</tr>
<tr>
<td>Hospital in district</td>
<td>Bed</td>
<td>1,200</td>
</tr>
<tr>
<td>Clinic station in commune</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistic data in the district, 2001

17. Family planning and population control are two important aspects of public health care. The hospitals and health workers conduct awareness creating propaganda and communication programs for the benefit of residents in villages and townships.

3.5. Standard of Living

18. Every household has been given one sao of land for cultivation under the land funds of the commune. Food crop production has increased in terms of the area and productivity in which rice and maize are the main crops.
3.6.  **Food Security**

19. Table 7 below shows that food security has increased significantly because of improved rice production. Such an increase of production became possible with the widespread use of new high yielding varieties of rice and the application of appropriate inputs such as fertilizer. Average cereal food crop per person has increased from 309-kg/person in 1996 to 356 kg/person in 2000. This has significantly contributed to solve food safety issues in the area and to divert attention to other crops, particularly industrial crops.

**Table 7: Food Per Person – Comparison between 1996 and 2000**  
(Units: kg/capita)

<table>
<thead>
<tr>
<th>District</th>
<th>1996</th>
<th>2000</th>
<th>Increasing rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lang Giang</td>
<td>326</td>
<td>339</td>
<td>13</td>
</tr>
<tr>
<td>Luc Nam</td>
<td>292</td>
<td>317</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Statistic data in the district, 2001

20. After upgrading the irrigation system in the Scheme, cultivated area will be expanded from 10,300 ha to 22,416 ha by 2005, which will be a more than 300 percent increase. Thus food crop productivity in area and average food per person will lead to improve household incomes, regional development and general well being of the people in the Province as shown in table 8-10.

**Table 8: Comparative Indicators of Food Production in the Scheme**

<table>
<thead>
<tr>
<th></th>
<th>Lang Giang</th>
<th>Luc Nam</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1996</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice Area (ha)</td>
<td>15,000</td>
<td>7,599</td>
<td>28,575</td>
</tr>
<tr>
<td>Yield (ton)</td>
<td>53,181</td>
<td>25,989</td>
<td>99,080</td>
</tr>
<tr>
<td>Average Yield (ton/ha)</td>
<td>3.55</td>
<td>3.42</td>
<td>3.47</td>
</tr>
<tr>
<td>Corn Area (ha)</td>
<td>1,131</td>
<td>127</td>
<td>1,440</td>
</tr>
<tr>
<td>Yield (ton)</td>
<td>3,474</td>
<td>257</td>
<td>4,272</td>
</tr>
<tr>
<td>Average Yield (ton/ha)</td>
<td>3.12</td>
<td>2.02</td>
<td>2.97</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2000</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice Area (ha)</td>
<td>15,363</td>
<td>8,653</td>
<td>30,146</td>
</tr>
<tr>
<td>Yield (ton)</td>
<td>66,098</td>
<td>35,760</td>
<td>128,629</td>
</tr>
<tr>
<td>Average Yield (ton/ha)</td>
<td>4.30</td>
<td>4.13</td>
<td>4.27</td>
</tr>
<tr>
<td>Corn Area (ha)</td>
<td>1,683</td>
<td>123</td>
<td>1,944</td>
</tr>
<tr>
<td>Yield (ton)</td>
<td>4,815</td>
<td>338</td>
<td>5,525</td>
</tr>
<tr>
<td>Average Yield (ton/ha)</td>
<td>2.94</td>
<td>2.75</td>
<td>2.84</td>
</tr>
</tbody>
</table>

**Increase Rate**

<table>
<thead>
<tr>
<th></th>
<th>Lang Giang</th>
<th>Luc Nam</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice Area (%)</td>
<td>102.4</td>
<td>113.9</td>
<td>105.5</td>
</tr>
<tr>
<td>Yield (%)</td>
<td>124.3</td>
<td>137.6</td>
<td>129.8</td>
</tr>
<tr>
<td>Average Yield (%)</td>
<td>121.3</td>
<td>120.8</td>
<td></td>
</tr>
<tr>
<td>Corn Area (%)</td>
<td>147.2</td>
<td>96.9</td>
<td>135.0</td>
</tr>
<tr>
<td>Yield (%)</td>
<td>138.6</td>
<td>131.8</td>
<td>129.3</td>
</tr>
<tr>
<td>Average Yield (%)</td>
<td>94.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Statistic data in the district, 2001
Table 9: Status of Food Crop Development Targets in 2000

<table>
<thead>
<tr>
<th>Type of plant</th>
<th>Area (ha)</th>
<th>Yield (ton)</th>
<th>Average yield (ton/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean</td>
<td>1,421</td>
<td>1,518</td>
<td>1.07</td>
</tr>
<tr>
<td>Peanut</td>
<td>1,294</td>
<td>1,385</td>
<td>1.07</td>
</tr>
<tr>
<td>Vegetable</td>
<td>4,331</td>
<td>52,591</td>
<td>12.14</td>
</tr>
<tr>
<td>Batata</td>
<td>5,626</td>
<td>39,904</td>
<td>7.09</td>
</tr>
</tbody>
</table>

Source: Statistic data in the district, 2001

Table 10: Status of Fruit Tree Cultivation Targets in 2000

<table>
<thead>
<tr>
<th>Type of Fruit Trees</th>
<th>Area (ha)</th>
<th>Yield (ton)</th>
<th>Average yield (ton/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logan, Litchi</td>
<td>3,111.0</td>
<td>2,653.8</td>
<td>0.85</td>
</tr>
<tr>
<td>Mango</td>
<td>4.0</td>
<td>5.0</td>
<td>1.25</td>
</tr>
<tr>
<td>Persimmon</td>
<td>189.7</td>
<td>170.2</td>
<td>0.89</td>
</tr>
<tr>
<td>Custard- apple</td>
<td>519</td>
<td>1,309.0</td>
<td>3.04</td>
</tr>
</tbody>
</table>

Table 11: Status of Breeding in 2000.

<table>
<thead>
<tr>
<th>District</th>
<th>Buffalo</th>
<th>Cow</th>
<th>Pig</th>
<th>Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lang Giang</td>
<td>11,543</td>
<td>8,373</td>
<td>94,691</td>
<td>1,025,528</td>
</tr>
<tr>
<td>Bac Giang</td>
<td>163</td>
<td>473</td>
<td>10,755</td>
<td>268,979</td>
</tr>
<tr>
<td>Luc Nam</td>
<td>11,031</td>
<td>5,436</td>
<td>44,614</td>
<td>635,816</td>
</tr>
<tr>
<td>Yen Dung</td>
<td>2,210</td>
<td>3,342</td>
<td>22,242</td>
<td>562,756</td>
</tr>
<tr>
<td>Total</td>
<td>24,947</td>
<td>17,624</td>
<td>172,302</td>
<td>2,493,079</td>
</tr>
</tbody>
</table>

21. Agricultural extension services in the area have contributed to cultivation diversification, which has improved farmers' income substantially. In addition has some forestland been transformed to fruit trees, with the result that farmers' income had become three times higher than before, and the general standard of living improved as illustrated in the table on households' assets.

3.7. Poverty Levels

22. However, the district statistical data indicate the following poverty levels, which indicate widespread poverty between 12 and 29 percent of the population. Poverty was particularly high in the mountain areas.

Table 12: Poverty Line by Districts

<table>
<thead>
<tr>
<th>District</th>
<th>Percentage of the Population below the Poverty line (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lang Giang</td>
<td>12</td>
</tr>
<tr>
<td>Luc Nam</td>
<td>29</td>
</tr>
</tbody>
</table>

3.8. Gender and Vulnerable Groups

23. The poor perceive the reason for their situation as a result of the lack of funding for cultivation and husbandry; lack of employment particularly those that can bring cash; and lack

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2 Figures in table 9-11 include figures from four districts, which was originally part of the subproject area.
3 Information in this section relies on PRAs and consultation in 2003.
of labor or illness in the family. Poverty was high among those headed by women, single women or plight women (where the husband has died, their children or themselves were malformed by birth or by war).

24. Women are not treated subordinate in the family neither are they discriminated against by the society. However, in some community the women still suffer more compared with man due to the traditional division of labor and in the decision whether they should have a son or not. There was little spacing between birth and many had gynaecological problems. The ethnic minority women mainly give birth at home with the assistance of the ethnic minority midwife. Only 30% of ethnic minority women give birth at commune health clinics.

25. The women are participating in most of the socio-economic development programs in the area and play an important role in the social life of the community, especially the campaign for "Good and strong children", "Hunger eradication and poverty alleviation and employment generation"; other programs include the "For the advancement of the women", "Gender equality", "Reproduction health", and "Care to teenagers".

26. There is a distinct gender related division of labor. The women are usually responsible for transplanting, maintenance, spraying of pesticide, harvesting, transporting, drying, storing and selling the products, while the men mainly take care of preparation of soil, spraying of pesticide, harvesting, transporting, technical information. Ratio of doing field work (time spent in the field) between women and men is 60% and 40%. Vegetable growing provide more secure income, but the planting of vegetable has increased the time spent in the field of the women, since this work is considered a "light work", suitable for women. 90% of work related to raising livestock and poultry are done by women and only 10% by men. Women was also responsible for housework and caring for children.

27. Women are only marginally involved in water management. Due to the deteriorated canal systems, the women could not participate in water distribution because this is a hard work which sometimes needs to be done at night, and was not considered proper for women. Decision for opening and closing of water in canal was made by men, not by women while it was the women who provide information of water needs in their field to the men. However, women was eager to learn and 70% of women participate in the agricultural extension for application of new farming technology and new varieties, while only 30% of men participate in this program.

3.9. A Vision for the Future

28. The Cam Son Reservoir is a beautiful location for tourist industry. Beside, there are famous cultural historical site in the nearby areas such as Can Tram, Pho Cat, Xuong Giang and Tien Luc pagoda. As the area already has developed transport infrastructure, it is easy to develop it into an ecological tourist area. There is a Master Development Plan for 2000-2005 with an emphasis on agricultural development towards commodity production and industrial improvements particularly small-scale industries together with educational investments and administrative reform. Further, there is a medium-term development plan.

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4 50% of women were contracted with gynaecological illness and goitre according to the chairperson of the Women's Association.
for the province up to 2010, which emphasizes a balanced growth with regional goals and an aim of combining economic development with protection of the environment.

29. For the local farmers the main concern was (i) access to reliable water resources, (ii) handicraft development in the village or introduce new craft in the community to generate employment, (iii) participation in construction and access to cash income jobs, and (iv) training and capacity building in water management for both men and women.

3.10. Conclusions: Social Impact Assessment

30. The investment in irrigation modernization will bring about considerable improvement in the irrigation system performance and will result in increased agricultural production. Overall, the social impact on most of the scheme population will be highly positive in terms of increasing farm incomes from improved agricultural production, employment generation, safe water supply, flood protection, and better road and transport conditions. The subproject would facilitate multiple cropping in the sample areas that are now limited to single season paddy crop or to two unstable paddy crops. Flood protection and draining of waterlogged areas would not only help the beneficiaries to start highly-lucrative aquaculture, but more importantly would bring significant social benefits, including protection of properties and crops, access to schools and health facilities during the flood season.

During Construction: During the construction period, there will be an increased demand for local labor as well as for operational staff for on-farm canal rehabilitation. After the completion of rehabilitation, the demand will dwindle. The big gathering of workers for construction can have impacts to the security and order of the community, and increase local prices. However, most of the people, including the ethnic minority, think that this is not a serious problem since they before have experienced big gathering of people for construction of this irrigation system. But closing of water for construction will have impacts not only on irrigation water for crops but also water for domestic use since most of the well levels depend on canals water levels.

Impact on transportation and the environment. After completion transportation is still affected because earth left over from the dredging and excavating of canals, which should be used for strengthening embankment access road, has been taken by some people. This will affect the environment of the community both socially and environmentally. Impact on the transportation of people may also occur because the construction will affect canal bridge and power grid. Impact on the environment may also occur due to dust from the road where there is transportation of construction materials.

Impact on hygiene and domestic water supply. During project construction, the ground water level in the region will be affected for a short time because of the closure of canals. The impact will be felt especially in fetching water for domestic uses as the majority of farmers depend on dug wells for water supplies. The major effect will be on the regional groundwater quality because of the lining of canals, which will prevent direct water seepage from the fields to the ground water sources. In addition, the active water regulation in the rainy and dry season will control flooding in the region.
Impact to health care. Rehabilitation of canals will certainly improve local residents’ health status. Better water supplies will change their hygiene, which in turn will result in reducing the water born diseases such as gynecological disease, sore eyes and diarrhea.

Impact on vulnerable groups. Landless laborers, estimated to about 25 per cent of the total population in the scheme would benefit from the increase in hired labor requirements of more intensive cropping, infrastructure development, and their maintenance. However, the returns on this investment will be quickly eroded if the project infrastructure is allowed to deteriorate through the lack of adequate maintenance and sound operational management. Efficient operations and effective maintenance are therefore essential to safeguard the investment and to sustain the irrigation system.

Conflict resolution. After the completion of the rehabilitation/modernization of the irrigation system, it would be possible to resolve and prevent disputes between upstream and downstream farmers regarding water distribution of canals.

4. CONSULTATION, INFORMATION AND PARTICIPATION

4.1. Commitments to Implement the Project According to the Policy of the World Bank

31. After being informed of: (i) the general content of VWRAP at national scale, including the Part of ‘Modernization of irrigation systems’ in which the Cau Son – Com Son irrigation system is one of the Subprojects, and (ii) World Bank policy on Resettlement, Ethnic Minorities, and Cultural Heritage the local authorities at all levels were committed to implement the Subproject according to WB policy.

A. Consultation with provincial PC and Department of Agriculture and Rural Development

32. The PC and the DARD found the target of the Project very suitable to the local target of socio-economic development and its development Direction to the year 2010. Provincial PC would be ready to receive the Project and was committed to implement the WB policy and to create the best conditions for the implementation of the Project. Further, the province had experiences and good results in its implementation of Projects using loan capital from international organization, including WB, especially in compensation, site clearance and resettlement.

B. Consultation with PC of Lang Giang district:

33. The People’s Committee completely supported the Project and found it is very useful for the socio-economic development of the locality, especially in agricultural production and the life of the citizens. The PC Agree to make commitment to the implementation of the subproject according to WB policy. In case of land compensation, the communes still have land fund of 5% (reserved land managed by PC of communes, which is temporarily assigned to households at present) for compensation without any difficulties.

5 Comprising: PC of Bac Giang province (with the attendance of leaders of Department of Agriculture and Rural Development); PC of Lang Giang district (with the attendance of representatives of related specialized offices).
34. Leaders of provincial and district governments found that: (i) it is very necessary to repair, upgrade or renew canal lines grade 3/ on farm synchronously with the works in the framework of Subproject. In addition, it is difficult for the people to make contribution to the construction themselves, as their lives are difficult, with low income particularly concerning cash and they found it necessary to gain support from the State as well as from the Project. (ii) If the counterpart capital from the central budget would be available, it would be much more convenient and active to carry out WB policy on resettlement compared to capital from local budget. (iii) Irrespective of which level would supply the counterpart capital, the PC of districts agreed to fulfill their commitments regarding the implementation of Subproject according to WB policy.

C. Consultation with PC at commune level:

35. Equally, the commune level found implementation of the Subproject very suitable with the people’s aspirations for the improvement of irrigation water supply. The PC at the commune level would actively take part in the implementation of the Subproject according to WB policy. For the commune the fulfillment of this commitment was also part of the responsibility of the locality assigned to them by the PCs of province and the district. The PC of communes will use the land fund of 5% under their management to compensate for households loosing land, if they agree to receive land, in accordance with WB policy. In case the people for some reason refused to receive the compensated lot of land, the PC would negotiate with neighboring households for changes, or transfer to make it suitable to the desire of the households receiving compensation.

D. Consultation with Farmers

36. All households as well as representatives of social organizations and community leaders enthusiastically agree to implement the Subproject in accordance with WB policy. Although their land and some of their property may be lost the losses are inconsiderable and necessary to change for infrastructure for socio-economic development of families and communities. The people were determined to cooperate in implementation of the Subproject. The farmers mentioned that when there would be enough water, it would be possible to plant not only fruit trees in high area, but also other food grain crops (as maize) in order to supplement the food source, which at present was mainly from paddy. However, the people and community leaders were worried about the implementation of WB policy if the counterpart capital source would come from the local budget, because this budget source was normally not ready, not timely, thus affecting the pace of compensation, site clearance and project implementation, and reducing the trust of affected people. On the contrary, if the counterpart fund is from the central budget, it will be much more convenient for “the correct implementation of WB policy on resettlement, and it’s also suitable to the local financial capability.”

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6 Comprising: - Representatives of social organization: 1) Chairman of front; 2) Representative of former soldiers' association; 3) Women’s association; 4) Farmers’ association; 5) Association for agricultural promotion; 6) Association of old age people; 7) Youth’s Union; (There’s no EM people in Subproject area), and Representative of local government and specialized officials: 1) Secretary/Asst.secretary; 2) Chairman/or Vice Chairman of PC of commune; 3) Head/or deputy head of hamlet/ward; 4) Commune cadastral; 5) Head of Coop. 6)Heads of irrigation teams of communes; 7) Heads of EM groups.
4.2. **Farmers Participation in Water Management**

37. The people are ready to take part in the implementation of the subproject to get more income in cash, especially poor households, and households with temporary unemployed youth. They could take part in the following works: (i) Simple work (digging, heaping, transport, concretion, construction, keeping guard); (ii) do some parts of project implementation such as building, renovating canals, ditches of simple technique with guidance of technicians; (iii) take part in the monitoring of project implementation; (iv) maintenance, protection of canal lines after completion. (v) Women could take part in the water management, distribution work on the canal system grade 3/on farm after the completion of the subproject. Men, who could stay up late at night to lead water, currently did most of that work. The community found that they were ready to contribute their property to the State for the renovation, up-grading, and new construction of canal line grade 3/on farm. The elderly people even regard those contributions as the property left for their offspring in the future.

38. However, farmers confirm that they themselves are not financially capable of doing the above-mentioned works, and they need assistance from the State. Possible contributions of people and the communities could be: (i) labor, as there are a lot of redundant laborers in rural area at present, especially students graduated from senior secondary schools who are not admitted to universities or vocational schools, and (ii) part of their property if affected by the Project, including land. Ethnic minority people agree to contribute 15% of expense in the form of their working days to renovate canals and ditches.

*Ways of implementation and capability, level of contribution, especially land contribution:*

39. The general way consulted with the people for repair, upgrading or new construction of canals grade 3/on farm is "joint efforts made by the State and the people", in which the people may contribute according to the following 2 options:

(1) **Option 1:** Contribution level is the same as the existing level in the implementation of the Program for fortification of canals, ditches of the province at present, i.e. the people contribute 30%, the State (province and district) 70% of the total estimated cost of the project.

(2) **Option 2:** The State provides all material and technical assistance (including the dispatch of engineers for direct guidance during implementation period) until the completion of the project, while the people and community will themselves receive, manage, execute the project and control it without hiring implementation contractors.

The farmers prefer the second option because:
- Project quality is ensured.
- Avoid the loss of material, money due to corruption or lacking in responsibility during the implementation of the project, and it
- Creates more income source to the people, especially the poor.

4.3. **Farmers Recommendation Concerning Water Closing Management**

40. The local crop calendar is:
41. The best time for water closing for project implementation according to Gregorian calendar would be from 15/9 - 31/12 (3.5 months).

42. At this time, when there will mainly be cultivation of vegetables and beans, with low demand for water of plant cultivation. The growth of rice seedlings may be affected due to shortage of water, as seed sowing is completed around 20/11. In some localities domestic water will be affected as water level in wells depends on horizontal underground spring, and therefore also depending on water level of canal (as in Xuong Giang commune, Lang Giang district, belonging to canal line Y2).

**Measures to minimize affections during the time of water closing:**

43. During the time of water closing, it would be necessary to open water once for 10 days and warn the people to reserve water in ponds, and use domestic water economically. According to the farmers it might be possible to use the method of leading water and implementation at the same time as it was done in the year 2000 when canals, ditches were repaired, by the way of executing section by section and pumping water through that section, or embanking at one side, while still leading water at another side. As for seedlings, its demand for water is not much, and therefore affection could be overcome by reserving water in ponds, lakes, and carrying out irrigation by manual work. In case it is impossible to open water during implementation of the project due to technical reason, it is necessary to widely announce implementation schedule so that the farmers can try to reserve water.

### 4.4. Present Models of Water Management and Distribution

44. At present, there is no Association of water users in communities of Subproject area, and there are 2 models of water management, distribution, depending on the existence of Agriculture Service Cooperative in the community.

**Model where the PC of the commune was the representative:**

45. The essence of this model is to sign contract on water usage with IMC and carry out water management, distribution through the governments of communes, wards. This model is normally applied to communities without agriculture service cooperative. However, in some places, which had agriculture service cooperative, as My Thang commune (Lang Giang district), this model still applied.

46. In this model the commune PC is the representative for water using households to directly sign contract on water usage with IMC. In order to manage and distribute water, commune PC establishes an irrigation team directed by Vice Chairman of commune PC and headed by 1 official in charge of communications-irrigation of the commune. Under the commune PC, each ward has 1 irrigation group headed by the head/deputy head of ward, with 2-3 or more members subject to the cultivation land area of the ward. This irrigation group has its function to manage and distribute water to households in the ward.
47. In this model the irrigation fee to be paid to the IMC the households have to pay another sum of money for salaries of members of ward's irrigation group who distribute and lead water. The irrigation fee paid to IMC was 6 kg of paddy/pole's length/crop (rice). With 2 rice crops (Spring-Winter and Autumn-Summer) and 1 crop of vegetables, beans (Winter crop), water using households have to pay IMC a total of 14.8 kg of paddy/pole's length/year (equal to 410 kg of paddy/ha/year). Based on how difficult the work was the commune PC determined payment of irrigation service to irrigation team. If water runs automatically, the payment by water using households is 2kg of paddy/pole's length/year (equal to 56 kg/ha). If irrigation water is from pumping, the payment is the same as the irrigation fee paid to IMC (as the model of which the cooperative is the representative at Huong Son commune, Lang Giang district), i.e. apart from payment to IMC, water-using households have to pay an addition of 411 kg of paddy/ha/year. The additional payment outside the irrigation fee paid to IMC was distributed as follows: 30% paying to commune PC (or cooperative for the model in which cooperative is the representative), 70% paying salary to members of irrigation group of ward. Hence, total expense for water usage of farming households was 467 kg of paddy/ha/year (equal to VND1,027,400) for automatically running water, or 820 kg/ha/year (equal to VND1,804,200) for irrigation water from pumping. This figure is apparently too big for farmers. With this model, each irrigation team of commune consists of more than 20 members.

**Strong points of model:**

48. Model in which the commune PC is the representative to sign contract with IMC has superiority over the model in which the management Board of agriculture service cooperative sign contract with IMC, as the commune PC is the local authority, it is easier for them to take the initiative in solving disagreements and disputes relating to the use of water with other communes. Meanwhile, cooperative, which wants to do this work, needs the cooperation of PC, and it takes time to wait for the commune PC, and sometimes solution is not timely. It is easy for farmers to get information on water source, plan for water distribution and usage and distribute to each production ward/team.

**Weak points of the model:**

49. With the commune PC as the representative for households to directly sign contract with IMC, the water using households usually are not well informed or consulted about the contents, especially on the number of irrigated area written in the contract, as well as the area irrigated in reality. Area that paid irrigation fee to IMC (the area signed in the contract) was usually lower than the actual watering area. Area under gravity irrigation that paid irrigation fee was as well lower than the actual accessible area. With that existing status, the State suffered losses of revenue. And water users got no benefit, but their representative who signed contract with IMC did. As the consequence, irrigation fees provided IMCs with inadequate budget to pay for maintenance. As time passed the canal systems rapidly degraded and became incapable of providing enough irrigation water. Meanwhile, farmers paid irrigation fee for their actual watering area and gravity level. And they did not know about that exceed payment. Only their representative (CPC or Cooperative’s Administrative Section) knew about it, and they used this exceeded amount. This created an environment for financial violation and corruption. Under this management water users households gradually lost trust in their representatives and showed aspiration to have alternative models of water management and distribution.

50. Regarding IMCs, the existing models provided no linkage between IMCs and the water use farmers and the IMC could not control the actual watering areas. Many people
participating in water management and distribution required high budget for their salary and households had to pay a high non-irrigation expense to IMC.

51. In short, next to disadvantages of each existing model of water management and distribution, there were also concerns about quality of service provided by IMC. Quantity of provided water did not meet requirement because of the degraded canal systems. Sections at the end of canals often suffered watering destitute or delay. It took much of farmers’ time to lead water into their fields. Although water distribution timetable of IMC was accepted with water managers and distributors in communities and was informed to household-user level, but in fact, there were often cases of disputes between localities because users at the head end showed a waste/excessive use of water while the tail end users were in lack of water.

**Model with Agricultural Cooperative** as the representative

52. This was the model applied in communities where agricultural cooperative existed. In the subproject area, its scale often covered commune level (such as in Xuong Giang, Xuong Lam communes of Lang Giang district). This model was of similar substance to the model with CPC as the representative. The only difference was that the representative was not CPC, but the Administrative Section of the Cooperative, and cooperative’s President was to sign water use contract with Regional Irrigation Enterprise entrusted by IMC. It could be seen as a model somewhat close to model of Water Users Association because cooperative members in their meeting selected the representative. However, the weakness in water management and distribution, along with the lack of a mechanism for household-users on monitoring operation of the Administrative Section, made this model bear similar weak-points as model with CPC as the representative did.

53. Regarding organization the whole commune/cooperative had an irrigation team which was responsible for distributing water to commune’s fields and informing each household-user about this distribution to its fields. Besides, this irrigation team was as well under obligation to protect the canal system, manage the maintenance of the canal with participation of cooperative members. The number of irrigation team’s members was based on irrigation status, mode of irrigation (gravity irrigation or source-creation irrigation) and it varied between communes.

54. There were two types: In case of communes with irrigation mode of source-creation (such as Huong Son commune in Lang Giang district) in addition to Irrigation Management Board elected by the Cooperative, including 3 members: a head (the Cooperative Head as well) and 2 vice- heads (one was in charge of agriculture and the other was in charge of electricity because there was the use of water-pump for water source creation), there was also irrigation teams with 3-4 members each, and hamlet head was team leader. A commune could have up to 24 hamlets, so number of people participated in water management and distribution could be 72 - 96. When water reached to a hamlet, management board of the Cooperative would inform corresponsive irrigation team.

55. In case of communes with a better irrigation (gravity irrigation): the Cooperative established an irrigation team headed by the Cooperative Head, and the Cooperative

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7 Although the name Agricultural Cooperative was kept unchanged as it had been before the ‘Renovation’ but its structure was changed.
Directorial Board participated in management. Usually, this irrigation team consisted of 10 members representing for 10 hamlets/production teams which had watering difficulties to ensure equal rights for these hamlets (such as in Xuong Giang commune of Lang Giang district which had total 20 hamlets/production teams but its irrigation teams had only 10 representatives for 10 hamlets/production teams having difficulties getting water). The irrigation team was in charge of leading water to each field area, then informing each household-users of the hamlets to lead water to their own fields. The irrigation team was responsible for protecting and maintaining 3-class/in-farm canals of the commune.

Advantages:
56. With irrigation team at hamlet level, water was regulated among fields of each hamlet/production team. It reduced waste of water when Cooperative’s irrigation teams, in accordance with rational set schedule, did water distribution. Disputes at household level could be avoided. Local people were promptly accessible to water and somewhat more assured since they were regularly provided with information about the water use contract by their closest representative in irrigation team, who was their hamlet head/or vice-head, as well by other members of the irrigation team. Water household-users could control their watering plans since irrigation team implemented water distribution in accordance with schedule agreed with IMC.

57. Members of Irrigation Team at hamlet level were truly farmers, and under leadership of hamlet’s head/or vice-head, they understood well water requirement of each field, each parcel of field of each household in their hamlet. They as well could give advisory opinion to the Cooperative and IMC in regards to timely adjusting watering schedule in the most effective way. Farmers could easily do monitoring on their contribution concerning water use because they were periodically reported by the Cooperative, especially when given information from members of their irrigation team. Therefore, there would be no case of collecting irrigation fees according to actual watering area but delivering less to IMC due to the different area between the contracted area and the actual area of watering. Proposals and recommendations made by household-users were easily received and solved by members of irrigation team.

Disadvantages
58. In case of water dispute with another locality, the Cooperative must do the redress through canal of CPC and need the intervention and assistance from CPC, which were not always timely and conveniently provided. Too many people participating in water management and distribution caused an increase in cost contribution for water leading (in addition to irrigation fee paid to IMC) that must be paid by household-users. This model could not erase the difference between actual watering area and the contracted area signed by Cooperative’s Head and Irrigation Enterprise. Therefore, there still existed a tendency of wrong use, even individual use of the exceed amount paid by water users for that different area. With the existing status, the State suffered losses of revenue whilst the water users got no benefit, but their representative, who signed contract with IMC did. As a consequence, irrigation fees provided IMCs with inadequate budget for maintenance of the irrigation systems. As time passed the canal systems rapidly degraded and became incapable of providing enough irrigation water. This was a structural inadequacy in management of the existing models of water management, which created an environment for financial violation and corruption. With the above status, water household-users gradually lost trust in their
representatives and showed aspiration to have alternative models of water management and distribution.

59. Regarding IMCs, the existing models provided no linkage between IMCs and the water use farmers so they could not control the actual watering areas. Regarding inter-communal canals, self-absorption at commune level in water management and distribution caused difficulties for IMC in regulation of water for the whole system.

**Overcoming and improving measures concerning water management and distribution.**

60. First of all, there should be an improvement and modernization of canal systems. Only in doing that existing models of water management and distribution could be improved. Intermediate stages in water management and distribution should be avoided, which means there should only be representative elected by water household-users to be responsible for managing, distributing water and signing contract with IMC.

61. The area under irrigation should be publicized and signed in contracts with IMC to water user level. Concurrently, distribution/balance sheet of the signed watering area for each household-user by each field should as well be publicized. Only in so doing, local people could have chances to implement their monitoring right on the implementation of contract signed between their representative and IMC as well as their monitoring on the activities of water managing and distributing staff.

62. According to the farmers the time awaiting the new model, the State should provide a united management from central level down, covering as well 3-class/in-farm canal system to avoid existing disputes between localities. Those people participated in water management and distribution should be paid by the State (by monthly salary or by products) as IMC staff. That could assure delivery of the system.

63. To overcome the matter of local self-absorption created by models of water management and distribution conducted by commune level, there should be establishment of Water Users Association. Only then the regulation of water could be done systematically and uninterruptedly on basis of canal system, not on basis of administrative territory as happened presently.

### 4.5. Irrigation Fees

64. In addition to irrigation fee paid to IMC, water household-users had to pay another expenditure called ‘cost for leading of water’ to either CPC or Cooperative, depended on which model of water management and distribution applied in their locality. Level of irrigation fee paid to IMC was regulated by PPC depending on watering capacity of irrigation system and agricultural productivity. However, according to IMC, although rice productivity increased 1.5 times in comparison to that of 1985 but the level of irrigation fee paid to IMC was kept unchanged. Level of cost for leading of water was decided by CPC or Cooperative, depending on the convenient/difficult level and watering type (gravity irrigation or source-creation irrigation). In case of gravity irrigation the fee was of 2 kg of rice/sao/year (equivalent to 56 kg of rice/hectare/year and in case of pumping irrigation (source-creation), it was of the same level with irrigation fee that paid to IMC (for example in the model with Cooperative as the representative in Huong Son commune, Lang Giang district), that meant along with the payment to IMC, local people in this commune as well paid 411 kg of rice/hectare/year.
65. To sections where water cannot reach (Xuong Giang commune, Lang Giang district had 4 of its total 20 hamlet felt into this status), local water users did not have to pay irrigation fee to IMC. Only cost for leading of water had to pay to commune’s Agricultural Cooperative. Level of this contribution was of 4 kg of rice/sao/year.

*Level of payment for watering service paid by water household-users*  
+ Irrigation fee paid to IMC  
i) Rice winter-spring harvest: 6 kg of rice/sao/harvest\(^8\).  
ii) Summer-Autumn harvest: 6 kg of rice/sao/harvest.  
iii) Winter harvest: 2.8 kg of rice/sao/harvest.  
Total: 14.8 kg of rice/sao/year (or 411 kg of rice/ha/year, equal to 904,200 VND).

+ Cost for leading of water:

66. Gravity irrigation: 2 kg of rice/sao/year (or 56 kg of rice/ha/year, equal to 123,200 VND); Pumping irrigation (source-creation): equal to irrigation fee paid to IMC, that meant equal to 411 kg of rice/ha/year (equal to 904,200 VND). Cost for leading of water was distributed as follows: 30% went to CPC of Cooperative budget for canal repairmen; 70% was to pay salary to members of hamlets’ irrigation teams. Therefore, total payment for water use of a farm household was of 467 kg of rice/ha/year (equivalent to 1,027,200 VND) in case of gravity irrigation, or 820 kg of rice/ha/year (equivalent to 1,804,200 VND) in case of pumping (source-creation) irrigation. Clearly, that contribution was too high for farmers.

*Willingness in payment for irrigation services after the completion of the subproject*

67. Presently, there were about 20% of households not yet adequately paid their irrigation fee and cost for leading of water. They were poor households under difficult living conditions. Some are households getting not enough water and therefore did not pay the required contribution. However, some CPCs or Cooperatives did pay to IMC for those poor people, who were incapable of payment. For example in My Thang commune (Lang Giang district) in 2002, among 1,570 water household-users, 20% did not yet contribute their irrigation fees, because they were either poor or did not get water.

68. In the future, local people would be willing to pay a higher irrigation fee, if the provision of water would be entirely in type of gravity irrigation, which would meet their requirement (for both watering and drainage) for different agricultural seasons. In such case, surely productivity of crops and animals would be improved. Area under cultivation would as well expanded and the crop diversification would be possible. With those improvements, they would be satisfied and willing to pay even a higher contribution for irrigation fee because they could get a higher revenue on the same area of cultivation than that of the present. Moreover, they would not have to wake up late at night and could avoid disputes with other localities concerning leading water.

69. Results of interview with ethnic minority group in Huong Son found that after the subproject completion, they could pay irrigation fee to IMC at 8 kg of rice/sao/harvest, that meant 2 kg increased in comparison to present level.

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\(^8\) 1 northern sao = 360 m\(^2\).
4.6. Community Consultation on Water Management

70. To overcome the issues which presently happened in models with CPC or Administrative Section of Agricultural Cooperative as representative for water household-users signing water use contract with IMC, local people agreed that there should be an alternative model in which, they would elect themselves truly representatives to participate in managing, distributing water and signing water use contract with IMC. Concurrently, they would like to be able to control their financial contribution concerning use of water.

71. Local people entirely supported the application of market principles in water provision from IMC and they would pay for what they use which would be measured by measurement equipment, and would depended on level of satisfaction for agricultural seasons. This principle would ensure equity between water provider and water users, and as well as overcome the existing lack of responsibility in maintaining canals system and the waste use of water. If these requirements would be met local people would be willing to pay a higher level of irrigation fee.

72. However, water users were also worried concerning the existing canal status and capacity, if local authority (CPC, hamlet head/vice-head) did not directly act as water manager and distributor. If they did not there would be no one powerful enough to make timely interfering or solving disputes with other water-head localities in regards to leading water. Local people showed hopes that this difficulty would be overcome with the modernization of canal system under the subproject.

73. The farmers want to and are able to participate in the distribution and management of the irrigation water in their community, including ethnic minority women, after the canal system has been modernized. They can operate technical equipment, modern irrigating schedule, and so forth, if they are trained by IMC technician. Because there are a considerable number of farmers who have finished high school in the project areas and they need employment.

74. Farmers want to participate in activities such as guarding and maintenance of canals, including earth work, dredging, construction, etc. because these are not only the opportunities to help them to earn income in cash, and more important is to ensure the quality of the works better than done by contractors from elsewhere. They want to take part in the maintenance and protection canals of the works after the completion of the subproject such as dredging, strengthening the embankment, protection, and so forth. The regular maintenance and guarding work can be given to the cooperative, then the cooperative will assign it long term to each production team or each household or group of households living near canal sections.

75. The farmers are hopeful that the model of association and the application of market principles in irrigation sector will be a breakthrough to bring basic changes to the present mechanism of water distribution and management and introduce a new mechanism which guarantees fairness and benefits for the water users and water seller such as the IMC.

4.7. Farmers Proposed Management Model

76. Two models of water distribution and management were consulted with the farmers and communities for selection:

Vietnam Water Resources Assistance Project Nippon Koei in association with Haskoning (VWRAP)
**Model 1.** The Government manages all canal systems, including tertiary on a top-down manner. Those who participate in the management and distribution of water at tertiary canals will receive salary or wage from the Government as applied to IMC, thus they will devote wholeheartedly to the work. This means IMC will take charge of water distribution and management of all canal systems, including the tertiary.

**Model 2.** Establish the association in each community is preferred more than model 1 where the water users will select their representatives for water distribution and management and sign the contract with IMC. All association’s activities will be agreed upon by its members in their regular and irregular meetings and made transparent all financial issues.

77. Although the model of association will make use of good experiences of the former agricultural cooperative at commune or village levels or the present agricultural service cooperatives, the farmers propose that: (i) the association should be of the initial size of village as it is suitable with the management ability of the farmers who are still less experienced with this work and (ii) establishment of this model should only be after the irrigation system has been modernized as said in the subproject’s content⁹.

### 4.8. Community Consultation Concerning Mitigation Measures

78. To minimize the reverse impacts, the comprehensive measures include: (i) use the 5% unallocated land for compensation to those who do not want compensation in cash. (ii) Disseminate widely and adequately to the people and community of the project content and policy as well as the construction plan and water closing and opening schedules. (iii) Mobilize the community for contribution to the works and share the losses with affected households. (iv) Those who are responsible for the management and implementation of the subproject should be qualified and experienced and know the policies of the WB and the government well. This helps to avoid losses for the people due to wrong or insufficient implementation of these policies. (v) Compensation should be at the rate acceptable to the people and support should be provided to the affected households to help them rehabilitate. (vi) There must be representatives of the people to participate in the monitoring of the process of compensation, resettlement, and construction in consistent with the WB. (vii) Enhance the administration management capacity of the community to limit the decline of security and social disorder likely to be caused by the big gathering of workers for construction. (viii) Rehabilitation and upgrade of canal embankment should also be aimed at making it an access road. (ix) Rehabilitation of canal should be made within the existing line and minimize the re-shaping. (x) Construction should be carried out at the time when there are less production activities with appropriate construction method.

***Mitigation measures during construction include:***

79. (i) Contractors have to commit, with legal enforcement, to repair the roads and other infrastructure they use for construction activities and have measures to reduce dust from the transportation. (ii) Find a suitable place for construction materials. (iii) Find the best roads for transportation. (iv) Strengthen the management and monitoring of the process of canal

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⁹ Experience of this model at Cam Hoa commune, Cam Xuyen District in Ha Tinh province (under Ke Go subproject) shows that this model cannot work because of the backward system, leading to differences of water provided to upstream, midstream and downstream.
(v) Advice and inform about the construction schedule to households who are using the safe corridor temporarily so that they will have their own production and harvesting plan to avoid maximum impacts.

80. Farmers' found that the increase of price in local markets is not worrisome because this is the motivation to stimulate the production in the development of the community and it will create jobs for people. Although the closing of water is at the time when there is the least demand for water, it still affects the production and domestic life. Therefore, it is suggested that water should be opened for about 10 days during the closing time based on crop schedule, and the people should be advised to use water reasonably and store it for production.