

**F: Environmental Impact Assessment
for Drainage Project**

CHAPTER 5

MITIGATIVE MEASURES

The project includes two components: Improvement of An Kim Hai channel and construction of the proposed Phuong Lau lake. The proposed project area is not in the very city's center but in the densely populated area along the channel and around the proposed Phuong Lau lake. With the anticipated great amount of dredged sludge and earth materials during construction and rehabilitation phase, negative impacts to the environment and nuisances to the residents may be generated if mitigate measured and management programs are not applied in construction and operation phase.

5.1. GENERAL MITIGATION MEASURES

According to the implementation plan, project component will be carried out in phases which last for 5 years. Therefore, a long mitigation plan should be designed so that technical, environmental aspects will be ensured.

- ◆ Rehabilitation works should be announced to the public regionally in newspapers and radio and locally to the ward representatives who will inform the residents.
- ◆ Landscape the lake and channel surroundings to create an attractive environment and recreation area for the public (planting of trees, ornament trees...).
- ◆ Minimize dust, waste and public inconvenience by effective construction management and site supervision.
- ◆ Minimize construction noise.
- ◆ Anti - vibration mountings and noise insulation on equipment should be used when possible.
- ◆ Safety and health regulations during cleaning of sewers, dredging of channel and lakes and safe transport and disposal of sewage and dredged sludge should be strictly followed;
- ◆ Minimizing work safety problem by providing appropriate tools, machinery and protective clothing;
- ◆ Ensure that appropriate working methods are applied;

CHAPTER 6

RESETTLEMENT ACTION PLAN

As mentioned in the chapter 4, the greatest impact of the project in general and of this period in particular is population removal and resettlement.

Removal of about 1044 households and other structures will likely give rise to socio-economic and environmental problems: removal of production line, shirking of agricultural areas, losses of production assets and income. The removed people to the new resettlement will tackle with many difficulties due to a strange living environment where they can not make the best of themselves and the strong point, to resources completion, changes of community structures, tradition and customs, separation of close neibough and family groups, decrease of mutual help. Involuntary resettlement may create long-term difficulties, environmental damage and exhaustion unless suitable mitigation measures are carefully and basically designed.

There is a fact in Vietnam in general and in Hai Phong in particular that any project necessitating land acquisition and resettlement will face with delay in implementation. This is a disadvantage for every project and possibly for An Kim Hai drainage project. Therefore, the foremost mitigative measure is to design an Resettlement Action Plan (RAP).

6.1. OBJECTIVES AND PRINCIPLE OF THE RESETTLEMENT PLAN

The main objective of the RAP is to ensure punctual land acquisition for project implementation, to minimize possible adverse impacts of involuntary resettlement and to provide a framework for policies, entitlement and implementation of the project facilitating Project Affected People (PAP) efforts to improve their living standards, income earning capacity and production levels, or at least restore them to the pre-project level.

SUMMARY TABLE OF QUESTIONNAIRES AN KIM HAI DRAINAGE PROJECT - HAIPHONG

| Item | AnDuong to DuHang | | Duong to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | | | | | | | | | | | |
|---------------------------------------|---|---|-------------------------|--------|-------------------------|-------|-------------------------|-------|-------------------------|-------|--|-----|------------|-------|-----|----|----|--|---|--|-----|--|--|--|
| | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min | | | | | | | | | | |
| <i>Total number of questionnaires</i> | | | | | | | | | | | 31 | | 35 | | 21 | | 12 | | 1 | | 100 | | | |
| 1 | General | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1 | Gender of respondent | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1 | 1 | Male | 14 | 45.16 | 23 | 65.71 | 12 | 57.14 | 10 | 83.33 | 1 | 100 | 60 | 60 | | | | | | | | | | |
| | 2 | Female | 17 | 54.84 | 12 | 34.29 | 9 | 42.86 | 2 | 16.67 | 0 | 0 | 40 | 40 | | | | | | | | | | |
| 1.2 | Age of respondent | | AVR=49 | | AVR=51 | | AVR=50.57 | | AVR=44.75 | | 25 | | AVR=49.33 | | 90 | 19 | | | | | | | | |
| 1.3 | Education of respondent | | | | | | | | | | | | | | | | | | | | | | | |
| 1.3 | 1 | No school | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | | | | | | | | | |
| | 2 | Primary school | 14 | 0.00 | 15 | 42.86 | 8 | 38.10 | 4 | 33.33 | 0 | 0 | 41 | 41 | | | | | | | | | | |
| | 3 | Secondary school | 10 | 32.26 | 12 | 34.29 | 9 | 42.86 | 5 | 41.67 | 1 | 100 | 37 | 37 | | | | | | | | | | |
| | 4 | High school | 3 | 9.68 | 1 | 2.86 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 6 | 6 | | | | | | | | | | |
| | 5 | Vocational school | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | | | | | | | | | |
| | 6 | University | 2 | 6.45 | 5 | 14.29 | 1 | 4.76 | 3 | 25.00 | 0 | 0 | 11 | 11 | | | | | | | | | | |
| | 7 | Other | 0 | 0.00 | 3 | 8.57 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 4 | 4 | | | | | | | | | | |
| 1.4 | Occupation of respondent | | | | | | | | | | | | | | | | | | | | | | | |
| 1.4 | 1 | Laborer | 4 | 12.90 | 4 | 11.43 | 2 | 9.52 | 1 | 8.33 | 0 | 0 | 11 | 11 | | | | | | | | | | |
| | 2 | Worker | 1 | 3.23 | 3 | 8.57 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 4 | 4 | | | | | | | | | | |
| | 3 | Civil servant | 5 | 16.13 | 5 | 14.29 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 12 | 12 | | | | | | | | | | |
| | 4 | Shopkeeper | 5 | 16.13 | 0 | 0.00 | 2 | 9.52 | 2 | 16.67 | 0 | 0 | 9 | 9 | | | | | | | | | | |
| | 5 | Businessman | 2 | 6.45 | 2 | 5.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 4 | 4 | | | | | | | | | | |
| | 6 | Farmer | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 3 | 25.00 | 1 | 100 | 5 | 5 | | | | | | | | | | |
| | 7 | Fisherman | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | | | | | | | | | |
| | 8 | Housewife | 1 | 3.23 | 3 | 8.57 | 3 | 14.29 | 0 | 0.00 | 0 | 0 | 7 | 7 | | | | | | | | | | |
| | 9 | Retired | 13 | 41.94 | 16 | 45.71 | 10 | 47.62 | 4 | 33.33 | 0 | 0 | 43 | 43 | | | | | | | | | | |
| | 10 | Unemployed | 0 | 0.00 | 1 | 2.86 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 3 | 3 | | | | | | | | | | |
| | 11 | Other | 0 | 0.00 | 0 | 0.00 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 2 | 2 | | | | | | | | | | |
| 1.5 | Number of family members living in this house | | | | | | | | | | | | | | | | | | | | | | | |
| 1.5 | 1 | Adult (>18 years old) | 98 | 89.01 | 127 | 72.57 | 76 | 79.17 | 40 | 72.73 | 6 | 600 | 347 | 73.21 | 10 | 1 | | | | | | | | |
| | 2 | Children | 44 | 30.99 | 48 | 27.43 | 20 | 20.83 | 15 | 27.27 | 0 | 0 | 127 | 26.79 | 5 | 0 | | | | | | | | |
| 2 | Housing | | | | | | | | | | | | | | | | | | | | | | | |
| 2.1 | Size of land your family occupies (m ²) | | AVR=104.13 | | AVR=105.09 | | AVR=128.14 | | AVR=137.83 | | 600 | | AVR=125.03 | | 900 | 18 | | | | | | | | |
| 2.2 | The long-term land use entitlement for the land that this house is built on | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | 1 | A resident member of the family has certificate of occupation | 31 | 100.00 | 18 | 51.43 | 14 | 66.67 | 9 | 75.00 | 0 | 0 | 72 | 72 | | | | | | | | | | |
| | 2 | A non resident member of the family has the certificate of occupation | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 1 | 1 | | | | | | | | | | |
| | 3 | The land is rented from the person who is not the member of the household | 0 | 0.00 | 0 | 0.00 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 1 | 1 | | | | | | | | | | |
| | 4 | The land belongs to the State | 0 | 0.00 | 4 | 11.43 | 2 | 9.52 | 2 | 16.67 | 0 | 0 | 8 | 8 | | | | | | | | | | |

| Item | AnDuong to DuHang | | Du ang to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | | |
|------|--|----|-------------------------|----|-------------------------|----|-------------------------|----|-------------------------|---|--|----|-----------|------|------|
| | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min | |
| 5 | The land belongs to a Government department or enterprise | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| 6 | The land belongs to the Military | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| 7 | Other | 0 | 0.00 | 11 | 31.43 | 5 | 23.81 | 0 | 0.00 | 0 | 0 | 16 | 16 | | |
| 8 | Don't know | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 100 | 1 | 1 | | |
| 2.3 | Your household own agricultural or aquacultural area | | | | | | | | | | | | | | |
| 2.3 | 1 No | 25 | 86.65 | 30 | 85.71 | 19 | 90.48 | 9 | 75.00 | 0 | 0 | 83 | 83 | | |
| | 2 Agricultural land (ha) | 0 | 0.00 | 3 | 8.57 | 2 | 9.52 | | AVR=0.12 | 1 | 100 | 9 | 9 | 0.2 | 0.08 |
| | 3 Aquacultural area (ha) | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 4 Don't know | 6 | 19.35 | 2 | 5.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 8 | 8 | | |
| 2.4 | How far is your agricultural land or aquacultural area from your house | | | | | | | | | | | | | | |
| 2.4 | 1 Agricultural land (m) | 0 | 0.00 | 3 | 8.57 | 2 | 9.52 | | AVR=500 | | 100 | | AVR=543 | 1000 | 1 |
| | 2 Aquacultural area (m) | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| 2.5 | What product do you mainly cultivate | | | | | | | | | | | | | | |
| 2.5 | 1 Rice | 0 | 0.00 | 2 | 5.71 | 0 | 0.00 | 2 | 16.67 | 1 | 100 | 5 | 55.56 | | |
| | 2 Vegetables | 0 | 0.00 | 0 | 0.00 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 2 | 22.22 | | |
| | 3 Shrimp | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| | 4 Fish | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 11.11 | | |
| | 5 Other | 0 | 0.00 | 0 | 0.00 | 4 | 19.05 | 1 | 8.33 | 0 | 0 | 5 | 55.56 | | |
| 2.6 | The size of the house your family live (m ²) | | AVR=36.37 | | AVR=57.44 | | AVR=39.95 | | AVR=71.08 | | 180 | | AVR=49.96 | 200 | 17 |
| 2.7 | The characteristic of your house | | | | | | | | | | | | | | |
| 2.7 | 1 A house surround by a garden | 6 | 19.35 | 4 | 11.43 | 0 | 0.00 | 1 | 8.33 | 1 | 100 | 12 | 12 | | |
| | 2 Multi storied house with own bathroom, kitchen and toilet | 3 | 9.68 | 5 | 14.29 | 2 | 9.52 | 5 | 41.67 | 0 | 0 | 15 | 15 | | |
| | 3 Multi storied house with share bathroom, kitchen and toilet | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 4 Single storied house with own bathroom, kitchen and toilet | 18 | 58.06 | 17 | 48.57 | 16 | 76.19 | 6 | 50.00 | 0 | 0 | 57 | 57 | | |
| | 5 Single storied house with share bathroom, kitchen and toilet | 1 | 3.23 | 1 | 2.86 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 3 | 3 | | |
| | 6 Semi permanent house of mixed brick, tin, timber construction | 3 | 9.68 | 1 | 2.86 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 5 | 5 | | |
| | 7 Temporary house of tin cladding, wood, bamboo construction | 0 | 0.00 | 1 | 2.86 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 2 | 2 | | |
| | 8 Other | 0 | 0.00 | 6 | 17.14 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 6 | 6 | | |
| 2.8 | When was this house constructed ? (year) | | AVR=1990 | | AVR=1994 | | AVR=1993 | | AVR=1993 | 0 | 1995 | | AVR=1992 | 2000 | 1964 |
| 2.9 | How many stories are there in your house? | | | | | | | | | | | | | | |
| 2.9 | 1 One | 29 | 93.55 | 27 | 77.14 | 19 | 90.48 | 8 | 66.67 | 1 | 100 | 84 | 84 | | |
| | 2 Two | 2 | 6.45 | 7 | 20.00 | 2 | 9.52 | 4 | 33.33 | 0 | 0 | 15 | 15 | | |
| | 3 Three | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 4 More | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| 2.10 | Who own this house where you live | | | | | | | | | | | | | | |
| 2.10 | 1 A family member living in the household | 27 | 87.10 | 30 | 85.71 | 21 | 100.00 | 11 | 91.67 | 1 | 100 | 90 | 90 | | |
| | 2 A family member not living in the household | 3 | 9.68 | 3 | 8.57 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 7 | 7 | | |
| | 3 A non family member who may or may not live in the household | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 4 The State | 0 | 0.00 | 2 | 5.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 2 | 2 | | |

| Item | AnDuong to DuHang | | Duong to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | | |
|------|--|----|-------------------------|----|-------------------------|----|-------------------------|----|-------------------------|---|--|----|-----------|-----|---|
| | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min | |
| 5 | A government department or enterprise | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| 6 | Other | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| 7 | Don't know | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| 2.11 | How many year has your family been living in this house (years) | | AVR=10.39 | | AVR=15 | | AVR=9.95 | | AVR=7.25 | | 5 | | AVR=11.34 | 86 | 1 |
| 2.12 | Where did you live before you moved to this house | | | | | | | | | | | | | | |
| 2.12 | 1 Always lived in this house | 12 | 38.71 | 9 | 25.71 | 4 | 19.05 | 5 | 41.67 | 1 | 100 | 31 | 31 | | |
| | 2 In another house in the same phuong | 3 | 9.68 | 7 | 20.00 | 6 | 28.57 | 2 | 16.67 | 0 | 0 | 18 | 18 | | |
| | 3 In another house in the same district | 6 | 19.35 | 6 | 17.14 | 3 | 14.29 | 2 | 16.67 | 0 | 0 | 17 | 17 | | |
| | 4 In another house in the same city | 8 | 25.81 | 10 | 28.57 | 7 | 33.33 | 3 | 25.00 | 0 | 0 | 28 | 28 | | |
| | 5 In rural areas of the same province | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 6 Other province | 1 | 3.23 | 3 | 8.57 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 5 | 5 | | |
| 2.13 | Kind of commercial or other business activities in your household | | | | | | | | | | | | | | |
| 2.13 | 1 Cafe, restaurant | 3 | 9.68 | 3 | 8.57 | 3 | 14.29 | 3 | 25.00 | 0 | 0 | 12 | 12 | | |
| | 2 Shop | 7 | 22.58 | 1 | 2.86 | 4 | 19.05 | 4 | 33.33 | 0 | 0 | 16 | 16 | | |
| | 3 Barber shop | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 4 Manufacturing (wood, metal) | 0 | 0.00 | 2 | 5.71 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 4 | 4 | | |
| | 5 Food production | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 6 Storage | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 7 Office | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 8 Breeding animals for sell | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 9 Bike washing | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 10 Bike/ car repair | 0 | 0.00 | 2 | 5.71 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 3 | 3 | | |
| | 11 Rooms rented out for business | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 12 Other | 0 | 0.00 | 5 | 14.29 | 5 | 23.81 | 2 | 16.67 | 0 | 0 | 12 | 12 | | |
| | 13 No business activities | 18 | 58.06 | 22 | 62.85 | 7 | 33.33 | 2 | 16.67 | 1 | 100 | 50 | 50 | | |
| 3 | <i>Water supply, sanitation and solid waste</i> | | | | | | | | | | | | | | |
| 3.10 | What is the main water source for this household | | | | | | | | | | | | | | |
| 3.10 | 1 Piped supply from Water Supply Company through own house connectio | 31 | 100.00 | 31 | 88.57 | 21 | 100.00 | 7 | 58.33 | 0 | 0 | 90 | 90 | | |
| | 2 Piped supply from water supply company to public tank | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1 | | |
| | 3 Own shallow well | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 1 | 1 | | |
| | 4 Shared shallow well | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 5 Own deep well (UNICEF well) | 0 | 0.00 | 3 | 8.57 | 3 | 14.29 | 3 | 25.00 | 1 | 100 | 10 | 10 | | |
| | 6 Shared deep well (UNICEF well) | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0 | | |
| | 7 Other | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 1 | 1 | | |
| 3.2 | Is your house connected to communal sewer network? | | | | | | | | | | | | | | |
| 3.2 | 1 Yes | 4 | 12.90 | 7 | 20.00 | 7 | 33.33 | 0 | 0.00 | 0 | 0 | 18 | 18 | | |
| | 2 No | 27 | 87.10 | 26 | 74.29 | 14 | 66.67 | 10 | 83.33 | 0 | 0 | 77 | 77 | | |
| | 3 Don't know | 0 | 0.00 | 2 | 5.71 | 0 | 0.00 | 2 | 16.67 | 1 | 100 | 5 | 5 | | |
| 3.3 | If not, where is your wastewater discharged? | | | | | | | | | | | | | | |

| Item | AnDuong to DuHang | | Du ang to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | |
|--------|--|-------|-------------------------|-------|-------------------------|-------|-------------------------|-------|-------------------------|-----|--|-------|-----|-----|
| | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min |
| 5 | 10 | 66.67 | 17 | 68.00 | 10 | 66.67 | 7 | 77.78 | 0 | 0 | 44 | 67.69 | | |
| 6 | 1 | 6.67 | 0 | 0.00 | 1 | 6.67 | 1 | 11.11 | 1 | 100 | 4 | 6.15 | | |
| 3.9 | Does your household suffer from chronic flooding? | | | | | | | | | | | | | |
| 3.9 1 | 0 | 0.00 | 3 | 8.57 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 4 | 4.00 | | |
| 2 | 4 | 12.90 | 5 | 14.29 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 11 | 11.00 | | |
| 3 | 1 | 3.23 | 2 | 5.71 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 5 | 5.00 | | |
| 4 | 25 | 80.65 | 22 | 62.86 | 13 | 61.90 | 11 | 91.67 | 1 | 100 | 72 | 72.00 | | |
| 5 | 1 | 3.23 | 3 | 8.57 | 4 | 19.05 | 0 | 0.00 | 0 | 0 | 8 | 8.00 | | |
| 3.10 | How is the solid waste from your house collected? | | | | | | | | | | | | | |
| 3.10 1 | 14 | 45.16 | 21 | 60.00 | 9 | 42.86 | 5 | 41.67 | 0 | 0 | 49 | 49.00 | | |
| 2 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 5 | 41.67 | 0 | 0 | 5 | 5.00 | | |
| 3 | 14 | 45.16 | 2 | 5.71 | 0 | 0.00 | 2 | 16.67 | 1 | 100 | 19 | 19.00 | | |
| 4 | 3 | 9.38 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 3 | 3.00 | | |
| 5 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| 6 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| 7 | 0 | 0.00 | 12 | 34.29 | 12 | 57.14 | 0 | 0.00 | 0 | 0 | 24 | 24.00 | | |
| 8 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| 3.11 | Which of the following items do you separate from your solid waste home? | | | | | | | | | | | | | |
| 3.11 1 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| 2 | 13 | 41.94 | 9 | 25.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 22 | 22.00 | | |
| 3 | 16 | 51.61 | 9 | 25.71 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 26 | 26.00 | | |
| 4 | 13 | 41.94 | 9 | 25.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 22 | 22.00 | | |
| 5 | 22 | 70.97 | 8 | 22.86 | 1 | 4.76 | 9 | 75.00 | 1 | 100 | 41 | 41.00 | | |
| 6 | 27 | 87.10 | 32 | 91.43 | 20 | 95.24 | 3 | 25.00 | 0 | 0 | 82 | 82.00 | | |
| 7 | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1.00 | | |
| 3.12 | What kind of garbage bin do you have at home? | | | | | | | | | | | | | |
| 3.12 1 | 3 | 9.68 | 2 | 5.71 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 7 | 7.00 | | |
| 2 | 3 | 9.68 | 3 | 8.57 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 8 | 8.00 | | |
| 3 | 9 | 29.03 | 7 | 20.00 | 1 | 4.76 | 2 | 16.67 | 1 | 100 | 20 | 20.00 | | |
| 4 | 1 | 3.23 | 1 | 2.86 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 3 | 3.00 | | |
| 5 | 0 | 0.00 | 1 | 2.86 | 4 | 19.05 | 0 | 0.00 | 0 | 0 | 5 | 5.00 | | |
| 6 | 2 | 6.45 | 1 | 2.86 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 4 | 4.00 | | |
| 7 | 14 | 45.16 | 19 | 54.29 | 13 | 61.90 | 7 | 58.33 | 0 | 0 | 53 | 53.00 | | |
| 8 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| 4 | <i>Environmental awareness</i> | | | | | | | | | | | | | |
| 4.1 | What do you think about the general cleanness of your living area? | | | | | | | | | | | | | |
| 4.1 1 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| 2 | 4 | 12.90 | 2 | 5.71 | 2 | 9.52 | 0 | 0.00 | 1 | 100 | 9 | 9.00 | | |
| 3 | 1 | 3.23 | 5 | 14.29 | 9 | 42.86 | 4 | 33.33 | 0 | 0 | 19 | 19.00 | | |
| 4 | 26 | 83.87 | 27 | 77.14 | 10 | 47.62 | 8 | 66.67 | 0 | 0 | 71 | 71.00 | | |
| 5 | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1.00 | | |

| Item | AnDuong to DuHang | | Duong to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | |
|------|-------------------------|---|-------------------------|---|-------------------------|---|-------------------------|---|-------------------------|---|--|---|-----|-----|
| | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min |
| 4.2 | | | | | | | | | | | | | | |
| 4.2 | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | |
| | 11 | | | | | | | | | | | | | |
| | 12 | | | | | | | | | | | | | |
| | 13 | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | |
| | 15 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| 4.3 | | | | | | | | | | | | | | |
| 4.3 | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | |
| 5.1 | | | | | | | | | | | | | | |
| 5.1 | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 5 | | | | | | | | | | | | | |
| | 6 | | | | | | | | | | | | | |
| | 7 | | | | | | | | | | | | | |
| | 8 | | | | | | | | | | | | | |
| | 9 | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | |
| | 11 | | | | | | | | | | | | | |
| 5.2 | | | | | | | | | | | | | | |
| 5.2 | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |

| Item | AnDuong to DuHang | | Duang to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | | | |
|------|--|---|-------------------------|------------|-------------------------|-------------|-------------------------|-------------|-------------------------|-------------|--|--------|-------|-------------|---------|--------|
| | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min | | |
| 3 | Floodwater | 3 | 9.68 | 3 | 8.57 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 7 | 7.00 | | | |
| 4 | Polluted food | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | | |
| 5 | Polluted drinking water | 1 | 3.23 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 2 | 2.00 | | | |
| 6 | Dusty air | 20 | 64.52 | 5 | 14.29 | 3 | 14.29 | 2 | 16.67 | 0 | 0 | 30 | 30.00 | | | |
| 7 | Other | 3 | 9.68 | 7 | 20.00 | 5 | 23.81 | 3 | 25.00 | 0 | 0 | 18 | 18.00 | | | |
| 8 | Don't know | 3 | 9.68 | 10 | 28.57 | 10 | 47.62 | 1 | 8.33 | 1 | 100 | 25 | 25.00 | | | |
| 6 | Household income | | | | | | | | | | | | | | | |
| 6.1 | Which the following items does your household own? | | | | | | | | | | | | | | | |
| 6.1 | 1 | Television | 31 | 100.00 | 33 | 94.29 | 19 | 90.48 | 12 | 100.00 | 1 | 100 | 96 | 96.00 | | |
| | 2 | Video equipment | 29 | 93.55 | 26 | 74.29 | 17 | 80.95 | 11 | 91.67 | 1 | 100 | 84 | 84.00 | | |
| | 3 | CD player | 8 | 25.81 | 9 | 25.71 | 6 | 28.57 | 6 | 50.00 | 0 | 0 | 29 | 29.00 | | |
| | 4 | Fan | 29 | 93.55 | 33 | 94.29 | 20 | 95.24 | 9 | 75.00 | 0 | 0 | 91 | 91.00 | | |
| | 5 | Air conditioner | 0 | 0.00 | 2 | 5.71 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 3 | 3.00 | | |
| | 6 | Refrigerator | 3 | 9.68 | 6 | 17.14 | 8 | 38.10 | 1 | 8.33 | 0 | 0 | 18 | 18.00 | | |
| | 7 | Electric cooker | 0 | 0.00 | 1 | 2.86 | 3 | 14.29 | 3 | 25.00 | 0 | 0 | 7 | 7.00 | | |
| | 8 | Washing machine | 3 | 9.68 | 4 | 11.43 | 3 | 14.29 | 0 | 0.00 | 0 | 0 | 10 | 10.00 | | |
| | 9 | Telephone | 10 | 32.26 | 10 | 28.57 | 7 | 33.33 | 4 | 33.33 | 0 | 0 | 31 | 31.00 | | |
| | 10 | Mobile telephone | 0 | 0.00 | 3 | 8.57 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 4 | 4.00 | | |
| | 11 | computer | 1 | 3.23 | 2 | 5.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 3 | 3.00 | | |
| | 12 | Modern beds | 0 | 0.00 | 1 | 2.86 | 1 | 4.76 | 1 | 8.33 | 0 | 0 | 3 | 3.00 | | |
| | 13 | Bicycle | 31 | 100.00 | 33 | 94.29 | 20 | 95.24 | 11 | 91.67 | 1 | 100 | 96 | 96.00 | | |
| | 14 | Motor bike | 23 | 74.19 | 10 | 28.57 | 10 | 47.62 | 6 | 50.00 | 0 | 0 | 49 | 49.00 | | |
| 6.2 | The main sources of income for your household | | | | | | | | | | | | | | | |
| 6.2 | 1 | Income from own business | 15 | 48.39 | 13 | 37.14 | 14 | 66.67 | 6 | 50.00 | 0 | 0 | 48 | 48.00 | | |
| | 2 | Income from agriculture or fishing | 0 | 0.00 | 0 | 0.00 | 1 | 4.76 | 3 | 25.00 | 1 | 100 | 5 | 5.00 | | |
| | 3 | Income as a government official | 7 | 22.58 | 8 | 22.86 | 2 | 9.52 | 1 | 8.33 | 0 | 0 | 18 | 18.00 | | |
| | 4 | Income as an employee in a state enterprise | 2 | 6.45 | 4 | 11.43 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 7 | 7.00 | | |
| | 5 | Income as an employee in a private enterprise | 0 | 0.00 | 2 | 5.71 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 3 | 3.00 | | |
| | 6 | Income from pension | 9 | 29.03 | 14 | 40.00 | 9 | 42.86 | 4 | 33.33 | 0 | 0 | 36 | 36.00 | | |
| | 7 | Income from relatives | 1 | 3.23 | 6 | 17.14 | 3 | 14.29 | 1 | 8.33 | 0 | 0 | 11 | 11.00 | | |
| | 8 | Other sources | 0 | 0.00 | 8 | 22.86 | 7 | 33.33 | 1 | 8.33 | 0 | 0 | 16 | 16.00 | | |
| 6.3 | Total monthly income of your family (VND) | | 31 | AVR=923226 | 35 | AVR=1077941 | 21 | AVR=1195238 | 12 | AVR=1241667 | | 700000 | | AVR=1070404 | 5000000 | 200000 |
| 7 | Household expenditure | | | | | | | | | | | | | | | |
| 7.1 | Total monthly expenditure of your family (VND) | | 28 | 983928 | 33 | 1065625 | 21 | 1015238 | 12 | 1141667 | 1 | 100 | | 1035851 | 4000000 | 120000 |
| 7.2 | Spending on the followings per month? (VND) | | | | | | | | | | | | | | | |
| 7.2 | 1 | Food | 30 | 523000 | 28 | 294642 | 21 | 642857 | 2 | 900000 | 0 | 0 | | 588148 | 1500000 | 60000 |
| | 2 | Education | 23 | 174565 | 27 | 173629 | 17 | 151176 | 1 | 400000 | 0 | 0 | | 171661 | 1000000 | 18000 |
| | 3 | health | 18 | 24666 | 9 | 95666 | 10 | 25000 | 0 | 0.00 | 0 | 0 | | 42027 | 350000 | 2000 |
| | 4 | Clothing and footwear | 9 | 26444 | 1 | 12000 | 0 | | 0 | 0.00 | 0 | 0 | | 25000 | 50000 | 8000 |

| Item | | | AnDuong to DuHang | | Duang to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | |
|------|----|---|-------------------------|--------|-------------------------|--------|-------------------------|--------|-------------------------|--------|-------------------------|-----|--|--------|--------|-------|
| | | | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min |
| | 5 | Housing | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | | 0 | | |
| | 6 | Transport and communication | 1 | 5000 | 0 | | 0 | | 0 | 0.00 | 0 | 0 | | 5000 | 5000 | 5000 |
| | 7 | Public utilities | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | | 0 | | |
| | 8 | Leisure | 3 | 50000 | 1 | 100000 | 0 | | 0 | 0.00 | 0 | 0 | | 62500 | 100000 | 40000 |
| | 9 | Others | 19 | 135263 | 9 | 283333 | 13 | 205384 | 2 | 98500 | 0 | 0 | | 185774 | 600000 | 30000 |
| | 10 | Don't know | 0 | 0.00 | 1 | 0.00 | 0 | 0.00 | 10 | 0.00 | 1 | 100 | | 0 | | |
| 7.3 | | Spending on public utilities per month | | | | | | | | | | | | | | |
| 7.3 | 1 | Water | 31 | 32967 | 33 | 38939 | 21 | 26380 | 7 | 47142 | 0 | 0 | | 34684 | 100000 | 10000 |
| | 2 | Electricity | 31 | 67258 | 35 | 71314 | 21 | 51428 | 12 | 75833 | 1 | 100 | | 66310 | 520000 | 10000 |
| | 3 | Telephone | 11 | 140000 | 15 | 115866 | 8 | 106750 | 5 | 114000 | 0 | 0 | | 120564 | 300000 | 28000 |
| | 4 | Gas | 4 | 90000 | 8 | 74375 | 9 | 35888 | 4 | 65000 | 0 | 0 | | 61520 | 100000 | 5000 |
| | 5 | Other | 7 | 35000 | 17 | 22588 | 7 | 7571 | 1 | 3000 | 0 | 0 | | 21406 | 170000 | 2000 |
| | 6 | Don't know | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | | 0 | | |
| 7.4 | | Is your household saving money for some big purchase | | | | | | | | | | | | | | |
| 7.4 | 1 | Yes | 3 | 9.68 | 2 | 5.71 | 5 | 23.81 | 1 | 8.33 | 0 | 0 | 11 | 11.00 | | |
| | 2 | No | 26 | 83.87 | 30 | 65.71 | 16 | 76.19 | 11 | 91.67 | 1 | 100 | 84 | 84.00 | | |
| | 3 | Don't know | 2 | 6.45 | 3 | 8.57 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 5 | 5.00 | | |
| 7.5 | | Does anybody in your household have a bank account? | | | | | | | | | | | | | | |
| 7.5 | 1 | Yes | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1.00 | | |
| | 2 | No | 26 | 90.32 | 31 | 68.57 | 20 | 95.24 | 12 | 100.00 | 1 | 100 | 92 | 92.00 | | |
| | 3 | Don't know | 3 | 9.68 | 3 | 8.57 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 7 | 7.00 | | |
| 8 | | <i>Preference for sanitation services and willingness to pay</i> | | | | | | | | | | | | | | |
| 8.1 | | Pay to reduce flooding in your area | | | | | | | | | | | | | | |
| 8.1 | 1 |VND | 7 | 22.58 | 2 | 5.71 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 10 | 10.00 | 10000 | 4000 |
| | 2 | Not willing to pay | 0 | 0.00 | 9 | 25.71 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 11 | 11.00 | | |
| | 3 | Don't know | 24 | 77.42 | 24 | 68.57 | 18 | 85.71 | 12 | 100.00 | 1 | 100 | 79 | 79.00 | | |
| 8.2 | | Connecting to sewer system, if the wastewater is treated in wastewater treatment plant? | | | | | | | | | | | | | | |
| 8.2 | 1 | Yes | 26 | 83.87 | 16 | 45.71 | 15 | 71.43 | 9 | 75.00 | 1 | 100 | 67 | 67.00 | | |
| | 2 | No | 0 | 0.00 | 3 | 8.57 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 4 | 4.00 | | |
| | 3 | Don't know | 6 | 19.35 | 15 | 42.86 | 6 | 28.57 | 2 | 16.67 | 0 | 0 | 29 | 29.00 | | |
| 8.3 | | Pay for wastewater fee per month | | | | | | | | | | | | | | |
| 8.3 | 1 |VND | 0 | 0.00 | 2 | 5.71 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 4 | 4.00 | 10000 | 4000 |
| | 2 | Not willing to pay | 0 | 0.00 | 7 | 20.00 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 8 | 8.00 | | |
| | 3 | Don't know | 31 | 100.00 | 26 | 74.29 | 18 | 85.71 | 12 | 100.00 | 1 | 100 | 88 | 88.00 | | |
| 8.4 | | Pay for sewer house connection | | | | | | | | | | | | | | |
| 8.4 | 1 |VND | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1.00 | 3000 | 3000 |
| | 2 | Not willing to pay | 0 | 0.00 | 6 | 17.14 | 1 | 4.76 | 0 | 0.00 | 0 | 0 | 7 | 7.00 | | |
| | 3 | Don't know | 31 | 100.00 | 28 | 80.00 | 20 | 95.24 | 12 | 100.00 | 1 | 100 | 92 | 92.00 | | |
| 8.5 | | Following household solid waste disposal method | | | | | | | | | | | | | | |

| Item | | | AnDuong to DuHang | | Duang to La hTray | | LachTray to KieuSon | | KieuSon to HaDoan | | HaDoan to NamDong | | Questionnaires of negative affected people | | | |
|------|---|---|-------------------------|--------|-------------------------|-------|-------------------------|--------|-------------------------|--------|-------------------------|-----|--|-------|-------|------|
| | | | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Number of questionnaire | % | Max | Min |
| 8.5 | 1 | Collection and disposal by URENCO | 30 | 96.77 | 26 | 74.29 | 17 | 80.95 | 12 | 100.00 | 1 | 100 | 86 | 86.00 | | |
| | 2 | Collection and disposal by private solid waste company | 0 | 0.00 | 0 | 0.00 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 2 | 2.00 | | |
| | 3 | Household themselves organize collection and disposal | 0 | 0.00 | 2 | 5.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 2 | 2.00 | | |
| | 4 | Other | 0 | 0.00 | 5 | 14.29 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 5 | 5.00 | | |
| | 5 | No opinion | 1 | 3.23 | 2 | 5.71 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 5 | 5.00 | | |
| 8.6 | | Would you be ready to participate in the cleaning of your living area | | | | | | | | | | | | | | |
| 8.6 | 1 | Yes | 31 | 100.00 | 32 | 91.43 | 21 | 100.00 | 12 | 100.00 | 1 | 100 | 97 | 97.00 | | |
| | 2 | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | | |
| | 3 | Don't know | 0 | 0.00 | 3 | 8.57 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 3 | 3.00 | | |
| 8.7 | | Sharing 120 - 240 liters waste container in your neighbourhood | | | | | | | | | | | | | | |
| 8.7 | 1 | Yes | 27 | 87.10 | 12 | 34.29 | 15 | 71.43 | 11 | 91.67 | 1 | 100 | 66 | 66.00 | | |
| | 2 | No | 3 | 9.68 | 10 | 28.57 | 2 | 9.52 | 0 | 0.00 | 0 | 0 | 15 | 15.00 | | |
| | 3 | No opinion | 1 | 3.23 | 13 | 37.14 | 4 | 19.05 | 1 | 8.33 | 0 | 0 | 19 | 19.00 | | |
| 8.8 | | Pay for solid waste fee per month | | | | | | | | | | | | | | |
| 8.8 | 1 |VND | 14 | 45.16 | 16 | 45.71 | 11 | 52.38 | 3 | 25.00 | 0 | 0 | 44 | 44.00 | 40000 | 2000 |
| | 2 | Not willing to pay | 0 | 0.00 | 1 | 2.86 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 1 | 1.00 | | |
| | 3 | Don't know | 17 | 54.84 | 18 | 51.43 | 10 | 47.62 | 9 | 75.00 | 1 | 100 | 55 | 55.00 | | |
| 9 | | Assessment of interviewer | | | | | | | | | | | | | | |
| | 1 | Very poor | 1 | 3.23 | 0 | 0.00 | 0 | 0.00 | 1 | 8.33 | 0 | 0 | 2 | 2.00 | | |
| | 2 | Poor | 6 | 19.35 | 11 | 31.43 | 5 | 23.81 | 0 | 0.00 | 1 | 100 | 23 | 23.00 | | |
| | 3 | Moderate | 21 | 67.74 | 18 | 51.43 | 14 | 66.67 | 3 | 25.00 | 0 | 0 | 56 | 56.00 | | |
| | 4 | Wealthy | 2 | 6.45 | 4 | 11.43 | 2 | 9.52 | 8 | 66.67 | 0 | 0 | 16 | 16.00 | | |
| | 5 | Rich | 1 | 3.23 | 2 | 5.71 | 0 | 0.00 | 0 | 0.00 | 0 | 0 | 3 | 3.00 | | |

**SUMMARY TABLE OF SOCIO - ECONOMIC SURVEY OF 50 BENEFICIARIES
FROM THE PROJECT**

| Number of questionnaires | | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|-----|----|---|-------|-------|---------|--------------|--------------|
| Item | | | | | | | | |
| 1 | | | General | | | | | |
| 1 | 1.1 | | Gender of respondent | | | | | |
| 1 | 1.1 | 1 | Male | 18 | 36 | | | |
| | | 2 | Female | 32 | 64 | | | |
| 1 | 1.2 | | Age of respondent | | | 46.1 | 75 | 17 |
| 1 | 1.3 | | Education of respondent | | | | | |
| 1 | 1.3 | 1 | No school | 2 | 4 | | | |
| | | 2 | Primary school | 14 | 28 | | | |
| | | 3 | Secondary school | 15 | 30 | | | |
| | | 4 | High school | 7 | 14 | | | |
| | | 5 | Vocational school | 1 | 2 | | | |
| | | 6 | University | 7 | 14 | | | |
| | | 7 | Other | 4 | 8 | | | |
| 1 | 1.4 | | Occupation of respondent | | | | | |
| | 1.4 | 1 | Laborer | 0 | 0 | | | |
| | | 2 | Worker | 3 | 6 | | | |
| | | 3 | Civil servant | 7 | 14 | | | |
| | | 4 | Shopkeeper | 4 | 8 | | | |
| | | 5 | Businessman | 1 | 2 | | | |
| | | 6 | Farmer | 0 | 0 | | | |
| | | 7 | Fisherman | 0 | 0 | | | |
| | | 8 | Housewife | 2 | 4 | | | |
| | | 9 | Retired | 23 | 46 | | | |
| | | 10 | Unemployed | 4 | 8 | | | |
| | | 11 | Other | 6 | 12 | | | |
| 1 | 1.5 | | Number of family members living in this house | | | | | |
| | 1.5 | 1 | Adult (>18 years old) | 161 | 70.61 | 3.22 | 8 | 1 |
| | | 2 | Children | 67 | 29.39 | 1.43 | 4 | 0 |
| 2 | | | Housing | | | | | |
| 2 | 2.1 | | Size of land your family occupies (m ²) | | | 44.83 | 300 | 5 |
| 2 | 2.2 | | The long-term land use entitlement for the land that this house is built on | | | | | |
| 2 | 2.2 | 1 | A resident member of the family has certificate of occupation | 13 | 26 | | | |
| | | 2 | A non resident member of the family has the certificate of occupation | 0 | 0 | | | |
| | | 3 | The land is rented from the person who is not the member of the household | 1 | 2 | | | |
| | | 4 | The land belongs to the State | 33 | 66 | | | |
| | | 5 | The land belongs to a Government department or enterprise | 3 | 6 | | | |
| | | 6 | The land belongs to the Military | 0 | 0 | | | |
| | | 7 | Other | 0 | 0 | | | |
| | | 8 | Don't know | 0 | 0 | | | |
| 2 | 2.3 | | Your household own agricultural or aquacultural area | | | | | |
| 2 | 2.3 | 1 | No | 50 | 100 | | | |

| Number of questionnaires | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|------|--|-------|----|---------|-----------|-----------|
| Item | | | | | | | |
| | 2 | Agricultural land (ha) | 0 | 0 | | | |
| | 3 | Aquacultural area (ha) | 0 | 0 | | | |
| | 4 | Don't know | 0 | 0 | | | |
| 2 | 2.4 | How far is your agricultural land or aquacultural area from your house | | | | | |
| 2 | 2.4 | 1 Agricultural land (m) | 0 | 0 | | | |
| | 2 | Aquacultural area (m) | 0 | 0 | | | |
| 2 | 2.5 | What product do you mainly cultivate | | | | | |
| 2 | 2.5 | 1 Rice | 0 | 0 | | | |
| | 2 | Vegetables | 0 | 0 | | | |
| | 3 | Shrimp | 0 | 0 | | | |
| | 4 | Fish | 0 | 0 | | | |
| | 5 | Other | 0 | 0 | | | |
| 2 | 2.6 | The size of the house your family live (m ²) | | | 40.59 | 160 | 5 |
| 2 | 2.7 | The characteristic of your house | | | | | |
| 2 | 2.7 | 1 A house surround by a garden | 1 | 2 | | | |
| | 2 | Multi storied house with own bathroom, kitchen and toilet | 10 | 20 | | | |
| | 3 | Multi storied house with share bathroom, kitchen and toilet | 9 | 18 | | | |
| | 4 | Single storied house with own bathroom, kitchen and toilet | 26 | 52 | | | |
| | 5 | Single storied house with share bathroom, kitchen and toilet | 4 | 8 | | | |
| | 6 | Semi permanent house of mixed brick, tin, timber construction | 0 | 0 | | | |
| | 7 | Temporary house of tin cladding, wood, bamboo construction | 0 | 0 | | | |
| | 8 | Other | 0 | 0 | | | |
| 2 | 2.8 | When was this house constructed ? (year) | | | | 1998 | 1900 |
| 2 | 2.9 | How many stories are there in your house? | | | | | |
| 2 | 2.9 | 1 One | 34 | 68 | | | |
| | 2 | Two | 14 | 28 | | | |
| | 3 | Three | 2 | 4 | | | |
| | 4 | More | 0 | 0 | | | |
| 2 | 2.10 | Who own this house where you live | | | | | |
| 2 | 2.10 | 1 A family member living in the household | 39 | 78 | | | |
| | 2 | A family member not living in the household | 5 | 10 | | | |
| | 3 | A non family member who may or may not live in the household | 0 | 0 | | | |
| | 4 | The State | 3 | 6 | | | |
| | 5 | A government department or enterprise | 1 | 2 | | | |
| | 6 | Other | 0 | 0 | | | |
| | 7 | Don't know | 2 | 4 | | | |
| 2 | 2.11 | How many year has your family been living in this house | | | 20.63 | 60 | 1 |
| 2 | 2.12 | Where did you live before you moved to this house | | | | | |
| 2 | 2.12 | 1 Always lived in this house | 10 | 20 | | | |
| | 2 | In another house in the same phuong | 9 | 18 | | | |
| | 3 | In another house in the same district | 11 | 22 | | | |
| | 4 | In another house in the same city | 13 | 26 | | | |
| | 5 | In rural areas of the same province | 4 | 8 | | | |
| | 6 | Other province | 3 | 6 | | | |

| Number of questionnaires | | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|------|----|---|-------|-------|---------|--------------|--------------|
| Item | | | | | | | | |
| 2 | 2.13 | | Kind of commercial or other business activities in your household | | | | | |
| 2 | 2.13 | 1 | Cafe, restaurant | 5 | 10 | | | |
| | | 2 | Shop | 13 | 26 | | | |
| | | 3 | Barber shop | 0 | 0 | | | |
| | | 4 | Manufacturing (wood, metal) | 0 | 0 | | | |
| | | 5 | Food production | 1 | 2 | | | |
| | | 6 | Storage | 0 | 0 | | | |
| | | 7 | Office | 2 | 4 | | | |
| | | 8 | Breeding animals for sell | 0 | 0 | | | |
| | | 9 | Bike washing | 0 | 0 | | | |
| | | 10 | Bike/ car repair | 0 | 0 | | | |
| | | 11 | Rooms rented out for business | 2 | 4 | | | |
| | | 12 | Other | 4 | 8 | | | |
| | | 13 | No business activities | 23 | 46 | | | |
| 3 | | | Water supply, sanitation and solid waste | | | | | |
| 3 | 3.1 | | What is the main water source for this household | | | | | |
| 3 | 3.1 | 1 | Piped supply from Water Supply Company through own house connection | 47 | 94 | | | |
| | | 2 | Piped supply from water supply company to public tank | 3 | 6 | | | |
| | | 3 | Own shallow well | 0 | 0 | | | |
| | | 4 | Shared shallow well | 0 | 0 | | | |
| | | 5 | Own deep well (UNICEF well) | 0 | 0 | | | |
| | | 6 | Shared deep well (UNICEF well) | 0 | 0 | | | |
| | | 7 | Other | 0 | 0 | | | |
| 3 | 3.2 | | Is your house connected to communal sewer network? | | | | | |
| 3 | 3.2 | 1 | Yes | 47 | 94 | | | |
| | | 2 | No | 2 | 4 | | | |
| | | 3 | Don't know | 1 | 2 | | | |
| 3 | 3.3 | | If not, where is your wastewater discharged? | | | | | |
| 3 | 3.3 | 1 | To drain | 0 | 0 | | | |
| | | 2 | To channel or pond | 2 | 66.67 | | | |
| | | 3 | To ground | 0 | 0 | | | |
| | | 4 | Don't know | 1 | 33.33 | | | |
| 3 | 3.4 | | Is there a toilet in this house? | | | | | |
| 3 | 3.4 | 1 | There is a toilet in this house | 34 | 68 | | | |
| | | 2 | We share a toilet with other household | 8 | 16 | | | |
| | | 3 | We are using neighbour's toilet | 0 | 0 | | | |
| | | 4 | We are using public toilet | 8 | 16 | | | |
| | | 5 | No toilet | 0 | 0 | | | |
| 3 | 3.5 | | Kind of toilet in your house | | | | | |
| 3 | 3.5 | 1 | Pour flush toilet | 21 | 42 | | | |
| | | 2 | Western style flush toilet | 26 | 52 | | | |
| | | 3 | Double vault composting toilet above ground | 2 | 4 | | | |
| | | 4 | Double vault composting toilet below ground | 1 | 2 | | | |
| | | 5 | Pit latrine - above ground | 0 | 0 | | | |

| Number of questionnaires | | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|------|----|--|-------|-------|---------|-----------|-----------|
| Item | | | | | | | | |
| | | 6 | Pit latrine -below ground | 0 | 0 | | | |
| | | 7 | Bucket latrine | 0 | 0 | | | |
| | | 8 | Open latrine or traditional methods | 0 | 0 | | | |
| | | 9 | Over hung latrine | 0 | 0 | | | |
| | | 10 | Other | 0 | 0 | | | |
| 3 | 3.6 | | Where does water from the pour flush toilet go? | | | | | |
| 3 | 3.6 | 1 | Septic tank | 43 | 91.49 | | | |
| | | 2 | Sewer | 4 | 8.51 | | | |
| | | 3 | Storm water drain | 0 | 0.00 | | | |
| | | 4 | Directly into ground | 0 | 0.00 | | | |
| | | 5 | Directly into river/ lake | 0 | 0.00 | | | |
| | | 6 | Don't know | 0 | 0.00 | | | |
| 3 | 3.7 | | Where does water from the septic tank go? | | | | | |
| 3 | 3.7 | 1 | Sewer | 39 | 90.70 | | | |
| | | 2 | Storm water drain | 0 | 0.00 | | | |
| | | 3 | Directly into ground | 0 | 0.00 | | | |
| | | 4 | Directly into river/ lake | 3 | 6.98 | | | |
| | | 5 | Don't know | 1 | 2.33 | | | |
| 3 | 3.8 | | How often is the septic tank emptied? | | | | | |
| 3 | 3.8 | 1 | Once per year | 2 | 4.65 | | | |
| | | 2 | Every second year | 0 | 0.00 | | | |
| | | 3 | In 5 years interval | 3 | 6.98 | | | |
| | | 4 | When needed | 11 | 25.56 | | | |
| | | 5 | Has not been emptied | 23 | 53.49 | | | |
| | | 6 | Don't know | 4 | 9.30 | | | |
| 3 | 3.9 | | Does your household suffer from chronic flooding? | | | | | |
| 3 | 3.9 | 1 | Yes frequently | 2 | 4 | | | |
| | | 2 | Yes, a few time per year | 2 | 4 | | | |
| | | 3 | Yes, a few time in 5 years | 10 | 20 | | | |
| | | 4 | No | 33 | 66 | | | |
| | | 5 | Don't know | 3 | 6 | | | |
| 3 | 3.10 | | How is the solid waste from your house collected? | | | | | |
| 3 | 3.10 | 1 | URENCO collects solid waste from door | 47 | 94 | | | |
| | | 2 | Solid waste is thrown to street or vacant land | 2 | 4 | | | |
| | | 3 | Solid waste is thrown on the channel or pond | 0 | 0 | | | |
| | | 4 | Solid waste is thrown on drain | 1 | 2 | | | |
| | | 5 | Solid waste is burnt | 0 | 0 | | | |
| | | 6 | Organic solid waste is used for fertilizer | 0 | 0 | | | |
| | | 7 | Other | 0 | 0 | | | |
| | | 8 | Don't know | 0 | 0 | | | |
| 3 | 3.11 | | Which of the following items do you separate from your solid waste home? | | | | | |
| 3 | 3.11 | 1 | Metal | 0 | 0 | | | |
| | | 2 | Paper | 0 | 0 | | | |
| | | 3 | Glass | 0 | 0 | | | |

| Number of questionnaires | | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|------|----|--|-------|----|---------|-----------|-----------|
| Item | | | | | | | | |
| | | 4 | Plastic | 0 | 0 | | | |
| | | 5 | Other | 0 | 0 | | | |
| | | 6 | No separation | 49 | 98 | | | |
| | | 7 | Don't know | 1 | 2 | | | |
| 3 | 3.12 | | What kind of garbage bin do you have at home? | | | | | |
| 3 | 3.12 | 1 | Bamboo basket | 1 | 2 | | | |
| | | 2 | Plastic bucket less than 10 liters without lid | 6 | 12 | | | |
| | | 3 | Plastic bucket less than 10 liters with lid | 29 | 58 | | | |
| | | 4 | Plastic bucket bigger than 10 liters without lid | 0 | 0 | | | |
| | | 5 | Plastic bucket bigger than 10 liters with lid | 1 | 2 | | | |
| | | 6 | No garbage bin | 0 | 0 | | | |
| | | 7 | Other | 12 | 24 | | | |
| | | 8 | Don't know | 1 | 2 | | | |
| 4 | | | Environmental awareness | | | | | |
| 4 | 4.1 | | What do you think about the general cleanness of your living area? | | | | | |
| 4 | 4.1 | 1 | Very clean | 0 | 0 | | | |
| | | 2 | Clean | 26 | 52 | | | |
| | | 3 | Dirty | 21 | 42 | | | |
| | | 4 | Very dirty | 3 | 6 | | | |
| | | 5 | No opinion | 0 | 0 | | | |
| 4 | 4.2 | | The biggest environmental problem in your living area | | | | | |
| 4 | 4.2 | 1 | Polluted lakes and ponds | 5 | 10 | | | |
| | | 2 | Polluted channels | 0 | 0 | | | |
| | | 3 | Smell of wastewater | 4 | 8 | | | |
| | | 4 | Smell from landfill | 8 | 16 | | | |
| | | 5 | Frequent traffic of trucks to landfill | 2 | 4 | | | |
| | | 6 | Flooding | 1 | 2 | | | |
| | | 7 | Poor solid waste collection | 1 | 2 | | | |
| | | 8 | Rats and vermin | 1 | 2 | | | |
| | | 9 | Dust in air and streets | 14 | 28 | | | |
| | | 10 | Poor air quality | 3 | 6 | | | |
| | | 11 | Noise | 18 | 36 | | | |
| | | 12 | Too crowded living area | 5 | 10 | | | |
| | | 13 | Lack of original nature and animals | 9 | 18 | | | |
| | | 14 | Other | 4 | 8 | | | |
| | | 15 | No environmental problems | 4 | 8 | | | |
| | | 16 | No opinion | 10 | 20 | | | |
| 4 | 4.3 | | When does the environmental problem mentioned above become worst? | | | | | |
| 4 | 4.3 | 1 | All the time | 23 | 46 | | | |
| | | 2 | In dry season | 3 | 6 | | | |
| | | 3 | In wet season | 9 | 18 | | | |
| | | 4 | When traffic is heavy | 2 | 4 | | | |
| | | 5 | Other | 3 | 6 | | | |
| 5 | | | Health | | | | | |

| Number of questionnaires | | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|-----|----|--|-------|----|---------|-----------|-----------|
| Item | | | | | | | | |
| 5 | 5.1 | | Diseases in your household in the last 12 months | | | | | |
| 5 | 5.1 | 1 | Diarrhea | 0 | 0 | | | |
| | | 2 | Eyes diseases | 4 | 8 | | | |
| | | 3 | Skin diseases | 0 | 0 | | | |
| | | 4 | Parasites | 0 | 0 | | | |
| | | 5 | Dengue fever | 1 | 2 | | | |
| | | 6 | Cholera | 0 | 0 | | | |
| | | 7 | Typhoid | 0 | 0 | | | |
| | | 8 | Other water related diseases | 0 | 0 | | | |
| | | 9 | Other air related diseases | 3 | 6 | | | |
| | | 10 | No diagnosed diseases | 33 | 66 | | | |
| | | 11 | Don't know | 10 | 20 | | | |
| 5 | 5.2 | | What do you think was the source of your diseases? | | | | | |
| 5 | 5.2 | 1 | Polluted lakes | 1 | 2 | | | |
| | | 2 | Polluted channels | 0 | 0 | | | |
| | | 3 | Floodwater | 0 | 0 | | | |
| | | 4 | Polluted food | 0 | 0 | | | |
| | | 5 | Polluted drinking water | 0 | 0 | | | |
| | | 6 | Dusty air | 7 | 14 | | | |
| | | 7 | Other | 0 | 0 | | | |
| | | 8 | Don't know | 43 | 86 | | | |
| 6 | | | Household income | | | | | |
| 6 | 6.1 | | Which the following items does your household own? | | | | | |
| 6 | 6.1 | 1 | Television | 49 | 98 | | | |
| | | 2 | Video equipment | 38 | 76 | | | |
| | | 3 | CD player | 16 | 32 | | | |
| | | 4 | Fan | 46 | 92 | | | |
| | | 5 | Air conditioner | 2 | 4 | | | |
| | | 6 | Refrigerator | 23 | 46 | | | |
| | | 7 | Electric cooker | 6 | 12 | | | |
| | | 8 | Washing machine | 9 | 18 | | | |
| | | 9 | Telephone | 17 | 34 | | | |
| | | 10 | Mobile telephone | 5 | 10 | | | |
| | | 11 | computer | 3 | 6 | | | |
| | | 12 | Modern beds | 4 | 8 | | | |
| | | 13 | Bicycle | 45 | 90 | | | |
| | | 14 | Motor bike | 29 | 58 | | | |
| 6 | 6.2 | | The main sources of income for your household | | | | | |
| 6 | 6.2 | 1 | Income from own business | 18 | 36 | | | |
| | | 2 | Income from agriculture or fishing | 0 | 0 | | | |
| | | 3 | Income as a government official | 25 | 50 | | | |
| | | 4 | Income as an employee in a state enterprise | 5 | 10 | | | |
| | | 5 | Income as an employee in a private enterprise | 1 | 2 | | | |
| | | 6 | Income from pension | 20 | 40 | | | |

| Number of questionnaires | | | | Total | % | Average | Max (VND) | Min (VND) |
|--------------------------|-----|----|---|-------|----|---------|-----------|-----------|
| item | | | | | | | | |
| | | 7 | Income from relatives | 3 | 6 | | | |
| | | 8 | Other sources | 13 | 26 | | | |
| 6 | 6.3 | | Total monthly income of your family (VND) | 50 | | 1160417 | 5000000 | 200000 |
| 7 | | | Household expenditure | | | | | |
| 7 | 7.1 | | Total monthly expenditure of your family (VND) | 44 | | 1009302 | 2000000 | 400000 |
| 7 | 7.2 | | Spending on the followings per month? (VND) | | | | 0 | 0 |
| 7 | 7.2 | 1 | Food | 21 | | 576190 | 1200000 | 250000 |
| | | 2 | Education | 30 | | 239862 | 800000 | 15000 |
| | | 3 | health | 6 | | 91867 | 150000 | 50000 |
| | | 4 | Clothing and footwear | 6 | | 113333 | 300000 | 50000 |
| | | 5 | Housing | 6 | | 26033 | 75000 | 10000 |
| | | 6 | Transport and communication | 2 | | 75000 | 100000 | 50000 |
| | | 7 | Public utilities | 1 | | 46000 | 46000 | 46000 |
| | | 8 | Leisure | 0 | | | | |
| | | 9 | Others | 0 | | | | |
| | | 10 | Don't know | 10 | | | | |
| 7 | 7.3 | | Spending on public utilities per month | | | | | |
| 7 | 7.3 | 1 | Water | 49 | | 30959 | 110000 | 4000 |
| | | 2 | Electricity | 49 | | 73604 | 200000 | 8000 |
| | | 3 | Telephone | 23 | | 135348 | 500000 | 40000 |
| | | 4 | Gas | 13 | | 60231 | 100000 | 20000 |
| | | 5 | Other | 26 | | 32115 | 100000 | 20000 |
| | | 6 | Don't know | 9 | | 61750 | 200000 | 20000 |
| 7 | 7.4 | | Is your household saving money for some big purchase | | | | | |
| 7 | 7.4 | 1 | Yes | 14 | 28 | | | |
| | | 2 | No | 30 | 60 | | | |
| | | 3 | Don't know | 6 | 12 | | | |
| 7 | 7.5 | | Does anybody in your household have a bank account? | | | | | |
| 7 | 7.5 | 1 | Yes | 1 | 2 | | | |
| | | 2 | No | 38 | 76 | | | |
| | | 3 | Don't know | 11 | 22 | | | |
| 8 | | | Preference for sanitation services and willingness to pay | | | | | |
| 8 | 8.1 | | Pay to reduce flooding in your area | | | | | |
| 8 | 8.1 | 1 |VND | 5 | 10 | 33000 | 70000 | 10000 |
| | | 2 | Not willing to pay | 4 | 8 | | | |
| | | 3 | Don't know | 41 | 82 | | | |
| 8 | 8.2 | | Connecting to sewer system, if the wastewater is treated in wastewater treatment plant? | | | | | |
| 8 | 8.2 | 1 | Yes | 36 | 72 | | | |
| | | 2 | No | 3 | 6 | | | |
| | | 3 | Don't know | 11 | 22 | | | |
| 8 | 8.3 | | Pay for wastewater fee per month | | | | | |
| 8 | 8.3 | 1 |VND | 6 | 12 | 14167 | 50000 | 5000 |
| | | 2 | Not willing to pay | 4 | 8 | | | |
| | | 3 | Don't know | 40 | 80 | | | |

| Number of questionnaires | | | Total | % | Average | Max (VND) | Min (VND) | |
|--------------------------|-----|---|---|----|---------|-----------|-----------|--|
| Item | | | | | | | | |
| 8 | 8.4 | | Pay for sewer house connection | | | | | |
| 8 | 8.4 | 1 | 5 | 10 | 17000 | 50000 | 5000 | |
| | | 2 | 5 | 10 | | | | |
| | | 3 | 40 | 80 | | | | |
| 8 | 8.5 | | Following household solid waste disposal method | | | | | |
| 8 | 8.5 | 1 | 44 | 38 | | | | |
| | | 2 | 0 | 0 | | | | |
| | | 3 | 0 | 0 | | | | |
| | | 4 | 0 | 0 | | | | |
| | | 5 | 6 | 12 | | | | |
| 8 | 8.6 | | Would you be ready to participate in the cleaning of your living area | | | | | |
| 8 | 8.6 | 1 | 47 | 94 | | | | |
| | | 2 | 0 | 0 | | | | |
| | | 3 | 3 | 6 | | | | |
| 8 | 8.7 | | Sharing 120 - 240 liters waste container in your neighbourhood | | | | | |
| 8 | 8.7 | 1 | 18 | 36 | | | | |
| | | 2 | 21 | 42 | | | | |
| | | 3 | 11 | 22 | | | | |
| 8 | 8.8 | | Pay for solid waste fee per month | | | | | |
| 8 | 8.8 | 1 | 6 | 12 | 4000 | 5000 | 2000 | |
| | | 2 | 7 | 14 | | | | |
| | | 3 | 37 | 74 | | | | |
| 9 | | | Assessment of interviewer | | | | | |
| 9 | | 1 | 0 | 0 | | | | |
| | | 2 | 8 | 16 | | | | |
| | | 3 | 26 | 52 | | | | |
| | | 4 | 15 | 30 | | | | |
| | | 5 | 1 | 2 | | | | |

**G: Environmental Impact Assessment
for Sewerage Project**

SUMMARY TABLE OF QUESTIONNAIRES VININIEM SEWERAGE TREATMENT PLANT

| Number of questionnaires | | | | Total | % | Average | Max | Min |
|--------------------------|-----|----|---|--------|--------|---------|------|-----|
| Item | | | | | | | | |
| 1 | | | General | | | | | |
| 1 | 1.1 | | Gender of respondent | | | | | |
| 1 | 1.1 | 1 | Male | 15 | 50.00 | | | |
| | | 2 | Female | 15 | 50.00 | | | |
| 1 | 1.2 | | Age of respondent | 30 | 100.00 | 48.17 | 73 | 30 |
| 1 | 1.3 | | Education of respondent | | | | | |
| 1 | 1.3 | 1 | No school | 2 | 6.67 | | | |
| | | 2 | Primary school | 10 | 33.33 | | | |
| | | 3 | Secondary school | 10 | 33.33 | | | |
| | | 4 | High school | 3 | 10.00 | | | |
| | | 5 | Vocational school | 3 | 10.00 | | | |
| | | 6 | University | 1 | 3.33 | | | |
| | | 7 | Other | 1 | 3.33 | | | |
| 1 | 1.4 | | Occupation of respondent | | | | | |
| | 1.4 | 1 | Laborer | 0 | 0.00 | | | |
| | | 2 | Worker | 2 | 6.67 | | | |
| | | 3 | Civil servant | 0 | 0.00 | | | |
| | | 4 | Shopkeeper | 1 | 3.33 | | | |
| | | 5 | Businessman | 4 | 13.33 | | | |
| | | 6 | Farmer | 13 | 43.33 | | | |
| | | 7 | Fisherman | 1 | 3.33 | | | |
| | | 8 | Housewife | 2 | 6.67 | | | |
| | | 9 | Retired | 6 | 20.00 | | | |
| | | 10 | Unemployed | 0 | 0.00 | | | |
| | | 11 | Other | 1 | 3.33 | | | |
| 1 | 1.5 | | Number of family members living in this house | People | % | | | |
| | 1.5 | 1 | Adult (> 18 years old) | 104 | 66.24 | 3.47 | 6 | 2 |
| | | 2 | Children | 53 | 33.76 | 2.04 | 4 | 1 |
| 2 | | | Housing | | | | | |
| 2 | 2.1 | | Size of land your family occupies (m ²) | | | 665.71 | 2880 | 80 |
| 2 | 2.2 | | The long-term land use entitlement for the land that this house is built on | | | | | |

| Number of questionnaires | | | | Total | % | Average | Max | Min |
|--------------------------|-----|---|--|-------|-------|---------|------|--------|
| Item | | | | | | | | |
| 2 | 2.2 | 1 | A resident member of the family has certificate of occupation | 22 | 73.33 | | | |
| | | 2 | A non resident member of the family has the certificate of occupation | 1 | 3.33 | | | |
| | | 3 | The land is rented from the person who is not the member | 1 | 3.33 | | | |
| | | 4 | The land belongs to the State | 5 | 16.67 | | | |
| | | 5 | The land belongs to a Government department or enterprise | 0 | 0.00 | | | |
| | | 6 | The land belongs to the Military | 0 | 0.00 | | | |
| | | 7 | Other | 1 | 3.33 | | | |
| | | 8 | Don't know | 0 | 0.00 | | | |
| 2 | 2.3 | | Your household own agricultural or aquacultural area | | | | | |
| 2 | 2.3 | 1 | No | 9 | 30.00 | | | |
| | | 2 | Agricultural land (ha) | 19 | 63.33 | 501.02 | 1440 | 0.0465 |
| | | 3 | Aquacultural area (ha) | 0 | 0.00 | 0.00 | 0 | 0 |
| | | 4 | Don't know | 2 | 6.67 | | | |
| 2 | 2.4 | | How far is your agricultural land or aquacultural area from your house | | | | | |
| 2 | 2.4 | 1 | Agricultural land (m) | | | 473.33 | 1000 | 20 |
| | | 2 | Aquacultural area (m) | | | 400.00 | 400 | 400 |
| 2 | 2.5 | | What product do you mainly cultivate | | | | | |
| 2 | 2.5 | 1 | Rice | 20 | 95.24 | | | |
| | | 2 | Vegetables | 10 | 47.62 | | | |
| | | 3 | Shrimp | 0 | 0.00 | | | |
| | | 4 | Fish | 1 | 4.76 | | | |
| | | 5 | Other | 0 | 0.00 | | | |
| 2 | 2.6 | | The size of the house your family live (m ²) | | | 56.39 | 190 | 7 |
| 2 | 2.7 | | The characteristic of your house | | | | | |
| 2 | 2.7 | 1 | A house surround by a garden | 24 | 80.00 | | | |
| | | 2 | Multi storied house with own bathroom, kitchen and toilet | 2 | 6.67 | | | |
| | | 3 | Multi storied house with share bathroom, kitchen and toilet | 0 | 0.00 | | | |
| | | 4 | Single storied house with own bathroom, kitchen and toilet | 6 | 20.00 | | | |
| | | 5 | Single storied house with share bathroom, kitchen and toilet | 3 | 10.00 | | | |
| | | 6 | Semi permanent house of mixed brick, tin, timber construction | 11 | 36.67 | | | |
| | | 7 | Temporary house of tin cladding, wood, bamboo construction | 2 | 6.67 | | | |
| | | 8 | Other | 0 | 0.00 | | | |
| 2 | 2.8 | | When was this house constructed? (year) | | | 1987.77 | 1999 | 1945 |
| 2 | 2.9 | | How many stories are there in your house? | | | | | |

| Number of questionnaires | | | | Total | % | Average | Max | Min |
|--------------------------|------|----|---|-------|-------|---------|-----|-----|
| Item | | | | | | | | |
| 2 | 2.9 | 1 | One | 28 | 93.33 | | | |
| | | 2 | Two | 2 | 6.67 | | | |
| | | 3 | Three | 0 | 0.00 | | | |
| | | 4 | More | 0 | 0.00 | | | |
| 2 | 2.1 | | Who own this house where you live | | | | | |
| 2 | 2.10 | 1 | A family member living in the household | 25 | 83.33 | | | |
| | | 2 | A family member not living in the household | 1 | 3.33 | | | |
| | | 3 | A non family member who may or may not live in the house | 0 | 0.00 | | | |
| | | 4 | The State | 0 | 0.00 | | | |
| | | 5 | A government department or enterprise | 0 | 0.00 | | | |
| | | 6 | Other | 0 | 0.00 | | | |
| | | 7 | Don't know | 4 | 13.33 | | | |
| 2 | 2.11 | | How many year has your family been living in this house | | | 18.80 | 45 | 0 |
| 2 | 2.12 | | Where did you live before you moved to this house | | | | | |
| 2 | 2.12 | 1 | Always lived in this house | 20 | 66.67 | | | |
| | | 2 | In another house in the same phuong | 2 | 6.67 | | | |
| | | 3 | In another house in the same district | 1 | 3.33 | | | |
| | | 4 | In another house in the same city | 4 | 13.33 | | | |
| | | 5 | In rural areas of the same province | 3 | 10.00 | | | |
| | | 6 | Other province | 0 | 0.00 | | | |
| 2 | 2.13 | | Kind of commercial or other business activities in your household | | | | | |
| 2 | 2.13 | 1 | Cafe, restaurant | 1 | 3.33 | | | |
| | | 2 | Shop | 2 | 6.67 | | | |
| | | 3 | Barber shop | 3 | 10.00 | | | |
| | | 4 | Manufacturing (wood, metal) | 1 | 3.33 | | | |
| | | 5 | Food production | 1 | 3.33 | | | |
| | | 6 | Storage | 0 | 0.00 | | | |
| | | 7 | Offices | 1 | 3.33 | | | |
| | | 8 | Breeding animals for sell | 5 | 16.67 | | | |
| | | 9 | Bike washing | 0 | 0.00 | | | |
| | | 10 | Bike/ car repair | 0 | 0.00 | | | |
| | | 11 | Rooms rented out for business | 0 | 0.00 | | | |
| | | 12 | Other | 2 | 6.67 | | | |
| | | 13 | No business activities | 14 | 46.67 | | | |

| Number of questionnaires | | | Total | % | Average | Max | Min |
|--------------------------|------|---|---|----|---------|-----|-----|
| Item | | | | | | | |
| 3 | | | Water supply, sanitation and solid waste | | | | |
| 3 | 3.10 | | What is the main water source for this household | | | | |
| 3 | 3.1 | 1 | Piped supply from Water Supply Company through own ho | 21 | 70.00 | | |
| | | 2 | Piped supply from water supply company to public tank | 1 | 3.33 | | |
| | | 3 | Own shallow well | 4 | 13.33 | | |
| | | 4 | Shared shallow well | 0 | 0.00 | | |
| | | 5 | Own deep well (UNICEF well) | 7 | 23.33 | | |
| | | 6 | Shared deep well (UNICEF well) | 0 | 0.00 | | |
| | | 7 | Other | 5 | 16.67 | | |
| 3 | 3.2 | | Is your house connected to communal sewer network? | | | | |
| 3 | 3.2 | 1 | Yes | 2 | 6.67 | | |
| | | 2 | No | 27 | 90.00 | | |
| | | 3 | Don't know | 1 | 3.33 | | |
| 3 | 3.3 | | If not, where is your wastewater discharged? | | | | |
| 3 | 3.3 | 1 | To drain | 4 | 13.33 | | |
| | | 2 | To channel or pond | 26 | 92.86 | | |
| | | 3 | To ground | 2 | 7.14 | | |
| | | 4 | Don't know | 0 | 0.00 | | |
| 3 | 3.4 | | Is there a toilet in this house? | | | | |
| 3 | 3.4 | 1 | There is a toilet in this house | 28 | 93.33 | | |
| | | 2 | We share a toilet with other household | 0 | 0.00 | | |
| | | 3 | We are using neighbour's toilet | 0 | 0.00 | | |
| | | 4 | We are using public toilet | 0 | 0.00 | | |
| | | 5 | No toilet | 2 | 6.67 | | |
| 3 | 3.5 | | Kind of toilet in your house | | | | |
| 3 | 3.5 | 1 | Pour flush toilet | 5 | 16.67 | | |
| | | 2 | Western style flush toilet | 8 | 26.67 | | |
| | | 3 | Double vault composting toilet above ground | 3 | 10.00 | | |
| | | 4 | Double vault composting toilet below ground | 3 | 10.00 | | |
| | | 5 | Pit latrine - above ground | 2 | 6.67 | | |
| | | 6 | Pit latrine -below ground | 0 | 0.00 | | |
| | | 7 | Bucket latrine | 4 | 13.33 | | |
| | | 8 | Open latrine or traditional methods | 4 | 13.33 | | |
| | | 9 | Over hung latrine | 0 | 0.00 | | |

| Number of questionnaires | | | Total | % | Average | Max | Min |
|--------------------------|------|----|---|----|---------|-----|-----|
| Item | | | | | | | |
| | | 10 | Other | 1 | 3.33 | | |
| 3 | 3.6 | | Where does water from the pour flush toilet go? | | | | |
| 3 | 3.6 | 1 | Septic tank | 11 | 36.87 | | |
| | | 2 | Sewer | 0 | 0.00 | | |
| | | 3 | Storm water drain | 0 | 0.00 | | |
| | | 4 | Directly into ground | 15 | 50.00 | | |
| | | 5 | Directly into river/ lake | 9 | 30.00 | | |
| | | 6 | Don't know | 0 | 0.00 | | |
| 3 | 3.7 | | Where does water from the septic tank go? | | | | |
| 3 | 3.7 | 1 | Sewer | 1 | 9.09 | | |
| | | 2 | Storm water drain | 1 | 3.33 | | |
| | | 3 | Directly into ground | 15 | 50.00 | | |
| | | 4 | Directly into river/ lake | 12 | 40.00 | | |
| | | 5 | Don't know | 0 | 0.00 | | |
| 3 | 3.8 | | How often is the septic tank emptied? | | | | |
| 3 | 3.8 | 1 | Once per year | 0 | 0.00 | | |
| | | 2 | Every second year | 0 | 0.00 | | |
| | | 3 | In 5 years interval | 0 | 0.00 | | |
| | | 4 | When needed | 4 | 36.36 | | |
| | | 5 | Has not been emptied | 7 | 63.64 | | |
| | | 6 | Don't know | 0 | 0.00 | | |
| 3 | 3.9 | | Does your household suffer from chronic flooding? | | | | |
| 3 | 3.9 | 1 | Yes frequently | 1 | 3.33 | | |
| | | 2 | Yes, a few time per year | 4 | 13.33 | | |
| | | 3 | Yes, a few time in 5 years | 0 | 0.00 | | |
| | | 4 | No | 24 | 80.00 | | |
| | | 5 | Don't know | 1 | 3.33 | | |
| 3 | 3.10 | | How is the solid waste from your house collected? | | | | |
| 3 | 3.10 | 1 | URENCO collects solid waste from door | 1 | 3.33 | | |
| | | 2 | Solid waste is thrown to street or vacant land | 3 | 10.00 | | |
| | | 3 | Solid waste is thrown on the channel or pond | 7 | 23.33 | | |
| | | 4 | Solid waste is thrown on drain | 0 | 0.00 | | |
| | | 5 | Solid waste is burnt | 23 | 76.67 | | |
| | | 6 | Organic solid waste is used for fertilizer | 5 | 16.67 | | |

| Number of questionnaires | | | Total | % | Average | Max | Min |
|--------------------------|------|--|-------|-------|---------|-----|-----|
| Item | | | | | | | |
| | 7 | Other | 0 | 0.00 | | | |
| | 3 | Don't know | 0 | 0.00 | | | |
| 3 | 3.11 | Which of the following items do you separate from your solid waste home? | | | | | |
| 3 | 3.11 | 1 | 1 | 3.33 | | | |
| | 2 | Paper | 4 | 13.33 | | | |
| | 3 | Glass | 3 | 10.00 | | | |
| | 4 | Plastic | 2 | 6.67 | | | |
| | 5 | Other | 1 | 3.33 | | | |
| | 6 | No separation | 25 | 83.33 | | | |
| | 7 | Don't know | 2 | 6.67 | | | |
| 3 | 3.12 | What kind of garbage bin do you have at home? | | | | | |
| 3 | 3.12 | 1 | 3 | 10.00 | | | |
| | 2 | Plastic bucket less than 10 liters without lid | 5 | 16.67 | | | |
| | 3 | Plastic bucket less than 10 liters with lid | 0 | 0.00 | | | |
| | 4 | Plastic bucket bigger than 10 liters without lid | 0 | 0.00 | | | |
| | 5 | Plastic bucket bigger than 10 liters with lid | 0 | 0.00 | | | |
| | 6 | No garbage bin | 15 | 50.00 | | | |
| | 7 | Other | 7 | 23.33 | | | |
| | 8 | Don't know | 0 | 0.00 | | | |
| 4 | | Environmental awareness | | | | | |
| 4 | 4.1 | What do you think about the general cleanliness of your living area? | | | | | |
| 4 | 4.1 | 1 | 1 | 3.33 | | | |
| | 2 | Clean | 3 | 10.00 | | | |
| | 3 | Dirty | 15 | 50.00 | | | |
| | 4 | Very dirty | 9 | 30.00 | | | |
| | 5 | No opinion | 2 | 6.67 | | | |
| 4 | 4.2 | The biggest environmental problem in your living area | | | | | |
| 4 | 4.2 | 1 | 13 | 43.33 | | | |
| | 2 | Polluted channels | 20 | 66.67 | | | |
| | 3 | Smell of wastewater | 15 | 50.00 | | | |
| | 4 | Smell from landfill | 9 | 30.00 | | | |
| | 5 | Frequent traffic of trucks to landfill | 0 | 0.00 | | | |
| | 6 | Flooding | 1 | 3.33 | | | |
| | 7 | Poor solid waste collection | 10 | 33.33 | | | |

| Number of questionnaires | | | Total | % | Average | Max | Min |
|--------------------------|-----|---|------------------------------|-------|---------|-----|-----|
| Item | | | | | | | |
| | 8 | Rats and vermin | 15 | 50.00 | | | |
| | 9 | Dust in air and streets | 1 | 3.33 | | | |
| | 10 | Poor air quality | 1 | 3.33 | | | |
| | 11 | Noise | 1 | 3.33 | | | |
| | 12 | Too crowded living area | 1 | 3.33 | | | |
| | 13 | Lack of original nature and animals | 1 | 3.33 | | | |
| | 14 | Other | 1 | 3.33 | | | |
| | 15 | No environmental problems | 0 | 0.00 | | | |
| | 16 | No opinion | 0 | 0.00 | | | |
| 4 | 4.3 | When does the environmental problem mentioned above become worst? | | | | | |
| 4 | 4.3 | 1 | All the time | 15 | 50.00 | | |
| | | 2 | In dry season | 12 | 40.00 | | |
| | | 3 | In wet season | 2 | 6.67 | | |
| | | 4 | When traffic is heavy | 0 | 0.00 | | |
| | | 5 | Other | 1 | 3.33 | | |
| 5 | | Health | | | | | |
| 5 | 5.1 | Diseases in your household in the last 12 months | | | | | |
| 5 | 5.1 | 1 | Diarrhea | 1 | 3.33 | | |
| | | 2 | Eyes diseases | 4 | 13.33 | | |
| | | 3 | Skin diseases | 3 | 10.00 | | |
| | | 4 | Parasites | 1 | 3.33 | | |
| | | 5 | Dengue fever | 2 | 6.67 | | |
| | | 6 | Cholera | 0 | 0.00 | | |
| | | 7 | Typhoid | 0 | 0.00 | | |
| | | 8 | Other water related diseases | 3 | 10.00 | | |
| | | 9 | Other air related diseases | 1 | 3.33 | | |
| | | 10 | No diagnosed diseases | 16 | 53.33 | | |
| | | 11 | Don't know | 5 | 16.67 | | |
| 5 | 5.2 | What do you think was the source of your diseases? | | | | | |
| 5 | 5.2 | 1 | Polluted lakes | 2 | 6.67 | | |
| | | 2 | Polluted channels | 7 | 23.33 | | |
| | | 3 | Floodwater | 0 | 0.00 | | |
| | | 4 | Polluted food | 0 | 0.00 | | |
| | | 5 | Polluted drinking water | 1 | 3.33 | | |

| Number of questionnaires | | | Total | % | Average | Max | Min |
|--------------------------|-----|--|-------|-------|-----------|---------|--------|
| Item | | | | | | | |
| | 6 | Dusty air | 2 | 6.67 | | | |
| | 7 | Other | 3 | 10.00 | | | |
| | 8 | Don't know | 6 | 20.00 | | | |
| 6 | | Household income | | | | | |
| 6 | 6.1 | Which the following items does your household own? | | | | | |
| 6 | 6.1 | 1 Television | 28 | 93.33 | | | |
| | | 2 Video equipment | 6 | 26.67 | | | |
| | | 3 CD player | 2 | 6.67 | | | |
| | | 4 Fan | 24 | 80.00 | | | |
| | | 5 Air conditioner | 0 | 0.00 | | | |
| | | 6 Refrigerator | 1 | 3.33 | | | |
| | | 7 Electric cooker | 0 | 0.00 | | | |
| | | 8 Washing machine | 0 | 0.00 | | | |
| | | 9 Telephone | 3 | 10.00 | | | |
| | | 10 Mobile telephone | 0 | 0.00 | | | |
| | | 11 computer | 0 | 0.00 | | | |
| | | 12 Modem beds | 1 | 3.33 | | | |
| | | 13 Bicycle | 28 | 93.33 | | | |
| | | 14 Motor bike | 5 | 16.67 | | | |
| 6 | 6.2 | The main sources of income for your household | | | | | |
| 6 | 6.2 | 1 Income from own business | 8 | 26.67 | | | |
| | | 2 Income from agriculture or fishing | 21 | 70.00 | | | |
| | | 3 Income as a government official | 5 | 16.67 | | | |
| | | 4 Income as an employee in a state enterprise | 1 | 3.33 | | | |
| | | 5 Income as an employee in a private enterprise | 0 | 0.00 | | | |
| | | 6 Income from pension | 2 | 6.67 | | | |
| | | 7 Income from relatives | 0 | 0.00 | | | |
| | | 8 Other sources | 6 | 20.00 | | | |
| 6 | 6.3 | Total monthly income of your family (VND) | 30 | | 726000.00 | 2000000 | 280000 |
| 7 | | Household expenditure | | | | | |
| 7 | 7.1 | Total monthly expenditure of your family (VND) | 26 | | 610000.00 | 1000000 | 280000 |
| 7 | 7.2 | Spending on the followings per month? (VND) | | | | | |
| 7 | 7.2 | 1 Food | 11 | | 390000.00 | 800000 | 200000 |
| | | 2 Education | 19 | | 115526.32 | 300000 | 15000 |

| Number of questionnaires | | | | Total | % | Average | Max | Min |
|--------------------------|-----|----|---|-------|-------|-----------|---------|-------|
| Item | | | | | | | | |
| | | 3 | health | 0 | | | | |
| | | 4 | Clothing and footwear | 0 | | | | |
| | | 5 | Housing | 1 | | 50000.00 | 50000 | 50000 |
| | | 6 | Transport and communication | 0 | | | | |
| | | 7 | Public utilities | 0 | | | | |
| | | 8 | Leisure | 0 | | | | |
| | | 9 | Others | 0 | | | | |
| | | 10 | Don't know | 6 | | | | |
| 7 | 7.3 | | Spending on public utilities per month | | | | | |
| 7 | 7.3 | 1 | Water | 16 | | 42687.50 | 200000 | 10000 |
| | | 2 | Electricity | 28 | | 109821.43 | 2000000 | 20000 |
| | | 3 | Telephone | 2 | | 130000.00 | 180000 | 80000 |
| | | 4 | Gas | 3 | | 31666.67 | 50000 | 15000 |
| | | 5 | Other | 9 | | 41111.11 | 80000 | 20000 |
| | | 6 | Don't know | 1 | | | | |
| 7 | 7.4 | | is your household saving money for some big purchase | | | | | |
| 7 | 7.4 | 1 | Yes | 3 | | | | |
| | | 2 | No | 20 | | | | |
| | | 3 | Don't know | 7 | | | | |
| 7 | 7.5 | | Does anybody in your household have a bank account? | | | | | |
| 7 | 7.5 | 1 | Yes | 0 | | | | |
| | | 2 | No | 23 | | | | |
| | | 3 | Don't know | 7 | | | | |
| 8 | | | Preference for sanitation services and willingness to pay | | | | | |
| 8 | 8.1 | | Pay to reduce flooding in your area | | | | | |
| 8 | 8.1 | 1 |VND | 1 | 3.33 | 15000.00 | 15000 | 15000 |
| | | 2 | Not willing to pay | 3 | 10.00 | | | |
| | | 3 | Don't know | 26 | 86.67 | | | |
| 8 | 8.2 | | Connecting to sewer system, if the wastewater is treated in wastewater treatment plant? | | | | | |
| 8 | 8.2 | 1 | Yes | 17 | 56.67 | | | |
| | | 2 | No | 1 | 3.33 | | | |
| | | 3 | Don't know | 12 | 40.00 | | | |
| 8 | 8.3 | | Pay for wastewater fee per month | | | | | |
| 8 | 8.3 | 1 |VND | 8 | 26.67 | 3000.00 | 5000 | 1000 |

| Number of questionnaires | | | Total | % | Average | Max | Min |
|--------------------------|-----|---|---|----|---------|----------|-------|
| Item | | | | | | | |
| | | 2 | Not willing to pay | 4 | 13.33 | | |
| | | 3 | Don't know | 18 | 60.00 | | |
| 8 | 8.4 | | Pay for sewer house connection | | | | |
| 8 | 8.4 | 1 |VND | 8 | 26.67 | 14000.00 | 50000 |
| | | 2 | Not willing to pay | 2 | 6.67 | | |
| | | 3 | Don't know | 20 | 66.67 | | |
| 8 | 8.5 | | Following household solid waste disposal method | | | | |
| 8 | 8.5 | 1 | Collection and disposal by URENCO | 13 | 43.33 | | |
| | | 2 | Collection and disposal by private solid waste company | 0 | 0.00 | | |
| | | 3 | Household themselves organize collection and disposal | 11 | 36.67 | | |
| | | 4 | Other | 1 | 3.33 | | |
| | | 5 | No opinion | 5 | 16.67 | | |
| 8 | 8.6 | | Would you be ready to participate in the cleaning of your living area | | | | |
| 8 | 8.6 | 1 | Yes | 26 | 86.67 | | |
| | | 2 | No | 1 | 3.33 | | |
| | | 3 | Don't know | 3 | 10.00 | | |
| 8 | 8.7 | | Sharing 120 - 240 liters waste container in your neighbourhood | | | | |
| 8 | 8.7 | 1 | Yes | 11 | 36.67 | | |
| | | 2 | No | 11 | 36.67 | | |
| | | 3 | No opinion | 8 | 26.67 | | |
| 8 | 8.8 | | Pay for solid waste fee per month | | | | |
| 8 | 8.8 | 1 |VND | 6 | 20.00 | 3800.00 | 5000 |
| | | 2 | Not willing to pay | 2 | 6.67 | | |
| | | 3 | Don't know | 22 | 73.33 | | |
| 9 | | | Assessment of interviewer | | | | |
| 9 | | 1 | Very poor | 1 | 3.33 | | |
| | | 2 | Poor | 10 | 33.33 | | |
| | | 3 | Moderate | 19 | 63.33 | | |
| | | 4 | Wealthy | 0 | 0.00 | | |
| | | 5 | Rich | 0 | 0.00 | | |

APPENDIX IV

MEASUREMENT RESULTS OF WATER FLOW IN LACH TRAY RIVER

**REPORT ON WATER FLOW MEASUREMENT
IN LACHITRAY RIVER.**

(Dong Lap gate, hamlet 3, Vinh Niem commune, Hai Phong City)

17th - 23rd November 2000.

1. PURPOSE OF MEASUREMENT.

The purpose of the work is to measure and calculate the water flow according to tide fluctuation at the river section near the proposed Vinh Niem sewerage treatment plant in serve for assessment of discharge capacity of the river.

2. EQUIPMENT AND METHOD.

The measuring location is in the section affected by tide regime and variable water level and flow in the year. Therefore, in order to ensure the consistence of the measuring data, the measuring work must be carried out simultaneously over the cross-section. Traditional measurement method can not meet the above requirement. To satisfy the set requirement, we have selected the ADCP technology (Acoustic Dropper Current Profile) in combination with the software programme TRANSECT. This is and simple flow measuring machine, with short measuring duration but supply more exact results, facilitating the identification of extreme value for better serve of water flow calculation.

The ADCP operation principles.

This is and measuring machine using acoustic transmission energy. This sound generated will be transmitted into the water such as the technology used for submarine but with higher frequency. This energy will be dispersed into the water with a part returning to ADCP. ADCP will measures the changes in energy feed-back thereby calculating the flow rate of water as compared with ADCP.

ADCP analyses partly feedback signals of water with assumption that the water vapour being divided into several water layers in vertical direction. These layers are called deep layers or deep units. ADCP will define velocity and direction of each deep unit, giving us vertical velocity distributing diagram from the surface to the bottom. By using 1200 kHz frequency ADCP, the depth of each selected unit can be as small as 5 cm. With 600 kHz ADCP, this depth will be as small as 10cm.

ADCP's compliments.

ADCP comprises following components:

- ◆ Microwave machine placed in the probe generating 04 beams with the same frequency of 600 kHz. (this Tanso is suitable to Vietnam).
- ◆ Positioning device (with tree-dimentional ordinate) placed inside the acoutics receiving-generating device to position the exact location of the ship in the Decader ordinate:
 - The vertical axe taking the same positive direction with gravitional vector.
 - Horizontal axe taking the north positive direction (by using electric compass).
 - Another horizontal axe taking the east positive direction (by using electronic compass).
- ◆ A timer (an electronic clock with high exacty) placed in probe identifying the accurate time of receiving the feedback beams.
- ◆ Sensors placed in the probe to receive and transmit microwave feedback from 4 transmitted beams (according to ordinates, time, water temperatures, angle of transmitting and feedback beams).
- ◆ Signal transmitter in the probe will change received/transmitting signals to digital signals and stored on computer through I/O cable.
- ◆ TRANSECT software program on computer will receive/transmit and analyzed monitoring results (TRANSECT is a simultaneous data collection program. This program creates configurative file to run ADCP, to check orders received by ADCP).

Measuring phases.

- ✓ *Phase1:* After installation of equipment on board, the ship moves to the location which is deep enough for measuring. This location is identified by a buoy and is the starting and finishing point for measuring on this side. The ship then moves slowly to the other, making the nearest distance where the measuring results can not be achieved. This is the starting (or finishing) point for this other side.
- ✓ *Phase 2:* Collection of data near the bank. The ship moves to the point deep enough for measuring, this is the starting point. Press the strating button to achieve and store the distance results from the measuring point to the watershed

(this data used for calculating the watershed flow). The measurement repeats 2 or 3 times at the same cross-section.

- ✓ *Phase 3:* Data collection and measuring on the river. The ship moves as slowly as possible (the results are best when the ship velocity is smaller than the water velocity). The measuring machine is placed in the front of the ship and the ship moves slowly across the river in direction square with the water flow.
- ✓ *Phase 4:* Collection of data in the other finishing bank. Continuous measuring across the river to the previously determined watershed point (in the otherside bank) will provide us with measuring results of the two layers under the surface. After locating and measuring for 2 or 3 times, press F5 button to stop data storing

Repeated measurement from phase 2 to phase 4 as required (4 times at least). To finish the measurement, press the stop button to cancel ADCP sound transmission.

Calculation of water flow.

After the data filing, press (Alt-E) button to define flow in location where measurement is impossible. Press "Yes" button to identify near shore water flow. The computed near shore distance will be shown together with the measured near shore water flow. In case results are not shown or there are mistakes, correct them to calculate the exact near shore water flow. Middle layers' flow will be directly calculated based on measured segments, flow of top and bottom layers will be calculated based on the middle layers. All of the measuring results will be summarized on the left corner of the screen.

Bases for flow calculation.

The TRANSECT calculates the water flow on ground of data measured by ADCP (which mean the water flow over the cross-section in a time unit).

TRANSECT calculates the total flow for each ADCP m^3 water unit (ensemble). The total Q will be the total flow of top, middle and bottom layers. Flow of the middle layer is calculated by TRANSECT through direct measurement (mid.Q) and segment which is not calculated at cross-section are top layer (Top.Q) and bottom layer (Bot. Q).

Near shore flow will not be calculated in total water flow which includes the measured middle layers, near top layers and near bottom layers. TRANSCET has an

extra polation for calculating near shore flow. This near shore flow will be included to define the total flow of all cross-section.

The water flow value in a river cross-section after repeated measurement at one location (at least 4 times), the real water flow will be calculated by averaging the total N times of independent measurement.

$$\Sigma q = \frac{\sum_{i=1}^N \Sigma q_i}{N}$$

Of which:

N: Time of measurement.

ΣQ_i : flow value at measurement N^{th} i.

ΣQ : flow at measuring location.

I: sequence of measurement.

3. PLAN FOR MEASUREMENT.

Water flow measurement was carried out from 17th to 23rd November 2000 at Dong Lap gate in hamlet 3, Vinh Niem commune, Hai Phong City. Measuring schedule is as follow:

- 17th November 2000: measurement at 7:30h, 13:27h, 20:15h.
- 18th November 2000: measurement at 2:28h.
- 20th November 2000: measurement at 10:19h, 16:36h, 22:53h.
- 22nd November 2000: measurement at 4:00h.
- 23rd November 2000: measurement at 11:30h, 14:49h, 18:06h, 22:04h.
- Cross-section measurement: 1 time .

Results of water flow measurement are shown in the table 1 .

Cross-section measurement result is shown in table 2 and figure 1.

Cross-section measurement in TRANSECT in figure 2.

Water flow measuring result at each segment of cross-section in figure 3.

Flow rate and direction measurement during high tide in figure 4.

Flow rate and direction measurement during low tide in figure 5.

Figure 6,7,8,9,10,11,12,13,14 show direction and flow of each measurement.

Figure 1: Flow measurement results at Lach Tray river (Dong Lap gate, Hamlet 3, Vinh Niem commune)

| TT | file name | Time | Date | Q (m ³ /s) | Legend |
|----|--------------|-------|------------|-----------------------|-----------|
| 1 | Ltra005R.000 | 7:53 | 17/11/2000 | -355 | High tide |
| 2 | Ltra008R.000 | 13:22 | 17/11/2000 | 382 | Low tide |
| 3 | Ltra011R.000 | 20:19 | 17/11/2000 | 163 | Low tide |
| 4 | Ltra014R.000 | 2:37 | 18/11/2000 | -216 | High tide |
| 5 | Ltra019R.000 | 10:34 | 20/11/2000 | -161 | High tide |
| 6 | Ltra023R.000 | 16:41 | 20/11/2000 | 281 | Low tide |
| 7 | Ltra026R.000 | 22:38 | 20/11/2000 | 132 | Low tide |
| 8 | Ltra028R.000 | 3:59 | 22/11/2000 | -36.1 | High tide |
| 9 | Ltra036R.000 | 11:49 | 23/11/2000 | -14.4 | High tide |
| 10 | Ltra041R.000 | 15:05 | 23/11/2000 | 120 | Low tide |
| 11 | LTR003R.000 | 17:55 | 23/11/2000 | 162 | Low tide |
| 12 | LTR007R.000 | 22:02 | 23/11/2000 | -10.8 | High tide |

Figure 2: Cross-section measurement in Lach Tray river (Dong Lap gate, Hamlet 3, Vinh Niem commune)

| TT | Distance from the left bank (m) | Supposed river bed altitude (m) | Legend |
|----|---------------------------------|---------------------------------|------------------|
| 1 | 0.00 | 0.00 | Left bank |
| 2 | 1.00 | -1.00 | Left shore water |
| 3 | 4.00 | -1.93 | |
| 4 | 5.21 | -2.03 | |
| 5 | 6.52 | -2.24 | |
| 6 | 7.76 | -2.51 | |
| 7 | 9.39 | -2.69 | |
| 8 | 10.40 | -3.15 | |
| 9 | 11.46 | -3.83 | |
| 10 | 15.73 | -4.53 | |
| 11 | 19.00 | -4.68 | |
| 12 | 21.23 | -4.97 | |
| 13 | 22.34 | -5.09 | |
| 14 | 24.60 | -5.35 | |
| 15 | 26.91 | -5.36 | |
| 16 | 29.31 | -5.55 | |

Report on water flow measurement-Lach Tray river

| TT | Distance from the left bank (m) | Supposed river bed altitude (m) | Legend |
|----|---------------------------------|---------------------------------|-------------------|
| 17 | 32.88 | -6.18 | |
| 18 | 34.09 | -6.26 | |
| 19 | 35.29 | -6.42 | |
| 20 | 37.74 | -7.37 | |
| 21 | 38.94 | -7.79 | |
| 22 | 40.24 | -8.15 | |
| 23 | 41.58 | -8.51 | |
| 24 | 44.09 | -9.22 | |
| 25 | 46.62 | -9.93 | |
| 26 | 49.05 | -10.65 | |
| 27 | 50.21 | -10.75 | |
| 28 | 51.41 | -11.11 | |
| 29 | 52.69 | -11.36 | |
| 30 | 55.16 | -11.72 | |
| 31 | 57.68 | -12.08 | |
| 32 | 58.97 | -12.13 | |
| 33 | 60.17 | -12.15 | |
| 34 | 61.43 | -12.10 | |
| 35 | 64.09 | -12.08 | |
| 36 | 66.77 | -11.72 | |
| 37 | 68.13 | -11.01 | |
| 38 | 69.43 | -10.29 | |
| 39 | 70.82 | -9.93 | |
| 40 | 72.20 | -9.58 | |
| 41 | 73.54 | -8.86 | |
| 42 | 74.86 | -8.15 | |
| 43 | 76.13 | -7.79 | |
| 44 | 78.54 | -6.74 | |
| 45 | 79.74 | -6.52 | |
| 46 | 80.92 | -6.51 | |
| 47 | 83.15 | -5.83 | |
| 48 | 84.25 | -5.22 | |
| 49 | 90.99 | -2.60 | |
| 50 | 93.22 | -1.95 | |
| 51 | 94.30 | -1.00 | Right shore water |
| 52 | 95.22 | 0.00 | Right bank |

4. REMARKS ON MEASUREMENT RESULTS.

Based on flow measurement results (shown in table 1) and distribution of water velocity at the cross-section, following remarks can be made:

- ✓ Although the measuring schedule is specific and detail, and the measuring location is strongly affected by tide regime which is difficult for hydrological survey, the survey's set purposes has been met, ensuring the tight time schedule requirement and measurement results at high tide, low tide and other extremes.
- ✓ The accuracy of machine is high, differences between two measurement times at the same measuring location is negligible. The results are, therefore, reliable and can be used in serve for technical designing.
- ✓ The measurement results fully presents the distribution of water flow and direction (clearly shown during high tide and low tide), and can be used for intensive researches and design in the long run.
- ✓ The cross-section measurement results ensures high accuracy (the depth of river bed is an assumption).

Hình 1: Mặt cắt ngang sông Lach Tray (Cống Đổng Lấp, thôn 3, xã Vĩnh Niệm)

Figure 1: CROSS-SECTION OF LACH TRAY RIVER
(*Sewer Đổng Lấp, hamlet 3, village Vĩnh Niệm*)

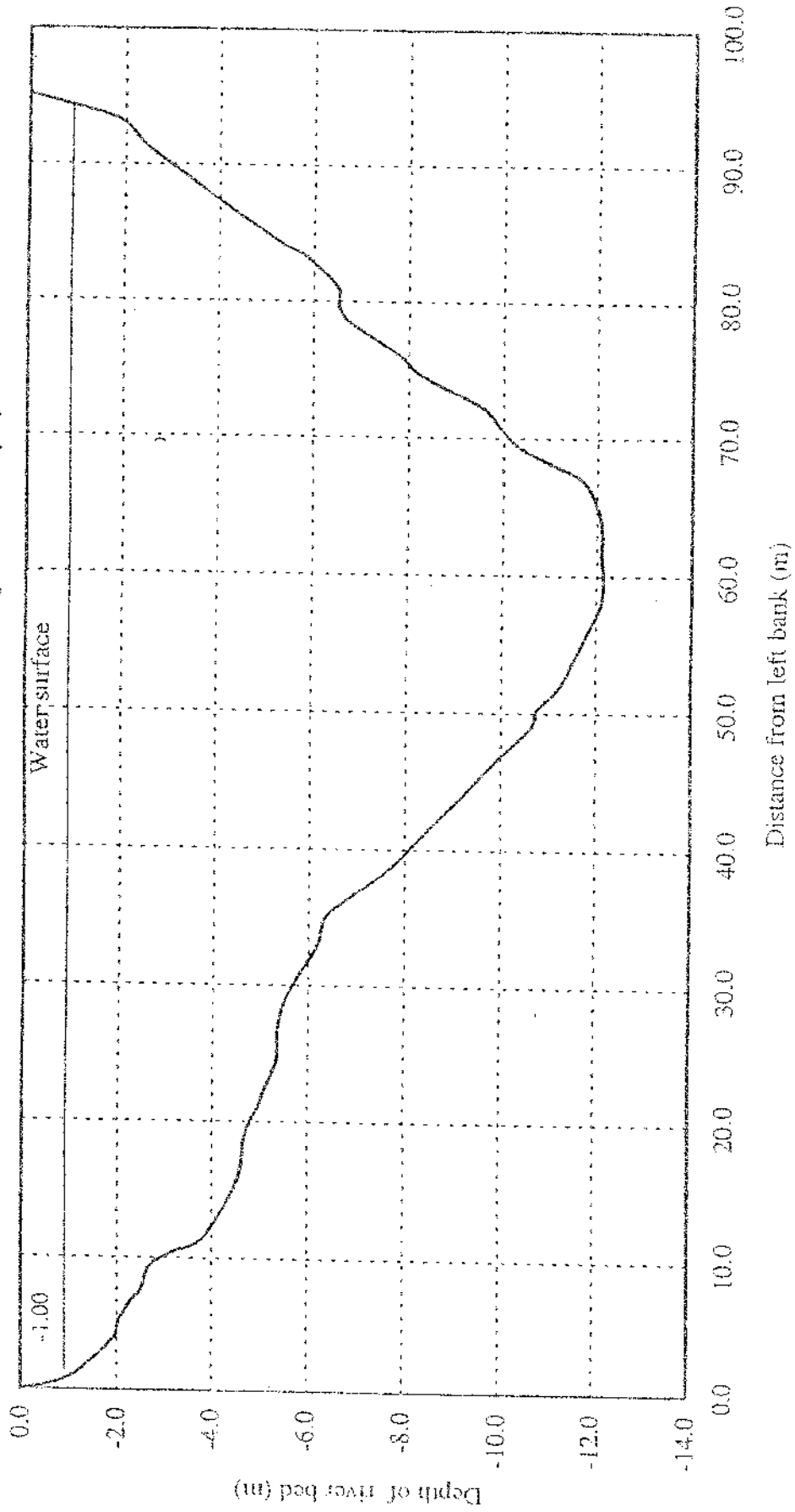


Figure 2: flow and topographical measurement at river bed

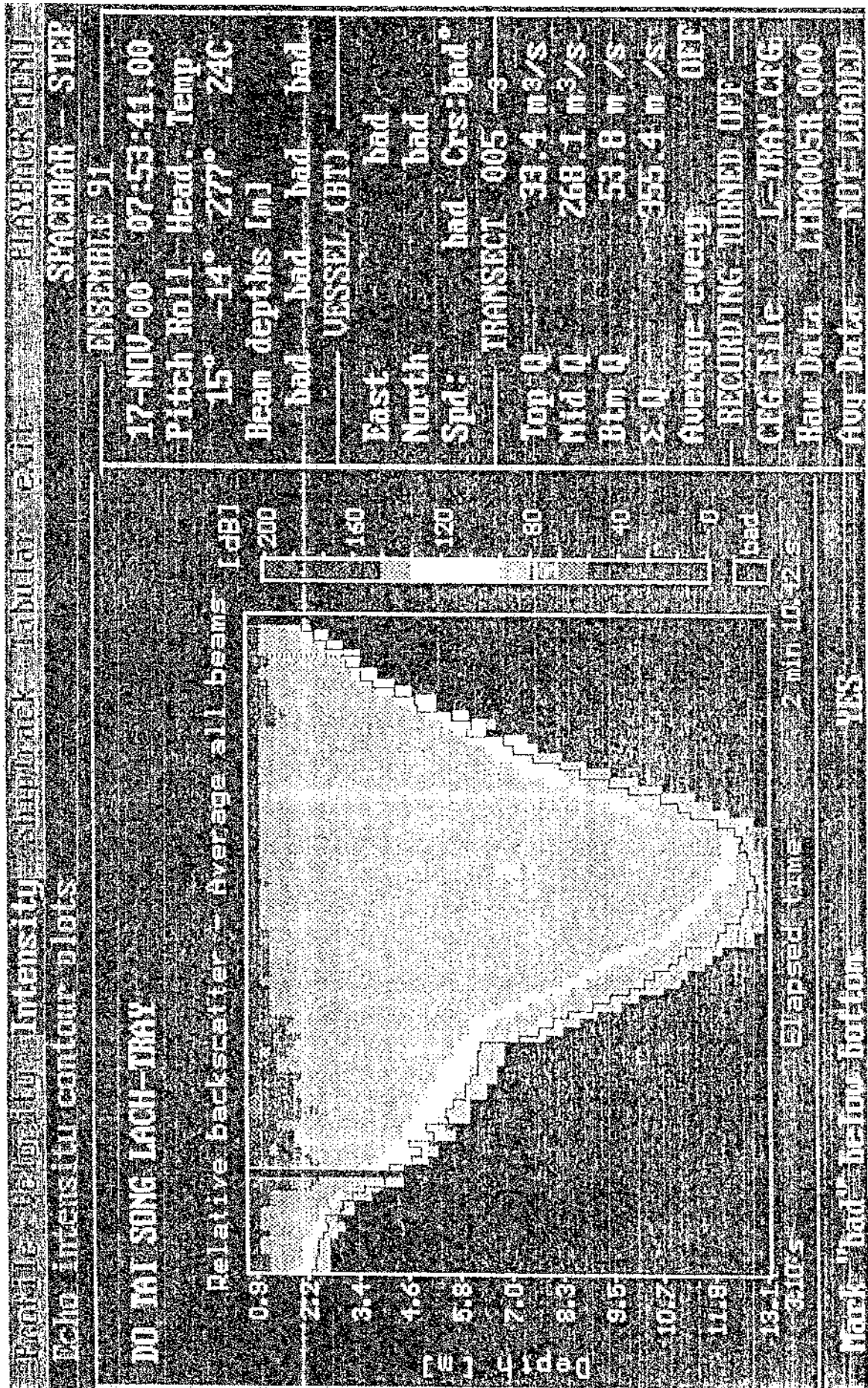


Figure 3: flow measurement result of each segment of cross-section

| Profile | | 17-NOV-00 07:53:41.00 | |
|--|-------------------------|-----------------------|-------------------------|
| Toggle side channel discharge estimate on or off | | Pitch Roll Head Temp | |
| ESTIMATE NEAR SHORE DISCHARGE | | 15° -14° 277° 24C | |
| Starting distance (boat to shore): | 4.00 m | Beam depths [m] | bad bad bad bad |
| Mean velocity mag first segment | 0.00 cm/s | VESSEL (HT) | bad |
| Start shore discharge estimate | 0.0 m/s | East | bad |
| Ending distance (boat to shore) | 2.00 m | North | bad |
| Mean velocity mag last segment | 0.00 cm/s | Spd: | bad Cps:bad |
| End shore discharge estimate | 0.0 m/s | TRANSECT | 005 |
| DISCHARGE(Q) TOTALS FOR TRANSECT 005 | | | |
| Top layer estimate | 33.4 m ³ /s | Top Q | 33.4 m ³ /s |
| Middle layer estimate | 268.1 m ³ /s | Mid Q | 268.1 m ³ /s |
| Bottom layer estimate | 53.8 m/s | Botm Q | 53.8 m/s |
| Start near shore estimate | 0.0 m/s | Σ Q | 355.4 m/s |
| End near shore estimate | 0.0 m/s | Average every | OFF |
| - RECORDING TURNED OFF | | | |
| CRG FILE L-TRAY.CRG | | | |
| Raw Data EXTRA005R000 | | | |
| Avg Data NOT LOADED | | | |
| TOTAL Discharge | 355.4 m/s | | |

Figure 4: Measurement results of water flow rate and direction

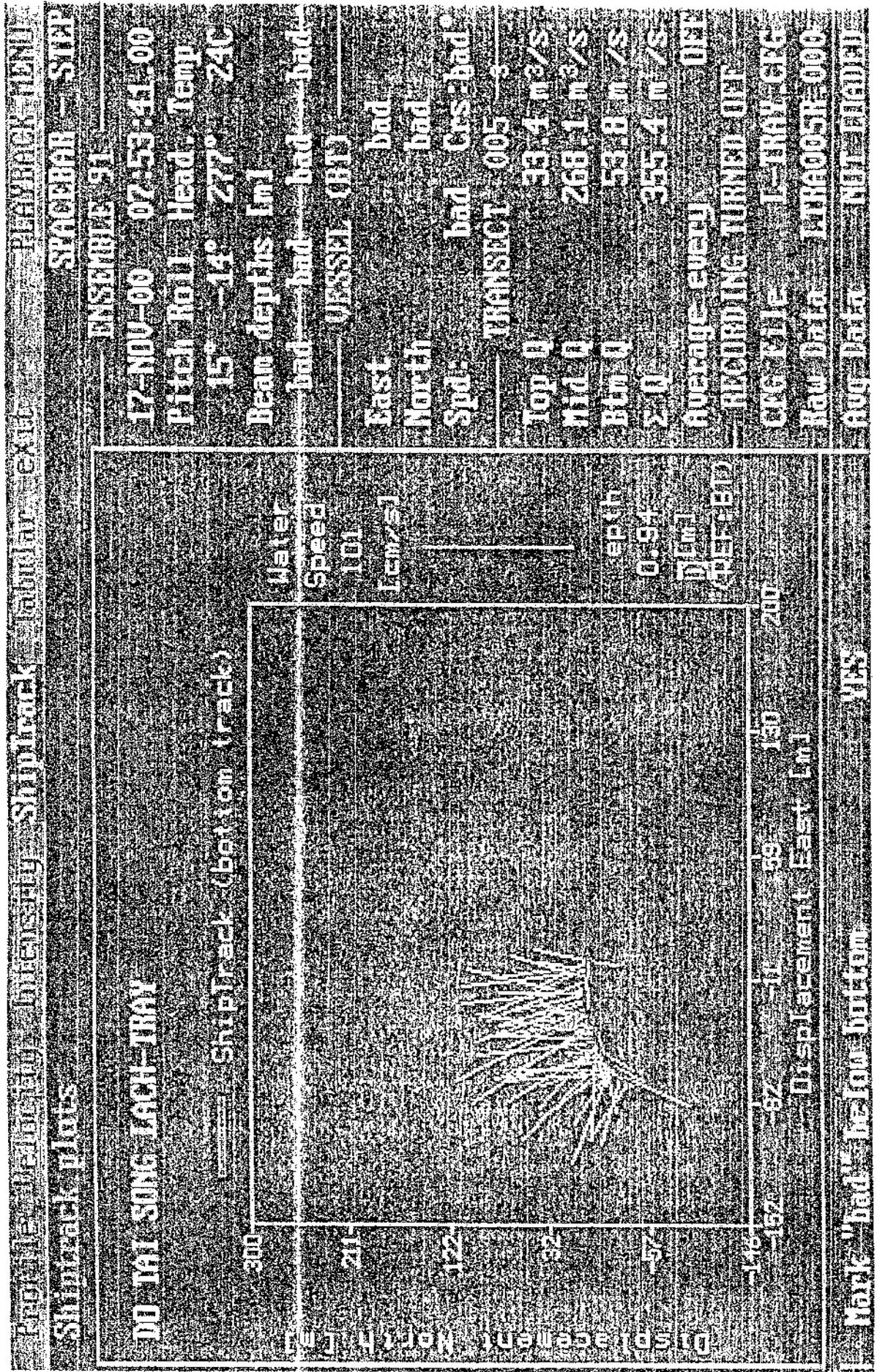


Figure 5: Measurement results of water flow rate and direction at low tide (13:22' on 17/11/2000)

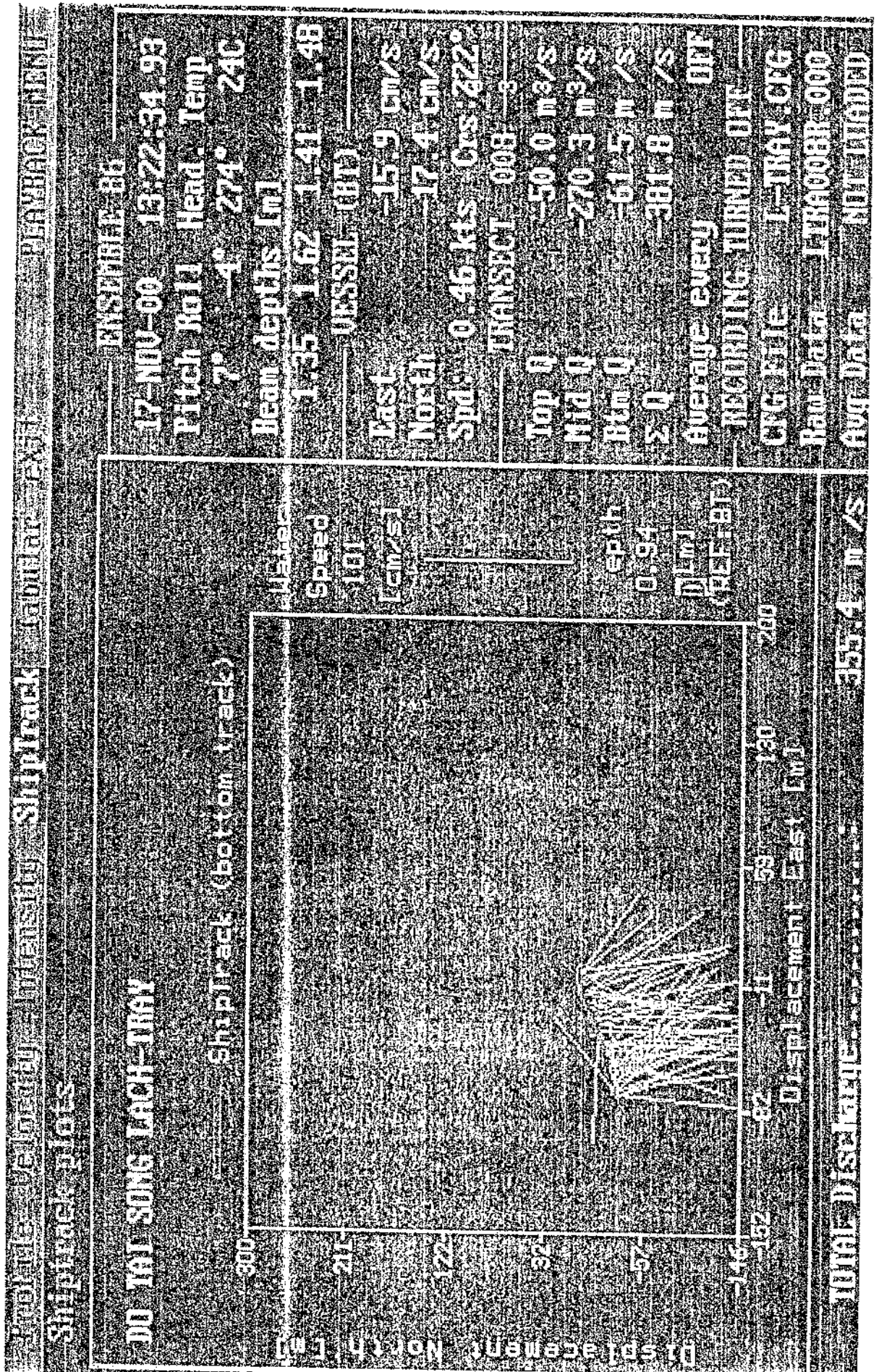


Figure 6: Measurement results of water flow rate and direction at low tide (20:19'55" on 17/11/2000)

