

C. Screening and Implementation Schedule

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C. SCREENING AND IMPLEMENTATION SCHEDULE

1 FIRST SCREENING

1.1 Procedure of the First Screening

The procedure of the First Screening is shown in the Figure C. 1.1.

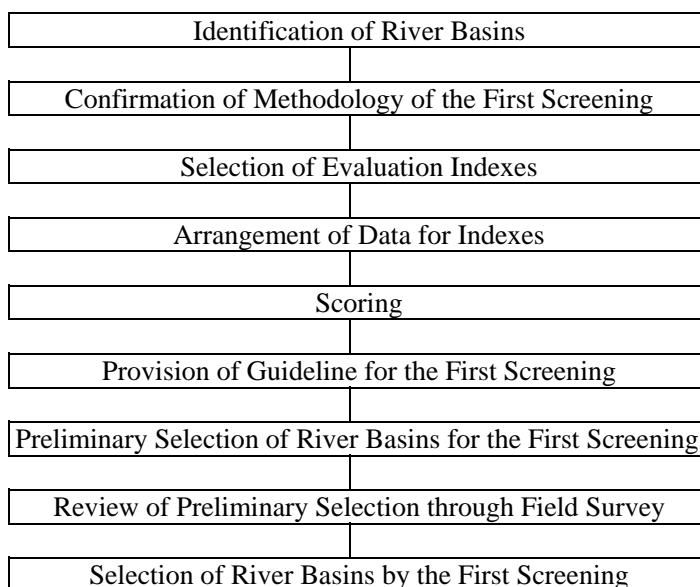


Figure C. 1.1 Procedure of the First Screening

The contents of these items are explained below.

(1) Identification of River Basins

The objective river basins for the First Screening are identified as to where 947 flood prone cities/municipalities belong.

(2) Confirmation of Methodology of the First Screening

The methodology of the First Screening is confirmed by referring to previously conducted studies. The proposed methodology is the scoring of evaluation indexes.

(3) Selection of Evaluation Indexes

Based on the confirmed methodology, evaluation indexes are selected. These evaluation indexes represent flood damage potential from the viewpoints of natural and socio-economic conditions.

(4) Arrangement of Data for Indexes

Based on the selection of the evaluation indexes, necessary data are collected and arranged. After these collection and arrangement, the data defined by administrative boundaries are converted into river basin data. In this conversion, GIS is utilized.

(5) Scoring

Based on the river basin data of the indexes for each river basin, the score of each index is given. As the results, the total score is calculated for each river basin.

(6) Provision of Guideline for the First Screening

For the First Screening, some other factors together with the ranking by score are considered and arranged as a guideline.

(7) Preliminary Selection of River Basins for the First Screening

Based on the above guideline, 100 river basins, of which adequacy will be confirmed through field survey including discussion with DPWH regional offices, are preliminarily selected.

(8) Review of Preliminary Selection through Field Survey

To confirm the adequacy of the preliminary 100 river basins, a field survey as well as the discussion with DPWH regional offices are conducted.

(9) Selection of River Basins by the First Screening

Through the above mentioned procedure, river basins are finally selected as the output of the First Screening.

1.2 Identifications of River Basins

The Study covers the 947 flood-prone cities/municipalities identified by the NDCC (refer to Tab. C-1-1). In this connection, identification of river basins, where such cities/municipalities belong to, is conducted following to the procedure below:

1.2.1 Basic Data and Information for Identification of River Basins

The administration boundary of the above cities/municipalities is derived from the information of NSO Census 2000 in the Philippines.

While, the identification of basin boundary of river basins related to the 947 cities/municipalities is carried out on a topographic map of 1:250,000 scale issued by NAMRIA, principally.

In the whole country of the Philippines, 421 river basins have been defined as principal river basins in the report "Principal River Basins of the Philippines" published by NWRC in October 1976. In the

report, principal rivers are defined as those with more than 40 km² in catchment area. Among these, 18 river basins with areas of more than 1,400 km² are classified as major river basins.

As to the identification of the principal river basins under the Study, both the above-said report prepared by NWRC and the topographic maps of 1:250,000 scale by NAMRIA are made as reference to verify their locations, river names, main watercourses and catchment areas. Besides, the delineation of the principal river basin boundaries is carried out with GIS software and the digital elevation model data of the whole country of the Philippines, which is prepared by NASA in 2000. The number of principal and major river basins, which are related to the targeted cities/municipalities, in respective the water resources region is tabulated in from Tab. C-1-2 to Tab. C-1-4, respectively.

1.2.2 Other River Basins

The other river basins are defined as the remaining river basins with the exception of principal river basins. In the Study, such other river basins are delineated and identified on the topographic map of 1:250,000 scale of NAMRIA. The other river basins amount to 770 as shown in the Tab. C-1-5 and Tab. C-1-6 and the catchment areas are in the range between about 3 km² to 982 km². It is specified that most of the river basins are located along the narrow coastal area of each island.

As for the name of other river basin, it is difficult to extract all river names from the map of 1:250,000 scale because there are some rivers whose name is not indicated on the map. In this Study, these other river basins temporarily adopt the name of the neighboring city/municipality. The real names of other river basins are to be confirmed through the field survey.

1.2.3 River Basins Covering the Flood Susceptible Areas

According to the results of delineation for principal river basins and other river basins, it has been identified that the total number of river basins covering the flood prone areas is 1,164 river basins including major river basins. The total number of river basins is given in the following table:

Table C. 1.1 Total Number of River Basins

River Basins	Number	Remarks
Independent Principal River Basins	376	Including 75 Tributaries of Major Rivers
Major River	18	
Other River Basins	770	
Ground Total	1,164	Covering the Flood Prone Areas

The relationship between the river basins and cities/municipalities of NDCC list is shown in Fig. C-1-1.

1.3 Confirmation of Methodology of the First Screening

1.3.1 Method Adopted in Previous Studies

(1) Previous Related Studies

Two studies were previously conducted relating to the flood risk assessment in the Philippines. These are “Development of the Method for Assessing the Flood Vulnerability, 2004 - 2006” and “Natural Disaster Risk Management in the Philippines, 2004“. The salient features of these studies were, as follows:

- 1) **“Development of the Method for Assessing the Flood Vulnerability (including two successive reports)”, National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure and Transport of the Japanese Government, 2004-2006.**

Flood prevention work is usually time consuming by using either the structural or non-structural measures. In order to assist these policy decisions, it is vital to develop a method for assessing flood vulnerability. One potential method to assess flood risk is to build the index by combining several cause-effect components from a range of available data. The objective of this study was to develop the Flood Vulnerability Index (FVI) for assessing the flood vulnerability of the river basins in Japan and Asia Monsoon Area, to serve as a tool for assessing the flood risk due to climate change in the context of changing of socio-economic conditions and political activities.

- 2) **“Natural Disaster Risk Management in the Philippines”, First Study and Follow-on Study, the World Bank, May 2004 and November 2004**

The implementing agency was the National Disaster Coordinating Council (NDCC). The First Study was “Natural Disaster Risk Management in the Philippines: Enhancing Poverty Alleviation through Disaster Reduction” from May 2003 to May 2004. The First Study overviewed the impacts of natural disasters on the social and economic development, assessed the country’s current capacity to reduce and manage disaster risk, and identified options for more effective management of the risk.

The Follow-on Study was the supporting study for the First Study, and presented supplemental information of the condition of natural disasters and directions for necessary actions for improving disaster management including strengthening data, risk model and hazard map preparation. The objectives of Follow-on Study were to analyze the following three components:

- Review loss potential of catastrophic earthquake, volcanic eruptions, typhoons, floods, and sediment disasters;
- Assessment of inventory data requirements of the NDCC and its members; and
- Review the mapping requirements for hazards.

(2) Results of the Previous Related Studies

1) “Development of the Method for Assessing the Flood Vulnerability”

a) FVI Indicators applied in the Philippines

Eleven (11) FVI indicators were considered in four components: climate, hydrological, socio-economic and countermeasures. The details are shown in Table C. 1.2.

Table C. 1.2 FVI Indicators Applied in the Philippines

FVI Components	FVI Indicators		Definition
Climate (C)	I ₁	Tropical Cyclone Passage 5-Year Average Frequency	The number of tropical cyclone passage in the basin in 5 years (times/ 5 years)
Hydrological (H)	I ₂	River Gradient	Basin-wide average slope (degree)
	I ₃	Urbanized Area Ratio in Basin	Highly urbanized area ratio in basin (%)
Socio-Economic (S)	I ₄	TV Penetration Rate	The number of TV units per 1,000 persons (units/ 1,000 persons)
	I ₅	Literacy Rate	Literacy rate of population 10 to 64 years old (%)
	I ₆	Population Rate under Poverty	Poverty incidence of population (%)
	I ₇	Years Sustaining Healthy Life	Projected life expectancy at birth (year)
	I ₈	Population Density in Basin	Population density in basin (persons/ km ²)
Counter measures (M)	I ₉	Infant Mortality Rate	Infant mortality rate under 1 year of age (%)
	I ₁₀	State of Structural Countermeasures	Based on the expert judgment
	I ₁₁	State of Non-structural Countermeasures	Based on the expert judgment

b) Formulation of FVI Equation for Major River Basins

FVI was estimated using the formula below, and applied for major river basins in the Philippines. The type of the formula and the weights for the each component (W_c, W_h, W_s, W_m) were determined by try and error method so that the correlation coefficient between FVI and flood damages (casualties, affected people, damaged houses, and damaged properties) shows the maximum.

In the actual calculation of the FVI, each indicator (I₁–I₁₁) was converted into a non-dimensional value, namely, giving 0 for the worse basin, and giving 1 for the best basin.

$$FVI = \frac{w_c C + w_h H + w_s S}{w_m M} = \frac{3 \times I_1 + 2 \times \frac{\sum_{l=2}^3 I_l}{2} + \frac{\sum_{m=4}^9 I_m}{6}}{\frac{\sum_{n=10}^{11} I_n}{2}}$$

Where, C: Indicator for climate component (I_1)
H: Indicators for hydrological component ($I_2 - I_3$)
S: Indicators for socio-economic component ($I_4 - I_9$)
M: Indicators for countermeasures component ($I_{10} - I_{11}$)
Wc, Wh, Ws, Wm: Weights for each component

c) Results of FVI Assessment

The FVIs methodology was applied for the 18 major river basins in the Philippines, and the results are shown in Tab. C-1-7. The higher is the value of the FVI, the higher the flood vulnerability. Based on the results, the Abulog, Abra and Davao River Basins showed high flood vulnerability.

2) “Natural Disaster Risk Management in the Philippines”

a) Indexes used in Study

Five indexes were used in this study, and were estimated based on the affected persons, property damage, frequency of destructive typhoons and flashfloods. All of these indexes were prepared for each province, as shown below:

- Affected Persons per Year by Destructive Typhoons (persons/year)
- Annual Property Damages by Destructive Typhoons (pesos/year)
- Per-capita Annual Property Damages by Destructive Typhoons (pesos/year/person)
- Frequency of Destructive Typhoon including Flood Disaster (times/year)
- Frequency of Flashflood Disasters (times/year)

b) Results of Assessment

Based on the above indexes, eight problem areas were identified in this study. These areas were: 1) northeastern Luzon; 2) northwestern Luzon; 3) central Luzon; 4) Metro Manila; 5) Bicol and surroundings; 6) southern Luzon and eastern Mindoro; 7) south and northeastern Panay and western Negros; and 8) Leyte and northeastern Mindanao. The river basins included in these problem areas are shown in Tab. C-1-8.

1.3.2 Selection of Methodology

(1) Methodology Adopted in the Previous Studies

As discussed in the previous section, there were two studies related to flood risk assessment. The salient features of the methodology adopted in these studies are, as follows:

1) “Development of the Method for Assessing the Flood Vulnerability”

In this study, 11 FVI indicators were selected and each indicator was valued. Each value of the FVI indicator was then converted into non-dimensional value. On the other hand, the weights for indicators were decided so that the calculated FVI values had high correlation with flood damages. The FVI value for the objective basin was calculated, and the flood vulnerability of river basins was evaluated.

2) “Natural Disaster Risk Management in the Philippines”

In this study, five indexes were selected in order to identify the flood problem areas. However, scoring and ranking were not considered in this study.

(2) Selected Methodology of the First Screening

Referring to the idea in the previous studies, the methodology for the First Screening is decided considering 1) evaluation indexes and 2) scoring, as follows:

1) Evaluation Indexes

The evaluation indexes are to be built from the range of available data to represent the flood risk potential of the river basins.

2) Scoring

Score is decided for each river basin based on the evaluation results of the indexes, and the First Screening is conducted on the basis of this score.

1.4 Selection of Evaluation Indexes

The evaluation indexes should express the flood risk or flood damage potential of the river basins. In this sense, evaluation indexes should include flood casualties and damages.

The flood damage potential can be studied from the two aspects, socio-economic and natural conditions. In the selection of indexes, the availability of data is also considered. Following to these, the evaluation indexes are selected, as follows:

1.4.1 Indexes for Socio-economic Conditions

From the viewpoint of the relationship to flood risk, the indexes for socio-economic conditions are classified into two groups, direct and secondary indexes. The direct indexes show the conditions on flood casualties and damages of river basins. On the other hand, the secondary indexes show the conditions on assets, flood vulnerability, etc. of river basins.

The selected secondary indexes are: (S1) poverty incidence; (S2) population; (S3) population movement; (S4) production; (S5) forest cover ratio; and (S6) built-up area ratio. On the other hand, the selected direct indexes were (S7) flood casualties and (S8) flood damages. For the selection, it is considered that the indexes should not be disadvantageous to rural or poor areas. The details of these indexes are shown in Table C. 1.3.

Table C. 1.3 Evaluation Indexes for Socio-Economic Conditions

Index		Explanation	Relation to Flood Risk
S1	Poverty Incidence	Poverty incidence is an index on protection areas from the viewpoint of poverty reduction.	Secondary
S2	Population	Population is an index for flood damages.	Secondary
S3	Population Movement	Population movement is an index for flood damages.	Secondary
S4	Production	Production can be an index for assets.	Secondary
S5	Forest Cover Ratio	Forest cover ratio has strong relationship with flood and sediment runoff.	Secondary
S6	Built-up Area ratio	Built-up area ratio has strong relationship with flood runoff.	Secondary
S7	Flood Casualties	Flood casualties are one of the major indexes of flood damages.	Direct
S8	Flood Damages	Flood monetary damages are one of the major indexes of flood damages.	Direct

1.4.2 Indexes for Natural Conditions

Same to the socio-economic conditions, the indexes for natural conditions are classified into two groups, direct and secondary indexes. The direct indexes show the flood frequency, while the secondary indexes show the flood susceptibility from the viewpoints of meteorology, hydrology, topography and geology of river basins.

The selected secondary indexes are: (N1) frequency of tropical cyclone; (N2) rainfall intensity; (N3) river gradient; and (N4) ratio of hazards zone of volcano. On the other hand, the selected direct indexes are: (N5-C) frequency of floods based on flood casualty data; and (N5-D) frequency of floods based on flood damage data. The details of these indexes are shown in the Table C. 1.4.

Table C. 1.4 Evaluation Indexes for Natural Conditions

Index		Explanation	Relation to Flood Risk
N1	Frequency of Tropical Cyclone	Tropical cyclones are one of the major causes of floods.	Secondary
N2	Rainfall Intensity	Heavy rainfalls are another major causes of floods.	Secondary
N3	River Gradient	River gradients have strong relationship with flashfloods, debris flows, mudflows and lahars.	Secondary
N4	Ratio of Hazards Zone of Volcano	Volcano has strong relationship with flashfloods, debris flows, mudflows and lahars.	Secondary
N5-C	Frequency of Floods based on Flood Casualty Data	Frequency of floods is one of the major indexes of floods.	Direct
N5-D	Frequency of Floods based on Flood Damage Data	Frequency of floods is one of the major indexes of floods.	Direct

1.5 Arrange of Data for Indexes and Scoring

1.5.1 Data Collection

In line with the selected evaluation indexes, necessary data are collected. The details of collected data are shown in Tab. C-1-9.

Levels of the collected data are, as follows:

- | | |
|--|--|
| (1) City/municipal Level Data: | Population (S2 and S3) and Flood casualties (S7) |
| (2) Provincial Level Data: | Poverty incidence (S1), Production (S4), Flood damages (S8) and Frequency of tropical cyclones (N1) |
| (3) Other Level Data:
(nationwide GIS data) | Forest cover ratio (S5), Built-up area ratio (S6),
Rainfall intensity (N2), River gradient (N3) and Ratio of hazards zone of volcano (N4) |

1.5.2 Data Arrangement

As mentioned above, the data levels of evaluation indexes are: 1) city/municipal level data; 2) provincial level data; or 3) other level data (nationwide GIS data). Since the flood risk of identified river basins is to be assessed, the city/municipality level data (S2, S3 and S7) and provincial level data (S1, S4, S8 and N1) are to be converted into river basin level data. On the other hand, for the other level data (S5, S6, N2, N3 and N4), the river basin level data should be extracted directly from the GIS data. Details of the river basin data are shown in Tab.C-1-13, and the level of each index for each river basin is shown in Fig.C-1-5 to C-1-18.

For the conversion of city/municipal/provincial level data, GIS is utilized in principle. The major method used is area weighted average, and its basic procedure is, as follows (for details, refer to Supporting Report B):

- Within one river basin, the areas of related provinces/cities/municipalities are estimated using GIS; and
- Based on the areas and the corresponding basic values, the index value of the river basin is calculated using MS Excel.

Regarding S7 index, it is hard to identify the occurrence locations of the casualties of all relating cities/municipalities. Under this condition, S7 index is prepared considering casualties per year and basin area. For the arrangement of other level data, direct overlay method, etc. is applied.

1.5.3 Determination of Maximum Score

The score quantifies each evaluation index for the 1,164 river basins. The ranges of score for each evaluation index are determined taking into account the features and significance of evaluation index. The score is determined through the discussions with the counterpart agencies for the Study, as follows:

- In principle, a maximum of 5 points ranging from 1 to 5 is given to every index;
- Among these indexes, a maximum of 15 points ranging from 1 to 15 is given to the indexes of flood casualties and damages, since these indexes show the flood vulnerability directly, while the other indexes show it indirectly except flood frequency; and

- As for the flood frequency, this index can be indirectly evaluated in two cases; one is derived from the records of flood casualty and the other is from flood damage separately, and 5 points are given for each flood frequency in two cases.

The proposed scores including ranges are shown in Tab. C-1-14.

1.5.4 Distribution of Score

The maximum score for the respective evaluation indexes is determined as discussed in the previous section, and the respective scores needs to be assigned a range of basin value. In order to determine these ranges, the distribution of the basin values is studied for respective evaluation indexes as shown in Fig.C-1-19 to Fig.C-1-31. Based on these distributions, the ranges of scores are determined so as to easily identify the difference of the score of each river basin. The score given to each river basin is shown in Fig.C-1-19 to Fig.C-1-31 and Tab.C-1-15. The distribution of each evaluation index is described below (refer to Fig.C-1-19 to Fig.C-1-31).

(1) Score Distribution on Poverty Incidence (S1)

- Poverty incidence rather concentrates in the Visayas and Mindanao island groups rather than the Luzon Islands.
- Poverty incidence of over 26% is found in 80% of river basins of less than 40 km² in catchment area, 88% of 40 to 1,400 km², and 84% of over 1,400 km².

(2) Score Distribution on Population (S2)

- It is shown that 91% of the 1,164 river basins have the population of less than one hundred thousand (100,000) people, while only 0.9% of the river basins have the population of over one (1) million persons. The significant river basins with the population of over one million persons are given in the following Table C. 1.5 and Tab. C-1-16.

Table C. 1.5 Significant River Basins

Island Group	Name of River Basins
Luzon	Cagayan (M), Pampanga (M), Pasig-Laguna (M), Agno (M), Rio Chico (P), Marikina (P), Guagua (O) and Manila (O)
Visayas	Bicol (M)
Mindanao	Agusan (M), Mindanao (M)

Note: (M) Major River Basin, (P) Principal River Basin, (O) Other River Basin

- Population for catchment areas below 40 km² is less than one hundred thousand people. The seven (7) major river basins shown above have 30% of the population of the whole country and the total catchment areas of these river basins correspond to about 30% of the land area of the Philippines.

(3) Score Distribution on Population Movement (S3)

- Out of the 1,164 river basins, 67% have the upward population movement ranging from 1% to 7% and the population movement of the respective island groups is 58% in Luzon, 69% in Visayas and 77% in Mindanao.
- The population movement in the top 26 river basins having over 1,400 km² of catchment area is going up ranging from 1% to 9.5% in comparison with year of 2000 and 2005. The population movement in the 26 river basins corresponds to about 84% of all river basins of over 1,400 km². Tab. C-1-17 shows the top 10 river basins on population movement with over 1,400 km² of catchment area.

(4) Score Distribution on Production (S4)

- 78% of the 1,164 river basins have the production of less than 1 billion pesos in total, while 71% of the production is provided by the top 55 river basins that earn the production of more than 5 billion pesos. Tab. C-1-18 shows the production of river basins.
- The production of most river basins having the catchment areas of less than 40km² is less than 1 billion pesos. Therefore, in connection with catchment areas with population (S2), those river basins have a rather small property to protect from flood damage.

(5) Score Distribution on Forest Cover Ratio (S5)

- The river basins having the forest cover ratio of below 20% correspond to 59% of the 1,164 river basins, namely, 54% of Luzon, 76% of Visayas and 60% of Mindanao. On the other hand, the river basins having the forest cover ration of over 80% is composed of 11% of Luzon, 0.5% of Visayas and 2% of Mindanao, which correspond to 7% of the 1,164 river basins.

(6) Score Distribution on Built-up Area Ratio (S6)

- The river basins having the built-up ratio of below 5% correspond to 95% of the 1,164 river basins, while the river basins having the built-up ratio of over 20% correspond to only 0.6% of the 1,164 river basins.
- As for the river basins with a catchment area of over 1,400 km², two river basins are located in two levels as the highest score, namely Guagua (built-up area: 102km²) and Pasig-Laguna (built-up area: 242km²).

(7) Score Distribution on Flood Casualties (S7)

- The river basins with flood casualties of below $1 \frac{\text{Persons}}{\text{Year}} \cdot \frac{\text{km}^2}{100}$ correspond to 91% of the 1,164 river basins, while the worst scores of over $14 \frac{\text{Persons}}{\text{Year}} \cdot \frac{\text{km}^2}{100}$ are concentrated in the

Luzon island groups. Especially, most river basins having the worst scores in Luzon Island are located in the western coastal area of Region IV-A.

(8) Score Distribution on Flood Damages (S8)

- The river basins having flood damages of below 3 million pesos/year correspond to 89% of the 1,164 river basins. As for the Luzon island group, the occurrence of flood damage is observed significantly in all score categories.
- The river basins suffering from the worst flood damages are shown in Tab. C-1-19.

(9) Score Distribution on Frequency of Tropical Cyclones (N1)

- The river basins having the frequency of below 0.5 times/year correspond to 76% of the 1,164 river basins, while the 25 river basins having the most frequency belong to Cagayan Province in Luzon Island. Additionally, the all river basins of the Mindanao island group belong to the frequency of below 1 time/year.

(10) Score Distribution on Rainfall Intensity (N2)

- The river basins having the rainfall intensity of more than 255mm/day correspond to 88% of the Luzon island group, 76% of the Visayan island group and 66% of the Mindanao island group.
- The river basins in Luzon island group have the highest rainfall intensity among the three major island groups, while the river basins in the Visayan island group have the lowest rainfall intensity.

(11) Score Distribution on Riverbed Gradient (N3)

- The river basins having the riverbed gradient of gentler than 10 degrees correspond to 87% of the 1,164 river basins. However, 11% of the river basins belong to the range of 10-15 degrees, which is defined as debris flow conveyance zone in the Japanese standard. According to the study results on debris flow in Japan, the occurrence of debris flow composed of big boulder stones is expected in the river basins having the riverbed slope gradient of steeper than 15 degrees. The river basins expecting the occurrence of debris flow are 8 river basins in Luzon, 2 river basins in Visayas and 7 river basins in Mindanao.
- The river basins expecting the occurrence of debris flow are shown in Tab. C-1-20.

(12) Score Distribution on Ration of Hazards Zone of Volcano (N4)

- The river basins given point 1 correspond to 87% of the 1,164 river basins. The river basins covered with the volcano area of more than 50% are 11 river basins. The 11 river basins are shown in Tab. C-1-21.

(13) Score Distribution on Flood Frequency based on Flood Casualties (N5-C)

- The river basins given point 1 correspond to 84% of the 1,164 river basins. The Visayan island group does not have the flood frequency of more than 3 times and the Mindanao island group does not have the experience of more than 5 times, while the Luzon island group has three river basins having the flood experiences of more than 7 times in 10 years.
- The three river basins having the most flood frequencies are shown in Tab. C-1-22.

(14) Score Distribution on Flood Frequency based on Flood Damages (N5-D)

- Flood damages in the Luzon island group is inflicted every year and it is assumed that the frequency of flood damage is more than the frequency of flood casualty in comparison with index N5-C. Especially, the tendency of flood occurrence in the Luzon island group is significant.
- The river basins with no flood experience correspond to 23% of the 1,164 river basin.
- The number of river basins is roughly divided into equal shares on the category of catchment areas and urban/general river basins.

1.6 Preliminary Selection for the First Screening

1.6.1 Scoring Results

(1) Order of River Basin by Score

In the First Screening, 1,164 river basins are prioritized based on the total score. The prioritization from first place to 100th place is shown in Tab. C-1-23 and the detail of prioritization for 1,164 river basins is tabulated in Tab. C-1-24.

(2) Sensitivity Analysis

The sensitivity analysis in the First Screening is carried out in order to confirm the influence on ranking of the points for indexes S7 (flood casualties) and S8 (flood damages). Both indexes directly show the flood damage potential of the river basins. Under these conditions, the sensitivity analysis is conducted for three cases, as follows:

Case-1: 10 points are given for indexes S7 and S8;

Case-2: 15 points are given for the both indexes; and

Case-3: 20 points are given for the both indexes.

The results of the analysis are shown in the Tab. C-1-25. This table shows the top 50 ranking under the three cases. The colors in the table indicate the existence of river basins under the cases. Based on this table, the following items are considered:

- Some river basins are replaced by the other river basins with the change of score (from 15 points to 10 or 20 points) for two indexes; and

- The number of such river basins is only around 3-8 among the top 50 river basins for the score of 15 points.

Hence, 15 points is applied since the influence is minimal.

1.6.2 Issues of Scoring

The results and remaining issues of scoring are described below:

(1) Outputs obtained from the Scoring

The results of the scoring are, as follows:

- Relation between province/city/municipality and river basin has been identified;
- Basic data for evaluation of flood risk have been arranged;
- Flood risk areas on the river basin level have been identified; and
- System for evaluation of each river basin has been provided. Therefore, flood risk of each river basin can be easily re-evaluated adding new flood damage data.

(2) Remaining Issues on the Scoring

On the other hand, the remaining issues on the scoring are, as follows:

- Data obtained through this Study are very limited. Therefore, evaluation results do not always correspond to the recognition of flood risk for agencies concerned; and
- Data on flood damage should be collected as much as possible in addition to the data so far collected in the future.

1.6.3 Guideline on Preliminary Selection for the First Screening

Considering the above issues and the strategic points, the guideline for the First Screening is prepared.

The considered strategic points are, as follows:

- Classification of river basins (major river basins, principal river basins and other river basins);
- Dangerous river basins, defined as “river basins that have experienced severe flood damages, and are duly recognized as having a high risk of occurrence of devastating flood damages, and necessity of provision of countermeasures within a short period of time by everyone concerned”; and
- Regional distribution.

The prepared guideline is described below.

(1) Guideline 1:

- From the 100 river basins in the list, those already implemented or implementation is scheduled by the DPWH, such as Laoag, Pampanga, Pasig are replaced by the river basins after the 100 rank.
- The said river basins shall be extracted from “Water & Floods, March 2004” prepared by the DPWH (GOJ Assisted Projects: 1971 –Present). On the other hand, the river basins listed with requests for foreign-assisted projects in DPWH Medium-Term Investment Program are shown in Tab. C-1-26.

(2) Guideline 2:

- Major river basins and dangerous river basins on flood events are selected regardless of rank.
- The dangerous river basins are referred to “Water & Floods, March 2004” prepared by the DPWH.

(3) Guideline 3:

- At least a few river basins of higher rank shall be included in each administrative region.

(4) Guideline 4:

- For the remaining number of the river basins, 80% and 20% of river basins are allocated to “Principal river basins” and “Other river basins”, respectively.

1.6.4 Preliminary Selection of River Basins through the First Screening

The 100 river basins are selected preliminarily based on the guideline above mentioned. Tab. C-1-27 gives a list of the selected 100 river basins, and Fig. C-1-32 shows their locations. The composition of the 100 river basins is described below.

(1) Viewpoint of First Screening Guideline

Out of 18 major river basins, 14 major river basins are selected excluding Pampanga, Agno, Pasig-Marikina-Laguna Bay and Agusan. As the dangerous river basins, 20 river basins are selected. On the other hand, 47 river basins are allocated for each region. The total number of the above river basins is 81, while the remaining 19 river basins are allocated as: 15 to principal river basins (80%), and 4 to other river basins (20%). The details are shown in Table C. 1.6.

Table C. 1.6 River Basins from Viewpoint of Guideline

River Basins	Number of River Basins
Major River Basin	14
Dangerous River Basin	20
Allocated River Basins for Each Region	47
Allocated Principal River Basins	15
Allocated Other River Basins	4

(2) Category of River Basins

Among those included in the 100 river basins mentioned above are 14 major river basins, 69 principal river basins and 17 other river basins, a very important aspect of the selection process, as shown below.

Table C. 1.7 Category of River Basins

Category of River Basins	Number of River Basins
Major River Basin	14
Principal River Basin	69
Other River Basin	17

(3) Regional Distribution

The regional distribution of the 100 river basins is shown in Tab. C-1-28. In the guideline 3 of the First Screening, it is mentioned that a few river basins with higher rank are included in each administrative region. As a result, the average number per region becomes 6 river basins.

The details of the following procedures are described in the Supporting Report D:

- *Review of Preliminary Selection through Field Survey; and*
- *Selection of River Basins by the First Screening.*

2 SECOND SCREENING AND IMPLEMENTATION SCHEDULE

2.1 Objective and Procedure of the Second Screening

2.1.1 Objective of the Second Screening

The objective of the Second Screening is to further narrow down the 120 river basins selected through the First Screening to those that could be implemented within the target period of 26 years from 2009 to 2034.

2.1.2 Procedure of the Second Screening

(1) Key Points to be considered for the Second Screening

In the selection of 120 river basins during the First Screening, the following points are considered:

- Ranking by scores for 14 evaluation indexes of flood vulnerability based on the statistic data;
- Strategic significance of river basins such as major river basins and high flood risk river basins (dangerous river basin); and
- Regional distribution of flood control projects.

For the Second Screening, the following key points are further considered:

- Prioritization by ranking of river basins with newly obtained scores;
- Consideration of possible investment amount;
- Regional distribution of flood control projects; and
- Strategic significance of river basins.

(2) Procedure of the Second Screening

In due consideration of the above key points, the Second Screening is done, as follows:

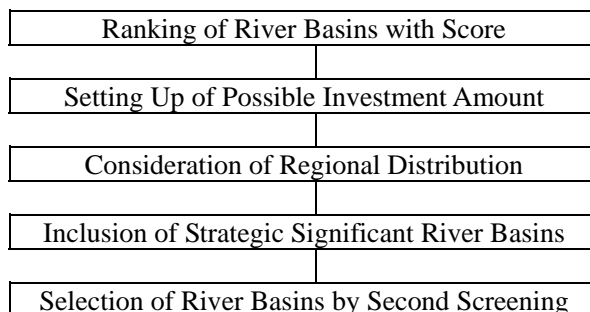


Figure C. 2.1 Basic Procedure of the Second Screening

1) Ranking of River Basins with Score

The prioritization of river basins for project implementation has been, in principle, given by ranking based on the new score. As for the new score, the scores based on economic efficiency, which is one of the essential points to identify the viability of projects, is newly examined and, finally, the aggregated score of those based on economic efficiency and that obtained in the First Screening is applied.

2) Setting up of Possible Investment Amount

For the above prioritization, the number of river basins is first be narrowed down considering the amount of possible investment by the DPWH for the target period of 26 years from 2009 to 2034.

3) Consideration of Regional Distribution

Development of the country should be promoted equally for every region without any discrimination. From this point of view, it is necessary to arrange infrastructure such as flood control projects for every region. In this context, at least a few river basins for each of the 17 administrative regions should be arranged in the list of Second Screening.

4) Strategic Significance of River Basins

Besides the above, some river basins, which are generally recognized as significant for the provision of flood control projects like the major river basins, should be included in the list regardless of the rank.

2.2 Basic Analysis for the Second Screening

2.2.1 Analysis for Cost Index

(1) Methodology

For the Second Screening, economic efficiency (cost and benefit) is examined for the selection of 120 river basins. However, it is virtually impossible to estimate such cost precisely for each river basin in this study stage. In this context, such cost as an index is obtained in the following manner:

- It is assumed that river improvement would be applied as the flood control measure for every river basin, since any flood control measures can not be examined for each river basin individually at this stage, while river improvement is the principal measures applied for flood mitigation. For only the river basins that have experienced debris flow damage, the sediment control dam is applied;
- Then, relation between unit project cost (C_0) for river channel improvement and design discharge (Q_0) is made up through previous study results on flood control projects (refer to Figure C. 2.2);

- River channel improvement stretch (L_1) for the selected river basin is derived from the flood inundation analysis by the HEC-RAS and HEC-GeoRAS model as discussed later. For the HEC-RAS model, design discharge (Q_0) is also calculated; and
- Based on the results of river channel improvement stretch (L_1) and design discharge (Q_1), unit cost (C_1) is obtained by the above relation and finally, cost index (C) can be obtained by multiplying (L_1) by (C_1): $C = (L_1) \times (C_1)$.

The previous study results (refer to Tab. C-2-1) are referred to obtain the relation between project cost (C_0) for river channel improvement and design discharge (Q_0).

(2) Condition of Project Cost Estimate

The conditions of project cost estimate are given below:

- The estimated project cost is composed of main construction cost, compensation cost, administration/engineering services cost and project contingency;
- The project costs by previous studies are revised with consumer prices index (CPI) issued by National Statistic Office (NSO) in order to define the price level for respective existing project costs. All such project costs are upgraded to the price level in 2006. Tab. C-2-2 is shown as the annual averaged CPI by NSO;
- In the geo-economic aspect due to the degree of property concentration, the river basins for the existing projects are classified into “Urban River Basin” and “General River Basin” based on production, which corresponds to index S4 of the First Screening, per square kilometer of the respective river basins. “Urban River Basin” is defined as a river basin having the production of 11 million pesos/km² and above, while a “General River Basin” has the production below 11 million pesos/km²; and
- Especially, the river basins related to the studies on the “Flood Control and Drainage Project in Metro Manila (1990)” and “Flood Control for Rivers in the Selected Urban Centers (1995)” shall be classified into “Urban River Basin”.

The examples of “Urban River Basin” are shown below.

Table C. 2.1 Examples of Urban River Basin

Urban River Basin	Production (Index: S4)
River Basins in Manila (excluding Pasig-Marikina River)	288.1 mil. Pesos/km ²
Pasig-Marikina River (Manila)	126.5 mil. Pesos /km ²
River Basins in Cebu City	15.0 mil. Pesos /km ²
Jaro River (Iloilo City)	11.4 mil. Pesos /km ²

The result of the recurrence analysis is graphed, as shown below:

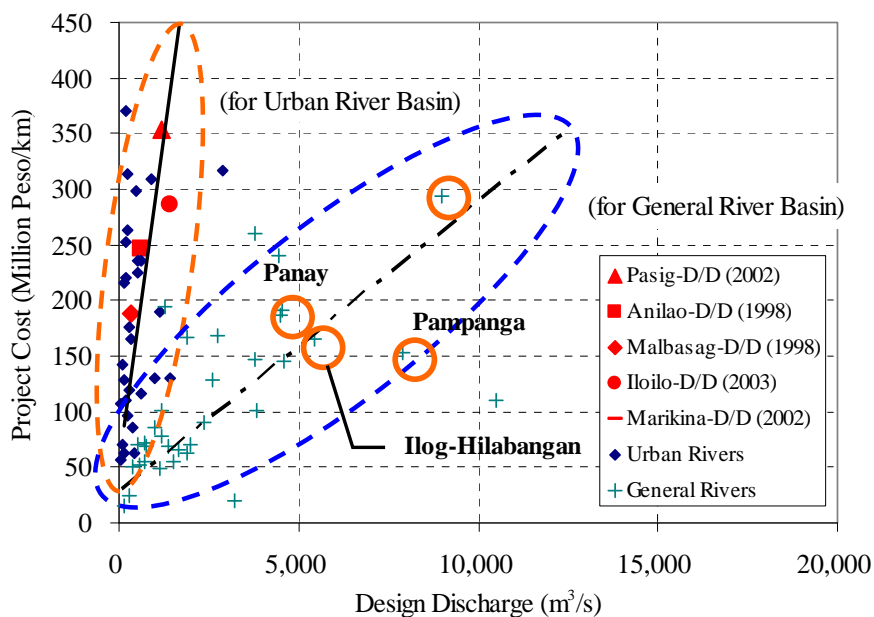


Figure C. 2.2 Estimated Lines with Relationship between Design Discharge and Project Cost

In the above figure, the estimated lines with relationship between design discharge and project cost are proposed for the urban river basin and general river basin in the above figure. These lines are set on the approximately middle position taking account of respective plotting points. Since these relations on the above figure are provided with limited data for 65 rivers only, they shall be reviewed with the additional sample data of other river improvement projects by the DPWH (refer to Tab. C-2-3).

2.2.2 Analysis for Benefit Index

The basic analysis for the benefit index consists of: 1) hydrologic analysis; 2) flood damage analysis; 3) benefit index estimation for flood control; and 4) benefit index for Sabo dam. The contents of these analyses are described below.

(1) Hydrologic Analysis

The hydrologic analysis aims at identifying the flood area of the 120 objective river basins for the flood magnitude of 20-year return period. The analysis consists of:

- Flood inundation analysis by simulation model; and
- Field and related study survey.

Flood areas are estimated using the simulation model. The simulated flood areas are then compared with the field survey results and the existing studies, and the flood areas are finally determined.

The adopted simulation model, outline of the input data and output of the model, and the estimation of flood areas are described below.

1) Simulation Model

The adopted simulation model is HEC-RAS and HEC-GeoRAS. HEC-RAS is software that performs one-dimensional steady and unsteady flow calculations. HEC-GeoRAS is an ArcView GIS extension specifically designed to process geospatial data for HEC-RAS.

HEC-GeoRAS creates a file of geometric for import into HEC-RAS, containing river, reach and station identifiers, cross sectional cut lines, etc. Once the hydraulic calculations are performed, water surface and velocity from HEC-RAS are exported to HEC-GeoRAS for spatial analysis.

Water surface TIN (Triangulated Irregular Network) is created from the water surface elevations attached to each cross section. The floodplain is then delineated where the water surface elevations are higher than the terrain elevations. The same water surface and terrain TIN are used to create a water depth grid.

2) Input Data and Output of the Model

As the input data for the model, a) design discharges; b) water level of river mouth; c) Manning's roughness coefficients; and d) river cross sectional data, are necessary as described below. On the other hand, the output is water levels and velocities, and are presented as e) flood area map. These contents are explained below.

a) Design Discharges

Specific Discharge Method is applied for this analysis. By this method, the design discharges are estimated based on the specific discharge formula, as shown below:

$$q = c \cdot A^{(A^{-0.048} - 1)}$$

Where, q : Specific discharges ($\text{m}^3/\text{sec}/\text{km}^2$)
 c : Constant depending on return period and regions
 A : Basin area (km^2)

The design discharges are determined for the river mouth and other major confluence points (minimum 3 points for each river).

b) Water Level of River Mouth

As the starting water level at the river mouth, the mean monthly highest water level (MHW) is input based on the Manual on Flood Control Planning, March 2003, DPWH.

c) Manning's Roughness Coefficient

Manning's roughness coefficients are determined based on the above Manual and others. The applied values are, as follows:

- Stream channel : 0.035
- Flood plains : 0.055

d) River Cross Sectional Data

River cross sectional data used in the simulation are based on the DEM (Digital Elevation Model) with 90 m grid. HEC-GeoRAS creates a file of cross sectional cut lines for import into HEC-RAS.

e) Sample of Flood Area Map

As samples of the output, the flood area maps of the Bicol, Panay and Jalaur River Basins are shown in Fig. C-2-1, C-2-2 and C-2-3.

3) Estimation of Flood Area

Considering the accuracy and limitation of the available data for the simulation, the simulated flood areas are better to be compared with the flood areas of the existing studies and the field survey.

Tab. C-2-4 shows the flood areas of the simulation, existing studies and field survey, and Figure C. 2.3 shows the relationship among them. Based on these, the following points can be understood:

- The total flood area of the existing studies is 1.4 times greater than that of the model. In the case of field survey, it becomes 1.3 times, however, its total flood area is far smaller than that of the existing studies. As the result, the total flood area of the studied/surveyed is 1.4 times greater than that of the model; and
- There is no clear relationship between the ratios and the basin areas.

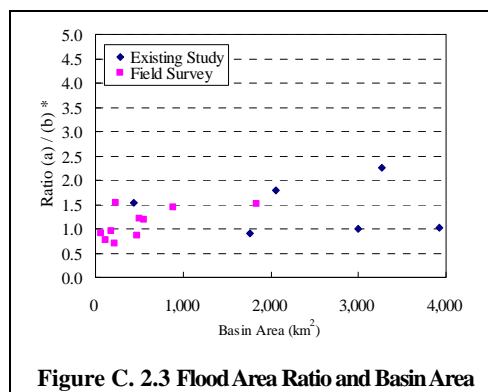


Figure C. 2.3 Flood Area Ratio and Basin Area

Based on these, it is recommended that the flood area by the model is better be multiplied by 1.4 in order to improve its accuracy.

(2) Flood Damage Analysis

1) Methods for the Analysis

The basic methods for the flood damage analysis are described below.

a) Items for Flood Damage Estimation

The flood damages are estimated for five major items: i) built-up area; ii) crop; iii) fishpond; iv) infrastructure; and v) indirect damage.

b) Estimation of Flood Damage

Flood damages of the built-up area, crop and fishpond are calculated multiplying damageable value by damage rate. On the other hand, the infrastructure and indirect damages are estimated multiplying the sum of damages or the other damage by ratio.

c) Estimation of Present Damageable Value

The present damageable values are estimated, as described below.

i) Built-up Area

A Source of Data

Damageable value of the built-up area is estimated based on the assessed value of real property of provinces/cities as of 2005 and 2006 (Source: Bureau of Local Government Finance, Department of Finance). For this Study, land value is excluded.

B Present Market Value per Area

The assessed values are converted into the market values by multiplying them with 4.6, which is the average feature estimated from the collected data. On the other hand, the areas of built-up area can be estimated using GIS for each city and municipality. As the results, the damageable value of built-up area per area can be estimated.

ii) Crop

A Kinds of Crops to be considered

Based on the information from the Department of Agriculture, major crops usually damaged by floods are:

- i. Irrigated paddy;
- ii. Rainfed paddy;
- iii. Corn; and
- iv. Sugarcane.

On the other hand, in the land use/land cover categories of NAMRIA GIS data, these crops are classified into one category, annual crop. Therefore, the damageable value of each crop is estimated at first, then, those values are synthesized by area-weighted average.

B Estimation of Present Damageable Value of Crop

Damageable value of a crop is calculated considering expected net income and production cost already spent when damage occurred. However, it is difficult to collect these values from the all regions. Therefore, the ratio of damageable value to gross income is adopted in this Study, assuming gross income changes in proportion to the growth of the net income and production cost. These ratios are developed from the existing studies.

The present gross income of each crop is obtained from the statistics. By multiplying the ratio and gross income, the damageable value of each crop is estimated, then, those values are synthesized by area-weighted average.

iii) Fishpond

A Type of fishponds to be considered

The total area of the existing fishpond in the Philippines (2005) was 253,854ha, which comprised freshwater fishponds of 14,531 ha (5.7%), and brackish water fishponds of 239,323ha (94.3%) (Source: Bureau of Agricultural Statistics, DA). These figures show that most of the fishponds in the Philippines are brackish water ponds, which were developed out of mangrove swamps. Considering these figures and the locations of the major flood areas (which locate in the downstream of rivers), brackish water fishponds only are considered in this Study.

B Cultured species to be considered

Volumes of cultured species of the brackish water fishponds (2005) were milkfish of 210,652 ton (78.7%), tiger prawn of 37,720 ton (14.1%), tilapia of 9,986.7 ton (3.7%) and others (3.5%) (Source: Bureau of Agricultural Statistics, DA). Considering that most tilapia production came from freshwater fishponds and freshwater fish cages, only milkfish and tiger prawn are considered in this Study. Assuming fishpond areas are proportionate to production volumes, the pond areas for milkfish and tiger prawn are estimated at 188,000ha and 34,000ha respectively.

C Estimation of Present Damageable Value of Fishpond

Damageable value of the fishpond is calculated in the same manner as crop. Namely, the ratio of damageable value to gross income is developed from the existing studies, and the present gross incomes of the both species are derived from the statistics, etc. By multiplying the ratio and gross income, the damageable value of each species is estimated, then, those values are synthesized.

d) Estimation of Future Damageable Value

The damageable values under future condition are estimated at the target year of 2034, assuming the values will increase in proportion to the growth of GNP per capita. In this Study, the growth rate of GNP per capita is assumed at 3.35% per annum, and the future values are estimated multiplying the 2006 values by 2.6.

e) Estimation of Damage Rates

Flood damages of the built-up area, crop and fishpond increase as the flood depth increases. This means the damage rates are subject to the flood depth in principle. However, in this Study, it is difficult to estimate the flood depth by places (this is usually done using mesh). Hence, the damage rate in this Study is estimated as the average rate when flood occurs. The damage rates are developed from the existing studies.

f) Estimation of Ratios for Infrastructure and Indirect Damages

i) Ratio for Infrastructure Damage

Infrastructure damage is estimated multiplying the sum of the built-up area, crop and fishpond damages by ratio. This ratio is developed from the existing studies.

ii) Ratio for Indirect Damage

Indirect damage consists of the income losses and the emergency costs. The income losses cover wages lost, commercial trade lost, industrial production lost, transportation losses, and losses from interruption of utility services resulting from the disruption of normal activities due to flood. The emergency costs include the cost of evacuation, reoccupation, flood-fighting and disaster relief operations.

The indirect damage can be estimated by multiplying the ratio to the direct damages, and this ratio is developed from the existing studies.

2) Survey on the Existing Studies

As described in the above, the results of the survey on the existing studies are utilized on the:

- Estimation of the ratios of damageable values to gross incomes;
- Estimation of the damage rates for the built-up area, crop and fishpond; and
- Estimation of the ratios for the infrastructure and indirect damages.

The contents of the survey are described below.

a) Existing Study Surveyed

For the survey of the existing reports, 12 studies are utilized consequently. Tab. C-2-5 and Tab. C-2-6 show the list of these studies and the contents of the existing study survey, respectively.

b) Results of the Survey

As the results of this survey, the ratios of damageable values to gross incomes, the damage rates, and the ratios for the infrastructure and indirect damages are estimated, and these values are shown in Tab. C-2-7 and Tab. C-2-8 respectively.

3) Estimation of Damages

a) Built-up Area Damage

i) Damageable value under present condition

Tab. C-2-9 shows the market values of built-up areas (the figures of the province mean the total of the municipalities of the said province). The provinces and cities shown in the table relate to the 120 river basins. Based on the table, the following points are understandable:

- For the provinces, the values range from 0.5 to 27.9 million pesos/ha (average 11.6 million pesos/ha);

- For the NCR (including Navotas, Pateros, San Juan and Taguig), the values range from 14.8 to 85.4 million pesos/ha (average 36.1 million pesos/ha); and
- For the cities other than the NCR, the values range from 1.3 to 74.0 million pesos/ha (average 9.4 million pesos/ha).

Based on the above features, the damageable value of a built-up area is estimated by two groups, one is the NCR and Cebu city (this is decided based on the field survey, etc.), and the other is other built-up area.

In line with this, the damageable values of the built-up area under the present condition are estimated at 36.1 million pesos/ha for NCR and Cebu City (including a part of Mandaue City adjacent to Cebu city), and 10.7 million pesos/ha for the other built-up areas.

ii) Damage rate of built-up area

The damage rate of the built-up area is estimated at 30% as shown in Tab. C-2-8.

iii) Damageable value under future condition

The future damageable values are estimated at 94 million pesos/ha for NCR and Cebu city, and 28 million pesos /ha for the other built-up areas.

b) Crop Damage

i) Gross Income of Crops

The volume of production, service/harvest area and farm-gate price of each crop are shown in Tab. C-2-10 (Source: Bureau of Agricultural Statistics, DA). Based on these statistics, the gross income of each crop is calculated as shown in the table.

ii) Damageable value under present condition

The ratio of damageable value to gross income is estimated at 0.3 for irrigated paddy, 0.4 for rainfed paddy, 0.2 for corn, and 0.7 for sugarcane. The details are shown in Tab. C-2-7. Based on these ratios and gross incomes, the damageable value of each crop is estimated. Based on the values, the value of crop is estimated at 16.3 thousand pesos/ha. The details of this calculation are shown in Tab. C-2-11.

iii) Damage rate of crop

The damage rates of irrigated paddy, rainfed paddy, corn and sugarcane are estimated at 50%, 50%, 80% and 10% respectively, and the damage rate of crop is estimated at 60%, as shown in Tab. C-2-8.

iv) Damageable value under future condition

The damageable value of crop under future condition is estimated at 42 thousand pesos/ha.

c) Fishpond Damage

i) Gross Income of Fishponds

Total harvest areas for milkfish and tiger prawn production were 281,727 ha and 77,172 ha respectively (Source: FAO, 2002). On the other hand, average yields of milkfish and tiger prawn from brackish water ponds were 0.71 ton/ha and 0.46 ton/ha (FAO, 2002). Based on

those figures, the gross income of milkfish and tiger prawn are estimated at 68 and 400 thousand pesos/ha. The details are shown in Tab. C-2-12.

ii) Damageable value under present condition

The ratios are estimated at 0.3 for milkfish and 0.3 for tiger prawn, as shown in Tab. C-2-7. Based on these ratios and gross incomes, the damageable value of each species is estimated, and the damageable value of fishpond is estimated at 35.3 thousand pesos/ha. The details of this calculation are shown in Tab. C-2-13.

iii) Damage rate of fishponds

This damage rate is estimated at 90% as shown in Tab. C-2-8.

iv) Damageable value under future condition

The damageable value of fishponds under future condition is estimated at 92 thousand pesos/ha.

d) Infrastructure Damage

The infrastructure damage is estimated multiplying the sum of the built-up area, crop and fishpond damages by ratio of 30%. The details of this ratio are shown in Tab. C-2-8. Generally, infrastructure damage in Japan is larger than the Philippines due to the difference of infrastructure amount.

e) Indirect Damage

The indirect damage can be estimated by multiplying the ratio (20%) to the direct damages. The details of this ratio are shown in Tab. C-2-8.

(3) Benefit Index Estimation for Flood Control

The benefit indexes are estimated based on the procedure: 1) estimation of annual average benefit; and 2) estimation of total benefit. These are explained below.

1) Estimation of Annual Average Benefit

The flood control benefit is defined as the damage reduction by the designed works. The annual average benefit is calculated as the sum of the product of an average damage reduction caused by floods (Q_{i-1} and Q_i discharges) and an occurrence probability between those floods.

In order to estimate this annual average benefit, the ratios of annual average benefits to flood damages of 20-year return period are studied based on the existing studies conducted in the Philippines. Tab. C-2-14 shows the details of this calculation. As the results, the average ratio becomes 0.38. Hence, the annual average benefit is estimated by multiplying 0.38 to the flood damage of 20-year return period.

2) Estimation of Total Benefit

The total benefit is estimated based on the annual average benefit covering the entire project life. In this estimation, the future benefits are converted with discount rate in order to

calculate the present value, and this present value becomes the total benefit. The total benefit is estimated for each river basin under the same condition, as follows:

- Implementation period is preliminarily assumed at four (4) years.
- Project life is assumed at 50 years.
- Discount rate is considered at 15%.

3) Calculation of Benefit Index

Based on the Study described above, the benefit indexes derived from flood control are calculated. Tab. C-2-15 shows the benefit indexes of the 120 river basins.

(4) Benefit Index for Sabo Dam

Sabo dams are considered for the river basins where the occurrences of sediment disaster are informed through field survey, etc. The benefit indexes for Sabo dams are calculated based on: 1) items for damages; 2) estimation of damages; and 3) benefit index calculation. These are explained below.

1) Items for Damages

Damages are considered for four major items: i) residence and effects; ii) crop; iii) infrastructure; and iv) indirect damage.

2) Estimation of Damages

The damages on residence/effects and crop are calculated as their damageable values, because the damage rates for these are estimated at 1.0 based on the existing studies. On the other hand, the infrastructure and indirect damages are estimated multiplying the sum of damages or the other damage by ratio. These are described, as follows:

a) Residence and Effect Damage

In the Study on Sabo and Flood Control for Western River Basins of Mount Pinatubo, JICA, 2003, the average damageable value of residence and house effects was estimated at 285,623 pesos. This value was converted into 2006 value using CPI, and result in 368,454 pesos. The future value is preliminarily estimated at 958 thousand pesos following to the same manner aforementioned.

b) Crop Damage

Following the same manner for flood control, the damageable values of crop under the present and future conditions are estimated at 16.3 and 42 thousand pesos, respectively.

c) Infrastructure Damage

Infrastructure damage is estimated multiplying the sum of residence/effects and crop damages by ratio. The ratio is estimated at 0.4 based on the same study reports.

d) Indirect Damage

Indirect damage can be estimated by multiplying the ratio to the direct damages. This ratio is estimated at 0.2 based on the same study reports.

3) Benefit Index Calculation

The benefit indexes are estimated as the same manner as the flood control.

a) Annual Average Benefit

The same value of 0.38 is applied for the estimation of annual average benefit.

b) Total Benefit

Total benefit for Sabo dam is estimated considering the same idea as flood control. However, the total benefit for Sabo dam is estimated under the different conditions, as follows:

- Implementation period is preliminarily assumed at one (1) year. If two dams are necessary, the second dam is constructed after 10 years of the first construction.
- Project life is assumed at 20 years for each dam.

Based on the above, the benefit indexes for Sabo dams are calculated for nine (9) river basins, as shown in Tab. C-2-16.

2.2.3 Scoring and Ranking of 120 River Basins

(1) General

As discussed in the previous sections, cost index (C) and benefit index (B) are obtained for 120 river basins. In this section, the scores for 120 river basins are examined from the economic efficiency point of view on the basis of these cost and benefit indexes, and furthermore, ranking of 120 river basins is arranged based on the score of economic efficiency in addition to the score obtained in the First Screening stage.

(2) Score for Economic Efficiency

1) Indexes to evaluate Economic Efficiency

For evaluation of economic efficiency, the following two indexes, which are generally applied for economic evaluation of the project together with EIRR, are considered:

- Magnitude of Benefit (Benefit Index (B) - Cost Index (C)); and
- Ratio between Benefit Index and Cost Index (B/C).

2) Maximum Score given to Two Indexes

As the maximum score given to two indexes, 90 is applied from the following reasons:

- In the First Screening, score of 90 in total is given for 14 indexes; and
- Since economic efficiency index is one of the very significant factors for decision-making on project implementation, the same score as the First Screening (90) is given to the economic efficiency index, i.e., 90 for (B) – (C) and 90 for (B)/(C).

3) Distribution of the Score

As shown in Fig. C-2-4, the values of (B)-(C) and (B)/(C) for 120 river basins are widely distributed. Under this situation, if the score is given dividing 90 from the lowest values to the highest values of (B)-(C) and (B)/(C), most of the river basin with the average values may have same score and thus, difference of the score of each river basin can not be identified easily. To avoid the situation, the score is given to each river basin as shown in Table C. 2.2 and Fig. C-2-5:

Table C. 2.2 Distribution of the Score

Index	Maximum Score		Lowest Score		Remarks
	Value of Index	Score	Value of Index	Score	
B-C	> 5,000 mil. Peso	90	< 0 Peso	1	Scores of 2-89 are given dividing the stretch between 0-5,000 mil. Peso equally
B/C	> 5	90	< 1	1	Scores of 2-89 are given dividing the range between 1-5 of B/C equally

4) Sensitivity Analysis

For the above mentioned scoring, sensitivity analysis is also conducted in the following two cases in order to assure the results of scoring:

Case-1: Maximum score is 70; and

Case-2: Maximum score is 45.

Tab. 2-17 and Fig. C-2-6 show the ranking of river basins up to 50 by the sensitivity analysis.

According to the sensitivity analysis, the following conditions are identified:

- Some river basins are replaced by the other river basins due to change of the maximum score from 90 to 70 and 45;
- The numbers of such river basins are only 3 river basins among the 50 river basins and thus, no significant change is observed due to change of the maximum score; and
- As the conclusion, it is identified that the case of 90 is applicable.

(3) Ranking Results of 120 River Basins

As discussed earlier, ranking is arranged by the total score of two indexes for economic efficiency in addition to the score obtained in the First Screening. Ranking of 120 river basins by the total score is shown in Tab. C-2-18.

2.2.4 Analysis for Investment Amount

(1) Comparison of Medium-term Investment Program and Actual Investment Amount

It is virtually impossible to implement flood control projects for 120 river basins during the limited target period of 2009 to 2034 considering the availability of funds. Since the funds for flood control projects is in principle provided from the DPWH budget, the expected budget amount for a flood control project is examined with several DPWH budgetary growth rate (hereinafter referred as “growth rate”) in this section based on the

previous practice, the Medium-Term Investment Program prepared by DPWH and the actual investment amount.

Medium-Term Investment Program is shown in Tab. C-2-19. Actual investment amount is shown in Tab. C-2-20. Comparison between the Medium-Term Investment Program and the actual investment amount is shown in Figure C. 2.4. The growth rate under the Medium-Term Investment Program for the period between 1999 and 2010 is around 7%. On the other hand the growth rate of the actual investment amount for the same period is around 1%, while that is about 11% for only the period from 2006 to 2008. Furthermore, the growth rate for the period between 2006 and 2010 reaches about 29%.

Based on these conditions, the growth rate for the target year can be considered in the wide range from 1% up to 29%.

(2) Expected investment amount

Fig. C-2-7 shows the expected investment amounts with several growth rates.

2.3 Selection of the River Basins through the Second Screening

2.3.1 Key Points Considered for the Second Screening

As discussed earlier, the following points have been considered for the Second Screening:

- Prioritization by ranking of river basins with score;
- Consideration of possible investment amount;
- Regional distribution; and
- Strategic significance of river basin.

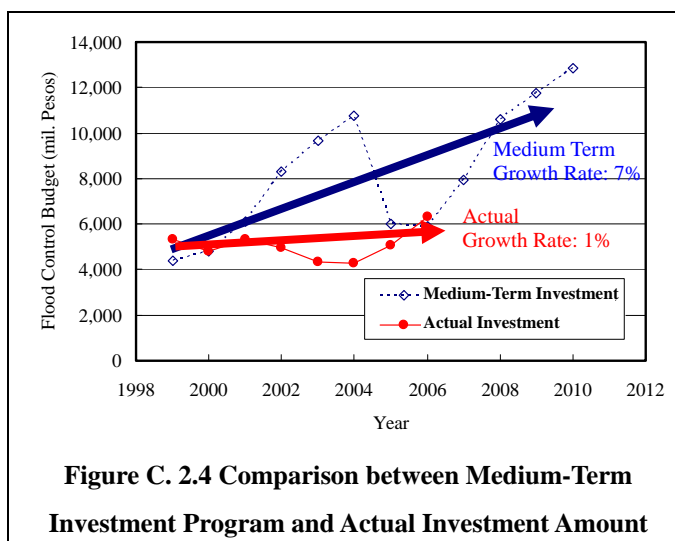


Figure C. 2.4 Comparison between Medium-Term Investment Program and Actual Investment Amount

2.3.2 Process for the Second Screening

(1) Prioritization by Ranking

The priority of river basins by ranking has been arranged, as shown in Tab. C-2-18.

(2) Consideration of Possible Investment Amount

As discussed earlier, several scenarios on the growth rate of the budget of DPWH has been considered in terms of possible investment amount, as mentioned below:

- 1% growth rate based on actual investment from 1999 to 2006;
- 7% growth rate based on the average Medium-Term Investment Program from 1999 to 2010;
- 8% growth rate based on higher Medium-Term Investment Program from 1999 to 2010;
- 11% growth rate based on recent actual investment from 2006 to 2008; and
- 29% growth rate based on the Medium-Term Investment Program from 2006-2012.

Among these growth rates, the 8% growth rate scenario is tentatively proposed from the following reasons (refer to Table C.2.3):

- It is not realistic to apply the 1% growth rate considering the significance of investment to flood control projects;
- Likewise, 29% is also not realistic to consider sustainability for the long term investment covering 26 years, even though this figure applied to a part of the previous Medium-Term Investment Program;
- It may be possible to apply 11%, which can cover almost all 120 river basins. However, it seems to be too high to sustain this growth rate, and it is not realistic to cover 120 river basins judging from the previous practices of implementation of flood control projects for the past 20 years, during which those for only about 20 river basins could be implemented; and
- Among the cases of 7% and 8% scenarios, both are applicable, but 8% is preferable to fulfill the requirement of early implementation of flood control projects from the local side, reflecting habitual occurrence of recent natural disasters.

Table C. 2.3 Relationship between DPWH Growth Rate, Available Budget and Number of Achievable Projects

DPWH Growth Rate	Available Budget (mil. Pesos)	Number of Achievable Projects
1 %	82,006	13
3 %	108,569	13
5 %	145,235	23
7 %	196,117	33
8 %	228,718	47
9 %	267,257	111
11%	367,035	more than 120

Assuming that 8% growth is applied, the total investment amount will be 228 billion pesos, by which flood control projects for 47 river basins can be implemented (refer to Tab. C-2-21).

(3) Regional Distribution

From the viewpoint of regional distribution of flood control projects, it is proposed that at least a few river basins for each of the 17 regions should be included in the list of the Second Screening.

On the other hand, among 47 river basins, only one river basin is allocated to five (5) regions (Region II, IV-B, VIII, IX and ARMM), while no river basin is included in one (1) region (Region XIII).

In this situation, for the above six (6) regions, it is proposed that at least two (2) river basins in total are allocated. To fulfill this condition, it is necessary to add, under the above 8% growth scenario of possible investment amount, seven (7) river basins ($47+7=54$) requiring an additional amount of 6.4 billion pesos (refer to Tab. C-2-22).

(4) Strategic Significance of River Basin

In the Philippines, flood control projects have been implemented putting high priority to strategically significant river basins, especially the 18 major river basins, considering magnitude of regional socio-economic influence. For this point of view, in the list of the above 54 river basins, two (2) major river basins were not included. Under this situation, it is proposed to include these two (2) major river basins ($54+2=56$) in the list of the Second Screening. To fulfill the condition, it is necessary to increase the investment amount by 1.3 billion pesos.

2.3.3 Selection of River Basins through the Second Screening

In accordance with the considerations mentioned above, the selected river basins together with the investment amount are as listed below (refer to Tab. C-2-21 and Fig. C-2-8):

- Number of Selected River Basins : 56 river basins
- Investment Amount (2009-2034) : 236 billion pesos
- DPWH Budget Growth Rate : 8.2%

2.4 Prioritization and Arrangement of Implementation Schedule

For the selected 56 river basins, prioritization was examined considering not only ranking by score but also other factors, and then the implementation schedule was arranged under the conditions discussed in the following subsections.

2.4.1 Implementation Period

It is assumed that the implementation of flood control projects for the 56 river basins is completed within the target period starting from 2009 to 2034. For the implementation of one project, it is assumed that 8 years is required in principle, including the period for feasibility study and detailed design. However, it is also assumed that some projects, which require a huge fund like the Cagayan River Basin with the project cost of about 50 billion pesos, will be implemented by dividing the implementation period into several phases.

2.4.2 Classification of River Basins

For the prioritization and arrangement of implementation schedule, 56 river basins are classified considering the financial source of the project:

(1) Financial Source

For project implementation, 236 billion pesos is proposed, which is composed of international funds and local funds.

(2) Classification of Projects

According to the Medium-Term Investment Program, flood control projects are broadly classified into: 1) foreign-assisted projects, which are financed by international funds and local funds; and 2) local fund projects, which are financed by only local funds. In the Study, projects are also classified into these two groups.

(3) Allocation for Foreign-Assisted Projects and Local Fund Projects

According to the Medium-Term Investment Program, it has proposed that 95% of the total investment amount should be allocated to foreign-assisted projects and 5% is allocated to locally funded projects. In this Study, it is assumed that the same ratio of 95% and 5% would be applied for future investment (refer to Table C.2.4).

Table C. 2.4 DPWH Medium-Term Investment Program (2005-2010)

Item	Amount (billion Pesos)	Rate (%)
Foreign-Assisted Project	93.4	95.0
<i>On-going Project</i>	38.6	39.3
<i>New Proposed</i>	54.8	55.7
Locally Funded Project	4.9	5.0
Total	98.3	100.0

(4) Classification of River Basins

Under the above situations, the 56 river basins are arranged in order of the amount of the project costs. Finally, out of the 56 river basins, 26 river basins, of which project costs are more than 1.0 billion pesos, are classified as foreign-assisted projects; while 30 river basins are classified as locally funded projects (refer to Table C.2.5).

The allocation from international funds amount to 223 billion pesos, and local funds account for 13 billion pesos.

Table C. 2.5 Classification of River Basins

Classification	No. of River Basins	Total Project Cost (billion Pesos)	Share (%)
Foreign-Assisted Project	26	223	95
Local Fund Project	30	13	5

(5) Prioritization

The prioritization, which is classified into two groups, foreign-assisted projects and local fund projects, was arranged separately through the following procedure:

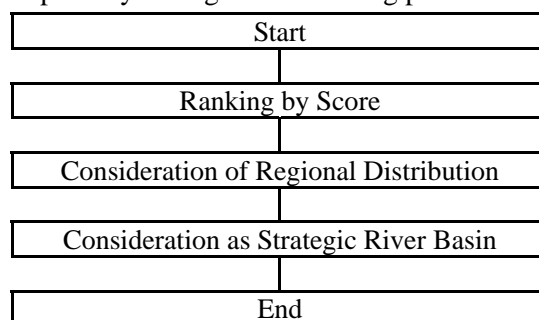


Figure C. 2.5 Procedure of Prioritization

1) Ranking by Score

As the first step, the foreign-assisted projects of 26 river basins and the local fund projects of 30 river basins are arranged according to score, as shown in Tab. C-2-23.

2) Consideration of Regional Distribution

According to the ranking by score, most of the river basins located in Luzon could be placed in the higher rank (refer to Tab. C-2-23); however, complaints may be raised from the other regions. To avoid such a situation, rotation of arrangement of river basins from each region, like the order of Luzon, Visayas and Mindanao, is considered. In case of river basins with foreign-assisted projects, the number of river basins in the three regions are: 15 in Luzon, 4 in Visayas and 7 in Mindanao; while, those with local fund projects are: 12 in Luzon, 6 in Visayas and 12 in Mindanao (refer to Tab. C-2-24).

Based on the above situations, the following rotations have been arranged: 2 river basins in Luzon, 1 in Visayas and 1 in Mindanao for foreign-assisted projects and 2 river basins in Luzon, 1 in Visayas and 2 in Mindanao for local fund projects.

Tab. C-2-25 shows the arrangement of river basins, considering regional distribution together with the ranking by score in each region.

3) Consideration of Strategic River Basin

Before the Study was started, the DPWH Medium-Term Investment Program had listed several strategic river basins with foreign-assisted flood control projects or local fund flood control projects for early implementation (refer to Tab. C-2-26). Since the early implementation of these river basins projects has already been announced and thus expected by the stakeholders, it has been difficult to disregard them in the Study. The arrangement of river basins, considering such strategic river basins as well as score and regional distribution is shown in Tab. C-2-27.

2.4.3 Implementation Schedule

The implementation schedule of the 56 river basins has been divided into two groups, namely, foreign-assisted projects and local fund projects, and arranged for the period from 2009 to 2034 as shown in Fig. C-2-9. For reference, the implementation schedule of the 120 river basin has been also arranged as shown in Fig. C-2-10.

3 DATA UPDATE

3.1 Utilized Data and Software

(1) Data

The data utilized for the Screening consist of GID database and XLS format data. The details of the GIS database including the list of GIS files are shown in the Supporting Report B. On the other hand, the list of the XLS format files is shown in Tab. C-3-1.

(2) Software

ArcView including extensions (Spatial Analyst and 3-D Analyst) are procured under this Study and utilized for GIS Analysis. On the other hand, HEC-RAS and HEC-GeoRAS are utilized for the flood hydraulic and inundation analyses. HEC-RAS is used for the non-uniform flow calculation, and the results of HEC-RAS analysis together with HEC-GeoRAS are used for the inundation analysis.

3.2 Update of Data

In order to keep the Screening system usable and valid, the GIS database and the XLS format data should be updated with specific time frame. The update of the GIS database is described in the Supporting Report B, proposing “long time update”, “less frequent update” and “frequent update”. In line with this idea, the following additional points are conceivable:

- Not only the flood casualty and damage data but also the flood frequencies estimated based on these data should be updated frequently. Based on this update, the First Screening will be carried out.
- “Medium-Term Philippine Development Plan” and “Medium-Term DPWH Infrastructure Development Plan” are formulated with the interval of around six years. Therefore, the relevant data should be updated less frequently in order to utilize the Screening system for these planning.

Tab. C-1-1 List of Flood Susceptible Areas Nominated by NDCC in 2004 (1/5)

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province
(Region 1)			35	Quirino	ILOCOS SUR	70	Agno	PANGASINAN
1	Bacarra	ILOCOS NORTE	36	Salcedo		71	Aguilar	
2	Badoc		37	San Esteban		72	Alaminos	
3	Bangui		38	San Ildefonso		73	Alcala	
4	Batac		39	San Juan		74	Asingan	
5	Burgos		40	San Vicente		75	Balungao	
6	Currimao		41	Santa		76	Bani	
7	Dingras		42	Santa Catalina		77	Basista	
8	Espiritu		43	Santa Cruz		78	Bautista	
9	Laoag		44	Santa Lucia		79	Bayambang	
10	Marcos		45	Santa Maria		80	Binalonan	
11	Nueva Era		46	Santiago		81	Binmaley	
12	Pagudpud		47	Santo Domingo		82	Bugallon	
13	Paoay		48	Sinait		83	Calasiao	
14	Pasuguin		49	Suyo		84	Dagupan	
15	Piddig		50	Tagudin		85	Dasol	
16	Pinili		51	Vigan		86	Labrador	
17	San Nicolas		52	Agoo		87	Lingayen	
18	Sarrat		53	Aring-ay		88	Mabini	
19	Solsona		54	Bacnotan		89	Malasiqui	
20	Vintar		55	Balaoan		90	Manaoag	
21	Alilem		56	Bangar		91	Mangaldan	
22	Banayoyo		57	Bauang		92	Mangatarem	
23	Bantay		58	Caba		93	Mapandan	
24	Burgos		59	Luna		94	Natividad	
25	Cabugao		60	Naguilian		95	Pozorrubio	
26	Candon		61	Pugo		96	Rosales	
27	Caocayan		62	Rosario		97	San Carlos City	
28	Cervantes		63	San Fernando		98	San Fabian	
29	G. del Pilar		64	San Gabriel		99	San Jacinto	
30	Galimuyod		65	San Juan		100	San Manuel	
31	Lidlidda		66	Santo Tomas		101	San Nicolas	
32	Magsingal		67	Santol		102	San Quintin	
33	Nagbukel		68	Sudipen		103	San Tomas	
34	Narvacan		69	Tubao	104	Santa Barbara		

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province	
105	Santa Maria	PANGASINAN	139	Alicia	ILOCOS SUR	174	Bambang	NUEVA VIZCAYA	
106	Sison		140	Angadanan		175	Bayombong		
107	Tayug		141	Aurora		176	Diadi		
108	Umingan		142	Benito Soliven		177	Dupax del Norte		
109	Urbiztondo		143	Burgos		178	Dupax del Sur		
110	Urdaneta		144	Cabagan		179	Quezon		
111	Villasis		145	Cabatuan		180	Santa Fe		
(Region 2)			146	Cauayan		181	Solano		
112	Abulug		CAGAYAN	147		Dinapiqui	182		Villa Verde
113	Alcala			148		Divilican	183		Madella
114	Allacapan			149		Echague	184		Nagtipunan
115	Amulong	150		Gamu	(Region 3)				
116	Aparri	151		Ilagan	185	Baler	AURORA		
117	Baggao	152		Jones	186	Casiguran			
118	Ballesteros	153		Luna	187	Dipaculao			
119	Buguey	154		Maconacon	188	Dilasag			
120	Camalaniugan	155		Magsaysay	189	Dinalungan			
121	Claveria	156		Mallig	190	Dingalan			
122	Enrile	157		Naguilian	191	Maria Aurora			
123	Gattaran	158		Palanan	192	San Luis			
124	Gonzaga	159		Quirino	193	Abucay			
125	Iguig	160		Ramon	194	Bagac			
126	Lallo	161		Reina Mercedes	195	Balanga			
127	Lasam	162		Roxas	196	Dinalupihan			
128	Pamplona	163		San Agustin	197	Hermosa			
129	Penablanca	164		San Guillermo	198	Mariveles			
130	Piat	165		San Mariano	199	Morong			
131	Rizal	166		San Mateo	200	Orani			
132	Sanchez-Mira	167		San Pablo	201	Pilar			
133	Santa Ana	168		Santa Maria	202	Samal			
134	Santa Teresita	169		Santiago	203	Angat			
135	Solana	170		Santo Tomas	204	Balagtas			
136	Sto. Nino	171		Tumauini	205	Baliuag			
137	Tuao	172		Aritao	206	Bocau			
138	Tuguegarao	173		Bagabag	207	Bulacan			

Tab. C-1-1 List of Flood Susceptible Areas Nominated by NDCC in 2004 (2/5)

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province
(Region 3)			242	Palayan	NUEVA ECIJA	277	Anao	TARLAC
208	Bustos	BULACAN	243	Peñaranda		278	Bamban	
209	Calumpit		244	Quezon		279	Camiling	
210	Guiguinto		245	Rizal		280	Capas	
211	Hagonoy		246	San Antonio		281	Concepcion	
212	Malolos		247	San Isidro		282	Gerona	
213	Marilao		248	San Jose		283	La Paz	
214	Masantol		249	San Leonardo		284	Mayantoc	
215	Meycauyan		250	Santa Rosa		285	Moncada	
216	Norzaragay		251	Santo Domingo		286	Paniqui	
217	Obando		252	Talavera	287	Pura		
218	Paombong	253	Talugtug	288	Ramos	TARLAC		
219	Plaridel	254	Zaragosa	289	San Clemente			
220	Pulilan	255	Angeles	290	San Manuel			
221	San Ildefonso	256	Apalit	291	Tarlac			
222	San Miguel	257	Arayat	292	Victoria			
223	San Rafael	258	Bacolor	293	Botolan			
224	Santa Maria	259	Calumpit	294	Candelaria			
225	Aliaga	260	Candaba	295	Castillejos			
226	Bongabon	261	Floridablanca	296	Iba			
227	Cabanatuan	262	Guagua	297	Masinloc			
228	Cabiao	263	Lubao	298	Olongapo	ZAMBALES		
229	Carranglan	264	Mabalacat	299	Palauig			
230	Cuyapo	265	Macabebe	300	San Antonio			
231	Gabaldon	266	Magalang	301	San Felipe			
232	Gapan	267	Masantol	302	San Marcelino			
233	General Tinio	268	Mexico	303	San Narciso			
234	Guimba	269	Minalin	304	Santa Cruz			
235	Jaen	270	Porac	305	Subic			
236	Laur	271	San Fernando	(Region 4A)				
237	Licab	272	San Luis	306	Balayan		BATANGAS	
238	Llanera	273	San Simon	307	Batangas			
239	Muñoz	274	Santa Ana	308	Bauan			
240	Nampicuan	275	Santa Rita	309	Calaca			
241	Natividad	276	Sasmuan	310	Calatagan			

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province
(Region 4A)			345	Santa Maria	LAGUNA	380	Cainta	RIZAL
311	Canda	BATANGAS	346	Santa Rosa		381	Jala-jala	
312	Lemery		347	Siniloan		382	Montalban	
313	Lian		348	Agdangan		383	San Mateo	
314	Lobo		349	Atimonan	384	Taytay		
315	Nasugbu	350	Bordeos	(Region 4B)				
316	San Juan	351	Buenavista	385	Boac	MARINDUQUE		
317	San Luis	352	Calauag	386	Gasan			
318	San Pascual	353	Catanauan	387	Mogpog			
319	Taal	354	General Luna	388	Santa Cruz			
320	Bacoor	355	General Nakar	389	Torrijos	OCCIDENTAL MINDORO		
321	Cavite City	356	Guinayangan	390	Abra de Ilog			
322	General Trias	357	Gumaca	391	Calintaan			
323	Imus	358	Infanta	392	Magsaysay			
324	Kawit	359	Lopez	393	Mamburao	ORIENTAL MINDORO		
325	Naic	360	Lucena	394	Rizal			
326	Noveleta	361	Macalelon	395	Sablayan			
327	Rosario	362	Padre Burgos	396	San Jose			
328	Tanza	363	Pagbilao	397	Santa Cruz	PALAWAN		
329	Ternate	364	Panukulan	398	Baco			
330	Bay	365	Pitogo	399	Bansud			
331	Binan	366	Plaridel	400	Bongabong			
332	Cabuyao	367	Polillio	401	Bulalakao	ORIENTAL MINDORO		
333	Calamba	368	Quezon	402	Calapan			
334	Famy	369	Real	403	Gloria			
335	Kalayaan	370	Sampaloc	404	Mansalay			
336	Lumban	371	San Andres	405	Naujan	PALAWAN		
337	Mabitac	372	San Francisco (Aurora)	406	Pinamalayan			
338	Paete	373	San Narciso	407	Pola			
339	Pagsanjan	374	Sariaya	408	Roxas			
340	Pakil	375	Taakawayan	409	Socorro	PALAWAN		
341	Pangil	376	Unisan	410	Aborlan			
342	Pila	377	Angono	411	Araceli			
343	San Pedro	378	Antipolo	412	Bataraza			
344	Santa Cruz	379	Binangonan	413	Brooke's Point			

Tab. C-1-1 List of Flood Susceptible Areas Nominated by NDCC in 2004 (3/5)

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province	
(Region 4B)			447	Santa Elena	Camarines Norte	482	Balud	Masbate	
414	Dumaran	PALAWAN	448	Talisay	Camarines Sur	483	Batuan		
415	El Nido		449	Vinzons		484	Cawayan		
416	Narra		450	Baao		485	Dimasalang		
417	Puerto Princesa		451	Bato		486	Milagros		
418	Quezon		452	Bombon		487	Placer		
419	Rizal		453	Bula		488	San Fernando		
420	Roxas		454	Calabanga		489	San Jacinto		
421	San Vicente		455	Caramoan		490	San Pascual		
422	Sofronio Espanola		456	Del Gallego		491	Uson		
423	Taytay		457	Garchitorena		492	Bacon	Sorsogon	
424	Alcantara	458	Goa	493	Barcelona				
425	Cajidiocan	459	Iriga City	494	Bulan				
426	Looc	460	Libmanan	495	Bulusan				
427	Magdiwang	461	Milaor	496	Casiguran				
428	Odiangan	462	Minalabac	497	Castilla				
429	Romblon	463	Nabua	498	City of Sorsogon				
430	San Andres	464	Pasacao	499	Donsol				
431	San Fernando	465	Pili	500	Gubat				
432	Santa Fe	466	Ragay	501	Irosin				
(Region 5)			467	Sagnay		502	Matnog		
433	City of Ligao	Albay	468	Sipocot	Catanduanes	503	Pilar		
434	Daraga (Locsin)		469	Tinambac		504	Prieto Diaz		
435	Guinobatan		470	Bagamanoc		(Region 6)			
436	Libon		471	Baras		505	Altavas	AKLAN	
437	Malinao		472	Bato		506	Batan		
438	Oas		473	Caramoran		507	Kalibo		
439	Pio Duran		474	Gigmoto		508	Numancia	ANTIQUE	
440	Tiwi		475	Pandan		509	Anini-y		
441	Basud		476	Panganiban (Payo)		510	Belison		
442	Capalonga		477	San Andres (Calolbon)		511	Hamtic		
443	Daet	478	San Miguel	512	San Jose				
444	Jose Panganiban	479	Viga	513	Sibalom				
445	Mercedes	480	Virac	514	Tibiao				
446	Paracale	481	Aroroy	515	Cuartero	CAPIZ			

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province		
(Region 6)			550	La Carlota	NEGROS OCCIDENTAL	584	Cebu City	CEBU		
516	Dao	CAPIZ	551	La Castellana		585	Compostela			
517	Dumalag		552	Pontevedra		586	Consolacion			
518	Dumarao		553	Pulupandan		587	Daanbantayan			
519	Ivisan		554	Silay City		588	Danao City			
520	Jamindan		555	Sipalay		589	Dumanjug			
521	Ma-ayon		556	Talisay		590	Liloan			
522	Mambusao		557	Victorias		591	Mandawe			
523	Panay		(Region 7)				592		Medellin	
524	Pontevedra		558	Anda		593	Minglanilla			
525	Roxas City		559	Bien Unido	594	Pinamungahan				
526	Siapian	560	Buenavista	595	Ronda					
527	Sigma	561	Calape	596	San Fernando					
528	Anilao	562	Candijay	597	San Remegio					
529	Balasan	563	Clarin	598	Sibonga					
530	Barotac Nuevo	564	Cortes	599	Tabuelan					
531	Carles	565	Guindulman	600	Talisay					
532	Dingle	566	Inabanga	601	Toledo City					
533	Dumangas	567	Jetafe	602	Tuburan					
534	Estancia	568	Loon	603	Amlan					
535	Iloilo City	569	Mabini	604	Ayungon					
536	Leganes	570	Maribojoc	605	Bacong					
537	Oton	571	San Miguel	606	Bais					
538	Pototan	572	Tagbilaran City	607	Basay					
539	Sara	573	Talibon	608	Bayawan					
540	Zarraga	574	Trinidad	609	Dauin					
541	Bacolod	575	Tubigon	610	Dumaguete City					
542	Bago	576	Ubay	611	Manjuyod					
543	Cadiz	577	Aloguinsan	612	San Jose					
544	Enrique Magalona	578	Argao	613	Santa Catalina					
545	Escalante	579	Asturias	614	Siaton					
546	Himamaylan	580	Balamban	615	Tanjay					
547	Hinigaran	581	Borbon	616	Tayasan					
548	Ilog	582	Carcar	617	Zamboanguita					
549	Kabankalan	583	Carmen	618	Lazi	SIQUEJOR				

Tab. C-1-1 List of Flood Susceptible Areas Nominated by NDCC in 2004 (4/5)

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province		
(Region 8)			653	Mondragon	NORTHERN SAMAR	686	Mahinog	CAMIGUIN IS.		
619	Almeria	BILIRAN	654	San Roque	SAMAR	687	Iligan City	LANAO DEL NORTE		
620	Biliran		655	Basey		688	Kalambagan			
621	Culaba		656	Calbayog City		689	Kapatagan			
622	Kawayan		657	Calbiga		690	Karomatan (Sultan Naga)			
623	Naval		658	Pagsanghan		691	Lala			
624	Balangiga		659	Hinunangan		692	Maigo			
625	Can-Avid	EASTERN SAMAR	660	Saint Bernard	SOUTHERN LEYTE	693	Nunungan	MISAMIS OCCIDENTAL		
626	Dolores		(Region 9)			694	Tubod			
627	Llorente		661	Dipolog City	ZAMBOANGA	695	Baliangao			
628	Oras		662	Katipunan	DEL NORTE	696	Bonifacio			
629	Taft		663	Labason	ZAMBOANGA	697	Calamba			
630	Abuyog		664	Manukan	DEL SUR	698	Lopez Jaena			
631	Albuera	LEYTE	665	Mahayag	ZAMBOANGA	699	Plaridel	MISAMIS ORIENTAL		
632	Barugo		666	Pagadian City	SIBUGAY	700	Sapang Dalaga			
633	Bato		667	Zamboanga City	701	Tangub City				
634	Baybay		668	Boug	702	Clarin				
635	Carigara		669	Ipil	703	Tudela				
636	Dagami		(Region 10)			704	Sinacaban			
637	Dulag	LEYTE	670	Baungon	BUKIDNON	705	Jimenez	MISAMIS ORIENTAL		
638	Hilongos		671	Malaybalay		706	Balingasag			
639	Javier		672	Maramag		707	Cagayan de Oro City			
640	Julita		673	San Fernando		708	El Salvador			
641	La Paz		674	Kalilangan		709	Gingog			
642	MacArthur		675	Valencia City		710	Island, Manticao			
643	Matag-ob		676	Manolo Fortich		711	Lagonglong			
644	Mayorga		677	Malitbog		712	Magsaysay (Linogos)			
645	Merida		678	Kadangilan		713	Manticao			
646	Ormoc		679	Kibawe		714	Medina			
647	Palo		680	Pangantucan		715	Naawan			
648	Pastrana		681	Dangcagan		716	Opol			
649	San Miguel		682	Damulog		717	Salay			
650	Tananuan		683	Catarman		718	Tagoloan			
651	Catarman		NORTHERN SAMAR	684		Mambajao	CAMIGUIN IS.		719	Villanueva
652	Laoang		685	Sagay						

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province		
(Region 11)			(Region 12)			(Region 13)				
720	Compostela	COMPOSTELA VALLEY	754	Banisilan	NORTH COTABATO	788	Lebak	SULTAN KUDARAT		
721	Mabini		755	Carmen		789	Lutayan			
722	Maco		756	Kabacan		790	Palimbang			
723	Monkayo		757	Kidapawan		791	Pres. Quirino			
724	Montevista		758	Libungan		792	Sen. Ninoy Aquino			
725	Nabunturan		759	Makilala		793	Tacurong			
726	New Bataan		DAVAO DEL NORTE	760		Matalam	SARANGANI	794	Cabadbaran	AGUSAN DEL NORTE
727	Pantukan			761		Midsayap		795	Carmen	
728	Asuncion			762		M'Lang		796	Jabonga	
729	Carmen			763		Pigcawayan		797	Santiago	
730	Kapalong	764		Pikit	798	Tubay				
731	New Corella	765		Tulunang	799	Buenavista				
732	Panabo	766		Alabel	800	Butuan City				
733	Santo Tomas	767		Glan	801	Kitcharao				
734	Tagum	768		Kiamba	802	Las Nieves				
735	Bansalan	769		Maasim	803	Magallanes				
736	Davao City	DAVAO DEL SUR	770	Maitum	804	Nasipit	AGUSAN DEL SUR			
737	Digos		771	Malapatan	805	R. T. Romualdez				
738	Hagonoy		772	Banqa	806	Rosario				
739	Magsaysay		773	Gen. Santos City	807	Trento				
740	Malita		774	Koronadal	808	Veruela				
741	Matanao		775	Norala	809	Bayugan				
742	Padada		776	Polomolok	810	Bunawan				
743	Santa Cruz		777	Sto. Nino	811	Esperanza				
744	Santa Maria		778	Surallah	812	La Paz				
745	Baganga		DAVAO ORIENTAL	779	Tampakan	813		Loreto		
746	Banaybanay	780		Tantangan	814	Prosperidad				
747	Caraga	781		Tupi	815	San Francisco				
748	Cateel	782		Bagumbayan	816	San Luis				
749	Lupon	783		Columbio	817	Santa Josefa				
750	Manay	784		Don Mariano Marcos	818	Sibatog				
751	Mati	785		Esperanza	819	Talacogon				
752	San Isidro	786		Isulan	820	Cagdianao				
753	Tarragona	787		Kalamansig	SULTAN KUDARAT	821	Alegria			
								SURIGAO DEL NORTE		

Tab. C-1-1 List of Flood Susceptible Areas Nominated by NDCC in 2004 (5/5)

No.	City/Municipality	Province	No.	City/Municipality	Province	No.	City/Municipality	Province	
(Region 13)			856	Carmen	SURIGAO DEL SUR	890	Mulundo	LANAO DEL SUR	
822	Claver	SURIGAO DEL NORTE	857	Carrascal		891	Pagayawan		
823	Dapa		858	Cortes		892	Saguiaran		
824	Dinagat		859	Hinatuan		893	Sultan Gumander		
825	Malimono		860	Lianga		894	Tamparan		
826	San Isidro		861	Madrid		895	Taraka		
827	Sison		862	Marihatag		896	Tugaya		
828	Tubajon		863	San Agustin		897	Ampatuan		
829	Bacuag		864	San Miguel		898	Barira		
830	Basilisa		865	Tagbina		899	Buluan		
831	Burgos		866	Tago		900	Cotabato City		
832	Del Carmen		(ARMM)			901	Datu Piang		
833	General Luna		867	Isabela		902	Datu Saudi-Ampatuan		
834	Gigaquit		868	Lamitan		903	Dinaig (Datu Odin Sinsua)		
835	Libjo		869	Lantawan	904	Gen. S. K. Pendatun			
836	Loreto	870	Maluso	905	Kabuntalan (Tumbao)				
837	Mainit	871	Sumisip	906	Pagalungan				
838	Pilar	872	Tipo-tipo	907	Parang				
839	Placer	873	Tuburan	908	Shariff Aguak (Maganoy)				
840	San Benito	874	Bacolod-Kalawi (Bacolod)	909	Sultan Kudarat (Nuling)				
841	San Francisco	875	Balabagan	910	Sultan Mastura				
842	San Jose	876	Balindong (Watu)	911	Sultan sa Barongis				
843	Santa Monica	877	Bayang	912	Talayan				
844	Socorro	878	Binidayan	913	Upi				
845	Surigao City	879	Buadipuso Buntong	914	Bongao				
846	Taganaan	880	Butig	(CAR)					
847	Tubod	881	Ditsaan-Ramain	915	Bucay	ABRA			
848	Barobo	882	Ganassi	916	La Paz				
849	Cagwait	883	Kapatagan	917	Lagangilang				
850	Lanuza	884	Lumbatan	918	San Juan	APAYAO			
851	Lingig	885	Madalum	919	Luna				
852	Tandag	886	Madamba	920	Pudtol	BENGUET			
853	Bayabas	887	Malabang	921	Baguio				
854	Bislig	888	Marawi City	922	Itoyon				
855	Cantilan	889	Masui	923	La Trinidad				

No.	City/Municipality	Province
(CAR)		
924	Tabuk	KALINGA
925	Bontoc	MOUNTAIN PROVINCE
(NCR)		
926	Caloocan City	METRO MANILA
927	Las Pinas	
928	Makati	
929	Malabon	
930	Mandaluyong	
931	Manila	
932	Marikina	
933	Muntinlupa	
934	Paranaque	
935	Pasay	
936	Pasig	
937	Pateros	
938	Quezon City	
939	Taguig	
940	Valenzuela	

Tab. C-1-2 Principal River Basins

Water Resources Region	Number of River Basins		
	Independent	Tributaries of Major River	Total
No.1	11	1	12
No.2	11	24	35
No.3	15	7	22
No.4	87	6	93
No.5	27	1	28
No.6	20	6	26
No.7	19	0	19
No.8	30	0	30
No.9	26	0	26
No.10	15	11	26
No.11	30	2	32
No.12	10	17	27
Total	301	75	376

Note: excluding Eighteen Major River Basins

Tab. C-1-3 Major River Basins

Water Resources Region	Number of Rivers	Name of Major River Basins
No.1	1	Abra
No.2	2	Abulug, Cagayan
No.3	2	Agno, Pampanga
No.4	1	Pasig-Laguna Bay
No.5	1	Bicol
No.6	3	Panay, Jalaur, Ilog-Hilabangan
No.7	0	
No.8	0	
No.9	0	
No.10	3	Cagayan de Oro, Tagoloan, Agusan
No.11	3	Tagum-Libuganon, Davao, Buayan-Malungan
No.12	2	Agus, Mindanao
Total	18	

Tab. C-1-6 List of Other River Basins (2/2)

No.	River Name	W.R.R.	No.	River Name	W.R.R.	No.	River Name	W.R.R.
449	JIMALALUD	07	561	ZAMBOANGA CITY-6	09	673	MABINI-1-(b)	11
450	LOON	07	562	ZAMBOANGA CITY-7	09	674	MABINI-2-(b)	11
451	MANJUJOD	07	563	ZAMBOANGA CITY-8	09	675	MABINI-3-(b)	11
452	MARIBOJOC	07	564	ZAMBOANGA CITY-9	09	676	MACO	11
453	MINGLANILLA	07	565	BACUAG	10	677	MAITUM-1-(a)	11
454	NAGA	07	566	BALINGASAG	10	678	MALALAG	11
455	PINAMUNGAHAN-1	07	567	BALINGOAN	10	679	MALAPATAN-1	11
456	PINAMUNGAHAN-1	07	568	BUENAVISTA-1-(c)	10	680	MALAPATAN-2	11
457	SAGBAYAN	07	569	BUENAVISTA-2-(c)	10	681	MALAPATAN-3	11
458	SAN FERNANDO-1-(c)	07	570	CABADBARAN-1-S	10	682	MALTA-1	11
459	SAN JOSE-1-(b)	07	571	CARMEN-(b)	10	683	MALTA-2	11
460	SANTA CATALINA-1	07	572	CARRASCAL-1	10	684	MALTA-3	11
461	SANTA CATALINA-2	07	573	CARRASCAL-2	10	685	MALTA-4	11
462	SANTA CATALINA-3	07	574	CARRASCAL-3	10	686	MANAY-1	11
463	SIATON-1-S	07	575	CATARMAN-1-S	10	687	MANAY-2	11
464	SIATON-2-S	07	576	CLAVER-1	10	688	MANAY-3	11
465	SIQUJOR	07	577	CLAVER-2	10	689	MARIHATAG	11
466	SOGOD	07	578	CLAVER-3	10	690	MATI-1	11
467	TABOGON	07	579	CLAVER-4	10	691	MATI-10	11
468	TAGBILARAN CITY	07	580	CLAVER-5	10	692	MATI-11	11
469	TAYASAN	07	581	CLAVER-6	10	693	MATI-12	11
470	TOLEDO CITY	07	582	DAPA	10	694	MATI-13	11
471	TRINIDAD	07	583	DEL CARMEN	10	695	MATI-14	11
472	TUBIGON	07	584	EL SALVADOR-1	10	696	MATI-15	11
473	TUBURAN-1-(a)	07	585	EL SALVADOR-2	10	697	MATI-2	11
474	TUBURAN-2-(a)	07	586	GINGOG CITY-1	10	698	MATI-3	11
475	UBAY-1	07	587	GINGOG CITY-2	10	699	MATI-4	11
476	UBAY-2	07	588	GINGOG CITY-3	10	700	MATI-5	11
477	VALENCIA (LUZURRIAGA)	07	589	JABONGA	10	701	MATI-6	11
478	ZAMBOANGUITA	07	590	JASAAN-1	10	702	MATI-7	11
479	ALBUERA	08	591	JASAAN-2	10	703	MATI-8	11
480	BALANGKAYAN	08	592	LAGONGLONG	10	704	MATI-9	11
481	BASEY-1-S	08	593	MAGSAYSAY-1-(b)	10	705	PANABO CITY	11
482	BAYBAY-1	08	594	MAINIT	10	706	PANTUKAN-1	11
483	BAYBAY-2	08	595	MALIMON-1	10	707	PANTUKAN-2	11
484	BAYBAY-3	08	596	MALIMON-2	10	708	PANTUKAN-3	11
485	BAYBAY-4	08	597	MANOLO FORTICH	10	709	POLOMOLOK	11
486	BOBON-1	08	598	MEDINA-1-(b)	10	710	ROSARIO-1-(b)	11
487	BOBON-2	08	599	OPO	10	711	SAN ISIDRO-1	11
488	BONTOC	08	600	PILAR-1-(b)	10	712	SAN ISIDRO-2	11
489	CALBAYOG CITY-1	08	601	PLACER	10	713	SAN ISIDRO-3	11
490	CALBAYOG CITY-2	08	602	SALAY	10	714	SAN ISIDRO-4	11
491	CALBAYOG CITY-3	08	603	SURIGAO CITY-1	10	715	SAN ISIDRO-5	11
492	CALBAYOG CITY-4	08	604	SURIGAO CITY-2	10	716	SANTA CRUZ-1-(d)	11
493	CALBAYOG CITY-5	08	605	TAGANA-AN	10	717	SANTA CRUZ-2-(d)	11
494	CALBIGA-1-S	08	606	ALABEL	11	718	SANTA CRUZ-3-(d)	11
495	CAN-AVID	08	607	BAGANGA-1	11	719	SANTA MARIA-1	11
496	CARIGARA	08	608	BAGANGA-2	11	720	SANTA MARIA-2	11
497	CULABA	08	609	BAGANGA-3	11	721	SANTA MARIA-3	11
498	GENERAL MACARTHUR	08	610	BAGANGA-4	11	722	TAGBINA-1	11
499	GIPORLOS	08	611	BAGANGA-5	11	723	TAGBINA-2	11
500	HINUNDAYAN	08	612	BANAYBANAY-1	11	724	TAGUM CITY	11
501	JAVIER	08	613	BANAYBANAY-2	11	725	TANDAG-1-S	11
502	LEYTE	08	614	BANAYBANAY-3	11	726	TANDAG-2-S	11
503	LIBAGON	08	615	BAROBO	11	727	TARRAGONA-1	11
504	LILUAN	08	616	BISLIG-1-S	11	728	TARRAGONA-2	11
505	MARABUTI	08	617	BISLIG-2-S	11	729	TARRAGONA-3	11
506	MATALOM	08	618	BISLIG-3-S	11	730	BALABAGAN	12
507	MERIDA-1-(a)	08	619	BISLIG-4-S	11	731	DATU ODIN SINSUAT (DINAIG)	12
508	MERIDA-2-(a)	08	620	BOSTON	11	732	ILIGAN CITY-1	12
509	MONDRAGON	08	621	CAGWAIT	11	733	ILIGAN CITY-2	12
510	ORAS-1-S	08	622	CARAGA-1-S	11	734	INITAO	12
511	ORMOC CITY	08	623	CARAGA-2-S	11	735	KALAMANSIG-1	12
512	PALOMPON	08	624	CATEEL	11	736	KALAMANSIG-2	12
513	SAINT 1	08	625	CORTES-1	11	737	KALAMANSIG-3	12
514	SAINT BERNARD	08	626	CORTES-2	11	738	KAROMATAN (SULTAN NAGA DIMAPO)-1	12
515	SAN MIGUEL-1-(b)	08	627	DAVAO CITY	11	739	KAROMATAN (SULTAN NAGA DIMAPO)-2	12
516	SAN POLICARPO	08	628	DAVAO CITY4	11	740	KAROMATAN (SULTAN NAGA DIMAPO)-3	12
517	SAN ROQUE	08	629	DIGOS-1-S	11	741	LALA	12
518	TAFT-1-S	08	630	DON MARCELINO6	11	742	LEBAK	12
519	BUUG-1	09	631	GENERAL SANTOS CITY-1	11	743	MAIGO	12
520	BUUG-1	09	632	GENERAL SANTOS CITY-2	11	744	MAITUM-1-(b)	12
521	CALAMBA	09	633	GLAN-1-S	11	745	MAITUM-2-(b)	12
522	IPIL-1-S	09	634	GLAN-2-S	11	746	MAITUM-3-(b)	12
523	ISABEL	09	635	GLAN-3-S	11	747	MAITUM-4-(b)	12
524	JOSE DALMAN (PONOT)	09	636	GLAN-4-S	11	748	MANTICAO	12
525	KALAWIT	09	637	GLAN-5-S	11	749	MATANOG-1	12
526	KATIPUNAN	09	638	GLAN-6-S	11	750	MATANOG-2	12
527	LABASON-1	09	639	GLAN-7-S	11	751	NAAWAN	12
528	LABASON-2	09	640	GOVERNOR GENEROSO-1	11	752	PALIMBANG-1	12
529	LAMITAN-1	09	641	GOVERNOR GENEROSO-2	11	753	PALIMBANG-2	12
530	LAMITAN-2	09	642	GOVERNOR GENEROSO-3	11	754	PALIMBANG-3	12
531	LANTAWAN	09	643	GOVERNOR GENEROSO-4	11	755	PALIMBANG-4	12
532	LOPEZ JAENA	09	644	GOVERNOR GENEROSO-5	11	756	PALIMBANG-5	12
533	MANUKAN-1	09	645	GOVERNOR GENEROSO-6	11	757	PALIMBANG-6	12
534	MANUKAN-2	09	646	GOVERNOR GENEROSO-7	11	758	PALIMBANG-7	12
535	OZAMIS CITY	09	647	GOVERNOR GENEROSO-8	11	759	SULTAN GUMANDER-1	12
536	PAGADJIAN CITY	09	648	HINATUAN-1-S	11	760	SULTAN GUMANDER-2	12
537	PRES. MANUEL A. ROXAS	09	649	HINATUAN-2-S	11	761	TANGCAL	12
538	RIZAL-1-S-(b)	09	650	JOSE ABAD SANTOS (TRINIDAD)-1	11	762	TUBOD	12
539	SAPANG DALAGA	09	651	JOSE ABAD SANTOS (TRINIDAD)-2	11	763	UPI-1	12
540	SIBUCO-1-S	09	652	JOSE ABAD SANTOS (TRINIDAD)-3	11	764	UPI-2	12
541	SIBUCO-2-S	09	653	KIAMBA-1	11	765	UPI-3	12
542	SINACABAN	09	654	KIAMBA-2	11	766	UPI-4	12
543	SUMISIP-1	09	655	KIAMBA-3	11	767	UPI-5	12
544	SUMISIP-2	09	656	KIAMBA-4	11	768	UPI-6	12
545	SUMISIP-3	09	657	KIAMBA-5	11	769	UPI-7	12
546	TANGUB CITY	09	658	KIAMBA-6	11	770	UPI-8	12
547	TIPO-TIPO	09	659	LANUZA-1	11			
548	TUBURAN-1-(b)	09	660	LANUZA-2	11			
549	TUKURAN	09	661	LANUZA-3	11			
550	ZAMBOANGA CITY-1	09	662	LANUZA-4	11			
551	ZAMBOANGA CITY-10	09	663	LIANGA-1	11			
552	ZAMBOANGA CITY-11	09	664	LIANGA-2	11			
553	ZAMBOANGA CITY-12	09	665	LIANGA-3	11			
554	ZAMBOANGA CITY-13	09	666	LIANGA-4	11			
555	ZAMBOANGA CITY-14	09	667	LINGIG-1	11			
556	ZAMBOANGA CITY-15	09	668	LINGIG-2	11			
557	ZAMBOANGA CITY-2	09	669	LINGIG-3	11			
558	ZAMBOANGA CITY-3	09	670	MAASIM-1	11			
559	ZAMBOANGA CITY-4	09	671	MAASIM-2	11			
560	ZAMBOANGA CITY-5	09	672	MAASIM-3	11			

Tab. C-1-7 FVI Values of the Major River Basins

FVI Value	Major River Basin
2.0 – 5.0	Agno, Pampanga, Pasig-Marikina-Laguna de Bay, Bicol, Tagum-Libuganon
5.0 – 10.0	Cagayan, Agusan, Mindanao, Buayan-Malangum
10.0 – 15.0	Ilog-Hilabangan, Cagayan de Oro, Agus-Lake Lanao
15.0 – 20.0	Panay, Jalaur, Tagaloan
20.0 – 35.0	Abulog, Abra, Davao

Tab. C-1-8 Problem Areas of Floods/Sediment Disasters

Problem Area	River Basins
1. Northeastern Luzon	1) Cagayan
2. Northwestern Luzon	1) Laoag 2) Abra
3. Central Luzon	1) Agno and surrounding river basins 2) Eastern rivers of Mt. Pinatubo 3) Western rivers of Mt. Pinatubo 4) Pampanga
4. Metro Manila	1) Pasig-Laguna Bay
5. Bicol and surroundings	1) Bicol and other rivers
6. Southern Luzon and Eastern Mindoro	1) Rivers in Eastern Mindoro 2) Rivers in Southern Luzon
7. South and Northeastern Panay and Western Negros	1) Panay 2) Jalaur 3) River basins in and around Iloilo City 4) Ilog-Hilabangan and others
8. Leyte and Northeastern Mindanao	1) River basins in Leyte and Southern Leyte 2) River basins in Northeastern Mindanao

Tab. C-1-9 Collected Data for Evaluation Indexes

Evaluation Index		Collected Data	Source of Data
S1	Poverty Incidence	Provincial poverty incidence was collected (%) (refer to Tab. C-1-10)	NSCB, 2000
S2	Population	City/municipality population (2000) was collected (persons) (refer to Tab. C-1-11)	NSO, 2000 Population Census
S3	Population Movement	City/municipality population (2005 projection) was collected, and growth rate was calculated (%) (for population, refer to Tab. C-1-11)	NSO, 2005 Population Projection
S4	Production	Provincial average annual family income and family number were collected, and production was estimated by multiplying them (mil. Pesos) (refer to Tab. C-1-10)	NSCB, 2000
S5	Forest Cover Ratio	Nationwide land use map was collected (refer to Fig. C-1-2)	NAMRIA, s=1/100,000, Land Sat 2002-03
S6	Built-up Area Ratio	Nationwide land use map was collected (refer to Fig. C-1-2)	NAMRIA, s=1/100,000, Land Sat 2002-03
S7	Flood Casualties	City/municipality annual casualties caused by typhoons and flashfloods were collected and averaged (persons/year) (refer to Tab. C-1-12)	DSWD, 1996-2005 (10 years)
S8	Flood Damages	Provincial damage per destructive typhoon was collected and averaged (mil. Pesos /typhoon) (refer to Tab. C-1-10)	NDCC, 2001-2005 (25 Typhoons)
N1	Frequency of Tropical Cyclones	Provincial annual average passage of tropical cyclones was collected (times/year) (refer to Tab. C-1-10)	PAGASA, 1948-2000
N2	Rainfall Intensity	Nationwide isohyet graph (1/25) was collected, and basin value was estimated (mm/day) (refer to Fig. C-1-3)	FCSEC, 2003
N3	River Gradient	DEM data was collected, and averaged slope of river was estimated (degree)	DEM, NASA 2000
N4	Ratio of Hazards Zone of Volcano	Location of active/potential volcano and its influential area (ground gradient is greater than 2 degrees) was prepared, and ratio was estimated (refer to Fig. C-1-4)	Volcano Location: PHIVOLCS, 2005
N5-C	Frequency of Floods based on Flood Casualty Data	Flood frequency was estimated based on the same data as S7 (times/10 years) (refer to Tab. C-1-12)	DSWD, 1996-2005 (10 years)
N5-D	Frequency of Floods based on Flood Damage Data	Flood frequency was estimated based on the same data as S8 (times/5 years) (refer to Tab. C-1-10)	NDCC, 2001-2005 (25 Typhoons)

Tab. C-1-10 Provincial Data

Province	Poverty Incidence (S1) (%)	Production (S4) (PhP million)	Flood Damages (S8) (PhP million/typhoon)	Frequency of Tropical Cyclones (N1) (times/year)	Frequency of Floods(N5) (times/5years)
Abra	48.8	4,386.5	55.16	1.30	5.0
Agusan del Norte	39.9	9,660.9	3.13	0.50	1.0
Agusan del Sur	50.2	7,698.4	1.62	0.28	1.0
Aklan	36.3	8,609.2	14.04	0.24	3.0
Albay	39.6	22,787.4	12.37	0.88	4.0
Antique	35.1	8,755.8	8.39	0.80	2.0
Aurora	26.6	3,965.5	48.99	1.50	4.0
Basilan	26.2	4,089.1	0.00	0.04	0.0
Bataan	9.9	20,272.3	1.84	0.48	4.0
Batanes	7.5	512.1	1.69	2.10	3.0
Batangas	25.9	51,444.2	0.98	0.66	2.0
Benguet	14.1	23,457.9	24.78	0.62	5.0
Bhiran	34.8	2,201.1	3.97	0.40	4.0
Bohol	47.3	16,245.2	9.14	0.54	2.0
Bukidnon	32.2	21,507.3	0.00	0.08	0.0
Bulacan	5.4	72,986.9	23.87	0.44	4.0
Cagayan	20.3	18,881.1	79.65	2.02	4.0
Camarines Norte	52.7	9,134.3	2.21	0.58	4.0
Camarines Sur	42.6	30,309.2	26.21	1.02	3.0
Camiguin	53.1	1,262.9	7.98	0.40	1.0
Capiz	51.0	13,022.0	21.51	0.38	3.0
Catanduanes	44.7	4,462.8	4.72	0.66	4.0
Cavite	10.2	73,439.6	0.54	0.48	2.0
Cebu	28.7	72,012.0	3.56	1.00	3.0
Compostela Valley	38.9	4,546.9	0.00	0.06	0.0
Davao (Davao del Norte)	38.9	7,113.3	0.00	0.06	0.0
Davao Oriental	34.4	8,088.2	0.23	0.10	1.0
Davao del Sur	18.2	46,983.9	0.00	0.02	0.0
Eastern Samar	47.3	5,302.8	0.24	1.30	2.0
Guimaras	22.6	2,638.5	2.45	0.68	2.0
Ifugao	55.6	2,777.1	12.29	0.50	5.0
Ilocos Norte	18.2	15,046.8	14.99	1.10	5.0
Ilocos Sur	30.6	13,812.9	9.64	1.20	5.0
Iloilo	29.8	52,659.0	11.61	0.68	4.0
Isabela	30.2	29,640.1	98.66	1.12	4.0
Kalinga-Apayao	64.9	5,044.7	32.70	1.58	5.0
La Union	33.7	15,835.4	11.35	0.56	5.0
Laguna	8.6	73,483.5	0.04	0.38	1.0
Lanao del Norte	50.8	15,578.4	0.00	0.04	0.0
Lanao del Sur	55.0	8,347.3	2.42	0.04	1.0
Leyte	36.1	36,053.7	4.51	1.06	4.0
Maguindanao	55.1	11,158.8	1.39	0.02	2.0
Marinduque	45.2	3,635.0	1.40	0.34	2.0
Masbate	62.8	20,584.5	1.04	1.08	2.0
Metro Manila	5.7	657,267.9	0.04	0.04	1.0
Mindoro Occidental	41.4	7,461.7	3.49	0.96	4.0
Mindoro Oriental	43.1	14,012.4	29.86	0.96	3.0
Misamis Occidental	43.4	7,929.5	0.00	0.06	0.0
Misamis Oriental	27.6	28,409.8	0.00	0.08	0.0
Mountain Provin	49.0	2,737.8	27.35	0.32	5.0
Negros Occidental	41.6	47,121.3	36.46	0.82	4.0
Negros Oriental	28.9	20,347.2	2.54	0.82	1.0
Northern Samar	40.7	7,563.8	4.35	1.32	3.0
Nueva Ecija	27.3	40,169.8	16.61	0.74	4.0
Nueva Vizcaya	15.9	9,572.2	23.42	0.78	4.0
Palawan	27.9	15,463.4	0.69	0.84	3.0
Pampanga	14.4	54,270.9	27.68	0.46	4.0
Pangasinan	30.9	52,933.1	29.72	0.74	4.0
Quezon	34.1	36,903.7	8.94	0.58	2.0
Quirino	31.4	2,839.3	12.64	0.70	4.0
Rizal	8.0	84,703.9	0.66	0.40	2.0
Romblon	55.2	3,897.3	4.49	0.72	3.0
Samar (Western Samar)	40.7	10,045.4	0.17	1.30	2.0
Sarangani	48.0	6,051.2	1.38	0.00	2.0
Siquijor	29.2	1,376.4	0.26	0.02	1.0
Sorsogon	41.4	10,596.5	3.65	0.66	4.0
South Cotabato	37.3	31,754.6	0.00	0.00	2.0
Southern Leyte	28.5	6,265.6	0.28	1.06	1.0
Sultan Kudarat	54.3	8,971.9	0.96	0.02	1.0
Sulu	63.2	7,714.5	0.00	0.00	0.0
Surigao del Norte	42.4	7,344.4	5.12	0.48	3.0
Surigao del Sur	38.2	8,620.6	4.91	0.26	2.0
Tarlac	27.6	22,989.2	27.54	0.40	3.0
Tawi-Tawi	56.5	4,158.2	0.00	0.00	0.0
Zambales	23.5	19,069.2	0.32	0.72	2.0
Zamboanga Sibugay	37.0	2,208.9	8.66	0.04	2.0
Zamboanga del Norte	45.6	14,454.7	0.20	0.08	1.0
Zamboanga del Sur	37.0	18,473.7	0.07	0.04	1.0
Cotabato (North Cotabato)	42.9	15,753.9	3.59	0.02	2.0

Tab. C-1-12 Flood Casualties and Frequency (1/5)

City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)
Santo Tomas	Davao (Davao del Norte)	0.100	1.000	Sablayan	Mindoro Occidental			Balingoan	Misamis Oriental		
Senator Ninoy Aquino		0.300	1.000	San Jose		0.600	1.000	Talisayan			
President Quirino				Santa Cruz		2.600	1.000	Medina			
Tacurong City				Baco		0.100	1.000	Gingoog City		0.100	1.000
Don Mariano Marcos				Bansud		0.300	2.000	Magsaysav			
Lutayan	Sultan Kudarat			Bongabong		2.600	2.000	Don Victoriano Chiongbian (DM)			
Izulan				Bulalacao				Bonifacio			
Esperanza				Calapan City		0.100	1.000	Sinacaban			
Columbio				Gloria		6.100	1.000	Tudela			
Bagumbayan				Mansalay		8.700	1.000	Clarín			
Palimbang				Naujan		0.200	1.000	Ozamis City		0.000	0.000
Lebak		4.300	1.000	Pinamalayan		4.900	4.000	Tangub City			
Kalamansig		1.100	1.000	Pola				Concepcion			
Lake Sebu		0.100	1.000	Puerto Galera				Calamba			
Norala		0.000	0.000	Roxas		2.800	2.000	Baliangao			
Polomolok		0.000	0.000	San Teodoro				Plaridel			
T Boli		0.100	1.000	Socorro				Lopez Jaena			
Tantangan				Victoria				Oroquieta City			
Tupi	South Cotabato	0.000	0.000	Aborlan		0.700	1.000	Aloran			
Banga		0.200	1.000	Agutaya				Panaon			
Koronadal City				Araceli				Jimenez			
Santo Nino				Balabac				Sapang Dalaga			
Surallah		0.300	1.000	Bataraza				Bacolod			
Tampakan		0.600	1.000	Brooke's Point				Kauswagan		10.200	1.000
Glan		1.100	1.000	Busuanga		0.100	1.000	Kolambugan			
Malungon				Coron				Linamon		7.400	1.000
Alabel				Culion		0.000	0.000	Maigo			
Maasim	Sarangani	0.200	1.000	Clayo		0.200	1.000	Tubod		0.700	1.000
Kiamba				Dumarán				Baloi			
Maitum		0.700	1.000	El Nido				Karomatagan (Sultan Naga Dimapo)			
Malapatan				Magsaysay				Lala			
Alamada		0.600	1.000	Quezon				Magsaysav			
Aleosan				Rizal		0.200	1.000	Matungao			
Banilsilan				Roxas		0.200	1.000	Munai			
Carmen				San Vicente				Nunungan			
Kabacan		0.700	1.000	Taytay				Pantao Ragat			
Libungan				Alcantara				Poona Piagapo			
Midsayap		0.200	2.000	Banton				Salvador			
Pigkawayan				Cajidiocan				Sapad			
Pikit	Cotabato (North Cotabato)		0.100	Calatrava		0.200	1.000	Tagoloan			
Antipas				Concepcion				Tangcal			
Kidapawan City				Corcuera		0.100	1.000	Pantar			
MLang				Ferrol				Higan City			
Arakan				Looc				Mambajao		5.200	1.000
Makilala				Magdiwang		0.300	1.000	Catarman		5.400	1.000
Matalam		0.800	1.000	Odiangan	Romblon			Sagay		0.400	1.000
President Roxas				Romblon				Guinsiliban			
Tulunan		0.000	0.000	San Andres				Mahinog		29.100	1.000
Magpet				San Fernando				Cagayan de Oro City	Misamis Oriental	1.000	3.000
General Santos City	South Cotabato	0.000	0.000	San Jose				Bauangon			
Cotabato City	Cotabato City			Santa Fe		2.400	2.000	Ibbona		0.200	1.000
Mati				San Agustin				Malibog			
San Isidro		0.300	1.000	Santa Maria (Imelda)				Manolo Fortich			
Lupon				Kalayaan				Sumilao			
Banaybanay				Linapacan				Talakag			
Governor Generoso	Davao Oriental	1.100	1.000	Casiguran		0.100	1.000	Danalog			
Boston		17.300	1.000	Dilasag		1.000	1.000	Dangcagan			
Cateel		0.300	1.000	Dinalungan		0.200	1.000	Don Carlos			
Baganga		0.200	1.000	Dingalan		0.300	1.000	Kadingilan			
Caraga		0.200	1.000	Dipaculao		0.800	2.000	Kalilangan			
Manay		0.300	1.000	Maria Aurora				Kibawe			
Farragona		0.000	0.000	San Luis				Maramag			
Don Marcelino		0.400	1.110	Agoncillo		0.000	0.000	Pangantucan			
Kiblawan				Alitagtag				Quezon			
Malalag				Balayán		0.100	1.000	Kitaotao			
Malita		0.800	2.220	Balete		0.100	1.000	Cabanglasan			
Santa Maria				Bauan		0.300	1.000	Impasug-Ong			
Sulop				Calaca				Lantapan			
Sarangani	Davao del Sur			Calatagan				Malaybalay City		0.300	1.000
Matanao				Cuenca		0.100	1.000	San Fernando		0.600	1.000
Magsaysav				Ibaan				Valencia City		1.100	1.000
Bansalan				Laurel				Imelda		1.800	1.000
Santa Cruz				Lemery				Diplahan			
Digos City				Lian				Olutanga			
Hagonoy				Lobo				Talusan			
Padada		0.600	3.000	Mabini				Mabuhay			
Asuncion (Saug)		0.000	0.000	Malvar		0.200	1.000	Sivay			
Carmen		0.300	1.000	Matias Na Kaltoy				Kabasalan			
Kanilong				Nasugbu		0.000	0.000	Naga			
New Corella	Davao (Davao del N)		0.000	Padre Garcia				Ipil			
Panabo City				San Jose				Titay		0.000	0.000
Tagum City				San Juan		0.200	1.000	Roseller Lim			
Island Garden City of Samal				San Luis				Tungawan			
Talaingod				San Nicolas		0.400	1.000	Buug			
Davao City	Davao del Sur			San Pascual				Malangas			
New Bataan		0.300	1.000	Santa Teresita				Alicia			
Nabunturan		0.200	1.000	Santo Tomas				Bayog		0.000	0.000
Montevista		0.200	1.000	Taal		0.000	0.000	Dimataling		0.200	1.000
Monkayo		2.700	3.000	Talisav				Dinas			
Mawab				Tanauan				Dumalinao			
Maragusan (San Mariano)	Compostela Valley	0.300	1.000	Taysan				Kumalarang			
Laak (San Vicente)				Tingloy		0.400	1.000	Lakewood			
Compostela		0.400	1.000	Tuy		0.400	1.000	Lapuyan			
Maco		0.400	1.000	Alfonso		0.200	1.000	Margosatubig			
Mabini				Amadeo				Pitogo			
Pantukan		0.200	1.000	Carmona				San Miguel			
Claveria				Dasmariñas				San Pablo			
Lugait				General Mariano Alvarez				Tabina			
Manticao	Misamis Oriental			General Emilio Aguinaldo		0.000	0.000	Vincenzo A. Sagun			
Naawan		0.100	1.000	General Trias				Guipos			
Initao				Imus		0.100	1.000	Tigbau			
Libertad				Indang							
Gitagun											

Tab. C-1-12 Flood Casualties and Frequency (2/5)

City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)
Laguindingan				Kawit		0.100	1.000	Sominot (Don Mariano Marcos)			
Alubijid		0.100	1.000	Magallanes				Josefina			
El Salvador		2.200	1.000	Maragondon		0.000	0.000	Ramon Magsaysay (Liang)			
Opol				Mendez-Nunez	Cavite			Molave	Zamboanga del Sur	0.200	1.000
Tagoloan	Misamis Oriental			Naic		0.000	0.000	Midsalip		0.300	1.000
Villanueva				Novleta		0.100	1.000	Mahayag			
Jasaan		0.100	1.000	Rosario		1.000	2.000	Dumungag		0.000	0.000
Balingasag				Silang		0.700	1.000	Aurora			
Lagonglong		0.000	0.000	Tanza		0.000	0.000	Tambulig		0.200	1.000
Salay				Ternate		0.200	1.000	Tukuran			
Bimuanan				Alaminos				Labangan			
Sugbongcogon				Bay	Laguna	0.700	1.000	Pagadian City			
Kinoguitan				Binan		1.000	1.000	Sergio Osmena Sr.	Zamboanga del Norte		
Cabuyao		0.300	1.000	Pinan (New Pinan)				Guimba			
Calauan				Mutia				Jaen			
Cavinti				La Libertad				Laur		0.100	1.000
Famy		0.200	1.000	Rizal				Licab		0.000	0.000
Kalayaan				Sibutad				Llanera			
Liliw				Dapitan City		0.200	1.000	Lupao			
Los Banos		0.100	1.000	Polanco		0.100	1.000	Munoz		0.000	0.000
Luisiana				Dipolog City		0.200	1.000	Nampicuan			
Lumban		0.100	1.000	Kalawit				Pantabangan			
Mabiat		0.100	1.000	Godod				Penaranda			
Magdalena				Tampilisan				Quezon	Nueva Ecija	0.000	0.000
Maiaviv				Sibaco		0.100	1.000	Rizal			
Nagscarlan	Laguna	0.100	1.000	Sirawai	Zamboanga del Norte			San Antonio			
Paete				Sison				San Isidro			
Pagsaman				Baliguian				San Leonardo			
Pakil				Bacungan				Santa Rosa			
Pangil				Salug				Santo Domingo			
Pila		0.000	0.000	Liloy				Talavera			
Rizal				Labason				Talugtog			
Santa Cruz		0.300	2.000	Gutalac				Zaragoza		0.000	0.000
Santa Maria				Siayan		0.800	1.000	Apalit		0.900	3.000
Santa Rosa		0.400	1.000	Katipunan				Arayat		0.100	1.000
Simloan		1.300	1.000	Pres. Manuel A. Roxas				Bacolor			
Victoria				Manukan		3.300	1.000	Candaba		0.800	4.000
Akdangan				Jose Dalman (Ponot)		2.700	1.000	Floridablanca		0.200	2.000
Alabat				Sindangan		0.200	1.000	Guagua		0.400	2.000
Atimonan		0.100	1.000	Zamboanga City	Zamboanga del Sur	0.600	1.000	Lubao		0.100	1.000
Buenavista				Lantawan				Mabalacat	Pampanga	0.100	1.000
Burdeos		0.300	1.000	Isabel				Macabebe		1.300	3.000
Calauag		1.800	1.000	Maluso				Magalang			
Candelaria				Sumisip	Basilan			Masantol		0.800	6.000
Catanauan		0.200	1.000	Tipo-tipo				Mexico		0.600	3.000
Dolores				Lamitan		0.000	0.000	Minalin		0.700	4.000
General Luna				Tuburan				Porac		0.200	1.000
General Nakar		57.100	1.000	San Jose de Buan				San Fernando		1.100	4.000
Guinayangan				Himbangan				San Luis		0.400	3.000
Guinaga		0.300	1.000	Marabut		0.000	0.000	San Simon		0.300	3.000
Infanta		70.700	1.000	Basey				Santa Ana		0.200	2.000
Jomalita				Santa Rita				Santa Rita			
Lopez		0.200	1.000	Talalora				Santo Tomas		0.300	3.000
Lucban				Villareal				Sasmuan (Sexmoan)		0.600	3.000
Macalelon				Pinabacdao				Anao			
Mauban	Quezon	1.400	3.000	Calbiga				Bamban			
Mulanay				San Sebastian		0.700	1.000	Camiling		0.100	1.000
Padre Burgos				Paranas (Wright)				Capas		0.100	1.000
Pagbilao				Motiong				Concepcion			
Panukulan				Jiabong	Samar (Western Samar)			Gerona		0.100	1.000
Patnanungan				Carbalogan		0.700	1.000	La Paz	Tarlac	0.300	1.000
Perez				Zumarraga		0.300	1.000	Mavantoc		0.000	0.000
Pitogo				Daram				Moncada		0.200	2.000
Plaridel				Matuguinao				Paniqui		1.000	2.000
Polillo				Calbavog City		0.400	1.000	Pura		0.100	1.000
Quezon				Tarangnan				Ramos		0.100	1.000
Real		45.000	2.000	San Jorge				San Clemente			
Sampaloc		2.100	1.000	Gandara				San Manuel		0.000	0.000
San Andres				Santa Margarita				Santa Ignacia			
San Francisco		0.400	1.000	Santo Nino				Victoria			
San Narciso				Almagro				Botolan		0.100	1.000
Sariaya		0.100	1.000	Tagapul-An				Cabangan		0.100	1.000
Tagkawavan				Pagsanghan				Candelaria			
Tavares		0.200	2.000	Limasawa				Castillejos			
Tiaog		0.400	1.000	Masin				Iba			
Uisan				Macrohon				Masinloc	Zambales	0.300	3.000
Angono		0.900	1.000	Padre Burgos				Palauig			
Antipolo City		13.700	2.000	Malibog				San Antonio			
Baras				Tomas Oppus				San Felipe			
Binangonan		0.400	2.000	Bontoc				San Marcelino			
Cardona		0.400	1.000	Sogod		0.100	1.000	San Narciso		0.100	1.000
Jala-Jala	Rizal			Libagon				Santa Cruz		0.300	2.000
Morong		0.200	1.000	Saint Bernard	Southern Leyte	0.100	1.000	Subic		2.400	3.000
Piñilla		0.300	2.000	San Francisco				San Jose	Tarlac		
Tanay		4.400	3.000	San Ricardo				Tarlac City		0.100	1.000
Teresa		0.100	1.000	Pintuyan				Abucay	Bataan	0.100	1.000
San Antonio	Quezon	0.100	1.000	Liloan				Ibavat			
Cavite City	Cavite	0.100	1.000	San Juan (Cabalian)				Ivana			
Baler	Aurora			Anahawan				Mahatao	Batanes		
Bagac				Hinundayan				Sabtang			
Balanga City		0.000	0.000	Hinunangan				Uvugan			
Dinalupihan		0.300	1.000	Silago				Abulug		0.300	2.000
Hermosa		1.100	2.000	Silvino Lobos		0.100	1.000	Alcala		0.700	5.000
Limay	Bataan	0.100	1.000	San Roque				Allacapan		0.000	0.000
Mariveles				Pambuan				Amulung		0.300	3.000
Morong		0.200	2.000	Palapag		0.200	1.000	Aparri		0.700	2.000
Orani		0.300	2.000	Mapanas				Bagao		0.900	4.000
Orion		0.000	0.000	Catubig				Ballesteros		0.200	2.000
Pilar		0.100	1.000	Gamay				Buguey		0.200	1.000
Samal		0.200	2.000	Lanitna				Calayan		2.400	1.000
Angat		0.100	1.110	Las Navas	Northern Samar			Camalanigan		0.000	0.000
Balagtas				Lasang				Claveria		0.600	2.000
Baliuag				Biri				Enrile		0.000	0.000
Bocaue		0.100	1.110	Allen				Gattaran		0.300	3.000
Bulacan	Bulacan	0.300	1.110	Victoria				Gonzaga		0.300	3.000
Bustos				Lavezares				Lal-lo		1.200	3.000
Calumpit		1.400	2.220	Rosario		0.100	1.000	Lasam		0.300	2.000
Dona Remedios				Bobon		0.200	1.000	Pamplona		0.800	4.000
Trinidad				San Jose				Penablanca		0.200	2.000
Guiquinto		0.300	1.110	San Jose							

Tab. C-1-12 Flood Casualties and Frequency (3/5)

City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	
Hagonoy	Bulacan	0.500	3.330	Lope De Vega	Northern Samar			Piat	Cagayan	0.600	0.000	
Malolos		0.600	3.330	Catarman			0.300	1.000		Rizal	0.000	0.000
Norzagaray				Mondragon						Sanchez-Mira	0.100	1.000
Pandi				San Isidro						Santa Ana	0.400	3.000
Paombong		0.100	1.110	San Antonio						Santa Praxedes	0.100	1.000
Plaridel				Capul						Santa Teresita	0.700	4.000
Pullian				San Vicente						Santo Nino	0.000	0.000
San Ildefonso				Mahaplag						Solana	0.200	1.000
San Miguel		2.400	1.110	Baybay			11.600	2.000		Tuao	0.100	1.000
San Rafael				Inopacan						Tuguegarao City	0.800	4.000
Santa Maria	0.300	1.110	Hindang				Alicia	4.900	1.000			
Aliaga	0.400	1.000	Hilongos				Angadanan	0.400	1.000			
Bongabon	0.000	0.000	Bato				Aurora					
Cabiao			Matalom	Leyte	0.100	1.000	Benito Soliven	0.600	2.000			
Carranglan	0.300	2.000	Abuyog			0.700	1.000	Burgos	0.000	0.000		
Cuyapo	0.000	0.000	Javier					Cabagan	0.300	2.000		
Gabaldon			Kananga			0.200	2.000	Cabatuan	0.200	1.000		
Gapan			Matag-ob			0.200	2.000	Cauayan	5.400	2.000		
General Mamerto Natividad			Palompon			1.600	1.000	Cordon	0.200	1.000		
General Timio			Isabel					Dinapigue	0.700	1.000		
Merida			Divilican			0.400	1.000	Alcoy				
Albuera	0.200	1.000	Echague					Dalaguete	0.200	1.000		
Ormoc City	1.300	1.000	Gamu					Argao				
Calubian			Hagan		2.000	4.000	Dumanjug					
San Isidro			Jones		0.400	1.000	Santander					
Leyte	0.600	1.000	Luna				Barili					
Villaba			Maconacon		0.800	2.000	Aloguinsan					
Tabango			Mallig				Pinamungahan					
Tunga			Nasuilan		0.300	2.000	Toledo City					
Pastrana			Palanan		0.200	2.000	Balamban	2.300	1.000			
La paz	1.300	1.000	Quezon		0.100	1.000	Asturias					
Julita			Quirino		0.100	1.000	Tuburan					
Jaro			Ramon	Isabela	0.200	1.000	Talisay	0.600	2.000			
Dagami			Reina Mercedes					Minglanilla	0.700	1.000		
Burauen	0.600	2.000	Roxas			0.000	0.000	Naga	0.100	1.000		
Macarthur			San Agustin					San Fernando				
Mavorga			San Guillermo			0.100	1.000	Carcar	0.100	1.000		
Dulag	1.200	1.000	San Isidro					Sibonga	0.200	1.000		
Tabontabon			San Manuel					Santa Fe				
Barugo			San Mariano			0.900	1.000	Medellin				
Carigara			San Mateo					Bogo				
Capoocan			San Pablo			0.100	1.000	Tabogon				
Alangalang			Santa Maria		0.100	1.000	San Remigio					
Babatngon			Santiago		0.100	1.000	Madridejos					
Palo	0.100	1.000	Santo Tomas		0.100	1.000	Tabuelan					
San Miguel			Tumauini		0.300	2.000	Danao					
Santa Fe			Alfonso Castaneda				Dagohoy					
Tanauan	2.700	1.000	Ambaguto				Jetafe					
Tolosa			Artiao		0.100	1.000	Buenavista					
Arceche			Baobang		0.400	1.000	Inabanga					
Balanriga			Bambang		1.000	1.000	Sagbayan					
Borongan	1.600	1.000	Bayombong		1.000	2.000	Clarin					
Can-Avid	0.100	1.000	Diadi		0.200	1.000	Uhay					
Dolores			Dupax Del Norte		0.100	1.000	San Miguel					
General Macarthur	0.200	10.000	Dupax Del Sur	Nueva Vizcaya	1.200	1.000	Trinidad	0.300	1.000			
Giporlos			Kasibu					Talibon				
Guituan			Kayapa			0.600	4.000	Bien Unido				
Hernani			Quezon			0.100	1.000	Pres. Carlos P. Garcia				
Jipapad			Santa Fe			0.000	0.000	San Isidro				
Llorente			Solano			0.600	2.000	Sierra Bullones				
Maslog			Villaverde					Sevilla				
Salcedo			Aglipay			0.200	1.000	Pilar				
Oras	0.100	1.000	Cabarroguis			0.200	1.000	Loboc				
Quinapondan			Diffun		Quirino	0.900	1.000	Carmen				
San Julian	0.100	1.000	Maddela			0.200	1.000	Bilar				
San Policarpo	0.100	1.000	Nagtipunan			1.000	2.000	Batuan				
Sulat			Saguday			0.400	1.000	Loay				
Taft			Delfin Albano (Magsaysay)	Isabela			Lila					
Balangkayan			Iguig	Cagayan	0.300	1.000	Dimiao					
Maydolong			Basco	Batanes			Valencia					
Lawa-an			Bacarra		0.200	2.000	Garcia Hernandez					
Mercedes			Badoc		0.300	2.000	Jagna					
Kawayan			Batac		1.000	3.000	Duro					
Almeria			Burgos		0.100	1.000	Guindulman					
Naval			Carasi		0.000	0.000	Anda					
Biliran			Currimao		0.100	1.000	Candjaj					
Cabugayan			Dingras		0.300	2.000	Alicia					
Caibiran			Dumalneg		0.100	1.000	Mabini					
Culaba	1.100	1.000	Espiritu (Banna)		0.100	1.000	Sikatuna					
Maripipi			Marcos	Ilocos Norte	0.900	4.000	Corella					
Larena			Nueva Era			0.100	1.000	Catigbian				
Enrique Villanueva			Paoy			0.300	2.000	Balilihan				
Maria			Pasquin			0.800	3.000	Antequera				
Lazi			Piddig			0.000	0.000	Tubigon				
San Juan			Pimili			0.000	0.000	Calape				
Siquijor			San Nicolas			0.200	2.000	Loon				
Mabinay			Sarrat			0.700	2.000	Maribojoc	0.100	1.000		
Canlaon City			Solsona			0.600	5.000	Cortes				
Guihulngan			Vintar			0.200	2.000	Tasbilaran City				
Vallehermoso			Alilem		1.000	3.000	Dausi					
La Libertad			Banayoyo		0.000	0.000	Panglao					
Jimalalud			Bantay		0.100	1.000	Baclayon					
Tayasan	2.300	1.110	Burgos		0.100	1.000	Alburquerque					
Ayungon			Cabugao		0.000	0.000	Bantayan	Cebu	0.700	2.000		
Bindov			Candon		0.400	3.000	Daanbantayan	Cebu				
Manjvod			Caoyan		0.100	1.000	Victorias City		0.000	0.000		
Pamplona			Cervantes		0.300	2.000	Enrique B. Magalona (Sarana)					
Tanig			Galinvod		0.000	0.000	Silay City		0.800	1.000		
Amilan			Gregorio Del Pilar		0.000	0.000	Murcia		0.200	1.000		
San Jose			Lalidida	Ilocos Sur	0.000	0.000	San Carlos City					
Sibulan			Maasingal			0.200	2.000	Calatrava				
Dumaguete City			Nasbukel			0.000	0.000	Manapla				
Bacong			Narvacan			0.000	0.000	Cadiz City	Negros Occidental	0.400	1.000	
Basay			Quirino (Anaki)			0.100	1.000	Sagay				
Bayawan			Salcedo (Baugen)			0.000	0.000	Toboso				
Dauin			San Emilio			0.000	0.000	Escalante City				
Santa Catalina	0.500	2.220	San Esteban			0.000	0.000	La Carlota City				
Siaton			San Ildefonso			0.000	0.000	Bago City				
Valencia (Luzurriaga)			San Juan			0.000	0.000	Pulupandan		0.100	1.000	
Zamboanguita			San Vicente		0.000	0.000	Valladolid					

Tab. C-1-12 Flood Casualties and Frequency (4/5)

City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)
Pilar		1.200	1.000	Santa Catalina	Ilocos Sur	1.300	2.000	San Enrique		0.100	1.000
Poro				Santa Cruz		0.000	0.000	Pontevedra		0.100	1.000
San Francisco				Santa Lucia		0.300	2.000	Candoni			
Tudela				Santa Maria		0.100	1.000	Cauayan		0.200	2.000
Borbon				Santiago		0.000	0.000	Hinoba-an (Asia)		1.100	1.000
Sogod				Santo Domingo		0.000	0.000	Ilog		0.800	1.000
Catmon				Sigay		0.000	0.000	Kabankalan City	Negros Occidental	0.300	1.000
Danao City				Sinait		0.000	0.000	Sipalay City		0.600	1.000
Carmen				Suyo		1.300	2.000	Himamaylan City		1.200	2.000
Compostela				Tagudin		0.200	2.000	Hinigaran		0.100	1.000
Liloan		0.100	1.000	Vigan City		0.100	1.000	Isabela		0.300	1.000
Consolacion				Agoo		0.700	4.000	La Castellana		0.100	1.000
Mandaue City	Cebu	0.000	0.000	Aringay		0.600	5.000	Moises Padilla (Magallon)		0.700	1.000
Lapu-Lapu City				Bacnotan		0.000	0.000	Iloilo City		0.600	2.000
Cordoba				Bagulain		0.700	2.000	Zarraga		0.100	1.000
Cebu City		1.400	3.000	Balaoan		1.000	3.000	Santa Barbara		0.000	0.000
Ronda				Bangar		1.100	4.000	San Miguel			
Alcantara				Bauang	La Union	0.100	1.000	Pavia		0.000	0.000
Moalboal				Burgos		0.300	2.000	New Lucena		0.000	0.000
Badian				Caba		1.200	3.000	Leon	Iloilo	0.200	2.000
Alegria				Luna		0.200	2.000	Almodian			
Malabuvoc		0.100	1.000	Naugilian		0.700	4.000	Leganes		0.100	1.000
Ginatilan				Pago		0.000	0.000	Sara			
Sanboan				Rosario		1.000	1.000	San Rafael			
Oslob				San Fernando		0.000	0.000	Barotac Viejo			
Boljoon				Barad				Kitcharao		0.100	1.000
San Gabriel		0.200	1.000	Balasan				Carmen		0.000	0.000
San Juan	La Union	0.100	1.000	Carles				Nasipit		0.100	1.000
Santo Tomas		0.400	4.000	San Dionisio				Buenavista			
Santol		0.200	1.000	Ajuy				R. T. Romualdez		0.200	1.000
Sudipen		0.800	2.000	San Enrique				Cabadbaran		0.300	1.000
Tubao		1.400	6.000	Pototan		0.000	0.000	Santiago		0.200	1.000
Agno		0.200	1.000	Passi City				Tubay		0.000	0.000
Aguilar		0.600	4.000	Mina				Magallanes		0.000	0.000
Alaminos		0.200	2.000	Maasin				Basilisa (Rizal)	Surigao del Norte	0.100	1.000
Alcala		1.600	4.000	Lambunao		0.100	1.000	Boliney		0.100	1.250
Anda				Januay				Bucay		0.300	1.250
Asingan		0.600	3.000	Duenas		0.100	1.000	Bucloc		0.400	2.500
Balungao		0.100	1.000	Dingle				Daguioaman			
Bani		0.000	0.000	Calinog	Iloilo			Danglas		0.100	1.250
Basista		0.000	0.000	Cabatuan				Dolores			
Bautista		0.300	1.000	Bingawan				La Paz		1.100	3.750
Bayambang		0.700	4.000	Badiangan				Lacub			
Binalonan		0.100	1.000	Dumangas				Laganitang		0.400	2.500
Bolinao		0.400	1.000	Barotac Nuevo		0.000	0.000	Lagayan			
Bugallon		0.400	3.000	Anilao				Lansidan			
Burgos		0.000	0.000	Banate				Lictian-Bsuy (Lictian)	Abra	0.100	1.250
Calasiao		1.700	6.000	Tubungan				Luba			
Dasol		0.200	2.000	Igaras				Malibcong			
Infanta		1.300	5.000	San Joaquin		0.200	1.000	Manabo		0.300	2.500
Labrador		0.000	0.000	Mia-gao				Penarrubia		0.300	1.250
Lingayen		2.000	6.000	Guimbal				Pidigan		0.400	1.250
Mabini	Pangasinan	0.200	2.000	Tigbauan		0.100	1.000	Pilar			
Malasiqui		0.800	5.000	Oton		0.200	1.000	Sallapadan		0.100	1.250
Manaog		0.200	2.000	Buenavista				San Isidro			
Mangaldan		1.200	3.000	Sibunag	Guimaras			San Juan			
Mangatarem		0.400	3.000	Nueva Valencia				San Quintin		0.300	1.250
Mapandan		0.100	1.000	San Lorenzo				Tayum		1.000	1.250
Natividad		0.200	1.000	Jordan				Tineg		0.100	1.250
Pozzorubio		0.300	2.000	Tapaz				Tubo			
Rosales		0.000	0.000	Sigma		0.100	1.000	Vilaviciosa			
San Fabian		0.700	4.000	Mambusao		0.100	1.000	Atok		2.600	2.220
San Jacinto		0.000	0.000	Ma-ayon		0.000	0.000	Bakun		0.100	1.110
San Manuel		0.100	1.000	Jamindan				Bokod		0.300	2.220
San Nicolas		0.200	1.000	Dumarao		0.000	0.000	Buguias		1.600	2.220
San Quintin		0.100	1.000	Dumalag		0.200	2.000	Itoyon		2.300	4.440
Santa Barbara		1.600	6.000	Dao	Capiz	0.300	1.000	Kabayan	Benguet	0.300	1.110
Santa Maria		0.100	1.000	Cuartero		0.300	1.000	Kapanagan		1.000	2.220
Santo Tomas		0.000	0.000	Isan		0.000	0.000	Kibangan		1.500	3.330
Sison		0.400	3.000	Roxas City		0.000	0.000	La Trinidad		6.000	5.560
Sual		0.200	2.000	Panay		0.000	0.000	Mankayan		0.100	1.110
Tayug		0.200	2.000	Panitan		0.100	1.000	Sablan		0.400	2.220
Umangan		0.100	1.000	Pontevedra		0.300	2.000	Tuba		2.500	4.440
Urbiztondo		0.300	2.000	President Roxas		0.100	1.000	Tublay		0.500	2.220
Urdaneta City		0.900	5.000	Pilar		0.100	1.000	Aguinaldo		0.100	1.110
Villasis		0.000	0.000	Sapi-An		0.100	1.000	Banaue		1.300	2.220
Pagudpad	Ilocos Norte	1.700	4.000	Bacolod City	Negros Occidental	0.000	0.000	Alfonso Lista (Potia)		0.300	1.110
Banguit		0.400	2.000	Valderrama				Hingyon		0.100	1.110
Sugpon	Ilocos Sur	1.300	1.000	Sibalom		0.400	1.000	Hungduan	Ifugao	0.300	1.110
Adams	Ilocos Norte	0.200	1.000	San Remigio		0.100	1.000	Kiangan			
Barobo				Libertad				Lagawe		0.300	1.110
Tagbina				Pandan				Lamut		0.400	1.110
Hinatuan		0.100	1.000	Sebaste				Mavovao		0.900	2.220
Bislig		1.000	2.000	Culasi				Tinoc		0.100	1.110
Lingig		0.700	3.000	Tibiao		0.100	1.000	Balbalan		1.300	2.500
San Miguel		0.400	4.000	Barbaza	Antique			Calanasan		0.400	2.220
Carrascal		0.100	1.000	Laua-an				Conner		0.300	1.110
Cantilan		0.100	1.000	Bugasang				Flora		1.400	1.110
Madrid	Surigao del Sur	0.100	1.000	Patnongon				Kabugao			
Carmen		0.400	2.000	Belison				Lubuagan		0.400	2.500
Lanuza		0.100	1.000	San Jose				Luna		0.400	2.220
Cortes		0.800	2.000	Hamic				Pasil	Kalinga-Apayaon	0.400	1.250
Tandang		1.300	2.000	Tobias Fornier (Dao)				Pinakpuk		0.600	2.500
Tago		0.700	1.000	Arini-y				Pindol		0.300	2.220
Bayabas		0.300	2.000	Malinao				Santa Marcela			
Cayawan		0.300	2.000	Madalag				Tanudan		1.000	2.500
Muarhatag		0.100	1.000	Libacao				Tinglayan		0.100	1.250
San Agustin		0.100	1.000	Lezo				Barlig			
Lianga		2.800	1.000	Banga				Bauko		1.200	1.430
Tubajan		1.300	2.000	Balete				Besao		0.300	2.860
Libjo				Malay	Aklan			Bontoc		0.200	1.430
San Jose				Nabas				Natonin	Mountain Provin	1.300	1.430
Loreto				Burungana				Paracelis			
Dinagat	Surigao del Norte			Ibsjay				Sabangan			
Cagdianao		0.200	1.000	Tangalan				Sadanga		0.800	2.860
Tubod		1.100	1.000	Makato				Sagada		0.800	1.430
Sison				Numancia				Tadian		1.000	2.860
Surigao City											
San Francisco											

Tab. C-1-12 Flood Casualties and Frequency (5/5)

City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)	City/Municipality	Province	Flood Casualties (persons/year)	Frequency of Floods (times/10years)
Malimono		0.600	2.000	Castilla				Wao			
Mainit		0.300	2.000	Donsol				Pagayawan			
Alegria		0.000	0.000	Gubat	Sorsogon	0.100	1.000	Tuharan			
Tagana-An				Irosin		0.100	1.000	Karapatan	Lanao del Sur		
Placer		0.300	1.000	Kalibo		0.100	1.000	Balabagan			
Bacuag		0.400	3.000	New Washington	Aklan			Malabang			
Gigaquit		0.300	1.000	Batan				Sultan Gumander			
Claver		0.100	1.000	Altavas				Marawi City			
Burgos	Surigao del Norte			Juban				Rizal	Kalinga-Apaya		
Santa Monica				Magallanes				Bangued	Abra	5.300	2.500
San Isidro				Matnog		0.200	1.000	Bongao	Tawi-Tawi		
Pilar				Pilar	Sorsogon	0.200	1.000	Languyan			
General Luna				Prieto Diaz				Mandaluyong			
San Benito				Santa Magdalena				San Juan			
Dapa				Sorsogon		0.300	2.000	Quezon City		0.700	2.000
Del Carmen				Bombon	Camarines Sur	0.100	1.000	Pasig		0.200	1.000
Socorro				Magarao				Manila		0.700	1.000
Butuan City		0.400	2.000	Bacacay	Albay			Pateros		0.800	1.000
Esperanza		2.100	2.000	Boac		0.600	2.000	Makati	Metro Manila	0.200	1.000
La Paz		0.200	2.000	Buavista				Muntinlupa		1.100	2.000
Loreso		0.000	0.000	Gisan	Marinduque	0.200	1.000	Taguig		1.800	2.000
San Luis		0.300	2.000	Moronog		0.400	2.000	Panauague		0.200	2.000
Santa Josefa		0.100	1.000	Santa Cruz		1.100	1.000	Las Pinas		0.300	2.000
Talacogon		0.200	1.000	Torrjies		0.100	1.000	Marikina		0.300	1.000
Vertela	Agusan del Sur	0.900	3.000	Abra De Ilog				Valenzuela		0.700	2.000
Bayugan		0.000	0.000	Calintaan				Malabon		0.200	2.000
Bunawan		0.700	2.000	Looc	Occidental			Navotas		0.100	1.000
Prosperidad		0.600	4.000	Lubang	Occidental			Bacoor	Cavite	0.000	0.000
Rosario		0.800	3.000	Magsaysay				San Pedro	Laguna		
San Francisco		0.800	3.000	Mambarao				Taytay		3.000	2.000
Sibatag		0.400	3.000	Paluan				Cainta		1.000	2.000
Trento		1.100	3.000	Rizal		0.100	1.000	San Mateo	Rizal	2.100	2.000
Jabonga	Agusan del Norte	1.900	5.000	Concepcion	Iloilo			Rodriguez (Montalban)			
Vinzons	Camarines Norte			Estancia		0.000	0.000	San Jose Del Monte			
Baao		0.100	1.000	Camalig		0.600	2.000	Marilao	Bulacan	0.100	1.110
Balatan		0.200	1.000	Daraga (Locsin)		0.300	1.000	Meycauayan		0.400	1.110
Bato		1.200	3.000	Guinobatan		0.200	1.000	Obando		0.500	3.330
Buhi		0.200	1.000	Jovellar				Baroy	Lanao del Norte		
Bula		0.400	1.000	Libon		0.400	1.000	Tacloban City	Levite	0.100	1.000
Cabusao		0.600	2.000	Ligao City		0.300	1.000	Iriga City	Camarines Sur	1.200	2.000
Calabanga		0.900	1.000	Mahilpot		0.100	1.000	Legazpi City	Albay		
Camaligan		1.000	2.000	Malinao	Albay	0.200	2.000	Naga City	Camarines Sur	0.700	3.000
Canaman		1.000	2.000	Manito				Puerto Princesa City	Palawan		
Caramoan		0.200	1.000	Oas		0.300	2.000	Batangas City	Batangas	0.600	2.000
Del Gallego				Pio Duran				Lipa City			
Gaíña		0.400	1.000	Polangui				Lacena City	Quezon	0.100	1.000
Gacchitorea		0.200	1.000	Rana-Ranu		0.600	1.000	San Pablo City	Laguna	0.700	1.000
Gea		0.100	1.000	Santo Domingo				Tagaytay City	Cavite		
Lagonoy		0.700	2.000	Tabaco City				Trece Martires City			
Libmanan		0.100	1.000	Tiwi				Angeles City	Pampanga		
Lupi		0.300	1.000	Basud		0.300	2.000	Cabanatuan City	Nueva Ecija	0.100	1.000
Milaor		0.300	1.000	Capalonga		0.200	1.000	Olongapo City	Zambales	1.300	3.000
Minalabac	Camarines Sur			Daet		0.300	1.000	Palayan City			
Nabua		0.200	2.000	Jose Panganiban		0.300	1.000	San Jose City	Nueva Ecija		
Ocampo		0.900	1.000	Labo		0.400	1.000	Dagupan City	Pangasinan	0.300	2.000
Pamploña		0.300	1.000	Mercedes		1.000	2.000	Laogo City	Ilocos Norte	1.000	3.000
Pasacao		1.100	2.000	Paracale	Camarines Norte	0.900	2.000	San Carlos City	Pangasinan	2.200	4.000
Pili		0.400	2.000	San Lorenzo Ruiz (Imelda)		0.200	1.000	Jose Abad Santos (Trinidad)	Davao del Sur	0.300	1.110
Presentacion (Parubcan)		0.100	1.000	San Vicente		0.200	1.000	Baguio City	Benguet	16.000	8.000
Ragay		0.100	1.000	Santa Elena		0.200	1.000	Calamba	Laguna	0.900	2.000
Sagnay				Talisay		0.200	2.000	Bais City	Negros Oriental	0.100	1.110
San Fernando		0.100	1.000	Datu Odin Sinsuat (Dinaig)		0.200	1.000	Las Nieves	Agusan del Norte	0.000	0.000
San Jose				Shariff Aguak (Maganov)				Kalookan City	Metro Manila	0.100	1.000
Sipocot				Pagalungan				Pasay		0.000	0.000
Siruma		0.200	1.000	Sultan sa Barongis (Lambavong)				Panglima Sugala (Balimbing)			
Tigaon		0.600	1.000	Kabuntalan (Turmbao)	Maguindano			Simunul			
Tinambac		0.800	1.000	Upi				Sitangkai	Tawi-Tawi		
Bagamanoc		0.600	1.000	Talayan				South Ubian			
Baras		0.300	1.000	South Upi		3.300	2.000	Fandubas			
Bato		0.700	2.000	Baldon				Mapun			
Caramoran		0.200	1.000	Matanog				Turtle Islands			
Giemoto				Parang				Sapa-Sapa			
Pandan	Catanduanes	2.100	1.000	Sultan Kudarat (Nuling)		0.200	1.000	Indanan		0.000	0.000
Panganiban (Pavo)		0.200	1.000	Barira				Jolo		0.000	0.000
San Andres		0.700	1.000	Bacolod Kalawi				Kalingalan Caluang			
San Miguel		0.200	1.000	Balindong				Lugus			
Viga		2.600	2.000	Bayang				Luuk			
Virac		2.400	3.000	Binidayan				Maimbung			
Aroroy		1.000	1.000	Buadiposo Buntong				Hadji Panglima Tahil (Marungg)	Sulu		
Baleno		0.100	1.000	Bubong				Old Panamao			
Balud		0.600	1.000	Bumbaran				Pandami			
Batuan				Butig				Pangutaran			
Catangaan				Calanogas				Parang		0.000	0.000
Cawayan				Ditsaan-Ramain				Pata			
Claveria				Ganassi				Patikul		0.000	0.000
Dimasalang				Kapat				Siasi			
Esperanza				Lumba-Bayabao				Talipao		0.000	0.000
Mandaon				Lumbatan				Tapul		0.000	0.000
Masbate City	Masbate	0.300	2.000	Lumbayanague	Lanao del Sur			Tongkil			
Milagros				Madalum				Amnatanan			
Moho				Madamba				Buhayan	Maguindano		
Montreal		0.200	1.000	Maguig				Datu Paglas			
Palanas				Marantao				Datu Piang			
Pio V. Corpuz				Marogong							
Placer				Masiu							
San Fernando				Mulondo							
San Jacinto				Piagapo							
San Pascual				Poona Bayabao							
Uson				Pualas							
Bacon		0.200	1.000	Saguiran							
Barcelona		0.200	1.000	Tagoloan II							
Bulan	Sorsogon	0.300	2.000	Tamparan							
Bulusan		0.100	1.000	Taraka							
Casiguran				Tugaya							

Tab. C-1-13 River Basin Data

Condition	Evaluation Index		Basic Data	River Basin Data
Socio-Economic	S1	Poverty Incidence	Provincial poverty incidence (%)	Basin poverty incidence (%) (refer to Fig. C-1-5)
	S2	Population	City/municipality 2000 population (persons)	Basin population (persons) (refer to Fig. C-1-6)
	S3	Population Movement	City/municipality population growth rate (%)	Basin population growth rate (%) (refer to Fig. C-1-7)
	S4	Production	Provincial production (mil. Pesos)	Basin production (mil. Pesos) (refer to Fig. C-1-8)
	S5	Forest Cover Ratio	Nationwide land use map	Basin forest cover ratio (%) (refer to Fig. C-1-9)
	S6	Built-up Area Ratio	Nationwide land use map	Basin built-up area ratio (%) (refer to Fig. C-1-10)
	S7	Flood Casualties	City/municipality annual average casualties (persons/year)	Basin annual average casualties $\left(\frac{\text{Persons} \cdot \text{km}^2}{\text{Year} \cdot 100}\right)$ (refer to Fig. C-1-11)
	S8	Flood Damages	Provincial damages per destructive typhoon (mil. Pesos/typhoon)	Basin annual average damages (mil. Pesos/year) (refer to Fig. C-1-12)
Natural	N1	Frequency of Tropical Cyclones	Provincial annual average passage of tropical cyclones (times/year)	Basin annual average passage of tropical cyclones (times/yr) (refer to Fig. C-1-13)
	N2	Rainfall Intensity	Nationwide isohyet graph	Basin daily rainfall (mm/day) (refer to Fig. C-1-14)
	N3	River Gradient	Estimated average slope based on DEM	Averaged slope of river (degree) (refer to Fig. C-1-15)
	N4	Ratio of Hazards Zone of Volcano	Nationwide map of hazards zone of volcano	Basin ratio of hazards zone of volcano (%) (refer to Fig. C-1-16)
	N5-C	Frequency of Floods based on Flood Casualty Data	City/municipality frequency of floods based on flood casualty data (times/10 years)	Basin frequency of floods (times/10 years) (refer to Fig. C-1-17)
	N5-D	Frequency of Floods based on Flood Damage Data	Provincial frequency of floods based on flood damage data (times/5 years)	Basin frequency of floods (times/5 years) (refer to Fig. C-1-18)

Tab. C-1-14 List of Score

Category	Sub-Category	Index		Assessment Mark (score)/ Range Condition
Socio-Economic Conditions	Poverty	S1	Poverty Incidence	1-5
	Population	S2	Population	1-5
	Population	S3	Population Movement	1-5
	Assets	S4	Production	1-5
	Land Uses	S5	Forest Cover Ratio	1-5
	Land Uses	S6	Built-up Area ratio	1-5
	Flood Damage Records	S7	Flood Casualties	1-15
	Flood Damage Records	S8	Flood Damages	1-15
Natural Conditions	Meteorology	N1	Frequency of Typhoons	1-5
	Hydrology	N2	Rainfall Intensity	1-5
	Topography	N3	River Gradient	1-5
	Geology	N4	Ratio of Hazards Zone of Volcano	1-5
	Flood Frequency	N5-C	Flood Frequency based on Flood Casualties	1-5
		N5-D	Flood Frequency based on Flood Damages	1-5

Tab. C-1-15 Distribution of Score

Index	Maximum Score		Lowest Score		Remarks
	Value of Index	Score	Value of Index	Score	
S1	> 51.7 %	5	< 12.9 %	1	Scores of 2-4 are given dividing the stretch between 12.9 and 51.7 % equally.
S2	> 1.0 mil. persons	5	< 0.1 mil. persons	1	Scores of 2-4 are given dividing the stretch between 0.1 and 1.0 mil. persons equally.
S3	> 12.7 %	5	< -4.7 %	1	Scores of 2-4 are given dividing the stretch between -4.7 and 12.7 % equally.
S4	> 5.0 billion Pesos	5	< 1.0 billion Pesos	1	Scores of 2-4 are given dividing the stretch between 1.0 and 5.0 billion Pesos equally.
S5	< 20.0 %	5	> 80.0 %	1	Scores of 2-4 are given dividing the stretch between 20.0 and 80.0 % equally.
S6	> 20.0 %	5	< 5.0 %	1	Scores of 2-4 are given dividing the stretch between 5.0 and 20.0 % equally.
S7	> 14.0 $\left(\frac{\text{Persons} \cdot \text{km}^2}{\text{Year} \cdot 100}\right)$	15	< 2.0 $\left(\frac{\text{Persons} \cdot \text{km}^2}{\text{Year} \cdot 100}\right)$	1	Scores of 2-14 are given dividing the stretch between 2.0 and 14.0 $\left(\frac{\text{Persons} \cdot \text{km}^2}{\text{Year} \cdot 100}\right)$ equally.
S8	> 51.0 mil. Pesos/year	15	< 3.0 mil. Pesos/year	1	Scores of 2-14 are given dividing the stretch between 3.0 and 51.0 mil. Pesos/year equally.
N1	> 2.0 times/year	5	< 0.5 times/year	1	Scores of 2-4 are given dividing the stretch between 0.5 and 2.0 times/year equally.
N2	> 423.0 mm/day	5	< 172.0 mm/day	1	Scores of 2-4 are given dividing the stretch between 172.0 and 423.0 mm/day equally.
N3	> 20.0 degree	5	< 3.0 degree	1	Scores of 2-4 are given dividing the stretch between 3.0 and 20.0 degree at a certain interval.
N4	> 59.0 %	5	< 1.0 %	1	Scores of 2-4 are given dividing the stretch between 1.0 and 59.0 % equally.
N5-C	> 7.0 times/10years	5	< 1.0 times/10years	1	Scores of 2-4 are given dividing the stretch between 1.0 and 7.0 times/10years at a certain interval.
N5-D	> 4.0 times/5years	5	< 1.0 times/5years	1	Scores of 2-4 are given dividing the stretch between 1.0 and 4.0 times/5years equally.

Tab. C-1-16 Population of Major River Basin

No.	Major River Basin	Population (Persons)	Remarks
1	Cagayan	2,750,341	These population data are calculated on river basin level with GIS analysis and Census 2000.
2	Pampanga	2,935,697	
3	Agno	1,544,474	
4	Pasig-Laguna	9,694,470	
5	Bicol	1,169,417	
6	Agusan	1,189,760	
7	Mindanao	3,396,572	
	Sub-total	22,680,731	30% of total population
	Total Population	76,504,077	Census 2000 in the Philippines

Tab. C-1-17 Population Movement

No.	Name of River Basin (over 1,400 km ² of catchment area)	Population Movement (%)
1	Jalaud	9.49
2	Agusan	4.44
3	Cagayan de Oro	3.73
4	Buayan-Malungun	3.72
5	Tagaloan	3.50
6	Panay	3.06
7	Allah	2.90
8	Mindanao	2.84
9	Pasig-Laguna	2.59
10	Bicol	2.35

Tab. C-1-18 Production of River Basins

Island Group	Number of River Basins having the production of over 5 billion Pesos	Production (S4) in total (mil. Pesos)
Luzon	36	1,425,050
Visayas	9	99,094
Mindanao	10	144,705
Sub-total	55 (5% of 1164 river basins)	1,668,849 (71% of Whole Production)
Whole Production		2,347,876

Tab. C-1-19 The River Basins Suffering from the Worst Flood Damages

Name of River Basin (Administrative Region)	Classification	Flood Damages
Tineg (Region-I)	Principal River Basin	109.8 mil. Pesos/yr.
Siffu-Mallig (Region-II)	Principal River Basin	101.8 mil. Pesos /yr.
Guagua (Region-III)	Principal River Basins	91.1 mil. Pesos /yr.

Tab. C-1-20 River Basins Expecting Occurrence of Debris Flow

No.	Name of River Basin (Administrative Region)	Catchment Area(km ²)	Population in the river basin (Persons)
1	Bagao (Region-II)	103	5,499
2	San Antonio (Region-III)	21	3,033
3	Lobo-1 (Region -IV-A)	22	3,308
4	Lobo-2 (Region -IV-A)	15	2,220
5	Puerto Princesa City-5 (Region-IV-B)	54	4,191
6	Puerto Princesa City-6 (Region-IV-B)	57	4,378
7	Puerto Princesa City-7 (Region-IV-B)	85	6,550
8	Quezon-9 (Region-IV-B)	76	2,670
9	Baybay-1 (Region-VIII)	35	6,319
10	Libagon (Region-VIII)	30	3,563
11	Malimono-1 (CARAGA)	86	17,268
12	Don Marcelino-6 (Region-XI)	10	805
13	Mati-10 (Region-XI)	14	1,979
14	Mati-14 (Region-XI)	14	1,925
15	Mati-15 (Region-XI)	13	1,733
16	Santa Cruz (Region-XI)	62	14,923
17	Tarragona-3 (Region-XI)	19	1,724

Tab. C-1-21 River Basins Covered with Volcano Area of More than 50%

No.	Name of River Basin (Administrative Region)	Classification	Ratio Covered with Volcano Area (%)
1	Buenvista-1 (Region-IV-B)	Other	66.0
2	Olongapo City (Region-III)	Other	59.1
3	Catarman-1 (Region-X)	Other	57.2
4	Santa Cruz-3 (Region-XI)	Other	56.5
5	Tiwi-1 (Region-V)	Other	55.7
6	Digos (Region-XI)	Principal	54.0
7	Bagac-5 (Region-III)	Other	52.7
8	Mabini-1 (Region-XI)	Other	52.4
9	Gonzaga-1 (Region-II)	Other	52.2
10	Kulaman (Region-XII)	Principal	52.0
11	Baua (Region-II)	Principal	51.1

Tab. C-1-22 River Basins with Experience of the Most Flood Frequencies

No.	Name of River Basin (Administrative Region)	Classification	Flood Frequency	Flood Casualty
1	Aringay (Region-I)	Principal	8 times/10yrs.	7 persons/yr.
2	Bauang (Region-I)	Principal	8 times/10yrs.	4 persons/yr.
3	Patalan (Region-I)	Principal	8 times/10yrs.	6 persons/yr.

Tab. C-1-23 Scoring from First Place to 100th Place in the First Screening

Rank	RIVER_NAME	W.R. REGION	River Basins	Score Total	Rank	RIVER_NAME	W.R. REGION	River Basins	Score Total
1	BICOL (whole)	06	M-A	57	44	GENERAL NAKAR-2-(b)	04	Other	39
2	GUAGUA	03	Other	56	52	PANAY (whole)	06	M-A	38
3	AMBURAYAN	01	P	55	52	TUGUERARAO	02	P	38
4	CAGAYAN (whole)	02	M-A	54	52	DUMON	02	P	38
4	SIFFU-MALLIG	02	P	54	52	GENERAL NAKAR-2-(a)	03	Other	38
6	DAGUPAN	03	P	53	52	GENERAL NAKAR-5-(b)	04	Other	38
7	ABRA (whole)	01	M-A	52	52	GENERAL NAKAR-4-(b)	04	Other	38
7	ABULUG (whole)	02	M-A	52	52	GENERAL NAKAR-3-(b)	04	Other	38
7	CATARMAN-1-S	10	Other	52	59	JALAUD (whole)	06	M-A	37
10	CHICO	02	P	51	59	CAMILING	03	P	37
10	ANGAT	03	P	51	59	LABO	05	P	37
10	PATALAN	03	P	51	59	PAMPLONA	02	P	37
10	ARINGAY	01	P	51	59	MATUNO	02	P	37
14	PARET	02	P	50	59	AGOS	04	P	37
15	RIO CHICO	03	P	49	59	TANUDAN	02	P	37
15	BAUANG	01	P	49	59	BARARO	01	P	37
17	PAMPANGA (whole)	03	M-A	47	59	TIGNOAN	04	P	37
17	AGNO (whole)	04	M-A	47	59	GENERAL NAKAR-1-(a)	03	Other	37
17	ILAGAN	02	P	47	69	PULANGGI	12	P	36
17	LAOAG	01	P	47	69	PASIG-LAGUNA BAY (whole)	05	M-A	36
21	TINEG	01	P	46	69	BACARRA-VINTAR	01	P	36
21	MMANILA	04	Other	46	69	PALANAN-PINACANAUAN	02	P	36
21	UMIRAY	03	P	46	69	AGUANG	03	P	36
21	MARIKINA	04	P	46	69	LAL-LO-2	02	Other	36
25	CAGARAY	04	P	45	69	HIMOCAAN	06	P	36
26	ABUAN	02	P	44	69	JALAU	06	P	36
26	KALIWA	04	P	44	69	DAGUITAN-MARABANG	08	P	36
28	GANANO	02	P	43	69	BALINCUGUIN	03	P	36
28	SALTAN-BABACA	02	P	43	69	SUYO	01	Other	36
28	DISABUNGAN	02	P	43	69	LEGAZIPI CITY	05	Other	36
28	PAGBANGARAN	08	P	43	81	MINDANAO (whole)	12	M-A	35
32	O-DONNEL-MORIONES	03	P	42	81	PANTABANGAN	03	P	35
33	ILOG-HILABANGAN (whole)	06	M-A	41	81	IBULAO	02	P	35
33	MAGAT	02	P	41	81	JALANO	06	P	35
33	SIPOCOT	05	P	41	81	SILAG-SANTA MARIA	01	P	35
36	AGUSAN (whole)	10	M-A	40	81	DONSOL	05	P	35
36	BAGO	06	P	40	81	DAET-BASUD	05	P	35
36	TIAN	12	P	40	81	PULA	04	P	35
36	AMBAYABANG	03	P	40	81	BACOLOD CITY	06	Other	35
36	BALETE	04	P	40	81	IMUS	04	P	35
36	LABAYAT	04	P	40	91	TAGO	11	P	34
36	REAL-2	04	Other	40	91	CORONELL	03	P	34
36	REAL-1	04	Other	40	91	SAN AGUSTIN	04	Other	34
44	ILOG	06	P	39	91	CULABA	08	Other	34
44	HILABANGAN	06	P	39	91	PAGSANGAHAN	08	P	34
44	ADDALAM	02	P	39	91	NUEVA ERA	01	Other	34
44	SIMULAO	10	P	39	91	SANTOL	01	Other	34
44	AKLAN	06	P	39	91	SANTA ANA-1	02	Other	34
44	MATALAG	02	P	39	91	MANSALAY-2	04	Other	34
44	BONGABON	04	P	39	91	BAYBAY-2	08	Other	34

Tab. C-1-24 Prioritization of First Screening Results (1/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total	
1	BICOL (whole)	06	2,997	M-A	4	5	3	5	5	1	5	13	41	2	4	2	2	2	4	16	57	
2	GUAGUA	09	1,574	Other	2	5	3	5	5	2	5	15	42	1	3	1	2	2	4	14	56	
3	AMBURAYAN	01	1,011	P	2	2	3	5	4	1	9	11	37	1	5	5	1	1	18	55	55	
4	CAGAYAN (whole)	02	26,885	M-A	3	5	3	5	4	1	9	11	38	1	5	5	1	1	16	54	54	
4	SIFFU-MALLIG	02	2,037	P	4	2	3	4	4	1	5	15	39	1	5	5	1	1	15	54	54	
6	DAGUPAN	09	1,034	P	3	4	3	5	5	1	8	8	37	1	5	5	1	1	16	53	53	
7	ABRA (whole)	01	4,704	M-A	4	2	3	5	4	1	7	14	35	1	4	4	1	1	17	52	52	
7	ABULUG (whole)	02	2,881	M-A	5	1	3	3	3	1	4	13	33	4	4	1	1	5	19	52	52	
7	CATARMAN-1-S	10	245	Other	5	1	2	2	2	1	14	11	41	1	2	2	4	1	1	11	52	
10	CHICO	02	2,686	P	5	2	3	3	4	1	4	13	35	1	4	1	1	5	16	51	51	
10	ANGAT	09	900	P	1	2	2	3	3	1	15	11	39	1	1	1	1	1	4	12	51	
10	PATALAN	09	595	P	3	2	2	5	5	2	7	6	33	1	5	5	1	1	18	51	51	
10	ARINGAY	01	501	P	2	2	2	3	3	2	6	6	32	1	4	4	1	1	19	51	51	
14	PARET	02	1,007	P	2	2	2	2	2	1	6	13	31	1	4	4	1	1	4	19	50	
15	RIO CHICO	09	3,269	P	3	5	5	5	5	1	1	14	36	1	1	1	2	1	4	13	49	
15	BAUANG	01	507	P	2	2	2	2	2	1	1	6	29	1	1	1	1	1	5	20	49	
17	PAMPANGA (whole)	09	8,237	M-A	11	3	3	5	5	1	1	11	34	1	1	1	1	1	4	13	47	
17	AGNO (whole)	04	5,706	M-A	3	5	3	4	4	1	1	9	32	1	5	5	1	1	4	15	47	
17	ILAGAN	02	1,725	P	3	1	1	4	4	1	1	13	33	1	1	1	1	1	4	14	47	
17	LACAG	01	1,384	P	2	2	2	3	4	1	3	9	29	1	1	1	1	1	5	18	47	
21	TINEG	01	1,591	P	4	1	1	2	2	1	1	15	29	1	4	4	1	1	5	17	46	
21	MMANILA	04	846	Other	1	5	3	5	5	5	9	35	1	1	1	1	1	3	3	11	46	
21	LUMIRAY	09	640	P	3	1	1	3	3	1	15	4	33	1	5	5	1	1	4	13	46	
21	MARIKINA	04	572	P	1	5	3	5	5	2	13	1	35	1	5	5	1	1	2	11	46	
25	CAGARAY	04	423	P	4	1	2	2	2	1	14	3	32	1	5	5	1	1	4	13	45	
26	ABUAN	02	613	P	3	1	3	3	1	1	8	8	27	1	4	4	1	1	2	17	44	
26	KALIWA	04	479	P	2	2	4	5	5	1	15	1	33	1	5	5	1	1	2	11	44	
26	GANANO	02	1,054	P	3	2	3	2	2	1	4	11	31	1	5	5	1	1	4	12	43	
26	SALTAN-BABACA	02	902	P	5	1	3	1	1	1	6	6	26	4	5	5	1	1	5	17	43	
26	DISABUNGAN	02	773	P	3	1	3	2	2	1	5	10	27	1	5	5	1	1	4	16	43	
26	PAGBANGARAN	08	246	P	3	1	3	2	2	1	15	1	30	1	1	1	1	1	4	13	43	
32	O-DONNEL-MORIONES	03	737	P	3	2	3	3	4	1	1	10	29	1	5	5	1	3	1	4	13	42
33	ILOG-HILABANGAN (whole)	06	3,261	M-A	3	4	3	5	5	1	1	6	29	1	1	1	1	1	4	12	41	
33	MAGAT	02	1,559	P	2	2	3	3	4	1	3	9	27	1	1	1	1	1	5	14	41	
33	SIPOCOT	05	826	P	4	2	3	4	4	1	1	6	26	1	4	4	2	1	4	15	41	
36	AGUSAN (whole)	10	11,935	M-A	4	5	3	5	4	1	7	1	30	1	5	5	1	1	1	10	40	
36	BAGO	06	893	P	4	2	3	3	5	1	6	27	1	5	5	2	1	1	4	13	40	
36	TIAN	12	739	P	5	1	3	2	2	1	15	1	33	1	1	1	1	1	1	7	40	
36	AMBAYABANG	06	677	P	3	3	2	5	5	1	1	8	28	1	5	5	1	1	4	12	40	
36	BALETE	04	191	P	4	1	3	1	1	1	9	2	26	1	5	5	1	1	4	14	40	
36	LABAYAT	04	80	P	3	1	3	1	1	1	15	1	28	1	4	4	1	1	2	12	40	
36	REAL-2	04	70	Other	3	1	3	1	1	1	15	1	28	1	4	4	1	1	2	12	40	
36	REAL-1	04	54	Other	3	1	3	1	1	1	15	1	28	1	4	4	1	1	2	12	40	
44	ILOG	06	1,586	P	3	2	2	3	5	1	3	7	28	1	1	1	1	1	4	11	39	
44	HILABANGAN	06	1,428	P	4	2	3	5	5	1	2	5	27	1	2	2	1	1	4	12	39	
44	ADDALAM	02	1,076	P	3	1	3	3	5	1	4	7	26	1	5	5	1	1	4	13	39	
44	SIMULAO	10	978	P	4	1	3	2	2	1	13	1	27	1	4	4	1	2	2	12	39	
44	AKLAN	06	805	P	4	2	3	4	3	1	1	9	27	1	5	5	1	1	4	12	39	
44	MATALAG	02	731	P	5	1	3	1	4	1	1	6	22	4	5	5	1	2	5	17	39	
44	BONGABON	04	535	P	4	1	3	2	4	1	7	4	26	1	5	5	1	1	4	13	39	
44	GENERAL NAKAR-2-(b)	04	34	Other	3	1	3	1	1	1	15	1	27	1	5	5	1	1	2	12	39	
52	PANAY (whole)	02	2,052	M-A	4	3	3	5	5	1	1	5	27	1	5	5	1	1	4	11	38	
52	TUGUERARAO	02	666	P	2	1	3	2	3	1	1	8	21	4	4	4	1	2	4	17	38	
52	DUMON	02	440	P	2	1	3	1	3	1	1	6	18	1	5	5	2	1	4	20	38	
52	GENERAL NAKAR-2-(a)	03	83	Other	3	1	3	1	1	1	15	1	26	1	5	5	1	1	2	12	38	
52	GENERAL NAKAR-5-(b)	04	61	Other	3	1	3	1	1	1	15	1	26	1	5	5	1	1	2	12	38	
52	GENERAL NAKAR-4-(b)	04	41	Other	3	1	3	1	1	1	15	1	26	1	5	5	1	1	2	12	38	
52	GENERAL NAKAR-3-(b)	04	36	Other	3	1	3	1	1	1	15	1	26	1	5	5	1	1	2	12	38	
59	JALAUD (whole)	06	1,454	M-A	3	3	4	5	5	1	2	24	1	2	2	1	1	1	4	13	37	
59	CAMILING	03	995	P	3	2	2	5	4	1	1	5	23	1	5	5	1	1	4	14	37	
59	LABO	05	986	P	4	2	3	4	4	1	2	2	22	1	4	4	2	1	4	15	37	
59	PAMPLONA	02	669	P	5	1	2	1	1	1	2	6	19	4	4	4	1	2	5	18	37	
59	MATUNO	02	649	P	3	1	3	2	3	1	2	5	20	1	5	5	1	2	2	17	37	
59	AGOS	04	548	P	3	1	3	3	1	1	15	1	27	1	5	5	1	1	2	10	37	
59	TANUDAN	02	397	P	5	1	3	1	1	1	5	20	1	5	5	4	4	1	2	17	37	
59	BARARO	01	217	P	3	1	3	3	3	1	1	3	20	1	5	5	1	1	5	17	37	
59	TIGNOAN	04	91	P	3	1	3	1	1	1	15	1	26	1	5	5	1	1	2	11	37	
59	GENERAL NAKAR-1-(a)	03	34	Other	3	1	3	1	1	1	15	1	26	1	5	5	1	1	2	11	37	
69	PULANGGI	12	4,306	P	3	3	3	5	5	1	1	5	26	1	2	2	2	1	2	10	36	
69	PASIG-LAGUNA BAY (whole)	05	4,092	M-A	1	5	3	5	5	2	4	1	26	1	5	5	1	1	2	10	36	
69	BACARRA-VINTAR	01	609	P	2	1	3	3	3	1	1	4	18	1	5	5	1	1	5	18	36	
69	PALANAN-PINACANAUAN	02	599	P	3	1	3	2	1	1	2	8	21	4	4	4	1	1	4	15	36	
69	AGUANG	03	545	P	2	1	3	1	2	1	1	11	22	1	5	5	1	1	4	14	36	
69	LAL-LO-2	02	406	Other	2	1	2	1	3	1	3	5	18	1	4	4	1	2	4	18	36	
69	HIMOCANAN	06	406	P	4	2	3	3	3	1	1	3	22	1	5	5	3	1	4	14	36	
69	JALAU	06	390	P	3	2	5	4	5	1	1	2	23	1	5	5	1	1	4	13	36	
69	DAGUITAN-MARABANG	08	346	P	3	1	3	2	4	1	7	1	22	3	3	3	2	1	4	14	36	
69	BALINCUGIN	03	324	P	3	1	3	3	5	1	1	3	20	1	4	4	1	3	4	16	36	
69	SUYO	01	284	Other	3	1	3	2	5	1	1	2	18	1	5	5	1	2	5	18	36	
69	LEGAZIPI CITY	05	120	Other	4	2	3	2	5	3	1	1	21	1	5	5	3	1	4	15	36	
81	MINDANAO (whole)	12	20,759	M-A	4	5	3	5	5	1	2	1	26	1	1	1	2	2	9	35	35	
81	PANTABANGAN	03	969	P	2	1	3	5	4	1	1	5	22	1	5	5	1	1	4	13	35	
81	IBULAO																					

Tab. C-1-24 Prioritization of First Screening Results (2/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total	
101	LAL-LO-1	02	141	Other	2	1	1	1	1	1	1	1	2	11	4	4	4	4	2	4	22	33
101	VIRAC-1	05	138	Other	4	1	1	1	1	1	1	1	1	18	4	4	4	4	2	4	15	33
101	BAROC	04	123	P	4	1	1	1	1	1	7	1	22	9	1	1	1	1	3	11	33	
101	CARAMORAN-1	05	122	Other	4	1	1	1	1	1	1	1	17	4	4	4	4	1	4	16	33	
101	BAUA	02	119	P	2	1	1	1	1	1	2	12	12	4	4	4	4	2	4	21	33	
101	SANTO DOMINGO	01	93	Other	2	1	1	1	1	1	1	1	16	5	5	5	5	1	5	17	33	
101	BIACNOTAN	01	83	Other	2	1	1	1	1	1	1	1	16	5	5	5	5	1	5	17	33	
101	PASUGUIN-4	01	67	Other	2	1	1	1	1	1	1	1	15	5	5	5	5	1	5	18	33	
101	VIRAC-2	05	35	Other	4	1	1	1	1	2	1	18	4	4	4	4	4	2	4	15	33	
101	CURRIMAO	01	26	Other	2	1	1	1	1	1	1	1	15	5	5	5	5	1	5	18	33	
101	GENERAL NAKAR-1-(b)	04	22	Other	2	1	1	1	1	11	1	22	11	4	4	4	4	1	1	11	33	
101	AGOO-1	01	15	Other	2	1	1	1	1	3	1	18	9	5	5	5	5	1	5	15	33	
125	TAGUM-LIBUGANON (whole)	11	2,343	M-A	4	4	4	4	4	4	4	4	23	4	4	4	4	4	1	9	32	
125	MARIDAGAO	12	2,088	P	4	4	4	4	4	4	4	4	20	4	4	4	4	4	2	12	32	
125	SIBALOM-WEST-	06	765	P	2	2	2	2	2	2	2	19	3	3	3	3	3	3	1	4	13	32
125	LAKE MAINIT-TUBAY	10	617	P	2	2	2	2	2	2	2	19	4	4	4	4	4	1	3	13	32	
125	JARO AGANAN	06	439	P	2	2	2	2	2	2	2	20	2	2	2	2	2	2	1	4	12	32
125	LAMOT	02	437	P	2	2	2	2	2	2	2	18	3	3	3	3	3	3	5	14	32	
125	BIUTAS	04	437	P	2	2	2	2	2	2	4	20	3	3	3	3	3	3	1	1	12	32
125	TABOAN	02	315	P	2	2	2	2	2	1	4	14	4	4	4	4	4	2	4	18	32	
125	CASIGURAN	02	233	P	2	2	2	2	2	1	5	17	4	4	4	4	4	1	4	15	32	
125	ALAMINOS	03	230	P	2	2	2	2	2	1	2	18	4	4	4	4	4	1	4	14	32	
125	LAGONUY	05	222	P	4	1	1	1	1	1	2	18	4	4	4	4	4	2	1	14	32	
125	ILANG-ILANG	04	207	P	1	1	1	1	1	3	1	22	4	4	4	4	4	1	2	10	32	
125	CAPALONGA-2	05	163	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	1	1	4	14	32
125	BALATAN	05	149	Other	4	1	1	1	1	1	1	17	4	4	4	4	4	1	2	4	15	32
125	QUIAOIT	01	148	P	2	2	2	2	2	2	2	15	5	5	5	5	5	1	1	5	17	32
125	TALISAY	05	121	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	2	1	4	14	32
125	CANDON-2	01	120	Other	3	1	1	1	1	1	1	15	4	4	4	4	4	1	2	5	17	32
125	OLONGAPO CITY	03	119	Other	2	2	2	2	2	4	2	1	15	3	3	3	3	5	2	4	17	32
125	ALUNUGAY	02	109	P	2	2	2	2	2	2	1	2	12	4	4	4	4	3	2	4	20	32
125	JOSE PANGANIBAN-1	05	108	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	1	1	4	14	32
125	SANTA ELENA	05	106	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	1	1	4	14	32
125	GLORIA	04	90	Other	4	1	1	1	1	4	1	20	3	3	3	3	3	1	3	12	32	
125	CALABANGA-2	05	89	Other	4	1	1	1	1	1	1	17	4	4	4	4	4	2	2	3	15	32
125	PARACALE-2	05	88	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	1	1	4	14	32
125	CABUGAO	01	85	Other	3	1	1	1	1	1	1	14	5	5	5	5	5	1	1	5	18	32
125	GONZAGA-2	02	82	Other	2	1	1	1	1	1	1	13	4	4	4	4	4	2	2	4	19	32
125	BIANTAY	01	78	Other	3	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	BOSTON	11	73	Other	2	1	1	1	1	7	1	20	4	4	4	4	4	1	2	2	12	32
125	CAPALONGA-1	05	72	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	1	2	4	14	32
125	BAYBAY-1	08	62	Other	2	1	1	1	1	4	1	18	4	4	4	4	4	1	1	4	14	32
125	SINAIT	01	56	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	JOSE PANGANIBAN-2	05	56	Other	5	1	1	1	1	1	1	18	4	4	4	4	4	1	1	4	14	32
125	MAGSINGAL	01	49	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	PAOAY	01	47	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	CANDON-1	01	40	Other	2	1	1	1	1	2	1	16	4	4	4	4	4	1	2	5	16	32
125	SAN JUAN-2-(a)-S	01	40	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	NARVACAN-2	01	34	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	SAN JUAN-1-(a)-S	01	31	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	SAN FERNANDO-1-(a)	01	29	Other	2	1	1	1	1	2	1	17	4	4	4	4	4	1	1	1	15	32
125	LAOAG-1-S	01	27	Other	2	1	1	1	1	1	1	15	5	5	5	5	5	1	1	1	17	32
125	PASUGUIN-3	01	18	Other	2	1	1	1	1	4	1	14	5	5	5	5	5	1	1	1	18	32
125	CABA	01	17	Other	2	1	1	1	1	1	1	16	4	4	4	4	4	1	1	1	16	32
125	PASUGUIN-2	01	13	Other	2	1	1	1	1	4	1	14	5	5	5	5	5	1	1	1	18	32
125	AGOO-2	01	11	Other	3	1	1	1	1	1	1	16	3	3	3	3	3	1	1	1	16	32
125	BAUANG-2-S	01	7	Other	3	1	1	1	1	1	1	16	4	4	4	4	4	1	1	1	16	32
170	AGUS (whole)	12	1,876	M-A	4	4	4	4	4	4	4	4	2	21	1	1	1	1	1	1	10	31
170	BUAYAN-MALUNGUN (whole)	11	1,570	M-A	4	4	4	4	4	4	4	4	2	21	1	1	1	1	1	1	10	31
170	BUCAO	03	725	P	2	2	2	2	2	2	2	18	3	3	3	3	3	1	1	4	13	31
170	PANSIPIT	04	648	P	2	2	2	2	2	2	2	19	3	3	3	3	3	1	1	1	12	31
170	KAPUMPONG	04	592	P	2	2	2	2	2	2	2	21	3	3	3	3	3	1	1	1	10	31
170	CATARMAN	08	527	P	4	1	1	1	1	1	1	18	3	3	3	3	3	1	1	1	13	31
170	SANTA CRUZ-3-(c)	04	329	Other	4	1	1	1	1	3	2	18	3	3	3	3	3	1	1	4	13	31
170	PINACANAUAN	02	322	P	3	1	1	1	1	1	1	16	4	4	4	4	4	1	1	4	15	31
170	SANTO TOMAS	03	301	P	2	2	2	2	2	2	2	16	4	4	4	4	4	3	3	3	15	31
170	JAVIER	08	287	Other	3	1	1	1	1	2	1	18	3	3	3	3	3	1	1	1	13	31
170	PAGBAHAN	04	286	P	4	1	1	1	1	4	2	18	3	3	3	3	3	1	1	4	13	31
170	PULANG TUBIG	04	279	P	4	1	1	1	1	4	1	18	3	3	3	3	3	1	1	4	13	31
170	SANGPUTAN	08	277	P	3	1	1	1	1	2	1	17	3	3	3	3	3	2	2	4	14	31
170	DIKATAYAN	02	266	P	3	1	1	1	1	1	4	15	4	4	4	4	4	1	1	4	16	31
170	CEBU CITY	07	232	Other	3	2	2	2	2	2	1	19	2	2	2	2	2	1	2	3	12	31
170	SAN LUIS-1-(a)	03	231	Other	3	1	1	1	1	1	5	17	3	3	3	3	3	1	1	1	14	31
170	NAYAM	03	226	P	3	1	1	1	1	2	4	1	16	3	3	3	3	1	3	4	15	31
170	CADACAN	05	207	P	4	1	1	1	1	2	1	17	3	3	3	3	3	2	1	4	14	31
170	BALAMBAN	07	192	P	3	2	2	2	2	2	2	19	2	2	2	2	2	1	2	3	12	31
170	IMBANG	06	184	P	4	1	1	1	1	4	2	19	2	2	2	2	2	1	2	1	12	31
170	SAPANG DAKO	07	170	P	3	2	2	2	2	2	2	20	1	1	1	1	1	2	2	3	11	31
170	PALANAN-1	02	157	Other	3	1	1	1	1	1	1	2	15	4	4	4	4	1	1	4	16	31
170	SAGINAY-2	05	136	Other	4	1	1	1	1													

Tab. C-1-24 Prioritization of First Screening Results (3/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total
170	MARIVELES-3	.03	31	Other	1	1	1	1	4	3	1	1	15	1	4	3	3	1	4	16	31
170	PAGUDPUD-1	01	30	Other	2	1	1	3	2	1	1	1	13	3	5	2	1	2	1	18	31
170	PLACER	10	30	Other	4	1	1	5	1	1	1	1	17	1	5	2	1	2	1	14	31
170	SAN FABIAN-1	03	27	Other	3	1	1	5	1	1	1	1	16	2	3	2	1	2	1	15	31
170	BURGOS-1-(a)	01	24	Other	2	1	1	3	1	1	1	1	13	3	5	2	1	2	1	18	31
170	PAGUDPUD-2	01	22	Other	2	1	1	4	1	1	1	1	13	3	5	2	1	2	1	18	31
170	BACON-3	05	20	Other	4	1	1	5	1	1	1	1	17	2	3	3	1	1	4	14	31
170	SAN ESTEBAN	01	20	Other	3	1	1	5	1	1	1	1	15	3	4	2	1	1	1	16	31
170	BURGOS-2-(a)	01	18	Other	2	1	1	4	1	1	1	1	14	3	5	2	1	1	1	17	31
170	CALATAGAN-3	04	14	Other	3	1	1	5	4	1	1	1	19	2	4	2	1	1	1	12	31
170	SANTO TOMAS-1-S-(a)	01	14	Other	3	1	1	5	1	1	1	1	16	2	3	2	1	2	1	15	31
236	ALLAH	12	3,111	P	4	3	5	4	1	1	1	22	1	1	2	1	1	1	1	28	30
236	TAGALUAN (whole)	10	1,757	M-A	3	2	5	5	1	1	1	21	1	2	3	1	1	1	1	9	30
236	PADADA MAINIT	11	1,306	P	3	2	5	5	1	1	1	21	1	1	2	2	1	1	1	9	30
236	GIBONG	10	926	P	4	2	1	4	1	4	1	20	1	3	1	1	2	1	1	10	30
236	OJOT	10	924	P	4	1	3	2	1	6	1	21	1	3	2	1	1	1	1	9	30
236	SANTA FE	02	773	P	2	1	2	4	1	1	3	17	2	3	2	1	1	1	4	13	30
236	HUJO	11	648	P	4	2	1	5	1	1	1	18	1	3	2	4	1	1	1	12	30
236	PENARANDA	03	616	P	2	1	5	3	1	1	2	17	3	3	2	1	1	1	4	13	30
236	INABANGA	07	580	P	4	2	3	5	1	1	2	21	1	3	2	1	1	1	1	9	30
236	CADACAN	08	511	P	3	1	3	4	1	2	1	18	3	3	1	1	1	1	4	12	30
236	PAMBUKHAN	08	417	P	4	1	1	5	1	1	1	17	3	3	2	1	1	1	1	13	30
236	SAN PASCUAL-1-(b)	05	416	Other	5	1	2	5	1	1	1	18	3	3	2	1	1	1	1	12	30
236	AMNAY	04	413	P	4	1	1	4	1	2	1	17	2	3	2	1	1	1	4	13	30
236	LUNINTAO	04	407	P	4	1	1	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	MAMBUSAO	06	404	P	4	1	2	5	1	1	3	20	1	3	1	1	1	1	1	10	30
236	JEBATAN	08	377	P	4	1	1	5	1	1	1	17	3	3	2	1	1	1	1	13	30
236	SARIAYA	04	363	Other	3	2	2	5	1	1	1	18	2	3	2	1	1	1	1	12	30
236	DINALUPIHAN	03	331	Other	1	2	4	5	1	1	1	17	1	3	1	1	2	4	1	13	30
236	SAN JACINTO	05	327	Other	5	1	2	5	1	1	1	18	3	3	2	1	1	1	1	12	30
236	BINHAAN	08	315	P	3	1	2	4	1	1	1	16	3	3	1	1	1	1	4	14	30
236	PAGSANJAN	04	307	P	2	1	5	5	1	1	1	18	1	4	2	2	1	1	1	12	30
236	SIPALAY	06	307	P	4	1	2	5	1	1	2	19	2	1	2	1	1	1	4	11	30
236	LEYTE	08	300	Other	3	1	2	5	1	1	1	17	3	3	2	1	1	1	4	13	30
236	KILBAY-CATABANGAN	05	282	P	3	1	2	4	1	1	1	16	2	4	2	2	1	1	4	14	30
236	JOSE DALMAN (PONOT)	09	274	Other	4	1	1	5	1	5	1	21	1	2	3	1	1	1	1	9	30
236	BATO	05	259	P	4	1	1	3	1	1	1	15	2	4	2	1	2	4	1	15	30
236	SAN JUAN	04	257	P	2	2	5	5	2	1	1	20	2	3	1	1	1	1	1	10	30
236	CALBAYOG CITY-5	08	251	Other	4	1	1	5	1	1	1	17	3	3	2	1	1	1	1	13	30
236	PALOMPON	08	225	Other	3	1	2	5	1	1	1	17	3	3	2	1	1	1	1	14	30
236	PUTIAO	05	224	P	4	1	2	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	LABANGAN	04	223	P	4	1	1	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	BUGKO	08	215	P	4	1	1	5	1	1	1	17	3	3	2	1	1	1	4	13	30
236	BONTOC	08	201	Other	3	1	1	5	1	1	1	16	3	3	2	1	1	1	4	14	30
236	PILA-SANTA CRUZ	04	198	P	1	2	5	5	1	1	1	19	1	3	2	2	1	1	1	11	30
236	CARAMOAN-1	05	178	Other	4	1	2	5	1	1	1	18	2	3	2	1	1	1	1	12	30
236	SURIGAO	10	176	P	4	1	1	5	1	1	1	17	1	5	2	1	1	1	1	13	30
236	BONGOUIROGON	08	154	P	3	1	1	5	1	1	1	16	3	3	2	1	1	1	4	14	30
236	ILAGAN-2-S	02	154	Other	3	1	1	1	1	2	2	14	3	4	2	1	2	4	1	16	30
236	CABUYAN	05	149	P	4	1	1	3	1	2	1	16	2	4	2	1	1	1	4	14	30
236	BANBAN	01	140	P	2	1	1	2	1	1	1	12	3	5	2	1	2	1	1	18	30
236	PASACAO	05	136	Other	4	1	1	5	1	1	1	17	2	4	2	1	1	1	1	13	30
236	SAN CRISTOBAL	04	133	P	1	2	5	5	2	1	1	20	1	3	2	1	1	1	1	10	30
236	ROMERO-SANTA MARIA	04	132	P	1	1	5	4	1	3	1	19	1	4	2	1	1	1	1	11	30
236	ANAHAWIN	04	132	P	4	1	1	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	TINAMBAC-2	05	131	Other	4	1	1	5	1	1	1	17	2	4	1	2	1	1	1	13	30
236	BONGABONG-2	04	130	Other	4	1	1	5	1	2	1	18	2	3	2	1	1	1	1	12	30
236	TINALMUD	05	122	P	4	1	1	5	1	1	1	17	2	4	2	1	1	1	1	13	30
236	MURCIA-1	06	120	Other	4	1	1	5	1	1	1	17	2	3	2	2	1	1	4	13	30
236	RAGAY-1-S	05	117	Other	4	1	1	5	1	1	1	17	2	4	2	1	1	1	1	13	30
236	IYAM	04	113	P	3	2	2	4	2	1	1	17	2	4	2	2	1	1	1	13	30
236	NARVACAN-1	01	110	Other	3	1	1	5	1	1	1	15	3	4	1	1	1	1	1	15	30
236	DONSOL-1-S	03	108	Other	4	1	1	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	MATNOG	05	107	P	4	1	1	5	1	1	1	16	2	3	2	1	1	1	4	14	30
236	TAMBANG	05	99	P	4	1	1	5	1	1	1	17	2	4	2	1	1	1	1	13	30
236	TIGAON	05	98	Other	4	1	1	4	1	1	1	16	2	4	2	2	1	1	4	14	30
236	PIO DURAN	05	97	Other	4	1	1	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	SABLAYAN-4	04	97	Other	4	1	1	5	1	1	1	17	2	3	2	1	1	1	4	13	30
236	SANTA CRUZ-1-(b)	03	82	Other	2	1	1	5	1	1	1	14	2	4	2	1	3	4	1	16	30
236	MAINIT	10	81	Other	4	1	1	5	1	1	1	17	1	5	2	1	1	1	1	13	30
236	CALACA	04	81	Other	3	1	2	5	3	1	1	18	2	4	2	1	1	1	1	12	30
236	TIWI-2	05	75	Other	4	1	1	3	1	1	1	15	2	3	3	2	1	4	1	15	30
236	OAS-1	06	74	Other	4	1	1	5	1	1	1	16	2	4	2	1	1	1	4	14	30
236	DINAPIGUE-2	02	72	Other	3	1	1	1	1	1	1	14	3	4	3	1	1	4	1	16	30
236	KOTKOT	07	70	P	3	2	2	5	1	1	1	18	2	3	2	1	2	3	1	12	30
236	PINAMALAYAN	04	70	Other	4	1	1	5	1	2	1	18	2	3	1	1	2	3	1	12	30
236	PANDAN-2-S	05	70	Other	4	1	1	5	1	1	1	16	2	4	2	1	1	1	4	14	30
236	PANDAN-1-S	05	69	Other	4	1	1	5	1	1	1	16	2	4	2	1	1	1	4	14	30
236	CALABANGA-1	05	66	Other	4	1	1	4	1	1	1	16	2	4	2	2	1	1	1	14	30
236	TIWI-1	05	65	Other	4	1	1	1	1	1	1	13	2	3	3	4	1	4	1	17	30
236	CARAMOAN-2	05	65	Other	4	1	1	5	1	1	1	17	2	4	2	1	1	1	1	13	30
236	PUERTO GALERA	04	64	Other	4	1	1	4	1	1	1	16	2	3	3	1	1	4	1	14	30
236	CASIGURAN-1-(b)	04</																			

Tab. C-1-24 Prioritization of First Screening Results (4/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total
236	SIPOCOT-1-S	05	28	Other	4	1	3	1	5	1	1	1	17	2	4	2	1	1	3	13	30
236	SURIGAO CITY-1	10	27	Other	4	1	3	1	5	1	1	1	17	1	5	2	1	1	3	13	30
236	BANGAR	01	25	Other	3	1	3	1	5	1	1	1	15	2	4	1	1	2	5	15	30
236	MAUBAN-1	01	25	Other	3	1	3	1	5	1	1	1	17	2	4	2	1	2	5	15	30
236	SURIGAO CITY-2	10	22	Other	4	1	3	1	5	1	1	1	17	1	5	2	1	1	3	13	30
236	CALEPAYOS CITY-1	08	22	Other	4	1	3	1	5	1	1	1	17	3	3	2	1	1	3	13	30
236	ALAMINOS-1-S	08	20	Other	3	1	3	1	5	1	1	1	16	2	4	2	1	1	4	14	30
236	SAN ANTONIO-4	08	17	Other	2	1	3	1	5	1	1	1	15	2	4	2	1	2	5	15	30
236	SANTO TOMAS-1-S-(b)	08	12	Other	3	1	3	1	5	2	1	1	16	2	3	1	1	2	5	14	30
236	ROSARIO-1-(a)	01	10	Other	3	1	3	1	5	1	1	1	15	2	4	1	1	1	2	15	30
236	BALANG-1-S	01	10	Other	3	1	3	1	5	1	1	1	15	2	4	1	1	1	2	15	30
236	SUBIC-1	03	10	Other	2	1	3	1	5	1	1	1	15	2	4	1	1	2	3	15	30
349	BULLUAN	12	2,204	P	4	1	3	1	5	1	1	1	25	2	4	1	1	1	1	7	29
349	DAVAO (whole)	11	1,837	M-A	2	3	3	3	4	4	1	1	20	1	1	1	2	1	1	9	29
349	CAGAYAN DE ORO (whole)	10	1,821	M-A	2	3	3	3	4	4	1	1	20	1	1	1	2	2	1	8	29
349	BANGA	12	1,101	P	4	2	3	5	4	4	1	1	21	1	1	1	1	2	2	10	29
349	MARIPALI	12	1,022	P	3	2	3	5	4	4	1	1	19	1	1	2	2	2	1	10	29
349	SIBUGUEY	09	1,010	P	3	2	3	5	5	1	2	1	20	1	1	1	1	2	2	9	29
349	SALUG	11	978	P	4	2	3	5	5	1	1	1	20	1	1	1	1	2	1	9	29
349	POLOMOLOK	11	676	Other	3	2	3	4	5	1	1	1	20	1	1	2	2	1	2	9	29
349	GANDARA	08	572	P	4	1	3	4	4	1	1	1	17	3	3	2	1	1	2	12	29
349	MATALING	12	485	P	5	2	3	2	4	1	1	1	19	1	2	2	3	1	1	10	29
349	SAN FERNANDO-1-(b)	04	458	Other	5	1	2	3	1	1	2	1	17	2	3	2	1	1	3	12	29
349	PAGATBAN	07	429	P	3	1	2	3	5	1	1	2	18	2	1	2	1	1	4	11	29
349	MONPONG	04	338	P	4	1	3	1	4	1	1	1	16	2	3	2	1	1	4	13	29
349	MAMBURAO	10	310	P	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29
349	MAGALLANES	04	257	P	4	1	3	1	3	1	1	1	15	1	4	2	1	3	3	14	29
349	LEBAK	12	241	Other	5	1	3	1	4	1	6	1	22	1	1	2	1	1	1	7	29
349	PALUAN-1	04	229	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29
349	PANATAWAN	03	228	P	2	1	3	2	5	1	1	1	16	2	4	1	1	2	3	13	29
349	LINAO	02	224	P	2	1	2	1	3	1	1	3	14	4	4	1	1	1	4	15	29
349	MALBAG	05	220	P	5	1	2	2	5	1	1	1	18	3	3	1	1	1	2	11	29
349	TUMAUINI	02	207	P	3	1	3	1	2	1	1	3	15	3	3	2	1	1	4	14	29
349	BULLU	01	203	P	2	1	2	1	2	1	1	1	11	3	5	2	1	2	5	18	29
349	GUMBAL	06	201	P	3	1	3	2	5	1	1	1	17	2	2	2	1	1	4	12	29
349	LUBANG	04	192	Other	4	1	3	1	3	1	1	1	15	2	4	2	1	1	4	14	29
349	PALO	08	181	P	3	1	3	2	5	1	1	1	17	3	2	1	1	1	4	12	29
349	LANANG	05	168	P	5	1	2	1	5	1	1	1	17	3	3	2	1	1	2	12	29
349	MALOGO	06	166	P	4	1	3	1	3	1	1	1	15	2	2	2	3	1	4	14	29
349	BOLINAO	03	165	Other	3	1	2	2	5	1	1	1	16	2	4	1	1	1	4	13	29
349	TAYABAS	04	158	Other	3	1	3	1	5	1	1	1	16	2	4	2	2	1	2	13	29
349	SAN POLICARPO	08	154	Other	4	1	3	1	5	1	1	1	17	3	2	2	1	1	3	12	29
349	BALASIG	02	154	P	3	1	3	1	3	1	1	2	15	3	3	2	1	1	4	14	29
349	DANAŐ	06	152	P	4	1	3	1	5	1	1	1	17	2	2	2	1	1	4	12	29
349	BALANGA	03	151	P	1	1	2	3	4	1	1	1	14	1	4	2	3	1	4	15	29
349	BANI	03	151	Other	3	1	2	2	5	1	1	1	16	2	4	1	1	1	4	13	29
349	GAINZAI	05	151	Other	4	1	3	1	4	1	1	1	16	2	4	2	1	1	3	13	29
349	MURCIA-2	06	143	Other	4	1	3	1	5	1	1	1	17	2	2	1	2	1	4	12	29
349	SAN FELIPE	03	141	Other	2	1	3	1	5	1	1	1	15	2	4	2	2	1	3	14	29
349	ESCALANTE CITY	06	137	Other	4	1	3	1	5	1	1	1	17	2	2	2	1	1	4	12	29
349	VICTORIAS CITY	06	135	Other	4	1	3	1	5	1	1	1	17	2	2	1	2	1	4	12	29
349	BOBON-2	08	130	Other	4	1	3	1	4	1	1	1	16	3	3	2	1	1	3	13	29
349	CANAS	04	130	P	1	2	2	5	5	2	1	1	19	1	4	1	1	1	2	10	29
349	LINGIG-3	11	128	Other	4	1	3	1	4	1	2	1	17	1	4	2	1	2	2	12	29
349	CALAUAG-1-S	04	128	Other	3	1	3	1	5	1	1	1	16	2	4	1	1	1	4	13	29
349	AJUY	06	122	Other	3	1	3	2	5	1	1	1	17	2	2	2	1	1	4	12	29
349	OGOD	05	122	P	4	1	3	1	5	1	1	1	17	2	3	1	1	1	4	12	29
349	CANDUGAY	07	119	P	3	1	3	1	5	1	1	1	16	2	2	2	4	2	1	13	29
349	GRANDE	06	116	P	4	1	2	1	5	1	1	1	16	2	2	2	2	1	4	13	29
349	HIMAMAYLAN CITY	06	115	Other	4	1	3	1	5	1	1	1	17	2	2	2	1	1	4	12	29
349	SANTA LUCIA	04	112	P	3	1	3	1	5	1	1	1	16	2	4	2	1	2	2	13	29
349	BALER	03	110	Other	3	1	3	1	1	1	1	3	14	3	3	3	1	1	4	15	29
349	PALUAN-3	04	110	Other	4	1	3	1	5	1	1	1	16	2	3	2	1	1	4	13	29
349	AGSALIN	04	108	P	4	1	3	1	4	1	2	1	17	3	3	2	1	1	3	12	29
349	TOBOSO	06	106	Other	4	1	3	1	5	1	1	1	17	2	3	2	1	1	4	12	29
349	MIA-GAO	06	106	Other	3	1	3	2	5	1	1	1	17	3	2	2	1	1	4	12	29
349	DIMASALANG	05	105	Other	5	1	3	1	5	1	1	1	19	3	3	1	1	1	2	11	29
349	DIPACULAO-3	03	105	Other	3	1	3	1	1	1	1	3	14	3	3	3	1	1	4	15	29
349	ARORAY-2	05	101	Other	5	1	2	1	5	1	1	1	17	3	3	3	1	1	2	12	29
349	SALANOC-QUILOT-	08	100	P	3	1	3	1	5	1	1	1	16	3	2	1	2	1	4	13	29
349	CASTILLA	05	84	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29
349	MAMBURAO-2-S	04	82	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29
349	RACON-1	05	81	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29
349	SANCHEZ-MIRA-1	02	80	Other	2	1	3	1	5	1	1	1	15	2	4	2	1	2	4	16	29
349	MANANGA	07	88	P	3	2	3	2	5	1	1	1	18	2	5	2	1	2	3	12	29
349	BULALACAO	04	87	P	4	1	3	1	5	1	1	1	17	2	3	2	1	1	3	12	29
349	DILASAG	02	85	Other	3	1	3	1	5	1	1	1	17	2	3	2	1	1	3	15	29
349	MILAGROS-3	05	85	Other	5	1	3	1	5	1	1	2	17	4	3	1	1	2	1	12	29
349	PENABELANGA-2	05	83	Other	2	1	3	1	1	1	1	1	17	1	5	3	3	1	1	16	29
349	ARORAY-1	02	81	Other	5	1	3	1	5	1	1	1	17	3	3	2	1	1	2	12	29
349	SANTA ANA-3	02	81	Other	2	1	3	1	2	1	1	1	12	5	3	2	1	1	2	17	29
349	SAN ROQUE	08	79	Other	4	1	3	1	5	1	1	1	17	3	3	2	1	1	3	12	29
349	MILAGROS-4	05																			

Tab. C-1-24 Prioritization of First Screening Results (5/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total	
349	BULAN-2	05	53	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29	
349	CALEBAYOG CITY-4	08	52	Other	4	1	2	1	5	1	1	1	17	3	3	2	1	1	2	12	29	
349	HINUNDAYAN	08	50	Other	3	1	2	1	5	1	1	1	16	3	2	2	3	1	1	13	29	
349	AGNO-1-S	09	49	Other	3	1	2	1	5	1	1	1	15	2	4	2	2	1	1	14	29	
349	ORION-1	09	48	Other	1	1	2	1	5	1	1	1	14	1	4	2	2	1	1	15	29	
349	MATNOG-1-S	05	48	Other	4	1	2	1	5	1	1	1	16	2	2	2	2	1	1	14	29	
349	DINGALAN-2	09	47	Other	3	1	4	1	5	1	1	1	15	3	2	2	1	1	4	14	29	
349	BURGOS-2-(b)	06	46	Other	3	1	3	1	5	1	1	1	16	2	2	2	1	1	1	13	29	
349	CALEBAYOG CITY-2	08	46	Other	4	1	3	1	5	1	1	1	17	3	2	2	1	1	2	15	29	
349	PANTUKAN-2	11	44	Other	4	1	3	1	5	1	1	1	17	3	2	2	1	1	1	12	29	
349	PAGUDRUD-3	01	43	Other	2	1	2	1	5	1	1	1	11	3	2	2	1	1	2	15	29	
349	MERIDA-1-(a)	08	41	Other	3	1	3	1	5	1	1	1	16	3	2	2	1	1	1	14	29	
349	DIPACULAO-1	03	40	Other	3	1	3	1	4	1	1	1	15	3	2	2	1	1	1	14	29	
349	LIMAY-2	03	38	Other	1	1	3	1	4	1	1	1	14	1	4	2	2	1	1	15	29	
349	PENABLANCA-1	02	36	Other	2	1	3	1	1	2	1	1	11	5	4	3	3	1	1	4	15	29
349	CALEBAYOG CITY-3	08	35	Other	4	1	3	1	5	1	1	1	17	2	2	2	2	1	1	12	29	
349	ABRA DE ILOG-4	04	33	Other	4	1	3	1	5	1	1	1	17	2	3	2	1	1	1	4	14	29
349	SANT A ANA-5	02	33	Other	2	1	3	1	1	1	1	1	11	5	4	2	2	1	1	4	18	29
349	MABINI-3-(b)	11	32	Other	4	1	3	1	5	1	1	1	17	1	2	3	3	1	1	1	12	29
349	SUBIC-4	03	32	Other	2	1	3	1	5	2	1	1	16	2	2	2	2	1	2	3	13	29
349	CLAVER-4	10	27	Other	4	1	2	1	5	1	1	1	16	1	5	2	1	1	3	13	29	
349	BAGAC-1	09	26	Other	1	1	3	1	5	1	1	1	14	1	4	2	3	1	1	4	15	29
349	SANT A ANA-4	02	25	Other	2	1	3	1	1	1	1	1	11	5	4	2	1	1	2	4	18	29
349	SAN FABIAN-2	03	24	Other	3	1	3	1	5	1	1	1	16	2	3	1	1	2	4	13	29	
349	SUBIC-3	03	24	Other	2	1	3	1	5	1	1	1	15	2	4	2	1	1	2	3	14	29
349	BULALACAO-5-S	04	24	Other	4	1	3	1	5	1	1	1	17	2	3	2	1	1	3	12	29	
349	BULALACAO-4-S	04	24	Other	4	1	3	1	5	1	1	1	17	2	3	2	1	1	3	12	29	
349	CARRASCAL-1	10	23	Other	4	1	2	1	5	1	1	1	16	1	4	3	1	1	3	13	29	
349	ABRA DE ILOG-2	04	22	Other	4	1	2	1	4	1	1	1	15	2	3	3	1	1	4	14	29	
349	SAN ANTONIO-1	09	21	Other	2	1	2	1	5	1	1	1	14	2	4	4	1	1	3	15	29	
349	CASIGURAN-2-(b)	05	19	Other	4	1	2	1	5	1	1	1	16	2	3	1	2	1	4	13	29	
349	MATNOG-2-S	05	18	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	4	13	29	
349	BAGAC-5	09	17	Other	1	1	3	1	4	1	1	1	13	1	3	3	4	1	4	16	29	
349	CLAVER-1	10	16	Other	4	1	2	1	5	1	1	1	16	1	5	2	1	1	3	13	29	
349	DINGALAN-5	09	11	Other	3	1	4	1	2	1	1	1	14	3	3	3	1	1	4	15	29	
349	CLAVER-3	10	5	Other	4	1	2	1	5	1	1	1	16	1	5	2	1	1	3	13	29	
485	MAPANGI	09	1,301	P	4	2	3	4	5	1	1	1	21	1	2	1	1	1	1	7	28	
485	LIBUNGAN	12	956	P	4	2	3	2	4	1	1	1	18	1	2	2	2	1	2	10	28	
485	MARANDING	12	841	P	4	2	3	4	4	1	1	1	20	1	2	2	1	1	1	8	28	
485	MULITA	12	801	P	3	2	3	2	5	1	1	1	18	1	2	2	2	1	2	10	28	
485	KABAKAN	12	719	P	4	2	3	2	4	1	1	1	18	1	1	2	3	1	2	10	28	
485	NITUAN	12	446	P	5	1	3	2	4	1	1	1	18	1	2	2	3	1	1	10	28	
485	MALAKING ILOG	04	432	P	2	2	2	5	5	1	1	1	19	1	2	1	1	1	2	9	28	
485	MAG-ASAWANG TUBIG	04	429	P	4	1	3	1	2	1	1	2	15	2	2	2	1	1	4	13	28	
485	BISLIG	11	414	P	4	1	3	1	2	1	3	1	16	1	4	2	1	1	2	12	28	
485	BAYAWAN	07	394	P	3	1	3	2	5	1	1	1	17	2	1	2	1	1	4	11	28	
485	IBOD	04	359	P	4	1	3	1	4	1	1	1	16	2	2	2	1	1	4	12	28	
485	DIBOLUAN	02	343	P	3	1	2	1	2	1	1	4	15	2	2	2	1	1	4	13	28	
485	MARAGONDONG	04	327	P	1	2	2	5	5	1	1	1	18	1	4	1	1	1	2	10	28	
485	ROSARIO-1-(b)	11	287	Other	4	1	3	1	4	1	1	1	16	1	4	2	1	1	2	12	28	
485	MANO	08	285	P	4	1	3	1	3	1	1	1	15	3	2	2	1	1	3	13	28	
485	LIBERTAD	07	269	P	3	1	2	2	5	1	1	1	16	2	2	2	2	1	1	4	12	28
485	SIATON	07	230	P	3	1	3	1	5	1	1	1	16	2	2	2	3	2	1	12	28	
485	CATANAUAN-2-S	04	207	Other	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
485	SAN MIGUEL-1-(b)	08	204	Other	3	1	3	2	4	1	1	1	16	3	2	1	1	1	4	12	28	
485	PINANTAN	06	199	P	3	1	3	2	5	1	1	1	17	2	2	1	1	1	4	11	28	
485	ROSARIO-LOBO	04	199	P	3	1	2	3	5	1	1	1	17	2	3	2	1	1	2	11	28	
485	CALAUAG	04	184	P	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
485	BUGUEY	02	189	Other	1	1	2	1	5	1	1	3	13	3	3	1	1	2	4	13	28	
485	DIPACULAO-2	03	187	Other	2	1	3	1	1	1	3	1	13	3	3	1	1	1	4	15	28	
485	TYABANAN	07	185	P	4	1	2	2	5	1	1	1	17	2	1	2	1	1	4	11	28	
485	POLILLO	04	183	Other	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
485	MACALELON	04	178	P	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
485	SIRUMA	05	171	Other	4	1	2	1	5	1	1	1	16	2	4	1	1	1	3	12	28	
485	PANUKULAN	04	169	Other	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
485	LABOC-BALSAHAN	04	168	P	1	2	2	5	5	1	1	1	18	1	4	1	1	1	2	10	28	
485	CAIRAUAN	09	167	P	4	1	3	1	4	1	1	1	16	2	2	2	1	1	3	12	28	
485	SAN JOAQUIN	09	165	Other	3	1	3	2	4	1	1	1	16	2	2	2	1	1	4	12	28	
485	MILAGROS-1	05	165	Other	5	1	2	1	5	1	1	1	17	3	2	1	1	1	2	11	28	
485	LA CARLOTA CITY	06	163	Other	4	1	3	1	5	1	1	1	17	2	3	1	1	1	4	11	28	
485	GUHALINAN	04	161	P	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
485	ASID	05	157	P	5	1	2	1	5	1	1	1	17	3	3	1	1	1	2	11	28	
485	ARROYO-3	05	154	Other	5	1	2	1	5	1	1	1	17	2	3	2	1	1	2	11	28	
485	SIDABA	06	152	P	4	1	2	1	4	1	1	1	15	2	2	2	1	2	1	4	13	28
485	GIJOM	05	144	P	5	1	2	1	5	1	1	1	17	2	3	1	1	1	2	11	28	
485	PANDANAN	04	142	P	3	1	3	1	5	1	1	1	16	2	2	2	1	1	1	12	28	
485	CALBIGA	08	140	P	4	1	3	1	5	1	1	1	16	2	2	2	1	1	3	12	28	
485	DEL CARMEN	10	136	Other	4	1	3	1	5	1	1	1	17	1	4	1	1	1	4	11	28	
485	PONTEVEDRA	06	135	Other	4	1	3	1	5	1	1	1	17	2	2	2	1	1	1	4	11	28
485	TANGALAN	06	129	Other	3	1	3	1	5	1	1	2	17	3	3	2	1	1	3	11	28	
485	LJAN	04	127	P	3	1	2	2	5	1	1	1	16	2	4	2	1	1	3	12	28	
485	SALUG	08	123	P	3	1	3	1	4	1	1											

Tab. C-1-24 Prioritization of First Screening Results (6/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total	
495	MABINI-1-(a)	04	70	Other	3	1	2	2	5	2	1	1	17	2	3	2	1	1	2	11	28	
495	CASIGURAN-4-(a)	02	70	Other	3	1	3	1	2	1	1	2	14	3	3	2	2	1	1	4	14	28
495	BALANGKAYAN	09	69	Other	4	1	3	1	5	1	1	1	17	3	2	2	1	1	2	11	28	
495	NASUGBU-3	04	97	Other	3	1	2	2	5	1	1	1	16	2	4	2	1	1	2	12	28	
495	MASSAYSAY-1-(a)	04	66	Other	4	1	3	1	4	1	1	1	16	2	3	1	1	1	4	12	28	
495	MANDAON-1	05	57	Other	5	1	2	1	5	1	1	1	17	3	3	1	1	1	2	11	28	
495	BANGUI	01	57	Other	2	1	2	1	2	1	1	1	11	3	5	2	1	1	5	17	28	
495	CALATAGAN-2	04	56	Other	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
495	LOPEZ	04	55	Other	3	1	3	1	5	1	1	1	16	2	4	2	1	1	2	12	28	
495	PAJO	05	53	P	4	1	3	1	2	1	1	1	14	2	4	2	1	1	4	14	28	
495	CASIGURAN-3-(a)	02	51	Other	3	1	2	1	2	1	1	1	13	3	4	2	1	1	4	15	28	
495	CLAUERIA	02	49	Other	2	1	2	1	5	1	1	1	11	5	4	2	1	1	4	17	28	
495	MANDAONG	05	49	P	5	1	2	1	4	1	1	1	17	3	3	1	1	1	2	11	28	
495	UMAY-1	03	48	Other	1	1	3	1	4	1	1	1	13	1	4	2	1	3	1	4	15	28
495	BONGABONG-1	04	47	Other	4	1	3	1	5	1	1	1	17	2	3	1	1	1	3	11	28	
495	CLAVER-2	10	47	Other	4	1	2	1	4	1	1	1	15	1	5	2	1	1	3	13	28	
495	MILAGROS-2	05	46	Other	5	1	2	1	5	1	1	1	17	3	2	1	1	1	2	11	28	
495	ENRIQUE B. MAGALONA (SARANA)	06	45	Other	4	1	3	1	5	1	1	1	17	2	2	1	1	1	4	11	28	
495	SORSOGON-3	05	44	Other	4	1	2	1	5	1	1	1	16	2	3	1	1	1	4	12	28	
495	MORONG-3	03	42	Other	1	1	3	1	3	1	1	1	12	1	3	3	4	1	4	16	28	
495	PAGUDPUD-4	01	42	Other	2	1	2	1	1	1	1	1	10	3	5	2	1	2	5	18	28	
495	FABRICA-TUGBUGAN-	05	41	P	4	1	2	1	5	1	1	1	16	2	3	1	1	1	4	12	28	
495	SAN LORENZO RUIZ (MELDA)	05	40	Other	5	1	3	1	1	1	1	1	14	2	4	2	1	1	4	14	28	
495	DINGALAN-3	03	40	Other	3	1	4	1	1	1	1	1	13	3	3	3	1	1	4	15	28	
495	CASIGURAN-1-(a)	02	39	Other	3	1	3	1	2	1	1	1	13	3	4	2	1	1	4	15	28	
495	SAINT 1	06	38	Other	3	1	2	1	5	1	1	1	15	3	3	2	3	1	1	13	28	
495	BAÇON-2	05	38	Other	4	1	2	1	4	1	1	1	15	2	3	2	1	1	4	13	28	
495	CAN-AVID	06	38	Other	4	1	3	1	5	1	1	1	17	3	2	2	1	1	2	11	28	
495	SORSOGON-2	05	37	Other	4	1	1	1	5	1	1	1	15	2	3	2	1	1	4	13	28	
495	MANDAON-2	05	37	Other	5	1	2	1	5	1	1	1	17	3	3	1	1	1	2	11	28	
495	BALAYAN	04	34	Other	3	1	3	1	5	2	1	1	17	2	4	1	1	1	2	11	28	
495	TORRILLOS-1	04	33	Other	4	1	2	1	5	1	1	1	16	1	3	2	3	1	2	12	28	
495	MARIVELES-2	03	30	Other	1	1	3	1	4	1	1	1	13	1	4	2	3	1	4	15	28	
495	PANABO CITY	11	30	Other	4	1	3	1	5	5	1	1	21	1	2	1	1	1	1	7	28	
495	BAGAC-3	03	29	Other	1	1	3	1	4	1	1	1	13	1	4	2	3	1	4	15	28	
495	DINGALAN-4	03	29	Other	3	1	4	1	2	1	1	1	14	3	3	2	1	1	4	14	28	
495	MORONG-4	03	29	Other	1	1	3	1	4	1	1	1	13	1	4	2	3	1	4	15	28	
495	PALANAN-5	02	29	Other	3	1	3	1	2	1	1	1	13	3	4	2	1	1	4	15	28	
495	LINGIG-1	11	25	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	2	2	12	28	
495	RIETO DIAZ-1	05	24	Other	4	1	3	1	4	1	1	1	16	2	3	1	1	1	4	12	28	
495	DINGALAN-1	03	22	Other	3	1	4	1	2	1	1	1	14	3	3	2	1	1	4	14	28	
495	LOBO-1	04	22	Other	3	1	2	1	5	1	1	1	15	2	3	4	1	1	2	13	28	
495	BULALACAO-6-S	04	20	Other	4	1	2	1	5	1	1	1	16	2	3	2	1	1	3	12	28	
495	SAN ANTONIO-2	03	20	Other	2	1	2	1	5	1	1	1	14	2	4	3	1	1	3	14	28	
495	SAN MARIANO-1	02	19	Other	3	1	3	1	1	1	1	1	12	3	4	3	1	1	4	16	28	
495	BULALACAO-1-S	04	12	Other	4	1	3	1	5	1	1	1	17	2	3	1	1	1	3	11	28	
607	CATUL	11	651	P	3	1	3	1	3	1	3	1	16	1	4	2	1	2	1	11	27	
607	QUIPIT	09	580	P	4	1	3	2	5	1	1	1	18	1	2	2	1	1	2	9	27	
607	LASANG	11	558	P	2	2	3	2	5	1	1	1	18	2	2	2	1	1	1	9	27	
607	DALIKA	12	531	P	5	1	3	2	5	1	2	1	20	1	1	2	1	1	1	7	27	
607	PARO (DAPITAN)	08	513	P	4	2	3	2	5	1	1	1	19	1	2	2	1	1	1	8	27	
607	LOBOC	07	477	P	4	1	2	2	5	1	2	1	18	1	2	2	1	1	2	9	27	
607	LAWIS	03	472	P	2	1	2	3	2	1	1	1	13	2	3	2	1	2	4	14	27	
607	IPONON	10	471	P	3	2	3	3	4	1	1	1	18	1	2	2	1	2	1	9	27	
607	M-LANG	12	421	P	4	2	3	2	4	1	1	1	18	1	1	2	2	1	2	9	27	
607	TALOMO	11	386	P	2	2	3	3	4	1	1	1	17	1	1	2	3	1	2	10	27	
607	SIPOCONG	07	385	P	3	2	2	2	5	1	1	1	17	2	2	2	1	2	1	10	27	
607	SIGUIL	11	383	P	4	1	3	2	4	1	1	1	17	1	1	2	3	1	2	10	27	
607	HINATUAN	11	381	P	3	1	3	1	5	1	1	1	16	1	4	1	1	2	2	11	27	
607	MANOLO FORTICH	10	345	Other	3	2	3	2	5	1	1	1	18	1	2	2	1	2	1	9	27	
607	ANDANAN	1.0	297	P	4	1	3	1	4	1	1	1	16	1	3	2	1	2	2	11	27	
607	BOAC	04	255	P	4	1	2	2	4	1	1	1	16	1	3	2	2	1	2	11	27	
607	MUAPAG	12	252	P	3	1	3	1	5	1	1	1	16	1	2	2	4	1	1	11	27	
607	EL NIDO-2	04	241	Other	3	1	3	1	4	1	1	1	15	2	3	2	1	1	3	12	27	
607	LIPADAS	11	217	P	2	2	3	2	5	1	1	1	17	1	2	2	3	1	1	10	27	
607	ABRA DE ILOG	04	194	P	4	1	1	1	5	1	1	1	15	2	3	1	1	1	4	12	27	
607	TOBIAS FORNER (DAO)	08	191	Other	3	1	3	1	4	1	1	1	15	2	3	2	1	1	4	12	27	
607	MATIBO	11	184	P	3	1	3	1	4	1	1	1	15	1	3	2	4	1	1	12	27	
607	CAGWAIT	11	178	Other	3	1	3	1	3	1	1	1	16	1	4	2	1	1	2	11	27	
607	MAKUKAN-1	08	178	Other	4	1	3	1	3	1	3	1	19	1	2	2	1	1	1	9	27	
607	KULAMAN	12	173	P	3	1	3	1	3	1	1	1	16	1	2	2	4	1	1	11	27	
607	SILAGA	09	155	P	4	1	3	1	3	1	1	1	17	3	2	1	1	1	2	10	27	
607	BAROTAC NUEVO	06	150	Other	3	1	2	2	3	1	1	1	16	2	2	1	1	1	4	11	27	
607	MAAPON	04	144	P	3	1	2	2	4	1	1	1	15	1	1	1	2	1	2	12	27	
607	SAN ANDRES-1-(a)	04	137	Other	3	1	3	1	5	1	1	1	16	2	3	2	1	1	2	11	27	
607	BURDECS-1	04	133	Other	3	1	3	1	5	1	1	1	16	2	4	1	1	1	2	11	27	
607	GUINABASAN	07	133	P	3	1	2	2	5	1	1	1	16	2	2	2	1	1	3	11	27	
607	TUBURAN-1-(a)	07	132	Other	3	1	2	2	5	1	1	1	16	2	2	2	1	1	3	11	27	
607	CALBIGA-1-S	08	127	Other	4	1	3	2	4	1	1	1	16	3	2	2	1	1	3	11	27	
607	TUBURAN-2-(a)	07	123	Other	3	1	2	2	5	1	1	1	16	2	2	2	1	1	3	11	27	
607	CARCAR	07	122	Other	3	1	3	2	5	1	1	1	17	2	1	2	1	1	3	10	27	
607	GAAS LULET	10	119	P	4	1	3	1	3	1	1	1	15	1	4	2	1	1	3	1		

Tab. C-1-24 Prioritization of First Screening Results (7/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total
607	SANTA CRUZ-2-(c)	.04	65	Other	4	1	2	1	5	2	1	1	17	1	3	2	1	1	2	10	27
607	BISLIG-3-S	.11	65	Other	3	1	3	1	3	2	1	1	15	1	4	2	1	2	2	12	27
607	TABOGON	.07	63	Other	3	1	3	1	5	1	1	1	16	2	2	2	1	1	3	11	27
607	ABUCAY	.09	62	Other	1	1	2	2	4	1	1	1	13	1	3	2	3	1	4	14	27
607	CATANAUAN-3-S	.04	62	Other	3	1	2	1	5	1	1	1	15	2	4	2	1	1	2	12	27
607	CADIZ CITY	.06	61	Other	4	1	2	1	5	1	1	1	16	2	4	2	1	1	4	11	27
607	YABAHAN	.04	61	P	3	1	3	1	5	1	1	1	16	2	3	2	1	1	2	11	27
607	MORON	.09	61	P	1	1	3	2	3	1	1	1	13	1	3	2	3	1	4	14	27
607	GASAN	.04	59	Other	4	1	2	1	5	1	1	1	16	1	3	2	2	1	2	11	27
607	PAGADIAN CITY	.09	58	Other	3	1	3	1	5	5	1	1	20	1	2	1	1	1	7	27	
607	GIPORLOS	.08	55	Other	4	1	3	1	4	1	1	1	16	3	2	2	1	1	2	11	27
607	SANTA CRUZ-1-(c)	.04	55	Other	4	1	2	1	5	2	1	1	17	1	3	2	1	1	2	10	27
607	SAMAL	.09	54	Other	1	1	2	1	5	2	1	1	14	1	3	2	2	1	4	13	27
607	SILONGIN	.04	51	P	3	1	3	1	5	1	1	1	16	2	3	2	1	1	2	11	27
607	CALATAGAN-1	.04	50	Other	3	1	3	1	5	1	1	1	16	2	4	1	1	1	2	11	27
607	SORSOGON-1	.06	47	Other	4	1	1	1	4	1	1	1	14	2	3	2	1	1	4	13	27
607	PALANAN-2	.02	46	Other	3	1	3	1	1	1	1	1	12	3	4	2	1	1	4	15	27
607	MARABUTI	.06	45	Other	4	1	2	1	5	1	1	1	16	3	2	2	1	1	2	11	27
607	GENERAL SANTOS CITY-2	.11	42	Other	3	1	3	1	5	5	1	1	20	1	1	1	1	1	2	7	27
607	CATANAUAN-1-S	.04	41	Other	3	1	3	1	5	1	1	1	16	2	4	1	1	1	2	11	27
607	MORONG-2	.09	40	Other	1	1	2	1	2	2	1	1	11	1	3	2	4	2	4	16	27
607	MAUBAN-1	.04	40	Other	3	1	3	1	3	1	1	1	14	2	4	2	1	2	2	13	27
607	CLAVER-5	.10	39	Other	4	1	2	1	3	1	1	1	14	1	4	3	1	1	3	13	27
607	PANTUKAN-3	.11	39	Other	4	1	3	1	5	1	1	1	17	1	3	2	2	1	1	10	27
607	ROXAS-1	.04	36	Other	4	1	2	1	5	1	1	1	16	2	3	1	1	1	3	11	27
607	TANDAS-2-S	.11	37	Other	3	1	3	1	4	1	1	1	15	1	4	3	1	1	2	12	27
607	NASUGBU-2	.09	37	Other	3	1	2	1	5	1	1	1	15	2	4	2	1	1	2	12	27
607	BAGAC-2	.08	34	Other	1	1	3	1	3	1	1	1	12	1	4	2	3	1	4	15	27
607	BAGAC-3	.09	31	Other	1	1	3	1	4	1	1	1	13	1	3	2	3	1	4	14	27
607	PALANAN-4	.02	28	Other	3	1	3	1	1	1	1	1	13	1	3	2	3	1	4	14	27
607	ORION-2	.08	27	Other	1	1	3	1	5	1	1	1	12	3	4	2	2	1	4	14	27
607	PALANAN-3	.02	25	Other	3	1	2	1	5	1	1	1	13	3	4	2	2	1	4	15	27
607	SAN PABLO-1	.02	23	Other	3	1	3	1	1	1	1	1	12	3	4	3	1	1	4	16	27
607	HINATAUAN-2-S	.11	22	Other	3	1	3	1	5	1	1	1	16	1	3	4	3	1	2	11	27
607	MABINI-2-(c)	.11	21	Other	4	1	3	1	5	1	1	1	17	1	3	2	2	1	1	10	27
607	NASUGBU-1	.04	20	Other	3	1	2	1	5	1	1	1	15	2	4	2	2	1	2	12	27
607	TARRAGONA-3	.11	19	Other	3	1	3	1	5	1	1	1	16	1	3	4	1	1	1	11	27
607	BATANGAS CITY-3	.04	19	Other	3	1	2	1	5	1	1	1	15	2	3	3	1	1	2	12	27
607	SABLAYAN-2	.04	19	Other	4	1	3	1	2	1	1	1	14	2	3	2	1	1	4	13	27
607	SAINTE BERNARD	.08	16	Other	3	1	3	1	5	1	1	1	16	3	3	2	1	1	1	11	27
607	GENERAL LUNA-1	.04	15	Other	3	1	3	1	5	1	1	1	16	2	4	1	1	1	2	11	27
607	LOBO-4	.04	15	Other	3	1	2	1	5	1	1	1	15	2	3	3	1	1	2	12	27
607	LOBO-2	.04	15	Other	3	1	2	1	4	1	1	1	14	2	3	4	1	1	2	13	27
607	SABLAYAN-3	.04	12	Other	4	1	3	1	2	1	1	1	14	2	3	2	1	1	4	13	27
607	ABORLAN-2	.04	10	Other	3	1	3	1	5	1	1	1	16	2	2	2	1	1	3	11	27
607	CLAVER-5	.10	9	Other	4	1	2	1	4	1	1	1	15	1	5	1	1	1	3	12	27
607	BISLIG-2-S	.11	8	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	1	2	11	27
607	LANUZA-1	.11	5	Other	3	1	2	1	5	1	1	1	15	1	4	3	1	1	2	12	27
721	ULOT	.06	1,036	P	4	1	3	2	2	1	1	1	15	3	2	2	1	1	2	11	26
721	MANDULOG	.10	748	P	5	2	3	3	2	1	1	1	18	1	2	2	1	1	1	8	26
721	EL NIDO-1	.04	500	Other	3	1	3	1	3	1	1	1	14	2	3	2	1	1	3	12	26
721	LABANGAN	.09	482	P	3	2	3	2	5	1	1	1	18	1	2	2	1	1	1	8	26
721	ALKAN	.12	476	P	4	1	3	2	5	1	1	1	18	1	1	2	1	1	2	8	26
721	WAWA	.10	467	P	4	1	3	1	4	1	1	1	16	1	3	2	1	2	1	10	26
721	TORACAN	.11	442	P	3	1	2	1	2	1	1	1	12	1	4	2	1	3	3	14	26
721	TAYTAY	.04	350	Other	3	1	3	1	4	1	1	1	15	2	2	2	1	1	3	11	26
721	ARAJELI	.04	328	Other	3	1	3	1	5	1	1	1	16	2	2	1	1	1	3	10	26
721	TANJAY	.07	306	P	3	1	2	2	5	1	1	1	16	2	2	2	2	1	1	10	26
721	BALANGIGA	.08	297	P	4	1	3	1	3	1	1	1	15	3	2	2	1	1	2	11	26
721	CABULIG	.10	287	P	3	1	2	2	3	5	1	1	17	1	2	3	1	1	1	9	26
721	ABATAN	.07	264	P	4	1	2	2	5	1	1	1	17	1	2	2	1	1	2	9	26
721	CABADBARAN	.10	224	P	4	1	3	1	3	1	1	1	15	1	4	2	1	2	1	11	26
721	BUENAVISTA-1-(d)	.07	223	Other	4	1	3	1	5	1	1	1	17	1	2	2	1	1	2	9	26
721	MAT ABER	.12	220	P	5	1	3	1	5	1	1	1	18	1	2	2	1	1	1	8	26
721	Y-LANG	.12	205	P	5	1	3	1	5	1	1	1	18	1	2	2	1	1	1	8	26
721	BUENAVISTA-1-(c)	.10	186	Other	4	1	3	1	5	1	1	1	17	1	3	2	1	1	1	9	26
721	LIGAN CITY-2	.12	190	Other	5	1	3	1	5	1	1	1	18	1	2	2	1	1	1	8	26
721	OZAMIS CITY	.08	177	Other	4	1	2	2	5	1	1	1	18	1	2	2	1	1	1	8	26
721	DIGSOS	.11	171	P	2	1	2	2	5	2	1	1	15	1	1	2	4	1	1	10	26
721	BANCUL	.07	163	P	2	1	3	1	4	1	1	1	13	2	2	2	2	1	1	13	26
721	VALENCIA (LUZURRIAGA)	.07	162	Other	3	1	2	1	4	1	1	1	15	2	2	2	3	1	1	11	26
721	PALAUIG-1	.03	145	Other	4	1	3	1	4	1	1	1	14	2	3	2	1	1	3	12	26
721	PRES. MANUEL A. ROXAS	.09	143	Other	4	1	3	1	5	1	1	1	17	1	2	3	1	1	1	9	26
721	ARGAO-2	.07	135	Other	3	1	2	2	5	1	1	1	16	2	1	2	1	1	3	10	26
721	PATAUG	.09	135	P	4	1	3	1	5	1	1	1	17	1	2	2	1	1	2	9	26
721	CABADBARAN-1-S	.10	134	Other	4	1	3	1	5	1	1	1	17	1	4	1	1	1	1	9	26
721	JALO	.06	132	P	3	1	2	1	5	1	1	2	16	1	3	1	1	1	3	10	26
721	MAKAR	.11	119	P	3	1	3	1	5	1	1	1	16	1	1	2	3	1	2	10	26
721	SANTA CATALINA-3	.07	108	Other	3	1	3	1	5	1	1	1	16	2	2	2	1	2	1	10	26
721	HIMBANGAN	.08	106	P	3	1	3	1	3	1	1	1	14	3	3	2	2	1	1	12	26
721	MULANAY	.04	105	Other	3	1	3	1	5	1	1	1	16	2	3	1	1	1	2	10	26
721	BOLBOK-LAWAYA	.04	100	P	3	1	2	2	5	1	1	1	16	2	3	1	1	1	2	10	26
721	IWAHIG	.04	97																		

Tab. C-1-24 Prioritization of First Screening Results (8/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total
721	QUEZON-6	04	59	Other	3	1	2	1	5	1	1	1	15	2	2	2	1	1	3	11	26
721	LEMERY-1	04	59	Other	3	1	2	1	5	1	1	1	15	2	2	2	1	1	3	11	26
721	SULTAN GUMANDER-1	12	58	Other	5	1	3	1	5	1	1	1	18	1	2	2	1	1	1	8	26
721	CATEEL	11	56	Other	3	1	3	1	4	1	2	1	16	1	4	2	1	1	1	10	26
721	AYUNGON-1	07	56	Other	3	1	3	1	5	1	1	1	16	2	2	3	1	1	1	10	26
721	MOGPOG-1	04	55	Other	4	1	2	1	5	1	1	1	16	1	3	2	1	1	2	10	26
721	GLAN-5-S	11	54	Other	4	1	3	1	5	1	1	1	17	1	1	3	1	1	2	9	26
721	TAWIRAN-TAGUM	04	54	P	4	1	2	1	5	1	1	1	16	1	3	2	1	1	2	10	26
721	CARRASCAL-2	10	53	Other	4	1	2	1	5	1	1	1	13	1	4	3	1	1	3	13	26
721	MALAPATAN-3	11	53	Other	4	1	3	1	5	1	1	1	17	1	1	3	1	1	2	9	26
721	SAN ISIDRO-2	11	53	Other	3	1	3	1	5	1	1	1	16	1	3	3	1	1	1	10	26
721	DAUIN-2	07	52	Other	3	1	3	1	5	1	1	1	16	2	2	2	2	1	1	10	26
721	LEMERY-2	04	51	Other	3	1	2	1	5	2	1	1	16	2	3	1	1	1	2	10	26
721	BISLIG-1-S	11	49	Other	3	1	3	1	5	1	1	1	16	1	4	1	1	1	2	10	26
721	SOGOD	07	47	Other	3	1	2	1	5	1	1	1	15	2	2	2	1	1	3	11	26
721	SAN NARCISO-1-(a)	08	47	Other	2	1	2	1	5	1	1	1	14	2	4	1	1	1	3	12	26
721	CORTES-1	11	44	Other	3	1	2	1	5	1	1	1	15	1	4	2	1	1	2	11	26
721	BASUD-1	05	43	Other	1	1	3	1	5	1	1	1	14	1	4	1	1	1	4	12	26
721	MALAPATAN-2	11	41	Other	4	1	3	1	5	1	1	1	17	1	1	3	1	1	2	9	26
721	DATU ODIN SINSUAT (DINAIG)	12	38	Other	5	1	3	1	5	1	1	1	18	1	2	2	1	1	1	8	26
721	SAN MARIANO-2	02	37	Other	3	1	2	1	1	1	1	1	11	3	4	2	1	1	4	15	26
721	BALANGA-1-S	03	36	Other	1	1	2	1	5	2	1	1	14	1	3	1	2	1	4	12	26
721	CARAGA-2-S	11	36	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	1	1	10	26
721	PANTUKAN-1	11	35	Other	4	1	3	1	5	1	1	1	17	1	3	2	1	1	1	9	26
721	UPI-1	12	35	Other	5	1	3	1	4	1	1	1	17	1	2	3	1	1	1	9	26
721	LIANGA-3	11	30	Other	3	1	3	1	4	1	1	1	15	1	4	2	1	1	2	11	26
721	LIBAGON	08	30	Other	3	1	2	1	3	1	1	1	13	3	3	4	1	1	1	13	26
721	NAULAN	04	28	Other	4	1	3	1	1	1	1	1	13	2	3	3	1	1	3	13	26
721	TOLEDO CITY	07	28	Other	3	1	3	1	5	1	1	1	16	2	1	2	1	1	3	10	26
721	MANAY-2	11	27	Other	3	1	3	1	4	1	1	1	16	1	4	2	1	1	1	10	26
721	SUBIC-2	03	26	Other	4	1	2	1	4	1	1	1	13	1	4	2	1	1	2	9	26
721	TORILLOS-2	04	26	Other	4	1	2	1	5	1	1	1	16	1	4	2	1	1	2	10	26
721	BAGANGA-5	11	23	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	1	1	10	26
721	SANCHEZ-MIRA-3	02	21	Other	3	1	3	1	5	1	1	1	13	1	4	2	1	1	4	13	26
721	CARAGA-1-S	11	20	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	1	1	10	26
721	HINATUAN-1-S	11	20	Other	3	1	3	1	5	1	1	1	16	1	4	1	1	1	2	10	26
721	LOBIO-3	04	19	Other	3	1	2	1	4	1	1	1	14	2	3	3	1	1	2	12	26
721	BAGANGA-3	11	18	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	1	1	10	26
721	MATI-9	11	18	Other	3	1	3	1	5	1	1	1	16	1	3	3	1	1	1	10	26
721	BAGANGA-2	11	16	Other	3	1	3	1	5	1	1	1	16	1	4	2	1	1	1	10	26
721	MATI-14	11	14	Other	3	1	3	1	5	1	1	1	16	1	2	4	1	1	1	10	26
721	TANDAG-1-S	11	12	Other	3	1	3	1	4	1	1	1	15	1	4	2	1	1	2	11	26
721	BATANGAS CITY-1	04	12	Other	2	1	2	1	5	1	1	1	14	2	3	3	1	1	2	12	26
721	UPI-2	12	9	Other	5	1	3	1	5	1	1	1	18	1	2	2	1	1	1	8	26
721	UPI-8	12	7	Other	5	1	3	1	4	1	1	1	17	1	2	3	1	1	1	9	26
721	BISLIG-4-S	11	5	Other	3	1	3	1	5	1	1	1	16	1	4	1	1	1	2	10	26
831	TUGANAY	11	757	P	3	2	3	2	4	1	1	1	17	1	2	2	1	1	1	8	26
831	HAQAN	10	746	P	4	1	3	1	4	1	1	1	16	1	3	1	1	2	1	9	25
831	DOLORES	06	629	P	4	1	3	1	2	1	1	1	14	3	2	2	1	1	2	11	25
831	GLAN	11	521	P	3	1	3	2	4	1	2	1	17	1	1	2	1	1	2	8	25
831	CARAGA	11	517	P	3	1	3	1	3	1	1	1	14	1	4	3	1	1	1	11	25
831	BASEY	08	491	P	4	1	2	1	2	1	1	1	14	3	2	2	1	1	2	11	25
831	SURIBAO	08	467	P	4	1	3	1	3	1	1	1	14	3	2	2	1	1	2	11	25
831	LORENT O.	08	445	P	4	1	2	1	3	1	1	1	14	3	2	2	1	1	2	11	25
831	CASANUAN	11	377	P	3	1	3	1	3	1	1	1	14	1	4	3	1	1	1	11	25
831	BROOKES POINT-5	04	360	Other	3	1	2	1	5	1	1	1	15	2	1	2	1	1	3	10	25
831	DIPOLOG	09	348	P	4	1	3	1	5	1	1	1	17	1	2	2	1	1	1	8	25
831	SIQUIJOR	07	315	Other	3	1	3	2	5	1	1	1	17	1	2	2	1	1	1	8	25
831	LOPEZ JAENA	09	279	Other	4	1	2	2	5	1	1	1	17	1	2	2	1	1	1	8	25
831	DIKAYA	09	266	P	4	1	3	1	5	1	1	1	17	1	2	2	1	1	1	8	25
831	CANTILLAN	11	252	P	3	1	2	1	3	1	1	1	13	1	4	2	1	1	3	12	25
831	LIANGAN	12	236	P	4	1	3	2	4	1	1	1	17	1	2	2	1	1	1	9	25
831	BALATOCAN	10	235	P	3	1	2	2	5	1	1	1	16	1	2	3	1	1	1	9	25
831	KATIPUNAN	08	226	Other	4	1	3	1	5	1	1	1	17	1	2	2	1	1	1	8	25
831	LINAGOS	10	225	P	3	1	2	2	5	1	1	1	16	1	3	2	1	1	1	9	25
831	PUERT O. PRINCESA CITY-4	04	218	Other	3	1	3	1	4	1	1	1	14	2	2	2	1	1	3	11	25
831	TAGA PLAN	04	205	P	4	1	2	1	4	1	1	1	14	2	1	3	1	1	1	8	25
831	TANGAL	12	196	Other	4	1	3	2	4	1	1	1	17	1	2	2	1	1	1	8	25
831	PUERT O. PRINCESA CITY-1	04	188	Other	3	1	2	1	3	1	1	1	15	2	2	2	1	1	3	11	25
831	AMLAN	07	187	Other	3	1	3	1	5	1	1	1	15	2	2	2	1	1	2	10	25
831	RIZAL	04	183	P	3	1	3	1	3	1	1	1	14	2	2	2	1	1	3	11	25
831	CALAMBA	09	181	Other	4	1	3	1	5	1	1	1	17	1	2	2	1	1	1	8	25
831	IWAHIG-BROOKES-	04	174	P	3	1	3	1	5	1	1	1	16	2	1	1	1	1	3	9	25
831	BALINGOAN	10	167	Other	3	1	3	2	5	1	1	1	17	1	2	2	1	1	1	8	25
831	BUUG-1	09	165	Other	3	1	3	1	5	1	1	1	16	1	2	2	1	1	2	9	25
831	MANTICAO	12	150	Other	3	1	3	2	5	1	1	1	17	1	2	2	1	1	1	8	25
831	SANTA CRUZ-2-(b)	09	147	Other	2	1	2	1	4	1	1	1	13	2	3	2	1	1	3	12	25
831	MARIHATAG	11	142	Other	3	1	3	1	3	1	1	1	14	1	4	2	1	1	2	11	25
831	DIGOS-1-S	11	141	Other	2	1	3	2	5	1	1	1	16	1	1	2	2	1	2	9	25
831	MEDINA-1-(b)	10	140	Other	3	1	2	2	5	1	1	1	16	1	2	3	1	1	1	9	25
831	TUBOD	12	138	Other	4	1	3	1	5	1	1	1	17	1	2	2	1	1	1	8	25
831	MALAPATAN-1	11	133	Other	4	1	3	1	4	1	1	1	16	1	1	3	1	1	2	9	25
831	DAPRAS	11																			

Tab. C-1-24 Prioritization of First Screening Results (11/11)

Rank	RIVER_NAME	WR REGION	Catchment Area (km ²)	River Basins	S1	S2	S3	S4	S5	S6	S7	S8	Sub-Total	N1	N2	N3	N4	N5-C	N5-D	Sub-Total	Total
1121	MAOSAM	10	418	P	4	1	1	1	1	1	1	1	14	1	2	1	1	1	1	8	22
1121	TIGUA	12	261	P	1	1	1	1	1	1	1	1	14	1	2	1	1	1	1	8	22
1121	LUBANG	10	246	P	4	1	1	1	1	1	1	1	13	1	3	1	1	1	1	9	22
1121	TUMAGA	09	217	P	1	1	1	1	1	1	1	1	15	1	1	1	1	1	1	7	22
1121	LAMAKAN	04	166	P	1	1	1	1	1	1	1	1	12	1	1	1	1	1	3	10	22
1121	QUEZON-8	04	165	Other	1	1	1	1	1	1	1	1	11	2	2	1	1	1	3	11	22
1121	GUBAUAN	09	139	P	1	1	1	1	1	1	1	1	16	1	1	1	1	1	1	6	22
1121	MALABANGAN	04	120	P	1	1	1	1	1	1	1	1	12	2	1	1	1	1	3	10	22
1121	KALAMANSIG-3	12	107	Other	1	1	1	1	1	1	1	1	14	1	1	1	1	1	1	8	22
1121	KIAMBA-2	11	106	Other	4	1	1	1	1	1	1	1	14	1	1	1	1	1	2	8	22
1121	SUMSIP-2	09	97	Other	1	1	1	1	1	1	1	1	15	1	1	1	1	1	1	7	22
1121	FILANTROPIA	04	93	P	1	1	1	1	1	1	1	1	12	2	1	1	1	1	3	10	22
1121	CONDUAGA	04	88	P	1	1	1	1	1	1	1	1	12	2	1	1	1	1	3	10	22
1121	BANSANG	04	87	P	1	1	1	1	1	1	1	1	12	2	1	1	1	1	3	10	22
1121	RIZAL-3-S-(a)	04	84	Other	1	1	1	1	1	1	1	1	12	2	1	1	1	1	3	10	22
1121	LAMITAN-2	09	83	Other	1	1	1	1	1	1	1	1	16	1	1	1	1	1	1	6	22
1121	KALAMANSIG-1	12	81	Other	1	1	1	1	1	1	1	1	15	1	1	1	1	1	1	7	22
1121	MALITA-3	11	65	Other	2	1	1	1	1	1	1	1	14	1	1	1	1	2	1	8	22
1121	SANTA MARIA-2	11	64	Other	2	1	1	1	1	1	1	1	14	1	2	2	1	1	1	8	22
1121	ZAMBOANGA CITY-7	09	62	Other	1	1	1	1	1	1	1	1	16	1	1	1	1	1	1	6	22
1121	LAMITAN-1	09	61	Other	1	2	1	1	1	1	1	1	15	1	1	2	1	1	1	7	22
1121	UPI-6	12	60	Other	1	1	1	1	1	1	1	1	14	1	1	1	1	1	1	8	22
1121	JOSE ABAD SANTOS (TRINIDAD)-3	11	54	Other	2	1	1	1	1	1	1	1	14	1	1	2	1	1	2	8	22
1121	JOSE ABAD SANTOS (TRINIDAD)-1	11	53	Other	2	1	1	1	1	1	1	1	14	1	1	2	1	1	2	8	22
1121	ZAMBOANGA CITY-1	09	52	Other	1	1	1	1	1	1	1	1	15	1	1	2	1	1	1	7	22
1121	PALIMBANG-5	12	49	Other	1	1	1	1	1	1	1	1	14	1	1	1	1	1	1	8	22
1121	KALAMANSIG-2	12	44	Other	1	2	1	1	1	1	1	1	15	1	1	2	1	1	1	7	22
1121	GOVERNOR GENEROSO-5	11	39	Other	1	1	1	1	1	1	1	1	14	1	2	2	1	1	1	8	22
1121	JOSE ABAD SANTOS (TRINIDAD)-2	11	31	Other	2	1	2	1	1	1	1	1	14	1	1	2	1	1	2	8	22
1121	MAITUM-3-(b)	12	26	Other	4	1	1	2	1	1	1	1	14	1	1	2	1	1	2	8	22
1121	MATI-12	11	20	Other	1	1	1	2	1	1	1	1	13	1	2	3	1	1	1	9	22
1121	MATI-10	11	14	Other	1	1	1	1	1	1	1	1	12	1	2	4	1	1	1	10	22
1121	BALINGASAG	10	13	Other	1	2	1	1	1	1	1	1	15	1	2	1	1	1	1	7	22
1121	OPOL	10	8	Other	1	1	1	1	1	1	1	1	15	1	2	1	1	1	1	7	22
1155	ZAMBOANGA CITY-5	09	113	Other	1	1	1	1	1	1	1	1	14	1	1	2	1	1	1	7	21
1155	ILOG-PALAWAN	04	105	P	1	1	1	1	1	1	1	1	11	2	1	2	1	1	3	10	21
1155	PALIMBANG-1	12	97	Other	1	1	1	1	1	1	1	1	14	1	1	2	1	1	1	7	21
1155	MALALAG	11	96	Other	2	1	1	1	1	1	1	1	14	1	1	2	1	1	1	7	21
1155	SUMSIP-1	09	95	Other	1	2	1	1	1	1	1	1	14	1	1	2	1	1	1	7	21
1155	TUBURAN-1-(b)	09	90	Other	1	2	1	1	1	1	1	1	15	1	1	1	1	1	1	6	21
1155	KIAMBA-3	11	69	Other	4	1	1	1	1	1	1	1	13	1	1	2	1	1	2	8	21
1155	MATI-8	11	35	Other	1	1	1	1	1	1	1	1	12	1	2	3	1	1	1	9	21
1155	MATI-11	11	32	Other	1	1	1	1	1	1	1	1	12	1	2	3	1	1	1	9	21
1164	GUMALARANG	09	157	P	1	1	1	1	1	1	1	1	14	1	1	1	1	1	1	6	20

Tab. C-1-25 Result of Sensitivity Analysis

	CASE-1	CASE-2	CASE-3
RANK	Analysis with 10 Points for S7 and S8	Analysis with 15 Points for S7 and S8	Analysis with 20 Points for S7 and S8
1	BICOL (whole)	BICOL (whole)	GUAGUA
2	GUAGUA	GUAGUA	BICOL (whole)
3	DAGUPAN	AMBURAYAN	AMBURAYAN
4	AMBURAYAN	DAGUPAN	ANGAT
5	PATALAN	ANGAT	CATARMAN-1S
6	ARINGAY	PATALAN	DAGUPAN
7	ABULUG (whole)	CATARMAN-1S	ABULUG (whole)
8	BAUANG	ABULUG (whole)	PATALAN
9	ABRA (whole)	ARINGAY	ARINGAY
10	CATARMAN-1S	ABRA (whole)	ABRA (whole)
11	PAMPANGA (whole)	BAUANG	CAGAYAN (whole)
12	LAOAG	CAGAYAN (whole)	BAUANG
13	ANGAT	LAOAG	PAMPANGA (whole)
14	CAGAYAN (whole)	PAMPANGA (whole)	UMIRAY
15	MMANILA	MMANILA	LAOAG
16	AGNO (whole)	UMIRAY	KALIWA
17	UMIRAY	CAGARAY	CAGARAY
18	KALIWA	KALIWA	MMANILA
19	CAGARAY	AGNO (whole)	PAGBANGARAN
20	BAGO	PAGBANGARAN	AGNO (whole)
21	PAGBANGARAN	BAGO	TIAN
22	BALETE	TIAN	LABAYAT
23	ILOG-HILABANGAN (whole)	BALETE	REAL-2
24	JALAUD (whole)	LABAYAT	REAL-1
25	LABO	REAL-2	BALETE
26	AKLAN	REAL-1	GENERAL NAKAR-2-(b)
27	BONGABON	AKLAN	AGOS
28	BARARO	BONGABON	BONGABON
29	BACOLOD CITY	GENERAL NAKAR-2-(b)	GENERAL NAKAR-2-(a)
30	LEGAZPI CITY	ILOG-HILABANGAN (whole)	GENERAL NAKAR-5-(b)
31	TIAN	GENERAL NAKAR-2-(a)	GENERAL NAKAR-4-(b)
32	BACARRA-VINTAR	GENERAL NAKAR-5-(b)	GENERAL NAKAR-3-(b)
33	HIMOCAAN	GENERAL NAKAR-4-(b)	BAGO
34	BALINCUGUIN	GENERAL NAKAR-3-(b)	AKLAN
35	SUYO	LABO	TIGNOAN
36	DAET-BASUD	PAMPLONA	GENERAL NAKAR-1-(a)
37	IMUS	AGOS	ILOG-HILABANGAN (whole)
38	LABAYAT	BARARO	PAMPLONA
39	REAL-2	TIGNOAN	PALANAN-PINACANAUAN
40	REAL-1	GENERAL NAKAR-1-(a)	AGUANG
41	PAMPLONA	JALAUD (whole)	LAL-LO-2
42	PAGSANGAHAN	BACARRA-VINTAR	LABO
43	LAL-LO-2	PALANAN-PINACANAUAN	BACARRA-VINTAR
44	SILAG-SANTA MARIA	AGUANG	DAGUITAN-MARABANG
45	DONSOL	LAL-LO-2	JALAUD (whole)
46	DAGUITAN-MARABANG	HIMOCAAN	CULABA
47	PULA	DAGUITAN-MARABANG	MAGBANDO
48	GENERAL NAKAR-2-(b)	BALINCUGUIN	HIMOCAAN
49	SAN AGUSTIN	SUYO	SUYO
50	PALANAN-PINACANAUAN	BACOLOD CITY	PULA

Tab. C-1-26 Proposed Project (DPWH Medium-Term Public Investment Program)

Fund	Name of River Basin	JBIC loan applied	Budget Allocation	Implementation schedule	Ranking	Remarks (Present Status)
Foreign Assisted Project	Mt Pinatubo (Phase III)	27th	2006	2008-2010	-	
	Pasig-Marikina (Phase II)	27th	2007	2007-2013	-	accepted
	Cagayan	27th	2006	2009-2011	39	
	Panay (1st Stage)	27th	2008	2009-2014	17	
	Bicol	-	2006	2008-2012	21	
	Agno & allied (Phase-III)	-	2008	2009-	27	
	VOM (Meycauayan)	-	2008	2009-2013	6	
	Mayon volcano	-	2008	2009-	7	
	Lower Cotabato	-	2008	2009-2011	11	
	Davao urban drainage	-	2008	2009-2010	14	
	Tagaloan	-	2008	2009-2010	40	
	Upper Agusan	-	2008	2008-2011	33	
	Tagum-Libuganon	-	2008	2009-2011	45	
	Agus	-	2008	2009-2011	48	
	Buayan-Malungun	-	2008	2009-2011	44	
	Tarlac	-	2008	2009-2013	27	
	Iloilo (Phase-II)	-	2008	2009-2014	-	
	Ilog-Hilabangan	-	2008	2009-2010	28	
East-Mangahan	-	2009	2009-2014	2		
Local Fund Project	Kinanliman*	-	2008		25	Implementation will be started soon
	Yawa	-	2008		6	Updating of M/P and F/S is requested
	Agos*	-	2008		33	Detailed design is requested
	Dinalupihan-Hermosa-Lubao*	-	2008		-	Not included in 56 river basins

*: Not listed in the DPWH Medium-term Program

Tab. C-1-27 Selected 100 River Basins (1/3)

	No.	RIVER_NAME	Catchment Area (km ²)	Category	Administrative Region
River Basins Implemented or Scheduled by DFWH		LAOAG	1,384	P	
		MMANILA	846	Other	
		PAMPANGA (whole)	8,237	M-A	
		AGNO (whole)	5,706	M-A	
		AGUSAN (whole)	11,935	M-A	
		ORMOC CITY	222	Other	
		JARO AGANAN	439	P	
		PASIG-LAGUNA BAY (whole)	4,092	M-A	
Major River Basins	1	BICOL (whole)	2,997	M-A	V
	2	ABULUG (whole)	2,881	M-A	II,CAR
	3	ABRA (whole)	4,704	M-A	I,CAR
	4	CAGAYAN (whole)	26,885	M-A	II,CAR
	5	ILOG-HILABANGAN (whole)	3,261	M-A	VI,VII
	6	JALAUD (whole)	1,454	M-A	VI
	7	PANAY (whole)	2,052	M-A	VI
	8	AGUS (whole)	1,976	M-A	ARMM
	9	MINDANAO (whole)	20,759	M-A	X,XII,ARMM
	10	TAGALOAN (whole)	1,757	M-A	X
	11	BUAYAN-MALUNGUN (whole)	1,570	M-A	XI,XII
	12	DAVAO (whole)	1,837	M-A	XI
	13	TAGUM-LIBUGANON (whole)	2,343	M-A	XI
	14	CAGAYAN DE ORO (whole)	1,348	M-A	X
Dangerous River Basins on Flood Events	15	GUAGUA	1,574	Other	III
	16	AMBURAYAN	1,011	P	I
	17	CATARMAN-1-S	245	Other	X
	18	AGOS	548	P	IV-A
	19	LEGAZPI CITY	120	Other	V
	20	DONSOL	367	P	V
	21	IMUS	122	P	IV-A
	22	OLONGAPO CITY	119	Other	III
	23	CEBU CITY	232	Other	VII
	24	KAPUMPONG	592	P	IV-A
	25	SANTO TOMAS	301	P	III
	26	BUCAO	725	P	III
	27	CATARMAN	527	P	VIII
	28	SURIGAO	176	P	XIII
	29	IYAM	113	P	IV-A
	30	DARAGA (LOCSIN)	47	Other	V
	31	AMNAY	413	P	IV-B
	32	IYABAS	159	Other	IV-A
	33	MAG-ASAWANG TUBIG	429	P	IV-B
	34	TUMAGA	217	P	IX

Note:
 The extraction of the dangerous river basins on flood events refers to Water & Floods (DPWH 2004).
 SUC : the Study on Flood Control for Rivers in the Selected Urban Centers in the Philippines (JICA 1994)

Tab. C-1-27 Selected 100 River Basins (2/3)

	No.	RIVER NAME	Administrative Region	Basin Area (km ²)	Category	Population (Persons)	Remarks
Selection of River Basins for Respective Administrative Region	35	DAGUPAN	I	1,034	P	960,659	
	36	PATALAN	I	595	P	369,237	
	37	ARINGAY	I	501	P	279,298	
	38	PAMPLONA	II	669	P	32,470	
	39	PALANAN-PINACANAUAN	II	599	P	13,606	
	40	LAL-LO-2	II	406	Other	31,920	
	41	ANGAT	III	900	P	402,278	
	42	AGUANG	III	545	P	40,214	
	43	NAYAM	III	226	P	24,714	
	44	UMIRAY	IV-A	640	P	69,085	
	45	KALIWA	IV-A	479	P	175,250	
	46	LABAYAT	IV-A	80	P	12,426	
	47	LABO	V	986	P	118,052	
	48	DAET-BASUD	V	260	P	104,590	
	49	GUINALE	V	175	P	124,087	
	50	BAGO	VI	893	P	219,409	
	51	AKLAN	VI	805	P	145,582	
	52	BACOLOD CITY	VI	184	Other	354,251	
	53	BALAMBAN	VII	192	P	230,625	
	54	SAPANG DAKO	VII	170	P	136,130	
	55	SIPOCONG	VII	385	P	1,990,553	
	56	PAGBANGARAN	VIII	246	P	44,347	
	57	DAGUITAN-MARABANG	VIII	346	P	85,074	
	58	PAGSANGAHAN	VIII	452	P	135,028	
	59	JOSE DALMAN (PONOT)	IX	274	Other	37,170	
	60	SIBUGUEY	IX	1,010	P	127,013	
	61	MAPANGI	IX	1,301	P	258,734	
	62	MARANDING	X	841	P	160,900	
	63	IPONON	X	471	P	329,236	
	64	MANDULOG	X	748	P	123,275	
	65	PADADA, MAINIT	XI	1,306	P	306,487	
	66	HILJO	XI	648	P	125,488	
	67	MACO	XI	61	Other	11,026	
	68	TIAN	XII	739	P	92,661	
	69	POLOMOLOK	XII	676	Other	221,348	
	70	SIGUIL	XII	383	P	49,549	
	71	TAGO	XIII	1,286	P	95,738	
	72	LAKE MAINIT-TUBAY	XIII	617	P	69,365	
	73	BOSTON	XIII	73	Other	3,673	
	74	CAGARAY	IV-B	423	P	42,096	
75	BALETE	IV-B	191	P	35,493		
76	BONGABON	IV-B	535	P	55,938		
77	MATALING	ARMM	485	P	155,911		
78	NITUAN	ARMM	446	P	64,612		
79	MATABER	ARMM	220	P	16,659		
80	BAUANG	CAR	507	P	231,932		
		PAMPLONA	CAR	669	P	32,470	Refer to [II]

Tab. C-1-27 Selected 100 River Basins (3/3)

	No.	RIVER NAME	Administrative Region	Basin Area (km ²)	Category	Population (Persons)	Remarks
Principal River basins (Allocation 8-2 Ratio)		BAUJANG	I	507	P	231,932	Refer to [CAR]
	81	BARARO	I	217	P	62,285	
		LABO	IV-A	986	P	118,052	Refer to [V]
	82	TIGNOAN	IV-A	91	P	6,835	
	83	BACARRA-VINTAR	I	609	P	69,635	
	84	BALINCUGUIN	I	324	P	37,617	
	85	HIMOCAAN	VI	406	P	126,332	
	86	SILAY-S.TA. MARIA	I	369	P	62,663	
	87	PULA	IV-B	258	P	61,312	
	88	BUAYA	I	215	P	46,062	
	89	CABICUNGAN	II	254	P	18,894	
	90	BAUA	II	119	P	7,841	
	91	RAGAY	V	222	P	32,750	
	92	MALAYLAY-BACO	IV-B	482	P	55,195	
	93	MAGBANDO	IV-B	472	P	40,301	
	94	BAROC	IV-B	123	P	25,738	
	95	POLA	IV-B	216	P	9,547	
	96	ALAMINOS	I	230	P	67,947	
Other River Basins	97	REAL-2 (LALAVINAN)	IV-A	70	Other	6,913	
	98	REAL-1	IV-A	54	Other	4,077	
	99	GENERAL NAKAR-2-(b)	IV-A	34	Other	541	
	100	GENERAL NAKAR-2-(a)	IV-A	83	Other	1,333	

Tab. C-1-28 Regional Distribution of River Basins

Regional Distribution	Total Number of River Basins	Regional Distribution	Total Number of River Basins
Region I	11	Region VIII	4
Region II	6	Region IX	4
Region III	7	Region X	6
Region IV-A	13	Region XI	6
Region IV-B	10	Region XII	4
Region V	8	Region XIII	4
Region VI	7	Region CAR	2
Region VII	4	Region ARMM	4

Tab. C-2-1 List of the Existing Projects for Extraction of the Project Costs

	Project Title	Year of Formulation	Related Rivers
1	Nationwide Flood Control Plan and River Dredging Program	1982	8 rivers
2	The Panay River Basin-Wide Flood Control Study	1985	1 river (including 3 cases)
3	Flood Control and Drainage Project in Metro Manila	1990	13 rivers
4	Study of Agno River Basin Flood Control	1991	13 rivers
5	Study on Ilog-Hilabangan River Basin Flood Control Project	1991	1 river
6	Study on the Flood Control for Rivers in the Selected Urban Centers	1995	12 rivers
7	The Study on Flood and Mudflow Control for Sacobia-Bamban/Abacan River Draining from Mt. Pinatubo	1996	2 rivers
8	The Study on Sabo and Flood Control in the Laoag River Basins	1997	6 rivers
9	The Study on Sabo and Flood Control for Western River Basins of Mount Pinatubo	2003	2 rivers
10	The Feasibility Study on Flood Control and Drainage Improvement Project for MIAA Compound and Paranaque-Las Pinas River System	2004	5 rivers
	Total		65 Rivers

Tab. C-2-2 List of Averaged CPI (Year of 2006 = 100) in the Philippines

Year	CPI	Year	CPI	Year	CPI
1981	9.7	1990	32.6	1999	69.8
1982	10.7	1991	38.9	2000	72.5
1983	11.7	1992	41.2	2001	77.4
1984	17.6	1993	44.0	2002	79.8
1985	21.6	1994	49.7	2003	82.5
1986	21.8	1995	53.1	2004	87.5
1987	22.7	1996	57.1	2005	94.1
1988	25.9	1997	60.3	2006	100.0
1989	29.0	1998	65.8		

Note:

- 1) Source: Consumer prices index for all income households in the Philippines by NSO
- 2) Standard prices level in NSO is the prices level in 2000 and the price level above table is revised with the prices level in 2006.

Tab. C-2-4 Comparison of Flood Areas

Item	No.	River Basin	Flood Area (Km ²)		Ratio (a)/(b)
			By Reports/Survey (a)	HEC Analysis (b)	
Existing Study Reports	1	Bicol	387.2	386.7	1.0
	2	Tagaloan	11.7	12.9	0.9
	3	Upper Agusan	95.9	93.1	1.0
	4	Panay	206.7	115.1	1.8
	5	Ilog-Hilabangan	119.4	52.9	2.3
	6	Cagayan	968.0	650.0	1.5
	7	Jaro	28.0	18.3	1.5
	Sub-Total			1,816.9	1,328.9
Field Survey	1	Balatukan	5.0	3.3	1.5
	2	Aringay	11.6	10.3	1.1
	3	Bararo	4.3	7.6	0.6
	4	Guinale	5.7	7.0	0.8
	5	Olongapo	2.0	3.2	0.6
	6	Agos	21.0	17.7	1.2
	7	Bago	50.5	31.7	1.6
	8	Maco	0.9	1.2	0.8
	9	Iponon	5.7	7.8	0.7
	10	Tagaloan	4.7	12.9	0.4
	11	Davao	53.7	28.6	1.9
	Sub-Total			165.1	131.3
Total			1,982.0	1,460.2	1.4

Tab. C-2-5 Studied Existing Reports

No.	Study Report	Study Year	Studied River Basin
1	Nationwide Flood Control Plan and River Dredging Program	1982	Cagayan, Agno, Bicol, Panay, Jalaur, Ilog, Tagaloan, Upper Agusan, Lower Mindanao, Laoag
2	The Panay River Basin-wide Flood Control Study	1985	Panay
3	The Study on Flood Control and Drainage Project in Metro Manila	1990	East and West of Mangahan, Pasig-Marikina, Malabon-Navotas
4	Study of Agno River Basin Flood Control	1991	Upper Agno, Pantal-Sinocalan
5	Study on Ilog-Hilabangan River Basin Flood Control	1991	Ilog-Hilabangan
6	Study on the Flood Control for Rivers in the Selected Urban Centers	1995	Jaro, Iloilo, Cebu, Ormoc
7	The Study on Flood and Mudflow Control for Sacobia-Mamban/Abacan River Drainage from Mt. Pinatubo	1996	Sacobia-Bamban, Abacan
8	The Study on Sabo and Flood Control in the Laoag River Basin	1997	Laoag
9	Detailed Engineering Design of Iloilo Flood Control Project	1999	Jaro, Iloilo
10	The Feasibility Study of the Flood Control Project for the Lower Cagayan River	2002	Cagayan
11	Detailed Engineering Design of Pasig-Marikina River Channel Improvement Project	2002	Pasig-Marikina
12	The Study on Sabo and Flood Control for Western River Basins of Mount Pinatubo	2003	Bucayo, Maloma, Sto Tomas
12 Study Reports in Total		1982-2003	31 River Basins

Tab. C-2-6 Results of Existing Study Survey (1/12)

I. Study Name: Nationwide Flood Control and River Dredging Program
 II. Price Level: 1980
 III. Standard Conversion Factor: -

IV. Property (Thousand Pesos, 20-year Return Period, estimated by Interpolation)

River Basin	Bicol	Jalaur	Tagaloan	Upper Agusan	Lower Mindanao
1. Crop (Irrigated Palay)	19,033.1	4,738.5	0.0	3,505.5	4,929.4
2. Crop (Rainfed Palay)	12,342.0	1,112.4	0.0	0.0	1,554.8
3. Crop (Vegetables)	1,061.4	0.0	0.0	0.0	0.0
4. Crop (Root Crops)	447.0	0.0	0.0	0.0	414.7
5. Crop (Legume)	0.0	0.0	0.0	0.0	0.0
6. Crop (Corn)	39.3	0.0	3.9	1,458.9	111.4
7. Crop (Sugarcane)	377.1	45,496.1	0.0	0.0	0.0
8. Fishpond	0.0	9,498.4	0.0	0.0	9,702.7
9. Building	1,116,326.5	144,390.8	27,594.5	49,751.3	454,050.5
Total	1,149,626.4	205,236.2	27,598.4	54,715.7	470,763.5

V. Damage (Thousand Pesos, 20-year Return Period, estimated by Interpolation)

River Basin	Bicol	Jalaur	Tagaloan	Upper Agusan	Lower Mindanao
1. Crop (Irrigated Palay)	10,980.9	2,317.2	0.0	2,470.2	2,803.1
2. Crop (Rainfed Palay)	6,624.1	602.1	0.0	0.0	915.0
3. Crop (Vegetables)	760.4	0.0	0.0	0.0	0.0
4. Crop (Root Crops)	406.5	0.0	0.0	0.0	327.3
5. Crop (Legume)	0.0	0.0	0.0	0.0	0.0
6. Crop (Corn)	31.2	0.0	2.0	1,170.5	68.4
7. Crop (Sugarcane)	20.7	2,385.3	0.0	0.0	0.0
8. Fishpond	0.0	9,219.4	0.0	0.0	0.0
9. Livestock	1,054.1	297.1	0.1	203.8	230.4
10. Building	118,776.0	58,947.8	5,060.6	16,083.6	25,711.1
11. Infrastructure	68,890.0	30,652.9	3,036.3	6,594.3	10,541.5
12. Indirect	10,377.2	5,221.1	405.0	1,326.1	2,029.9
Total	217,921.1	109,642.9	8,504.0	27,848.5	42,626.7

VI. Damage Rate, etc.

River Basin	Bicol	Jalaur	Tagaloan	Upper Agusan	Lower Mindanao
1. Crop (Irrigated Palay)	0.58	0.49	-	0.70	0.57
2. Crop (Rainfed Palay)	0.54	0.54	-	-	0.59
3. Crop (Vegetables)	0.72	-	-	-	-
4. Crop (Root Crops)	0.91	-	-	-	0.79
5. Crop (Legume)	-	-	-	-	-
6. Crop (Corn)	0.79	-	0.51	0.80	0.61
7. Crop (Sugarcane)	0.05	0.05	-	-	-
8. Fishpond	-	0.97	-	-	0.00
9. Livestock (Rate to Crop Damage)	0.06	0.06	0.05	0.06	0.06
10. Building	0.11	0.41	0.18	0.32	0.06
11. Infrastructure Damage (Ratio to the Above)	0.50	0.42	0.60	0.33	0.35
12. Indirect Damage (Ratio to Direct Damage)	0.05	0.05	0.05	0.05	0.05

Note) Refer to the other studies for Cagayan, Agno, Panay, Ilog and Laoag river basins.

Tab. C-2-6 Results of Existing Study Survey (2/12)

I. Study Name: The Panay River Basin-Wide Flood Control Study
 II. Price Level: 1984
 III. Standard Conversion Factor: 0.90

IV. Property (Thousand Pesos in Economic Terms, 20-year Return Period, estimated by Interpolation)

River Basin	Panay
1. Crop (Irrigated Palay)	-
2. Crop (Rainfed Palay)	-
3. Crop (Vegetable)	-
4. Crop (Sugarcane)	23,182.7
5. Brackishwater Fishpond (Milkfish & Praw)	-
6. Building	591,989.3
Total	615,172.0

V. Damage (Thousand Pesos in Economic Terms, 20-year Return Period, estimated by Interpolation)

River Basin	Panay
1. Crop (Irrigated Palay)	16,330.3
2. Crop (Rainfed Palay)	13,721.7
3. Crop (Vegetable)	2,193.0
4. Crop (Sugarcane)	439.3
5. Brackishwater Fishpond (Milkfish & Praw)	22,079.0
6. Livestock	2,124.3
7. Building	189,296.8
8. Infrastructure	66,253.0
9. Indirect Damage	46,865.7
Total	359,303.1

VI. Damage Rate, etc.

River Basin	Panay
1. Crop (Irrigated Palay)	-
2. Crop (Rainfed Palay)	-
3. Crop (Vegetable)	-
4. Crop (Sugarcane)	0.02
5. Brackishwater Fishpond (Milkfish & Praw)	-
6. Livestock (Rate to Crop Damage)	0.065
7. Building	0.32
8. Infrastructure Damage (Ratio to the	0.27
9. Indirect Damage (Ratio to Direct	0.15

Tab. C-2-6 Results of Existing Study Survey (3/12)

I. Study Name: The Study on Flood Control and Drainage Project in Metro Manila
 II. Price Level: 1989
 III. Standard Conversion Factor: -

IV. Property (Million Pesos, 20-year Return Period, estimated by Interpolation)

River Basin	East & West Mangahan	Malabon Navotas	Pasig Marikina
1. House/Building	20,254.2	10,947.2	6,053.9

V. Damage (Million Pesos, 20-year Return Period, estimated by Interpolation)

River Basin	East & West Mangahan	Malabon Navotas	Pasig Marikina
1. House/Building	1,798.0	507.8	1,032.0

VI. Damage Rate

River Basin	East & West Mangahan	Malabon Navotas	Pasig Marikina
1. House/Building	0.09	0.05	0.17

Tab. C-2-6 Results of Existing Study Survey (4/12)

I. Study Name: Study of Agno River Basin Flood Control
 II. Price Level: 1991
 III. Standard Conversion Factor: -

IV. Property (Million Pesos in Market Prices, 20-year Return Period, estimated by Interpolation)

River Basin	Upper Agno	Pantal-Sinocalan
1. Crops (Palay, Sugarcane, Corn, Tobacco, Root Crop, Legume, Others)	283.4	255.8
2. Brackishwater Fishpond (Milkfish)	400.1	483.2
3. Building	6,461.7	6,003.7
Total	7,145.2	6,742.7

V. Damage (Million Pesos in Market Prices, 20-year Return Period, estimated by Interpolation)

River Basin	Upper Agno	Pantal-Sinocalan
1. Crops (Palay, Sugarcane, Corn, Tobacco, Root Crop, Legume, Others)	153.0	129.5
2. Livestocks	10.8	9.0
3. Brackishwater Fishpond (Milkfish)	150.3	144.7
4. Building	621.7	407.2
5. Infrastructure	241.5	221.2
6. Indirect Damage	338.8	258.5
Total	1,516.1	1,170.1

VI. Damage Rate, etc.

River Basin	Upper Agno	Pantal-Sinocalan
1. Crops (Palay, Sugarcane, Corn, Tobacco, Root Crop, Legume, Others)	0.54	0.51
2. Livestocks (Rate to Crop Damage)	0.07	0.07
3. Brackishwater Fishpond (Milkfish)	0.38	0.30
4. Building	0.10	0.07
5. Infrastructure Damage (Ratio to the Above)	0.26	0.32
6. Indirect Damage (Ratio to Direct Damage)	0.29	0.28

Tab. C-2-6 Results of Existing Study Survey (5/12)

I. Study Name: Study on Ilog-Hilabangan River Basin Flood Control Project
 II. Price Level: 1990
 III. Standard Conversion Factor: -

IV. Property (Million Pesos, 20-year Return Period, estimated by Interpolation)

River Basin	Ilog-Hilabangan
1. Crop (Sugarcane)	161.9
2. Crop (Irrigated Palay)	15.4
3. Brackishwater Fishpond (Prawns & Milkfish)	82.6
4. Buildings	1,773.7
5. Infrastructure	183.1
Total	2,216.7

V. Damage (Million Pesos, 20-year Return Period, estimated by Interpolation)

River Basin	Ilog-Hilabangan
1. Crop (Sugarcane)	53.8
2. Crop (Irrigated Palay)	4.3
3. Brackishwater Fishpond (Prawns & Milkfish)	80.6
4. Buildings	177.5
5. Infrastructure	5.3
6. Indirect	9.1
Total	330.6

VI. Damage Rate, etc.

River Basin	Ilog-Hilabangan
1. Crop (Sugarcane)	0.33
2. Crop (Irrigated Palay)	0.28
3. Brackishwater Fishpond (Prawns & Milkfish)	0.98
4. Buildings	0.10
5. Infrastructure Damage (Ratio to the Above)	0.02
6. Indirect Damage (Ratio to Direct Damage)	0.03

Tab. C-2-6 Results of Existing Study Survey (6/12)

I. Study Name: Study on the Flood Control for Rivers in the Selected Urban Centers
 II. Price Level: 1994
 III. Standard Conversion Factor: 0.82

IV. Property (Million Pesos in Economic Terms, 20-year Return Period)

City/River Basin	Iloilo/Jaro	Iloilo/Iloilo	Ormoc City	Cebu City
1. Dwelling	2,701.2	501.5	610.5	6,944.0
2. Industrial Establishment	663.3	217.2	99.8	739.7
3. Service Establishment	664.7	269.7	220.8	2,508.4
4. Crop (Irrigated Palay)	11.0	0.5	0.2	0.3
5. Brackishwater Fishpond (Prawn)	6.5	5.8	0.0	0.0
Total	4,046.7	994.7	931.3	10,192.4

V. Damage (Million Pesos in Economic Terms, 20-year Return Period)

City/River Basin	Iloilo/Jaro	Iloilo/Iloilo	Ormoc City	Cebu City
1. Dwelling	288.4	34.1	83.1	259.3
2. Industrial Establishment	169.1	169.1	22.2	138.9
3. Service Establishment	45.4	45.4	48.5	285.7
4. Crop (Irrigated Palay)	1.2	0.1	0.0	0.0
5. Brackishwater Fishpond (Prawn)	1.6	1.6	0.0	0.0
6. Infrastructure Damage	177.0	88.0	53.9	239.2
7. Indirect Damage	68.3	34.0	20.8	92.2
Total	751.0	372.3	228.5	1,015.3

VI. Damage Rate, etc.

City/River Basin	Iloilo/Jaro	Iloilo/Iloilo	Ormoc City	Cebu City
1. Dwelling & Establishment	0.12	0.25	0.17	0.07
2. Crop (Irrigated Palay)	0.11	0.10	0.00	0.00
3. Brackishwater Fishpond (Prawn)	0.25	0.28	-	-
4. Infrastructure Damage (Ratio to the	0.35	0.35	0.35	0.35
5. Indirect Damage (Ratio to Direct	0.10	0.10	0.10	0.10

Tab. C-2-6 Results of Existing Study Survey (7/12)

I. Study Name: The Study on Flood and Mudflow Control for Sacobia-Bamban/Abacan River Draining from Mt. Pinatubo
 II. Price Level: 1995
 III. Standard Conversion Factor: 0.86

IV. Property (Million Pesos, 20-year Return Period)

River Basin	Sacobia -Bamban	Abacan
1. Buildings	624.3	880.6
2. Crops & Livestock (Palay, Upland Crops, Sugarcane,	116.2	127.6
3. Infrastructure	363.6	267.4
Total	1,104.1	1,275.6

V. Damage (Million Pesos, 20-year Return Period)

River Basin	Sacobia -Bamban	Abacan
1. Buildings	72.3	108.3
2. Crops & Livestock (Palay, Upland Crops, Sugarcane,	23.6	30.1
3. Infrastructure	19.9	25.2
4. Indirect Damage	20.0	22.9
Total	135.8	186.5

VI. Damage Rate, etc.

River Basin	Sacobia -Bamban	Abacan
1. Buildings	0.12	0.12
2. Crops & Livestock (Palay, Upland Crops, Sugarcane,	0.20	0.24
3. Infrastructure Damage (Ratio to the	0.21	0.18
4. Indirect Damage (Ratio to Direct	0.17	0.14

Tab. C-2-6 Results of Existing Study Survey (8/12)

I. Study Name: The Study on Sabo and Flood Control in the Laoag River Basin
 II. Price Level: 1996
 III. Standard Conversion Factor: 0.82

IV. Property (Million Pesos in Market Prices, 20-year Return Period, estimated by Interpolation)

River Basin	Laoag
1. Living Quarters	1,035.7
2. Industrial Establishment	72.9
3. Crop (Irrigated Palay)	221.8
4. Crop (Rainfed Palay)	2.7
5. Infrastructure	854.3
Total	2,187.4

V. Damage (Million Pesos in Market Prices, 20-year Return Period, estimated by Interpolation)

River Basin	Laoag
1. Living Quarters	257.5
2. Industrial Establishment	31.9
3. Crop (Irrigated Palay)	112.6
4. Crop (Rainfed Palay)	2.1
5. Infrastructure	208.0
6. Indirect Damage	61.2
Total	673.3

VI. Damage Rate, etc.

River Basin	Laoag
1. Living Quarters & Establishment	0.30
3. Crop (Irrigated Palay)	0.51
3. Crop (Rainfed Palay)	0.78
4. Infrastructure Damage (Ratio to the	0.51
5. Indirect Damage (Ratio to Direct	0.10

Tab. C-2-6 Results of Existing Study Survey (9/12)

I. Study Name: Detailed Engineering Design of Iloilo Flood Control Project Phase I
 II. Price Level: 1998
 III. Standard Conversion Factor: 0.82

IV. Property (Million Pesos in Economic Terms, 20-year Return Period)

River Basin	Jaro	Iloilo
1. Dwelling	7,916.4	4,401.7
2. Industrial Establishment	1,453.5	762.4
3. Service Establishment	1,490.7	1,170.9
4. Crop (Irrigated Palay)	19.3	1.4
5. Brackishwater Fishpond (Milkfish)	10.9	11.7
Total	10,890.8	6,348.1

V. Damage (Million Pesos in Economic Terms, 20-year Return Period)

River Basin	Jaro	Iloilo
1. Dwelling	411.6	269.9
2. Industrial Establishment	227.8	120.8
3. Service Establishment	214.8	212.0
4. Crop (Irrigated Palay)	4.1	0.4
5. Brackishwater Fishpond (Milkfish)	5.0	5.7
6. Infrastructure Damage	302.2	213.1
7. Indirect Damage	116.6	82.2
Total	1282.0	904.1

VI. Damage Rate, etc.

River Basin	Jaro	Iloilo
1. Dwelling & Establishment	0.08	0.10
4. Crop (Irrigated Palay)	0.21	0.29
5. Brackishwater Fishpond (Milkfish)	0.46	0.49
4. Infrastructure Damage (Ratio to the	0.35	0.35
5. Indirect Damage (Ratio to Direct	0.10	0.10

Tab. C-2-6 Results of Existing Study Survey (10/12)

I. Study Name: The Feasibility Study of the Flood Control Project for the Lower Cagayan River

II. Price Level: 2001

III. Standard Conversion Factor: 0.85

IV. Property (Million Pesos in Economic Terms, 20-year Return Period, estimated by Interpolation)

River Basin	Lower Cagayan
1. Facilities	1,920.6
2. Crop (Irrigated Palay)	78.9
3. Crop (Rainfed Palay)	15.5
Total	2,015.0

V. Damage (Million Pesos in Economic Terms, 20-year Return Period, estimated by Interpolation)

River Basin	Lower Cagayan
1. Facilities	903.5
2. Crop (Irrigated Palay)	40.8
3. Crop (Rainfed Palay)	7.8
4. Infrastructure	190.3
5. Indirect Damage	204.8
Total	1,347.2

VI. Damage Rate, etc.

River Basin	Lower Cagayan
1. Facilities	0.47
2. Crop (Irrigated Palay)	0.52
3. Crop (Rainfed Palay)	0.50
4. Infrastructure Damage (Ratio to the Above)	0.20
5. Indirect Damage (Ratio to Direct Damage)	0.18

Tab. C-2-6 Results of Existing Study Survey (11/12)

I. Study Name: Detailed Engineering Design of Pasig-Marikina River Channel Improvement Project

II. Price Level: 2002

III. Standard Conversion Factor: 0.84

IV. Property (Million Pesos in Economic Terms, 20-year Return Period)

River Basin	Pasig Marikina
1. Facilities	94,394.8
2. Crop (Irrigated Palay & Eggplan)	1.0
3. Crop (Rainfed Palay & Corn)	0.1
Total	94,395.9

V. Damage (Million Pesos in Economic Terms, 20-year Return Period)

River Basin	Pasig Marikina
1. Facilities	22,596.0
2. Crop (Irrigated Palay & Eggplan)	1.0
3. Crop (Rainfed Palay & Corn)	0.0
4. Infrastructure	7,909.0
5. Indirect Damage	6,197.0
Total	36,703.0

VI. Damage Rate, etc.

River Basin	Pasig Marikina
1. Facilities	0.24
2. Crop (Irrigated Palay & Eggplan)	1.00
3. Infrastructure Damage (Ratio to the Above)	0.35
4. Indirect Damage (Ratio to Direct Damage)	0.20

Tab. C-2-6 Results of Existing Study Survey (12/12)

I. Study Name: The Study on Sabo and Flood Control for Western River Basins of Mount Pinatubo

II. Price Level: 2002

III. Standard Conversion Factor: 0.85

IV. Property (Million Pesos in Market Prices, 20-year Return Period)

River Basin	Bucao	Maloma	Sto Tomas	Total
1. Buildings	634.1	50.7	2,140.2	2,825.0
2. Crop (Palay)	17.7	8.4	120.6	146.7
3. Livestock	27.9	2.2	94.1	124.2
Total	679.7	61.3	2,354.9	3,095.9

V. Damage (Million Pesos in Market Prices, 20-year Return Period)

River Basin	Bucao	Maloma	Sto Tomas	Total
1. Buildings	634.1	50.7	2,140.2	2,825.0
2. Crop (Palay)	17.7	8.4	120.6	146.7
3. Livestock	27.9	2.2	94.1	124.2
4. Infrastructure	104.7	77.2	904.4	1,086.3
5. Indirect Damage (Annual)	189.4	46.9	231.9	468.2
Total	973.8	185.4	3,491.2	4,650.4

VI. Damage Rate, etc

River Basin	Bucao	Maloma	Sto Tomas	Total
1. Buildings	1.00	1.00	1.00	1.00
2. Crop (Palay)	1.00	1.00	1.00	1.00
3. Livestock	1.00	1.00	1.00	1.00
4. Infrastructure Damage (Ratio of the Above)	0.15	1.26	0.38	0.35
5. Indirect Damage (Ratio of Direct Damage)	0.24	0.34	0.07	0.11

Tab. C-2-7 Ratio of Damageable Value to Gross Income

(Irrigated Paddy)

River Basin	Yield (t/ha)	Price (P/t)	Gross Income (P/ha)	Production Cost (P/ha)	Net Income (P/ha)	Damageable Value (P/ha)	Ratio of Damageable Value to Gross Income
Bicol	4.8	1,490	7,152	1,995	2,028	1,550	0.22
Upper Agno	4.5	3,780	17,010	8,215	8,795	9,452	0.56
Laoag	8.0	8,000	64,000	35,940	28,060	18,019	0.28
Lower Cagayan	5.6	10,300	57,680	28,090	28,560	17,536	0.30
Jaro & Iloilo	5.8	8,200	47,560	31,580	15,980	15,830	0.33
Ilog-Hilabangan	6.0	4,880	29,280	7,200	7,440	9,919	0.34
Jalaur	3.9	1,490	5,811	1,995	2,177	2,058	0.35
Upper Agusan	5.5	1,490	8,195	1,995	2,475	1,025	0.13
Lower Mindanao	3.8	1,490	5,662	1,995	2,028	1,487	0.26
Min							0.13
Max							0.56
Average							0.31
Adopt							0.30

(Rainfed Paddy)

River Basin	Yield (t/ha)	Price (P/t)	Gross Income (P/ha)	Production Cost (P/ha)	Net Income (P/ha)	Damageable Value (P/ha)	Ratio of Damageable Value to Gross Income
Bicol	2.5	1,490	3,725	1,995	538	674	0.18
Upper Agno	2.8	3,780	10,584	7,650	2,934	4,726	0.45
Laoag	2.4	8,000	19,200	14,761	4,439	13,737	0.72
Lower Cagayan	2.0	8,100	16,200	6,829	13,771	12,329	0.76
Pasig-Marikina	2.3	11,600	26,680	12,399	13,933	9,502	0.36
Jalaur	2.2	1,490	3,278	1,995	538	918	0.28
Upper Agusan	3.1	1,490	4,619	1,995	687	615	0.13
Lower Mindanao	2.2	1,490	3,278	1,995	538	691	0.21
Min							0.13
Max							0.76
Average							0.39
Adopt							0.40

(Corn)

River Basin	Yield (t/ha)	Price (P/t)	Gross Income (P/ha)	Production Cost (P/ha)	Net Income (P/ha)	Damageable Value (P/ha)	Ratio of Damageable Value to Gross Income
Bicol	1.2	1,049	1,259	587	147	155	0.12
Pasig-Marikina	2.7	9,200	24,840	9,705	14,832	2,047	0.08
Tagaloan	0.8	996	797	587	111	190	0.24
Upper Agusan	2.6	955	2,483	587	750	295	0.12
Lower Mindanao	2.6	936	2,434	587	443	455	0.19
Min							0.08
Max							0.24
Average							0.15
Adopt							0.20

(Sugarcane)

River Basin	Yield (t/ha)	Price (P/t)	Gross Income (P/ha)	Production Cost (P/ha)	Net Income (P/ha)	Damageable Value (P/ha)	Ratio of Damageable Value to Gross Income
Bicol	55.0	339	18,645	5,709	12,936	15,540	0.83
Upper Agno	60.0	235	14,100	11,400	2,700	7,093	0.50
Ilog-Hilabangan	70.0	480	33,600	20,000	13,600	28,571	0.85
Panay	52.0	205	10,660	7,750	2,910	7,278	0.68
Jalaur	50.8	339	17,221	5,709	11,512	14,372	0.83
Min							0.50
Max							0.85
Average							0.74
Adopt							0.70

(Fishpond-Milkfish)

River Basin	Yield (t/ha)	Price (P/t)	Gross Income (P/ha)	Production Cost (P/ha)	Net Income (P/ha)	Damageable Value (P/ha)	Ratio of Damageable Value to Gross Income
Ilog-Hilabangan	1.50	30,000	45,000	30,000	15,000	11,765	0.26
Jaro & Iloilo	3.0	45,000	135,000	90,000	45,000	32,550	0.24
Min							0.24
Max							0.26
Average							0.25
Adopt							0.30

(Fishpond-Prawn)

River Basin	Yield (t/ha)	Price (P/t)	Gross Income (P/ha)	Production Cost (P/ha)	Net Income (P/ha)	Damageable Value (P/ha)	Ratio of Damageable Value to Gross Income
Panay	-	-	28,800	4,275	24,525	10,108	0.35
Ilog-Hilabangan	3.00	150,000	450,000	270,000	180,000	140,000	0.31
Min							0.31
Max							0.35
Average							0.33
Adopt							0.30

Tab. C-2-8 Summary of Damage Rate

River Basin	Crop				Fish-pond	Built-up Area	Infra-structure	Indirect Damage
	Irrigated Paddy	Rainfed Paddy	Corn	Sugarcane				
Bicol	0.58	0.54	0.79	0.05	-	0.11	0.50	0.05
East & West Mangahan	-	-	-	-	-	0.09	-	-
Malabon-Navotas	-	-	-	-	-	0.05	-	-
Upper Agno	-	-	-	-	-	0.10	0.26	0.29
Sacobia-Bamban	-	-	-	-	-	0.12	0.21	0.17
Abacan	-	-	-	-	-	0.12	0.18	0.14
Laoag	0.51	0.78	-	-	-	0.30	0.51	0.10
Lower Cagayan	0.52	0.50	-	-	-	0.47	0.20	0.18
Pasig-Marikina	-	-	-	-	-	0.24	0.35	0.20
Tagaloan	-	-	0.51	-	-	0.18	0.60	0.05
Upper Agusan	0.70	-	0.80	-	-	0.32	0.33	0.05
Lower Mindanao	0.57	0.59	0.61	-	-	0.06	0.35	0.05
Panay	-	-	-	0.02	-	0.32	0.27	0.15
Jalaur	0.49	0.54	-	0.05	-	0.41	0.42	0.05
Ilog-Hilabangan	0.28	-	-	0.33	0.98	0.10	0.02	0.03
Cebu	-	-	-	-	-	0.07	0.35	0.10
Ormoc	-	-	-	-	-	0.17	0.35	0.10
Jaro	0.21	-	-	-	0.46	0.08	0.35	0.10
Iloilo	0.29	-	-	-	0.49	0.10	0.35	0.10
Flood Area Weighted Average	0.52	0.54	0.75	0.08	0.87	0.27	0.28	0.17
Adopt	0.5	0.5	0.8	0.1	0.9	0.3	0.3	0.2
0.6 (Crop Area Weighted Average)								

Tab. C-2-9 Market Value of Built-up Area (1/2)

Region	Provinces	2006 Market Value (million Pesos)	Built-up Area (has)	Value per Hectare (million)
CAR	ABRA	2,392.0	571.81	4.2
	KALINGA-APAYAO	777.4	1,104.08	0.7
	BENGUET	12,967.4	5,088.40	2.5
	IFUGAO	533.6	1,022.64	0.5
	MTN. PROVINCE	699.2	841.52	0.8
REGION II	CAGAYAN	8,937.8	2,314.08	3.9
	ISABELA	11,817.4	3,644.28	3.2
	NVA. VISCAYA	19,067.0	1,026.08	18.6
	QUIRINO	1,495.0	502.67	3.0
REGION IV-A	BATANGAS	211,839.2	11,004.30	19.3
	CAVITE	233,164.8	10,757.01	21.7
	LAGUNA	174,731.0	6,260.04	27.9
	RIZAL	55,373.9	8,064.68	6.9
REGION IV-B	OCC. MINDORO	3,238.4	1,316.86	2.5
	OR. MINDORO	6,044.4	712.69	8.5
GEGION VI	AKLAN	6,978.2	987.51	7.1
	ANTIQUE	4,172.2	530.47	7.9
	ILOILO	17,273.0	2,170.65	8.0
	NEGROS OCCD'L	8,381.2	1,555.84	5.4
GEGION VII	NEGROS ORTL	12,029.0	1,797.09	6.7
REGION IX	ZAMB. DEL NORTE	3,482.2	711.79	4.9
	ZAMB. SIBUGAY	3,554.9	772.83	4.6
REGION X	BUKIDNON	17,346.6	3,259.20	5.3
	MISAMIS ORNTL	36,110.0	2,467.01	14.6
REGION XI	COMPOSTELA V.	8,887.2	1,234.77	7.2
	DAVAO DEL NORTE	5,115.2	471.10	10.9
	DAVAO DEL SUR	8,211.0	996.88	8.2
	DAVAO ORIENTAL	3,486.8	640.97	5.4
REGION XII	LANAO DEL SUR	1,346.4	1,211.94	1.1
	COTABATO	10,553.8	2,627.05	4.0
	SULTAN KUDARAT	4,792.7	1,169.12	4.1
	SO. COTABATO	19,921.7	2,452.66	8.1
	SARANGANI	8,552.8	647.24	13.2
Total		923,273.4	79,935.3	11.6

Tab. C-2-9 Market Value of Built-up Area (2/2)

Region	Cities	2006 Market Value (million Pesos)	Built-up Area (has)	Value per Hectare (million Pesos/ha)
NCR	CALOOCAN	53,692.1	3,134.72	17.1
	LAS PINAS	43,032.5	3,246.01	13.3
	MAKATI	445,942.4	2,867.01	155.5
	MALABON	27,452.8	1,515.21	18.1
	MANDALUYONG	73,610.6	1,265.01	58.2
	MANILA	353,494.4	4,140.32	85.4
	MARIKINA	48,065.4	2,059.56	23.3
	PARANAQUE	93,022.1	4,913.93	18.9
	PASAY	125,288.4	1,977.95	63.3
	PASIG	186,210.8	3,990.09	46.7
	QUEZON	399,897.8	11,901.49	33.6
	VALENZUELA	47,948.6	3,246.19	14.8
	TAGUIG	55,000.8	3,830.72	14.4
	NAVOTAS	18,068.8	323.27	55.9
PATEROS	2,474.8	205.82	12.0	
SAN JUAN	32,555.6	687.81	47.3	
CAR	BAGUIO	21,721.2	3,725.92	5.8
REGION II	CAUAYAN	2,056.2	385.61	5.3
	SANTIAGO	2,994.6	745.42	4.0
	TUGUEGARAO	5,796.0	2,025.36	2.9
REGION III	GAPAN	952.2	326.37	2.9
	SAN JOSE	3,979.0	408.97	9.7
	TARLAC	17,282.2	1,815.69	9.5
REGION IV-A	ANTIPOLO	21,498.1	2,258.48	9.5
	LUCENA	16,535.2	674.80	24.5
REGION IV-B	CALAPAN	1,518.0	317.95	4.8
REGION V	LEGAZPI	5,740.8	1,049.03	5.5
	NAGA	8,441.0	483.38	17.5
REGION VI	BACOLOD	18,036.6	3,898.94	4.6
	BAGO	6,049.5	188.68	32.1
	CADIZ	2,700.2	184.71	14.6
	ESCALANTE	713.0	63.19	11.3
	ILOILO	51,258.7	2,972.50	17.2
	HIMAMAYLAN	155.9	41.45	3.8
	KABANKALAN	2,346.9	142.36	16.5
	LA CARLOTA	5,234.8	158.51	33.0
	PASSI	5,566.0	75.17	74.0
	ROXAS	4,644.6	928.70	5.0
	SAGAY	3,137.2	125.18	25.1
SAN CARLOS	5,207.2	237.25	21.9	
SILAY	8,777.7	432.34	20.3	
REGION VII	BAIS	3,951.4	174.97	22.6
	BAYAWAN	702.0	133.85	5.2
	DANA O	5,326.8	367.73	14.5
	MANDAUE	22,710.2	2,203.03	10.3
	TANJAY	1,343.2	832.57	1.6
	TOLEDO	11,688.6	219.67	53.2
REGION IX	ZAMBOANGA	32,908.4	2,865.71	11.5
REGION X	CAGAYAN DE ORO	56,469.6	4,265.96	13.2
	GINGOOG	1,610.0	325.61	4.9
	OZAMIS	4,604.6	455.84	10.1
	TANGUB	308.2	130.86	2.4
REGION XI	DAVAO	62,307.0	5,736.93	10.9
	DIGOS	1,922.8	1,438.58	1.3
	PANABO	3,951.4	1,057.13	3.7
	TAGUM	6,568.8	1,260.88	5.2
REGION XII	COTABATO	3,818.9	1,278.35	3.0
	GENERAL SANTOS	28,705.4	3,136.17	9.2
	KIDAPAWAN	6,872.9	654.89	10.5
	KORONADAL	4,955.1	891.27	5.6
	TACURONG	3,013.5	699.29	4.3
REGION XIII	SURIGAO	3,989.6	339.48	11.8
NCR*		213,794.4	5,929.8	36.1
Other Cities		490,071.2	52,134.7	9.4
Other Built-up Area		1,413,344.6	132,070.0	10.7

Note) NCR*: The following area weight was applied based on the flood areas, Caloocan (5%), Mandaluyong (3%), Manila (5%), Marikina (16%), Pasig (27%), Quezon (32%), Valenzuela (9%) and San Juan (3%).

Tab. C-2-10 Gross Income (Irrigated Paddy, Rainfed Paddy, White & Yellow Corn, Sugarcane) (1/2)

Gross Income (1: Irrigated Paddy)

Region	Average Volume of Production, 2001-2005 (tons)	Irrigation Service Area, 2001 (has)	Average Yield (tons/ha)	Farmgate Price, 2006 (Pesos/kg)	Total Production ('000 Pesos)	Gross Income ('000 Pesos/ha)
Car	295,246	73,215	4.0	10.29	3,038,081	41
R 1: Ilocos	909,914	174,963	5.2	11.43	10,400,317	59
R 2: Cagayan Valley	1,645,664	198,524	8.3	10.70	17,608,605	89
R 3: Central Luzon	2,057,113	253,663	8.1	11.47	23,595,086	93
R 4: Calabarzon & Mimaropa	783,969	130,748	6.0	10.09	7,913,882	61
R 5: Bicol	588,236	117,699	5.0	9.11	5,358,830	46
R 6: Western Visayas	1,028,993	75,507	13.6	9.79	10,073,841	133
R 7: Central Visayas	142,239	25,875	5.5	11.36	1,615,835	62
R 8: Eastern Visayas	413,927	48,585	8.5	9.89	4,093,738	84
R 9: Zamboanga Peninsula	338,063	35,271	9.6	10.86	3,671,364	104
R 10: Northern Mindanao	455,890	39,845	11.4	10.92	4,978,319	125
R 11: Davao	406,174	83,822	4.8	9.90	4,021,123	48
R 12: Soccsksargen	917,519	55,813	16.4	10.69	9,808,278	176
R 13: Caraga	254,940	38,436	6.6	10.07	2,567,246	67
Armm	195,168	21,661	9.0	10.42	2,033,651	94
Philippines	10,433,055	1,373,627	7.6		110,778,196	81
Luzon	6,280,142	948,812	6.6		67,914,801	72
Visayas	1,585,159	149,967	10.6		15,783,414	105
Mindanao	2,567,754	274,848	9.3		27,079,981	99

Gross Income (2: Rainfed Paddy)

Region	Average Volume of Production, 2001-2005 (tons)	Average Area Harvested, 2001-2005 (has)	Average Yield (tons/ha)	Farmgate Price, 2006 (Pesos/kg)	Total Production ('000 Pesos)	Gross Income ('000 Pesos/ha)
Car	30,701	12,936	2.4	10.29	315,913	24
R 1: Ilocos	380,955	119,332	3.2	11.43	4,354,316	36
R 2: Cagayan Valley	139,419	62,557	2.2	10.70	1,491,783	24
R 3: Central Luzon	307,281	87,117	3.5	11.47	3,524,513	40
R 4A: Calabarzon	73,691	37,937	1.9	10.28	757,543	20
R 4B: Mimaropa	320,998	113,735	2.8	9.97	3,200,350	28
R 5: Bicol	239,819	111,075	2.2	9.11	2,184,751	20
R 6: Western Visayas	736,278	287,387	2.6	9.79	7,208,162	25
R 7: Central Visayas	72,748	43,123	1.7	11.36	826,417	19
R 8: Eastern Visayas	260,716	125,368	2.1	9.89	2,578,481	21
R 9: Zamboanga Peninsula	175,888	63,256	2.8	10.86	1,910,144	30
R 10: Northern Mindanao	39,918	14,536	2.7	10.92	435,905	30
R 11: Davao	44,325	17,842	2.5	9.90	438,818	25
R 12: Soccsksargen	149,763	58,566	2.6	10.69	1,600,966	27
R 13: Caraga	94,206	37,656	2.5	10.07	948,654	25
Armm	265,278	123,499	2.1	10.42	2,764,197	22
Philippines	3,331,984	1,315,922	2.5		34,540,913	26
Luzon	1,492,864	544,689	2.7		15,829,169	29
Visayas	1,069,742	455,878	2.3		10,613,060	23
Mindanao	769,378	315,355	2.4		8,098,684	26

Tab. C-2-10 Gross Income (Irrigated Paddy, Rainfed Paddy, White & Yellow Corn, Sugarcane) (2/2)

Gross Income (3: White & Yellow Corn)

Region	Average Volume of Production, 2001-2005 (tons)	Average Area Harvested, 2001-2005 (has)	Average Yield (tons/ha)	Farmgate Price, 2006 (Pesos/kg)	Total Production ('000 Pesos)	Gross Income ('000 Pesos/ha)
Car	101,614	34,839	2.9	-	916,852	26
R 1: Ilocos	217,089	56,380	3.9	-	2,412,683	43
R 2: Cagayan Valley	906,308	277,736	3.3	-	8,452,525	30
R 3: Central Luzon	141,959	36,765	3.9	-	1,424,120	39
R 4A: Calabarzon	48,703	36,413	1.3	-	453,942	12
R 4B: Mimaropa	68,369	31,362	2.2	-	585,321	19
R 5: Bicol	80,513	83,205	1.0	-	648,534	8
R 6: Western Visayas	124,655	86,013	1.4	-	1,149,998	13
R 7: Central Visayas	177,110	243,138	0.7	-	1,748,813	7
R 8: Eastern Visayas	55,467	57,504	1.0	-	494,233	9
R 9: Zamboanga Peninsula	173,701	176,556	1.0	-	1,617,654	9
R 10: Northern Mindanao	836,608	373,913	2.2	-	7,217,009	19
R 11: Davao	217,178	193,282	1.1	-	2,051,822	11
R 12: Soccsksargen	931,764	423,243	2.2	-	8,829,209	21
R 13: Caraga	80,838	52,360	1.5	-	716,219	14
Armm	663,413	289,451	2.3	-	5,542,416	19
Philippines	4,825,289	2,452,160	2.0	-	44,261,350	18
Luzon	1,564,555	556,700	2.8	-	14,893,977	27
Visayas	357,232	386,655	0.9	-	3,393,044	9
Mindanao	2,903,502	1,508,805	1.9	-	25,974,329	17

Gross Income (4: Sugarcane)

Region	Average Volume of Production, 2001-2005 (tons)	Average Area Harvested, 2001-2005 (has)	Average Yield (tons/ha)	Raw Sugar Production (tons)	Farmgate Price, Sugar (Centrifugal), 2006 (Pesos/kg)	Total Production ('000 Pesos)	Gross Income ('000 Pesos/ha)
Car	2,245	45	49.9	202.9	22.08	4,480	100
R 1: Ilocos	15,006	377	39.8	1,356.5	22.08	29,952	79
R 2: Cagayan Valley	222,021	5,138	43.2	20,070.7	22.08	443,161	86
R 3: Central Luzon	1,397,058	24,801	56.3	126,294.0	23.59	2,979,275	120
R 4A: Calabarzon	1,853,391	29,912	62.0	167,546.5	22.74	3,810,007	127
R 4B: Mimaropa						0	
R 5: Bicol	285,439	6,257	45.6	25,803.7	22.08	569,746	91
R 6: Western Visayas	12,482,514	185,797	67.2	1,128,419.3	23.72	26,766,106	144
R 7: Central Visayas	2,174,165	39,996	54.4	196,544.5	23.08	4,536,247	113
R 8: Eastern Visayas	525,042	9,783	53.7	47,463.8	21.49	1,019,997	104
R 9: Zamboanga Peninsula	652	158	4.1	58.9	22.08	1,301	8
R 10: Northern Mindanao	2,806,619	47,439	59.2	253,718.4	22.92	5,815,226	123
R 11: Davao	504,972	10,900	46.3	45,649.5	22.95	1,047,656	96
R 12: Soccsksargen	808,243	13,640	59.3	73,065.2	20.69	1,511,719	111
R 13: Caraga	35	3	11.7	3.2	22.08	71	24
Armm	42,851	761	56.3	3,873.7	22.08	85,531	112
Philippines	23,120,253	375,007	61.7	2,090,070.8		48,620,475	130
Luzon	3,775,160	66,530	56.7	341,274.3		7,836,621	118
Visayas	15,181,721	235,576	64.4	1,372,427.6		32,322,350	137
Mindanao	4,163,372	72,901	57.1	376,368.9		8,461,504	116

Tab. C-2-11 Damageable Value of Crop

Ratio of Damageable Value to Gross Income

Irrigated Paddy: 0.3
 Rainfed Paddy: 0.4
 Corn: 0.2
 Sugarcane: 0.7

Region	Irrigated Paddy		Rainfed Paddy		Corn		Sugarcane		Average		
	Area (has)	Damageable Value ('000 Pesos)	Area (has)	Damageable Value ('000 Pesos)	Area (has)	Damageable Value ('000 Pesos)	Area (has)	Damageable Value ('000 Pesos)	Total Area (has)	Total Damageable Value ('000 Pesos)	Average Damageable Value ('000 Pesos/ha)
Car	73,215	911,424	12,936	126,365	34,839	183,370	45	3,136	121,035	1,224,295	10
R 1: Ilocos	174,963	3,120,095	119,332	1,741,726	56,380	482,537	377	20,966	351,052	5,365,324	15
R 2: Cagayan Valley	198,524	5,282,582	62,557	596,713	277,736	1,690,505	5,138	310,213	543,955	7,880,013	14
R 3: Central Luzon	253,663	7,078,526	87,117	1,409,805	36,765	284,824	24,801	2,085,493	402,346	10,858,648	27
R 4: Calabarzon & Mimar	130,748	2,374,165	151,672	1,583,157	67,775	207,853	29,912	2,667,005	380,107	6,832,180	18
R 5: Bicol	117,699	1,607,649	111,075	873,900	83,205	129,707	6,257	398,822	318,236	3,010,078	9
R 6: Western Visayas	75,507	3,022,152	287,387	2,883,265	86,013	230,000	185,797	18,736,274	634,704	24,871,691	39
R 7: Central Visayas	25,875	484,751	43,123	330,567	243,138	349,763	39,996	3,175,373	352,132	4,340,454	12
R 8: Eastern Visayas	48,585	1,228,121	125,368	1,031,392	57,504	98,847	9,783	713,998	241,240	3,072,358	13
R 9: Zamboanga Peninsula	35,271	1,101,409	63,256	764,058	176,556	323,531	158	911	275,241	2,189,909	8
R 10: Northern Mindanao	39,845	1,493,496	14,536	174,362	373,913	1,443,402	47,439	4,070,658	475,733	7,181,918	15
R 11: Davao	83,822	1,206,337	17,842	175,527	193,282	410,364	10,900	733,359	305,846	2,525,587	8
R 12: Soccsksargen	55,813	2,942,483	58,566	640,386	423,243	1,765,842	13,640	1,058,203	551,262	6,406,914	12
R 13: Caraga	38,436	770,174	37,656	379,462	52,360	143,244	3	50	128,455	1,292,930	10
Armm	21,661	610,095	123,499	1,105,679	289,451	1,108,483	761	59,872	435,372	2,884,129	7
Philippines	1,373,627	33,233,459	1,315,922	13,816,364	2,452,160	8,852,272	375,007	34,034,333	5,516,716	89,936,428	16.3
Luzon	948,812	20,374,441	544,689	6,331,666	556,700	2,978,796	66,530	5,485,635	2,116,731	35,170,538	16.6
Visayas	149,967	4,735,024	455,878	4,245,224	386,655	678,610	235,576	22,625,645	1,228,076	32,284,503	26.3
Mindanao	274,848	8,123,994	315,355	3,239,474	1,508,805	5,194,866	72,901	5,923,053	2,171,909	22,481,387	10.4

Tab. C-2-12 Gross Income of Fishpond

Species	Estimated Area (has)	Total Harvest Area (has)	Yield of Brackishwater Fishpond (tonnes/harvest/ha)	Times of Harvest (times/year)	Value of Production, 2006 ('000 pesos/tonnes)	Gross Income ('000 Pesos/ha)
Milkfish	188,000	281,727	0.71	1.5	63.8	68
Shrimp/Prawn	34,000	77,172	0.46	2.3	382.8	400

Tab. C-2-13 Damageable Value of Fishpond

Ratio of Damageable Value to Gross Income

Species: Milkfish: 0.3
 Species: Prawn: 0.3

Brackishwater Fishpond	Milkfish			Prawn			Average		
	Fishpond Area (has)	Unit Damageable Value (000 Pesos/ha)	Damageable Value (000 Pesos)	Fishpond Area (has)	Unit Damageable Value (000 Pesos/ha)	Damageable Value (000 Pesos)	Total Area (has)	Total Damageable Value (000)	Average Damageable Value (000)
	188,000	20	3,760,000	34,000	120	4,080,000	222,000	7,840,000	35.3

Tab. C-2-14 Ratio of Annual Benefit to Flood Damage

River Basin Name	Flood Damage for 20-Year Return Period (a)	Annual Benefit (Million Pesos) (b)	Ratio (b)/(a)
East and West of Mangahan	1,194.2	381.6	0.320
Ormoc (urgent plan)	228.5	101.0	0.442
Iloilo (urgent plan)	1,124.6	528.0	0.470
Banban/Abacan	419.0	87.1	0.208
Laoag	210.0	24.6	0.117
Cura	159.2	79.2	0.497
Solsona	98.2	51.5	0.524
Madongan	113.0	55.4	0.490
Papa	42.7	23.3	0.546
Upper Bongo	1,451.4	373.2	0.257
Pantal-Sinocalan	1,132.4	439.6	0.388
Ilog-Hilabangan	409.8	104.3	0.255
Paranaque/Dongalo/South			
Paranaque/Las Pinas/Zapote	5,271.5	2,201.5	0.418
Average			0.38

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (1/11)

Item	Selected River Basins					
	1. Abra	2. Amburayan	3. Dagupan	4. Patalan	5. Aringay	6. Bararo
I. Inundated Property						
1. Built-up Area (ha)	0.0	5.6	183.1	353.1	6.8	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	5.6	183.1	353.1	6.8	0.0
2. Agricultural Area (ha)	919.8	303.4	6,918.1	2,363.4	652.0	427.7
a. Annual Crop	919.8	303.4	5,619.7	2,292.5	569.5	427.7
b. Fishpond	0.0	0.0	1,298.4	70.9	82.5	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	0.0	155.9	5,125.8	9,886.6	190.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	155.9	5,125.8	9,886.6	190.0	0.0
2. Agricultural Area	38.6	12.7	355.5	102.8	31.5	18.0
a. Annual Crop	38.6	12.7	236.0	96.3	23.9	18.0
b. Fishpond	0.0	0.0	119.5	6.5	7.6	0.0
3. Total	38.6	168.6	5,481.3	9,989.4	221.5	18.0
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	30.2	70.7	2,322.8	3,938.6	101.7	14.0
(1) Built-up Area	0.0	46.8	1,537.7	2,966.0	57.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	46.8	1,537.7	2,966.0	57.0	0.0
(2) Agricultural Area	23.2	7.6	249.1	63.7	21.2	10.8
a. Annual Crop	23.2	7.6	141.6	57.8	14.4	10.8
b. Fishpond	0.0	0.0	107.5	5.9	6.8	0.0
(3) Infrastructure	7.0	16.3	536.0	908.9	23.5	3.2
2. Indirect Damage	6.0	14.1	464.6	787.7	20.3	2.8
3. Total Damage	36.2	84.8	2,787.4	4,726.3	122.0	16.8
4. Area Adjusted	50.7	118.7	3,902.4	6,616.8	170.8	23.5
IV. Annual Average Damage	19.3	45.1	1,482.9	2,514.4	64.9	8.9
V. Time Adjusted Damage (Benefit Index)	65.6	153.3	5,041.9	8,549.0	220.7	30.3

Item	Selected River Basins					
	7. Bacarra-V.	8. Balincuguin	9. Silag-Sta M.	10. Buaya	11. Alaminos	12. Cagayan
I. Inundated Property						
1. Built-up Area (ha)	16.4	3.1	2.5	2.7	26.8	2,234.5
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	16.4	3.1	2.5	2.7	26.8	2,234.5
2. Agricultural Area (ha)	619.9	1,405.8	675.8	354.1	1,184.6	44,231.9
a. Annual Crop	619.9	1,405.8	675.8	354.1	1,123.6	44,231.9
b. Fishpond	0.0	0.0	0.0	0.0	61.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	458.7	86.1	70.8	76.2	751.6	62,565.4
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	458.7	86.1	70.8	76.2	751.6	62,565.4
2. Agricultural Area	26.0	59.0	28.4	14.9	52.8	1,857.7
a. Annual Crop	26.0	59.0	28.4	14.9	47.2	1,857.7
b. Fishpond	0.0	0.0	0.0	0.0	5.6	0.0
3. Total	484.7	145.1	99.2	91.1	804.4	64,423.1
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	199.2	79.6	49.7	41.3	336.6	25,849.5
(1) Built-up Area	137.6	25.8	21.2	22.9	225.5	18,769.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	137.6	25.8	21.2	22.9	225.5	18,769.6
(2) Agricultural Area	15.6	35.4	17.0	8.9	33.4	1,114.6
a. Annual Crop	15.6	35.4	17.0	8.9	28.3	1,114.6
b. Fishpond	0.0	0.0	0.0	0.0	5.1	0.0
(3) Infrastructure	46.0	18.4	11.5	9.5	77.7	5,965.3
2. Indirect Damage	39.8	15.9	9.9	8.3	67.3	5,169.9
3. Total Damage	239.0	95.5	59.6	49.6	403.9	31,019.4
4. Area Adjusted	334.6	133.7	83.4	69.4	565.5	43,427.2
IV. Annual Average Damage	127.1	50.8	31.7	26.4	214.9	16,502.3
V. Time Adjusted Damage (Benefit Index)	432.1	172.7	107.8	89.8	730.7	56,107.8

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (2/11)

Item	Selected River Basins					
	13. Pamplona	14. Palanan-P.	15. LAL-Lo2	16. Cabcungan	17. Baua	18. Guagua
I. Inundated Property						
1. Built-up Area (ha)	2.2	0.0	0.0	9.2	5.0	700.5
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	2.2	0.0	0.0	9.2	5.0	700.5
2. Agricultural Area (ha)	464.7	1,828.5	483.8	667.2	150.7	5,839.4
a. Annual Crop	464.7	1,828.5	483.8	667.2	150.7	3,372.4
b. Fishpond	0.0	0.0	0.0	0.0	0.0	2,467.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	62.0	0.0	0.0	256.6	140.1	19,614.7
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	62.0	0.0	0.0	256.6	140.1	19,614.7
2. Agricultural Area	19.5	76.8	20.3	28.0	6.3	368.6
a. Annual Crop	19.5	76.8	20.3	28.0	6.3	141.6
b. Fishpond	0.0	0.0	0.0	0.0	0.0	227.0
3. Total	81.5	76.8	20.3	284.6	146.4	19,983.3
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	39.4	59.9	15.9	121.9	59.5	8,025.8
(1) Built-up Area	18.6	0.0	0.0	77.0	42.0	5,884.4
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	18.6	0.0	0.0	77.0	42.0	5,884.4
(2) Agricultural Area	11.7	46.1	12.2	16.8	3.8	289.3
a. Annual Crop	11.7	46.1	12.2	16.8	3.8	85.0
b. Fishpond	0.0	0.0	0.0	0.0	0.0	204.3
(3) Infrastructure	9.1	13.8	3.7	28.1	13.7	1,852.1
2. Indirect Damage	7.9	12.0	3.2	24.4	11.9	1,605.2
3. Total Damage	47.3	71.9	19.1	146.3	71.4	9,631.0
4. Area Adjusted	66.2	100.7	26.7	204.8	100.0	13,483.4
IV. Annual Average Damage	25.2	38.3	10.1	77.8	38.0	5,123.7
V. Time Adjusted Damage (Benefit Index)	85.7	130.2	34.3	264.5	129.2	17,420.6

Item	Selected River Basins					
	19. Olongapo	20. Santo_Tomas	21. Bucao	22. Angat	23. Aguang	24. Nayum
I. Inundated Property						
1. Built-up Area (ha)	53.4	10.1	0.3	74.9	58.7	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	53.4	10.1	0.3	74.9	58.7	0.0
2. Agricultural Area (ha)	0.0	251.6	354.4	667.3	352.2	504.6
a. Annual Crop	0.0	251.6	354.4	605.7	352.2	504.6
b. Fishpond	0.0	0.0	0.0	61.6	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	1,495.4	282.3	9.3	2,098.3	1,644.2	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	1,495.4	282.3	9.3	2,098.3	1,644.2	0.0
2. Agricultural Area	0.0	10.6	14.9	31.1	14.8	21.2
a. Annual Crop	0.0	10.6	14.9	25.4	14.8	21.2
b. Fishpond	0.0	0.0	0.0	5.7	0.0	0.0
3. Total	1,495.4	292.9	24.2	2,129.4	1,659.0	21.2
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	583.2	118.3	15.2	844.9	652.7	16.5
(1) Built-up Area	448.6	84.7	2.8	629.5	493.2	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	448.6	84.7	2.8	629.5	493.2	0.0
(2) Agricultural Area	0.0	6.3	8.9	20.4	8.9	12.7
a. Annual Crop	0.0	6.3	8.9	15.3	8.9	12.7
b. Fishpond	0.0	0.0	0.0	5.1	0.0	0.0
(3) Infrastructure	134.6	27.3	3.5	195.0	150.6	3.8
2. Indirect Damage	116.6	23.7	3.0	169.0	130.5	3.3
3. Total Damage	699.8	142.0	18.2	1,013.9	783.2	19.8
4. Area Adjusted	979.7	198.8	25.5	1,419.5	1,096.5	27.7
IV. Annual Average Damage	372.3	75.5	9.7	539.4	416.7	10.5
V. Time Adjusted Damage (Benefit Index)	1,265.8	256.7	33.0	1,834.0	1,416.8	35.7

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (3/11)

Item	Selected River Basins					
	25. Agos	26. Imus	27. Kapumpong	28. Iyam	29. Tayabas	30. Umiray
I. Inundated Property						
1. Built-up Area (ha)	24.3	279.7	19.9	18.0	0.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	24.3	279.7	19.9	18.0	0.0	0.0
2. Agricultural Area (ha)	254.6	564.1	146.0	193.1	201.1	56.5
a. Annual Crop	254.6	526.0	146.0	124.9	201.1	56.5
b. Fishpond	0.0	38.1	0.0	68.3	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	680.4	7,830.8	556.9	503.1	0.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	680.4	7,830.8	556.9	503.1	0.0	0.0
2. Agricultural Area	10.7	25.6	6.1	11.5	8.4	2.4
a. Annual Crop	10.7	22.1	6.1	5.2	8.4	2.4
b. Fishpond	0.0	3.5	0.0	6.3	0.0	0.0
3. Total	691.1	7,856.4	563.0	514.6	8.4	2.4
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	273.7	3,075.4	222.0	207.6	6.6	1.8
(1) Built-up Area	204.1	2,349.2	167.1	150.9	0.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	204.1	2,349.2	167.1	150.9	0.0	0.0
(2) Agricultural Area	6.4	16.5	3.7	8.8	5.1	1.4
a. Annual Crop	6.4	13.3	3.7	3.1	5.1	1.4
b. Fishpond	0.0	3.2	0.0	5.7	0.0	0.0
(3) Infrastructure	63.2	709.7	51.2	47.9	1.5	0.4
2. Indirect Damage	54.7	615.1	44.4	41.5	1.3	0.4
3. Total Damage	328.4	3,690.5	266.4	249.1	7.9	2.2
4. Area Adjusted	459.8	5,166.7	373.0	348.7	11.1	3.1
IV. Annual Average Damage	174.7	1,963.3	141.7	132.5	4.2	1.2
V. Time Adjusted Damage (Benefit Index)	594.0	6,675.2	481.8	450.5	14.3	4.1

Item	Selected River Basins					
	31. Kaliwa	32. Tignoan	33. Real2	34. Real1	35. General N.2-b	36.General N.2-a
I. Inundated Property						
1. Built-up Area (ha)	1.3	0.0	0.0	3.2	0.0	0.9
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	1.3	0.0	0.0	3.2	0.0	0.9
2. Agricultural Area (ha)	0.0	0.0	0.7	0.0	26.7	0.0
a. Annual Crop	0.0	0.0	0.7	0.0	26.7	0.0
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	35.3	0.0	0.0	88.2	0.0	24.7
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	35.3	0.0	0.0	88.2	0.0	24.7
2. Agricultural Area	0.0	0.0	0.0	0.0	1.1	0.0
a. Annual Crop	0.0	0.0	0.0	0.0	1.1	0.0
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
3. Total	35.3	0.0	0.0	88.2	1.1	24.7
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	13.8	0.0	0.0	34.5	0.9	9.6
(1) Built-up Area	10.6	0.0	0.0	26.5	0.0	7.4
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	10.6	0.0	0.0	26.5	0.0	7.4
(2) Agricultural Area	0.0	0.0	0.0	0.0	0.7	0.0
a. Annual Crop	0.0	0.0	0.0	0.0	0.7	0.0
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
(3) Infrastructure	3.2	0.0	0.0	8.0	0.2	2.2
2. Indirect Damage	2.8	0.0	0.0	6.9	0.2	1.9
3. Total Damage	16.6	0.0	0.0	41.4	1.1	11.5
4. Area Adjusted	23.2	0.0	0.0	58.0	1.5	16.1
IV. Annual Average Damage	8.8	0.0	0.0	22.0	0.6	6.1
V. Time Adjusted Damage (Benefit Index)	29.9	0.0	0.0	74.8	2.0	20.7

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (4/11)

Item	Selected River Basins					
	37. Bicol	38. Legaspi City	39. Donsol	40. Labo	41. Daet-Basud	42. Guinala
I. Inundated Property						
1. Built-up Area (ha)	463.5	129.3	7.5	8.5	41.6	0.9
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	463.5	129.3	7.5	8.5	41.6	0.9
2. Agricultural Area (ha)	25,569.4	176.4	0.0	1,339.2	1,228.0	514.6
a. Annual Crop	25,569.4	176.4	0.0	1,339.2	1,002.7	514.6
b. Fishpond	0.0	0.0	0.0	0.0	225.4	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	12,977.1	3,619.6	209.5	239.0	1,164.8	25.1
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	12,977.1	3,619.6	209.5	239.0	1,164.8	25.1
2. Agricultural Area	1,073.9	7.4	0.0	56.2	62.8	21.6
a. Annual Crop	1,073.9	7.4	0.0	56.2	42.1	21.6
b. Fishpond	0.0	0.0	0.0	0.0	20.7	0.0
3. Total	14,051.0	3,627.0	209.5	295.2	1,227.6	46.7
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	5,898.6	1,417.4	81.6	137.0	511.4	26.7
(1) Built-up Area	3,893.1	1,085.9	62.8	71.7	349.4	7.5
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	3,893.1	1,085.9	62.8	71.7	349.4	7.5
(2) Agricultural Area	644.3	4.4	0.0	33.7	44.0	13.0
a. Annual Crop	644.3	4.4	0.0	33.7	25.3	13.0
b. Fishpond	0.0	0.0	0.0	0.0	18.7	0.0
(3) Infrastructure	1,361.2	327.1	18.8	31.6	118.0	6.2
2. Indirect Damage	1,179.7	283.5	16.3	27.4	102.3	5.3
3. Total Damage	7,078.3	1,700.9	97.9	164.4	613.7	32.0
4. Area Adjusted	9,909.6	2,381.3	137.1	230.2	859.2	44.8
IV. Annual Average Damage	3,765.6	904.9	52.1	87.5	326.5	17.0
V. Time Adjusted Damage (Benefit Index)	12,803.0	3,076.7	177.1	297.5	1,110.1	57.8

Item	Selected River Basins					
	43. Ragay	44. Ilog-Hilabangan	45. Jalaud	46. Panay	47. Bago	48. Aklan
I. Inundated Property						
1. Built-up Area (ha)	4.7	89.1	143.9	274.0	17.6	51.1
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	4.7	89.1	143.9	274.0	17.6	51.1
2. Agricultural Area (ha)	93.7	2,371.1	3,594.9	7,612.2	983.0	0.0
a. Annual Crop	0.0	2,340.6	3,187.6	6,798.0	933.9	0.0
b. Fishpond	93.7	30.5	407.3	814.1	49.1	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	131.0	2,495.1	4,029.2	7,671.3	491.6	1,430.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	131.0	2,495.1	4,029.2	7,671.3	491.6	1,430.0
2. Agricultural Area	8.6	101.1	171.4	360.4	43.7	0.0
a. Annual Crop	0.0	98.3	133.9	285.5	39.2	0.0
b. Fishpond	8.6	2.8	37.5	74.9	4.5	0.0
3. Total	139.6	2,596.2	4,200.6	8,031.7	535.3	1,430.0
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	61.2	1,053.0	1,719.6	3,302.1	227.6	557.7
(1) Built-up Area	39.3	748.5	1,208.8	2,301.4	147.5	429.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	39.3	748.5	1,208.8	2,301.4	147.5	429.0
(2) Agricultural Area	7.8	61.5	114.0	238.7	27.6	0.0
a. Annual Crop	0.0	59.0	80.3	171.3	23.5	0.0
b. Fishpond	7.8	2.5	33.7	67.4	4.1	0.0
(3) Infrastructure	14.1	243.0	396.8	762.0	52.5	128.7
2. Indirect Damage	12.2	210.6	343.9	660.4	45.5	111.5
3. Total Damage	73.4	1,263.6	2,063.5	3,962.5	273.1	669.2
4. Area Adjusted	102.8	1,769.0	2,888.9	5,547.5	382.3	936.9
IV. Annual Average Damage	39.1	672.2	1,097.8	2,108.1	145.3	356.0
V. Time Adjusted Damage (Benefit Index)	132.9	2,285.5	3,732.5	7,167.5	494.0	1,210.4

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (5/11)

Item	Selected River Basins					
	49. Bacolod	50. Himocaan	51. Cebu City	52. Balamban	53. Sapang Dako	54. Sipocong
I. Inundated Property						
1. Built-up Area (ha)	80.4	14.3	178.2	8.2	0.0	3.4
a. NCR & HUCs	0.0	0.0	178.2	0.0	0.0	0.0
b. Others	80.4	14.3	0.0	8.2	0.0	3.4
2. Agricultural Area (ha)	63.4	442.6	17.2	142.8	37.1	293.4
a. Annual Crop	63.4	423.1	0.0	142.8	37.1	293.4
b. Fishpond	0.0	19.5	17.2	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	2,252.5	400.9	16,755.3	228.5	0.0	95.2
a. NCR & HUCs	0.0	0.0	16,755.3	0.0	0.0	0.0
b. Others	2,252.5	400.9	0.0	228.5	0.0	95.2
2. Agricultural Area	2.7	19.6	1.6	6.0	1.6	12.3
a. Annual Crop	2.7	17.8	0.0	6.0	1.6	12.3
b. Fishpond	0.0	1.8	1.6	0.0	0.0	0.0
3. Total	2,255.2	420.5	16,756.9	234.5	1.6	107.5
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	880.5	172.4	6,536.4	93.7	1.2	46.8
(1) Built-up Area	675.7	120.3	5,026.6	68.5	0.0	28.6
a. NCR & HUCs	0.0	0.0	5,026.6	0.0	0.0	0.0
b. Others	675.7	120.3	0.0	68.5	0.0	28.6
(2) Agricultural Area	1.6	12.3	1.4	3.6	0.9	7.4
a. Annual Crop	1.6	10.7	0.0	3.6	0.9	7.4
b. Fishpond	0.0	1.6	1.4	0.0	0.0	0.0
(3) Infrastructure	203.2	39.8	1,508.4	21.6	0.3	10.8
2. Indirect Damage	176.1	34.5	1,307.3	18.7	0.2	9.4
3. Total Damage	1,056.6	206.9	7,843.7	112.4	1.4	56.2
4. Area Adjusted	1,479.2	289.7	10,981.2	157.4	2.0	78.7
IV. Annual Average Damage	562.1	110.1	4,172.9	59.8	0.8	29.9
V. Time Adjusted Damage (Benefit Index)	1,911.1	374.3	14,187.9	203.3	2.7	101.7

Item	Selected River Basins					
	55. Catarman	56. Pagbanganan	57. Daguitan-M.	58. Pagsangahan	59. Tumaga	60. Jose Dalman
I. Inundated Property						
1. Built-up Area (ha)	1.1	3.9	4.4	0.0	111.8	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	1.1	3.9	4.4	0.0	111.8	0.0
2. Agricultural Area (ha)	9.3	95.0	495.4	1,495.4	274.3	10.1
a. Annual Crop	0.0	95.0	495.4	1,491.9	149.1	10.1
b. Fishpond	9.3	0.0	0.0	3.5	125.2	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	30.6	109.2	123.6	0.0	3,130.4	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	30.6	109.2	123.6	0.0	3,130.4	0.0
2. Agricultural Area	0.9	4.0	20.8	63.0	17.8	0.4
a. Annual Crop	0.0	4.0	20.8	62.7	6.3	0.4
b. Fishpond	0.9	0.0	0.0	0.3	11.5	0.0
3. Total	31.5	113.2	144.4	63.0	3,148.2	0.4
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	13.0	45.8	64.5	49.3	1,239.3	0.4
(1) Built-up Area	9.2	32.8	37.1	0.0	939.1	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	9.2	32.8	37.1	0.0	939.1	0.0
(2) Agricultural Area	0.8	2.4	12.5	37.9	14.2	0.3
a. Annual Crop	0.0	2.4	12.5	37.6	3.8	0.3
b. Fishpond	0.8	0.0	0.0	0.3	10.4	0.0
(3) Infrastructure	3.0	10.6	14.9	11.4	286.0	0.1
2. Indirect Damage	2.6	9.2	12.9	9.9	247.9	0.1
3. Total Damage	15.6	55.0	77.4	59.2	1,487.2	0.5
4. Area Adjusted	21.8	77.0	108.4	82.9	2,082.1	0.7
IV. Annual Average Damage	8.3	29.3	41.2	31.5	791.2	0.3
V. Time Adjusted Damage (Benefit Index)	28.2	99.6	140.1	107.1	2,690.1	1.0

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (6/11)

Item	Selected River Basins					
	61. Sibuguey	62. Mapangi	63. Tagaloan	64. Cagayan D.O.	65. Catarman I-S	66. Maranding
I. Inundated Property						
1. Built-up Area (ha)	19.0	34.6	57.8	35.0	7.5	8.9
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	19.0	34.6	57.8	35.0	7.5	8.9
2. Agricultural Area (ha)	4,057.5	6,396.9	148.5	16.5	0.0	1,350.4
a. Annual Crop	3,451.4	5,300.9	148.5	16.5	0.0	641.0
b. Fishpond	606.1	1,096.1	0.0	0.0	0.0	709.4
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	532.2	968.6	1,619.5	980.0	211.1	249.2
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	532.2	968.6	1,619.5	980.0	211.1	249.2
2. Agricultural Area	200.8	323.4	6.2	0.7	0.0	92.2
a. Annual Crop	145.0	222.6	6.2	0.7	0.0	26.9
b. Fishpond	55.8	100.8	0.0	0.0	0.0	65.3
3. Total	733.0	1,292.0	1,625.7	980.7	211.1	341.4
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	386.0	669.5	636.5	382.7	82.3	194.6
(1) Built-up Area	159.7	290.6	485.9	294.0	63.3	74.8
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	159.7	290.6	485.9	294.0	63.3	74.8
(2) Agricultural Area	137.2	224.4	3.7	0.4	0.0	74.9
a. Annual Crop	87.0	133.6	3.7	0.4	0.0	16.2
b. Fishpond	50.2	90.8	0.0	0.0	0.0	58.7
(3) Infrastructure	89.1	154.5	146.9	88.3	19.0	44.9
2. Indirect Damage	77.2	133.9	127.3	76.5	16.5	38.9
3. Total Damage	463.2	803.4	763.8	459.2	98.8	233.5
4. Area Adjusted	648.5	1,124.8	1,069.3	642.9	138.3	326.9
IV. Annual Average Damage	246.4	427.4	406.3	244.3	52.6	124.2
V. Time Adjusted Damage (Benefit Index)	837.8	1,453.2	1,381.4	830.6	178.8	422.3

Item	Selected River Basins					
	67. Iponon	68. Mandulog	69. Buayan-M.	70. Davao	71. Tagum-L.	72. Padada_Mainit
I. Inundated Property						
1. Built-up Area (ha)	51.3	29.6	23.1	145.2	173.4	4.7
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	51.3	29.6	23.1	145.2	173.4	4.7
2. Agricultural Area (ha)	0.0	660.0	255.6	406.8	3,071.0	211.9
a. Annual Crop	0.0	660.0	198.3	406.8	3,000.0	211.9
b. Fishpond	0.0	0.0	57.3	0.0	71.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	1,436.2	829.8	647.2	4,066.7	4,855.5	132.5
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	1,436.2	829.8	647.2	4,066.7	4,855.5	132.5
2. Agricultural Area	0.0	27.7	13.6	17.1	132.5	8.9
a. Annual Crop	0.0	27.7	8.3	17.1	126.0	8.9
b. Fishpond	0.0	0.0	5.3	0.0	6.5	0.0
3. Total	1,436.2	857.5	660.8	4,083.8	4,988.0	141.4
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	560.2	345.3	265.1	1,599.4	1,999.5	58.5
(1) Built-up Area	430.9	249.0	194.2	1,220.0	1,456.6	39.7
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	430.9	249.0	194.2	1,220.0	1,456.6	39.7
(2) Agricultural Area	0.0	16.6	9.7	10.3	81.5	5.3
a. Annual Crop	0.0	16.6	5.0	10.3	75.6	5.3
b. Fishpond	0.0	0.0	4.7	0.0	5.9	0.0
(3) Infrastructure	129.3	79.7	61.2	369.1	461.4	13.5
2. Indirect Damage	112.0	69.1	53.0	319.9	399.9	11.7
3. Total Damage	672.2	414.4	318.1	1,919.3	2,399.4	70.2
4. Area Adjusted	941.1	580.2	445.3	2,687.0	3,359.2	98.3
IV. Annual Average Damage	357.6	220.5	169.2	1,021.1	1,276.5	37.4
V. Time Adjusted Damage (Benefit Index)	1,215.8	749.7	575.3	3,471.7	4,340.1	127.2

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (7/11)

Item	Selected River Basins					
	73. Hijo	74. Maco	75. Mindanao	76. Tian	77. Polomolok	78. Siquil
I. Inundated Property						
1. Built-up Area (ha)	6.6	0.0	1,410.0	0.0	26.8	3.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	6.6	0.0	1,410.0	0.0	26.8	3.6
2. Agricultural Area (ha)	71.6	1.5	31,260.7	563.3	2.6	0.0
a. Annual Crop	40.6	1.5	30,264.0	560.2	2.6	0.0
b. Fishpond	31.0	0.0	996.7	3.1	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	184.9	0.0	39,480.1	0.0	750.4	100.8
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	184.9	0.0	39,480.1	0.0	750.4	100.8
2. Agricultural Area	4.5	0.1	1,362.8	23.8	0.1	0.0
a. Annual Crop	1.7	0.1	1,271.1	23.5	0.1	0.0
b. Fishpond	2.8	0.0	91.7	0.3	0.0	0.0
3. Total	189.4	0.1	40,842.9	23.8	750.5	100.8
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	76.8	0.0	16,496.0	18.7	292.8	39.3
(1) Built-up Area	55.5	0.0	11,844.0	0.0	225.1	30.2
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	55.5	0.0	11,844.0	0.0	225.1	30.2
(2) Agricultural Area	3.6	0.0	845.2	14.4	0.1	0.0
a. Annual Crop	1.0	0.0	762.7	14.1	0.1	0.0
b. Fishpond	2.6	0.0	82.5	0.3	0.0	0.0
(3) Infrastructure	17.7	0.0	3,806.8	4.3	67.6	9.1
2. Indirect Damage	15.4	0.0	3,299.2	3.7	58.6	7.9
3. Total Damage	92.2	0.0	19,795.2	22.4	351.4	47.2
4. Area Adjusted	129.1	0.0	27,713.3	31.4	492.0	66.1
IV. Annual Average Damage	49.1	0.0	10,531.1	11.9	187.0	25.1
V. Time Adjusted Damage (Benefit Index)	166.9	0.0	35,805.7	40.5	635.8	85.3

Item	Selected River Basins					
	79. Surigao	80. Tago	81. Lake Mainit T.	82. Boston	83. Amnay	84. Mag-A. T.
I. Inundated Property						
1. Built-up Area (ha)	5.0	1.3	8.2	0.0	0.0	1.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	5.0	1.3	8.2	0.0	0.0	1.6
2. Agricultural Area (ha)	181.3	1,729.0	284.0	24.3	1,188.6	2,144.8
a. Annual Crop	181.3	1,556.3	284.0	24.3	1,188.6	2,144.8
b. Fishpond	0.0	172.8	0.0	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	138.8	37.2	230.1	0.0	0.0	45.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	138.8	37.2	230.1	0.0	0.0	45.6
2. Agricultural Area	7.6	81.3	11.9	1.0	49.9	90.1
a. Annual Crop	7.6	65.4	11.9	1.0	49.9	90.1
b. Fishpond	0.0	15.9	0.0	0.0	0.0	0.0
3. Total	146.4	118.5	242.0	1.0	49.9	135.7
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	60.1	84.1	99.1	0.8	39.0	88.0
(1) Built-up Area	41.6	11.2	69.0	0.0	0.0	13.7
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	41.6	11.2	69.0	0.0	0.0	13.7
(2) Agricultural Area	4.6	53.5	7.2	0.6	30.0	54.0
a. Annual Crop	4.6	39.2	7.2	0.6	30.0	54.0
b. Fishpond	0.0	14.3	0.0	0.0	0.0	0.0
(3) Infrastructure	13.9	19.4	22.9	0.2	9.0	20.3
2. Indirect Damage	12.0	16.8	19.8	0.2	7.8	17.6
3. Total Damage	72.1	100.9	118.9	1.0	46.8	105.6
4. Area Adjusted	100.9	141.3	166.5	1.4	65.5	147.8
IV. Annual Average Damage	38.3	53.7	63.3	0.5	24.9	56.2
V. Time Adjusted Damage (Benefit Index)	130.2	182.6	215.2	1.7	84.7	191.1

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (8/11)

Item	Selected River Basins					
	85. Cagaray	86. Balete	87. Bongabon	88. Pula	89. Malaylay-Baco	90. Magbando
I. Inundated Property						
1. Built-up Area (ha)	0.0	16.5	19.7	0.0	0.0	8.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	16.5	19.7	0.0	0.0	8.6
2. Agricultural Area (ha)	417.7	125.0	451.9	537.3	426.0	693.1
a. Annual Crop	335.7	125.0	451.9	537.3	426.0	693.1
b. Fishpond	82.0	0.0	0.0	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	0.0	462.5	551.9	0.0	0.0	241.9
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	462.5	551.9	0.0	0.0	241.9
2. Agricultural Area	21.6	5.2	19.0	22.6	17.9	29.1
a. Annual Crop	14.1	5.2	19.0	22.6	17.9	29.1
b. Fishpond	7.5	0.0	0.0	0.0	0.0	0.0
3. Total	21.6	467.7	570.9	22.6	17.9	271.0
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	19.9	184.3	230.1	17.6	13.9	117.1
(1) Built-up Area	0.0	138.7	165.6	0.0	0.0	72.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	138.7	165.6	0.0	0.0	72.6
(2) Agricultural Area	15.3	3.1	11.4	13.5	10.7	17.5
a. Annual Crop	8.5	3.1	11.4	13.5	10.7	17.5
b. Fishpond	6.8	0.0	0.0	0.0	0.0	0.0
(3) Infrastructure	4.6	42.5	53.1	4.1	3.2	27.0
2. Indirect Damage	4.0	36.9	46.0	3.5	2.8	23.4
3. Total Damage	23.9	221.2	276.1	21.1	16.7	140.5
4. Area Adjusted	33.5	309.7	386.5	29.5	23.4	196.7
IV. Annual Average Damage	12.7	117.7	146.9	11.2	8.9	74.7
V. Time Adjusted Damage (Benefit Index)	43.2	400.2	499.5	38.1	30.3	254.0

Item	Selected River Basins					
	91. Baroc	92. Pola	93. Agus	94. Mataling	95. Nituan	96. Mataber
I. Inundated Property						
1. Built-up Area (ha)	4.3	0.0	40.0	0.0	2.7	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	4.3	0.0	40.0	0.0	2.7	0.0
2. Agricultural Area (ha)	326.8	364.5	700.5	36.8	298.4	233.2
a. Annual Crop	324.9	364.5	700.5	36.8	298.4	233.2
b. Fishpond	1.9	0.0	0.0	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	121.7	0.0	1,120.0	0.0	75.3	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	121.7	0.0	1,120.0	0.0	75.3	0.0
2. Agricultural Area	13.8	15.3	29.4	1.5	12.5	9.8
a. Annual Crop	13.6	15.3	29.4	1.5	12.5	9.8
b. Fishpond	0.2	0.0	0.0	0.0	0.0	0.0
3. Total	135.5	15.3	1,149.4	1.5	87.8	9.8
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	58.4	12.0	459.8	1.2	39.1	7.7
(1) Built-up Area	36.5	0.0	336.0	0.0	22.6	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	36.5	0.0	336.0	0.0	22.6	0.0
(2) Agricultural Area	8.4	9.2	17.7	0.9	7.5	5.9
a. Annual Crop	8.2	9.2	17.7	0.9	7.5	5.9
b. Fishpond	0.2	0.0	0.0	0.0	0.0	0.0
(3) Infrastructure	13.5	2.8	106.1	0.3	9.0	1.8
2. Indirect Damage	11.7	2.4	92.0	0.2	7.8	1.5
3. Total Damage	70.1	14.4	551.8	1.4	46.9	9.2
4. Area Adjusted	98.1	20.2	772.5	2.0	65.7	12.9
IV. Annual Average Damage	37.3	7.7	293.6	0.8	25.0	4.9
V. Time Adjusted Damage (Benefit Index)	126.8	26.2	998.2	2.7	85.0	16.7

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (9/11)

Item	Selected River Basins					
	97. Abulug	98. Bauang	99. Upstream of Agno	100. Upstream of Pampanga	101. Meycauayan	102. Upper Marikina
I. Inundated Property						
1. Built-up Area (ha)	132.2	0.1	529.5	775.2	339.1	932.6
a. NCR & HUCs	0.0	0.0	0.0	0.0	150.6	765.0
b. Others	132.2	0.1	529.5	775.2	188.5	167.6
2. Agricultural Area (ha)	7,241.2	167.4	12,315.0	23,528.7	472.0	0.0
a. Annual Crop	7,241.2	167.4	12,315.0	23,528.7	328.4	0.0
b. Fishpond	0.0	0.0	0.0	0.0	143.6	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	3,702.7	2.3	14,825.8	21,705.6	19,435.4	76,605.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	14,157.5	71,912.8
b. Others	3,702.7	2.3	14,825.8	21,705.6	5,277.9	4,692.2
2. Agricultural Area	304.1	7.0	517.2	988.2	27.0	0.0
a. Annual Crop	304.1	7.0	517.2	988.2	13.8	0.0
b. Fishpond	0.0	0.0	0.0	0.0	13.2	0.0
3. Total	4,006.8	9.3	15,343.0	22,693.8	19,462.4	76,605.0
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	1,681.3	6.4	6,185.5	9,236.0	7,606.2	29,876.0
(1) Built-up Area	1,110.8	0.7	4,447.8	6,511.7	5,830.7	22,981.5
a. NCR & HUCs	0.0	0.0	0.0	0.0	4,247.3	21,573.8
b. Others	1,110.8	0.7	4,447.8	6,511.7	1,583.4	1,407.7
(2) Agricultural Area	182.5	4.2	310.3	592.9	20.2	0.0
a. Annual Crop	182.5	4.2	310.3	592.9	8.3	0.0
b. Fishpond	0.0	0.0	0.0	0.0	11.9	0.0
(3) Infrastructure	388.0	1.5	1,427.4	2,131.4	1,755.3	6,894.5
2. Indirect Damage	336.3	1.3	1,237.1	1,847.2	1,521.2	5,975.2
3. Total Damage	2,017.6	7.7	7,422.6	11,083.2	9,127.4	35,851.2
4. Area Adjusted	2,824.6	10.8	10,391.6	15,516.5	12,778.4	50,191.7
IV. Annual Average Damage	1,073.3	4.1	3,948.8	5,896.3	4,855.8	19,072.8
V. Time Adjusted Damage (Benefit Index)	3,649.2	13.9	13,425.9	20,047.4	16,509.7	64,847.5

Item	Selected River Basins					
	103. East Mangahan	104. San Juan	105. Jaro-Aganan	106. Cairawan	107. Sibalom-West	108. Dalanas
I. Inundated Property						
1. Built-up Area (ha)	1,333.5	424.1	24.9	0.0	0.1	0.0
a. NCR & HUCs	85.5	338.0	0.0	0.0	0.0	0.0
b. Others	1,248.0	86.1	24.9	0.0	0.1	0.0
2. Agricultural Area (ha)	269.8	0.0	0.0	55.0	136.8	11.6
a. Annual Crop	269.8	0.0	0.0	55.0	136.8	11.6
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	42,981.0	34,182.8	698.2	0.0	2.4	0.0
a. NCR & HUCs	8,037.0	31,772.0	0.0	0.0	0.0	0.0
b. Others	34,944.0	2,410.8	698.2	0.0	2.4	0.0
2. Agricultural Area	11.3	0.0	0.0	2.3	5.7	0.5
a. Annual Crop	11.3	0.0	0.0	2.3	5.7	0.5
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
3. Total	42,992.3	34,182.8	698.2	2.3	8.1	0.5
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	16,771.4	13,331.2	272.4	1.8	5.3	0.4
(1) Built-up Area	12,894.3	10,254.8	209.5	0.0	0.7	0.0
a. NCR & HUCs	2,411.1	9,531.6	0.0	0.0	0.0	0.0
b. Others	10,483.2	723.2	209.5	0.0	0.7	0.0
(2) Agricultural Area	6.8	0.0	0.0	1.4	3.4	0.3
a. Annual Crop	6.8	0.0	0.0	1.4	3.4	0.3
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
(3) Infrastructure	3,870.3	3,076.4	62.9	0.4	1.2	0.1
2. Indirect Damage	3,354.3	2,666.2	54.5	0.4	1.1	0.1
3. Total Damage	20,125.7	15,997.4	326.9	2.2	6.4	0.5
4. Area Adjusted	20,125.7	15,997.4	457.7	3.1	9.0	0.7
IV. Annual Average Damage	7,647.8	6,079.0	173.9	1.2	3.4	0.3
V. Time Adjusted Damage (Benefit Index)	26,002.5	20,668.6	591.3	4.1	11.6	1.0

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (10/11)

Item	Selected River Basins					
	109. Tibiao	110. Sipalay	111. Mananga	112. Guinabasan	113. San-Roque	114. Bugko
I. Inundated Property						
1. Built-up Area (ha)	1.2	18.4	0.9	53.7	0.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	1.2	18.4	0.9	53.7	0.0	0.0
2. Agricultural Area (ha)	40.6	390.5	66.1	150.3	37.5	278.2
a. Annual Crop	40.6	390.5	66.1	150.3	37.5	278.2
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	34.4	514.3	26.5	1,504.5	0.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	34.4	514.3	26.5	1,504.5	0.0	0.0
2. Agricultural Area	1.7	16.4	2.8	6.3	1.6	11.7
a. Annual Crop	1.7	16.4	2.8	6.3	1.6	11.7
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
3. Total	36.1	530.7	29.3	1,510.8	1.6	11.7
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	14.7	213.3	12.6	591.8	1.2	9.1
(1) Built-up Area	10.3	154.3	8.0	451.4	0.0	0.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	10.3	154.3	8.0	451.4	0.0	0.0
(2) Agricultural Area	1.0	9.8	1.7	3.8	0.9	7.0
a. Annual Crop	1.0	9.8	1.7	3.8	0.9	7.0
b. Fishpond	0.0	0.0	0.0	0.0	0.0	0.0
(3) Infrastructure	3.4	49.2	2.9	136.6	0.3	2.1
2. Indirect Damage	2.9	42.7	2.5	118.4	0.2	1.8
3. Total Damage	17.6	256.0	15.1	710.2	1.4	10.9
4. Area Adjusted	24.6	358.4	21.1	994.3	2.0	15.3
IV. Annual Average Damage	9.3	136.2	8.0	377.8	0.8	5.8
V. Time Adjusted Damage (Benefit Index)	31.6	463.1	27.2	1,284.5	2.7	19.7

Item	Selected River Basins					
	115. Cadacan	116. Balatocan	117. Tuganay	118. Lipadas	119. Talomo	120. Agusan
I. Inundated Property						
1. Built-up Area (ha)	0.0	7.6	137.9	28.4	31.9	108.7
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	7.6	137.9	28.4	31.9	108.7
2. Agricultural Area (ha)	830.0	101.3	8,634.5	8.1	429.6	3,109.3
a. Annual Crop	830.0	101.3	8,518.6	8.1	429.6	3,109.3
b. Fishpond	0.0	0.0	115.9	0.0	0.0	0.0
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	0.0	212.0	3,860.2	796.1	894.4	3,043.4
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	212.0	3,860.2	796.1	894.4	3,043.4
2. Agricultural Area	34.9	4.3	368.5	0.3	18.0	130.6
a. Annual Crop	34.9	4.3	357.8	0.3	18.0	130.6
b. Fishpond	0.0	0.0	10.7	0.0	0.0	0.0
3. Total	34.9	216.3	4,228.7	796.4	912.4	3,174.0
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	27.2	86.1	1,797.0	310.7	362.8	1,288.8
(1) Built-up Area	0.0	63.6	1,158.0	238.8	268.3	913.0
a. NCR & HUCs	0.0	0.0	0.0	0.0	0.0	0.0
b. Others	0.0	63.6	1,158.0	238.8	268.3	913.0
(2) Agricultural Area	20.9	2.6	224.3	0.2	10.8	78.4
a. Annual Crop	20.9	2.6	214.7	0.2	10.8	78.4
b. Fishpond	0.0	0.0	9.6	0.0	0.0	0.0
(3) Infrastructure	6.3	19.9	414.7	71.7	83.7	297.4
2. Indirect Damage	5.4	17.2	359.4	62.1	72.6	257.8
3. Total Damage	32.6	103.3	2,156.4	372.8	435.4	1,546.6
4. Area Adjusted	45.6	144.6	3,019.0	521.9	609.6	2,165.2
IV. Annual Average Damage	17.3	54.9	1,147.2	198.3	231.6	822.8
V. Time Adjusted Damage (Benefit Index)	58.8	186.7	3,900.5	674.2	787.4	2,797.5

Tab. C-2-15 Benefit Index from Flood Control under Future Condition (11/11)

Item	Selected River Basins					
	98-2.Ambayawan	98-3.Banila	99-2.Rio Chico			
I. Inundated Property						
1. Built-up Area (ha)	1.8	4.8	184.8			
a. NCR & HUCs	0.0	0.0	0.0			
b. Others	1.8	4.8	184.8			
2. Agricultural Area (ha)	356.4	2,700.9	20,345.1			
a. Annual Crop	356.4	2,700.9	20,345.1			
b. Fishpond	0.0	0.0	0.0			
II. Inundated Property Value (Million Pesos in Market Prices)						
1. Built-up Area	50.7	133.2	5,174.4			
a. NCR & HUCs	0.0	0.0	0.0			
b. Others	50.7	133.2	5,174.4			
2. Agricultural Area	15.0	113.4	854.5			
a. Annual Crop	15.0	113.4	854.5			
b. Fishpond	0.0	0.0	0.0			
3. Total	65.7	246.6	6,028.9			
III. Flood Damage (Million Pesos in Market Prices)						
1. Direct Damage	31.5	140.5	2,684.5			
(1) Built-up Area	15.2	40.0	1,552.3			
a. NCR & HUCs	0.0	0.0	0.0			
b. Others	15.2	40.0	1,552.3			
(2) Agricultural Area	9.0	68.1	512.7			
a. Annual Crop	9.0	68.1	512.7			
b. Fishpond	0.0	0.0	0.0			
(3) Infrastructure	7.3	32.4	619.5			
2. Indirect Damage	6.3	28.1	536.9			
3. Total Damage	37.8	168.6	3,221.4			
4. Area Adjusted	52.9	236.0	4,510.0			
IV. Annual Average Damage	20.1	89.7	1,713.8			
V. Time Adjusted Damage (Benefit Index)	68.3	305.0	5,826.9			

Tab. C-2-16 Benefit Index from Sabo Dam under Future Condition

Item	Selected River Basins				
	1. Olongapo	2. Legazpi	3. Guinale	4. Catarman-Is	5. Bucao
I. Inundated Property					
1. Buildings (Nos)	562	439	38	89	51
2. Crop (ha)	0.0	0.0	0.0	0.0	180.0
II. Flood Damage (Million Pesos in Market Prices)					
1. Direct Damage	753.8	588.8	51.0	119.4	79.1
(1) Buildings	538.4	420.6	36.4	85.3	48.9
(2) Crop	0.0	0.0	0.0	0.0	7.6
(3) Infrastructure	215.4	168.2	14.6	34.1	22.6
2. Indirect Damage	150.8	117.8	10.2	23.9	15.8
3. Total Damage	904.6	706.6	61.2	143.3	94.9
III. Annual Average Benefit	343.7	268.5	23.3	54.5	36.1
IV. Total Benefit (Benefit Index)	1,203.0	939.8	81.6	190.8	126.4
Item	Selected River Basins				
	6. Bago (No.1)	7. Bago (No.2)	8. Guagua	9. Santo Tomas	10. Agos
I. Inundated Property					
1. Buildings (Nos)	10	10	141	98	86
2. Agricultural Land (ha)	35.0	35.0	0.0	0.0	300.0
II. Flood Damage (Million Pesos in Market Prices)					
1. Direct Damage	15.5	15.5	189.1	131.5	133.0
(1) Buildings	9.6	9.6	135.1	93.9	82.4
(2) Agricultural Production	1.5	1.5	0.0	0.0	12.6
(3) Infrastructure	4.4	4.4	54.0	37.6	38.0
2. Indirect Damage	3.1	3.1	37.8	26.3	26.6
3. Total Damage	18.6	18.6	226.9	157.8	159.6
III. Annual Average Benefit	7.1	7.1	86.2	60.0	60.6
IV. Total Benefit (Benefit Index)	24.9	8.5	301.7	210.0	212.1

Tab. C-2-17 Result of Sensitivity Analysis

	Case1	Case2	Case3
Rank	Analysis with 45 Points	Analysis with 70 Points	Analysis with 90 Points
1	UPPER MARIKINA	UPPER MARIKINA	UPPER MARIKINA
2	EAST MANGAHAN	EAST MANGAHAN	EAST MANGAHAN
3	PATALAN/CAYANGA/ANGALACAN	SAN JUAN	SAN JUAN
4	SAN JUAN	CEBU/MANDAWÉ	CEBU/MANDAWÉ
5	CEBU/MANDAWÉ	PATALAN/CAYANGA/ANGALACAN	PATALAN/CAYANGA/ANGALACAN
6	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)
7	MEYCALAYAN	MEYCALAYAN	MEYCALAYAN
8	MANDALAGAN(BACOLOD CITY)	SANTA RITA/KALAKLAN(OLONGAPO CITY)	SANTA RITA/KALAKLAN(OLONGAPO CITY)
9	SANTA RITA/KALAKLAN(OLONGAPO CITY)	MANDALAGAN(BACOLOD CITY)	MANDALAGAN(BACOLOD CITY)
10	MINDANAO	MINDANAO	MINDANAO
11	IMUS	IMUS	IMUS
12	TUMAGA	TUMAGA	TUMAGA
13	UPSTREAM of PAMPANGA(include RIO CHICO)	UPSTREAM of PAMPANGA(include RIO CHICO)	UPSTREAM of PAMPANGA(include RIO CHICO)
14	NANGALISAN/BAGGAAO-PAREDI(CAGAYAN)	NANGALISAN/BAGGAAO-PAREDI(CAGAYAN)	NANGALISAN/BAGGAAO-PAREDI(CAGAYAN)
15	DINANGGASAN(CATARMAN-IS)	DINANGGASAN(CATARMAN-IS)	AKLAN
16	AKLAN	AKLAN	DINANGGASAN(CATARMAN-IS)
17	SINOCALAN/MAROSOY(DAGUPAN)	DAVAO	DAVAO
18	UPSTREAM of AGNO(include AMBAYAWAN)	IPONAN	IPONAN
19	KABILUGAN/VELASCO/BATO LAKE(BICOL)	UPSTREAM of AGNO(include AMBAYAWAN)	LIPADAS
20	DAVAO	MALUPA-DIAN(AGUANG)	MALUPA-DIAN(AGUANG)
21	MALUPA-DIAN(AGUANG)	SINOCALAN/MAROSOY(DAGUPAN)	UPSTREAM of AGNO(include AMBAYAWAN, BANILA)
22	IPONAN	LIPADAS	GUINABASAN
23	ABULUG	GUINABASAN	SINOCALAN/MAROSOY(DAGUPAN)
24	LIPADAS	KABILUGAN/VELASCO/BATO LAKE(BICOL)	KABILUGAN/VELASCO/BATO LAKE(BICOL)
25	UPPER AGUSAN	ABULUG	KINANLIMAN(REAL-1)
26	GUINABASAN	KINANLIMAN(REAL-1)	ABULUG
27	GUAGUA	UPPER AGUSAN	UPPER AGUSAN
28	KINANLIMAN(REAL-1)	DONSOL/MANLATO	DONSOL/MANLATO
29	AMBURAYAN	ILOG-HILABANGAN	PANAY/MAMBUSAO
30	ABRA	PANAY/MAMBUSAO	ILOG-HILABANGAN
31	ILOG-HILABANGAN	GUAGUA	TALOMO
32	ARINGAY	AMBURAYAN	TUGANAY
33	ANGAT	TALOMO	AGOS
34	PANAY/MAMBUSAO	AGOS	GUAGUA
35	DONSOL/MANLATO	BAGO	BAGO
36	BAGO	TUGANAY	AMBURAYAN
37	BAUANG	ABRA	BALETE
38	BALETE	BALETE	ITAGUM-LIBUGANON
39	AGOS	ARINGAY	ABRA
40	UMIRAY	ANGAT	ANGAT
41	DUNGCAAN(PAGBANGANAN)	BAUANG	ARINGAY
42	CAGURAY	ITAGUM-LIBUGANON	JALAU
43	KALIWA	JALAU	BAUANG
44	JALAU	UMIRAY	ITAGOLOAN
45	TALOMO	DUNGCAAN(PAGBANGANAN)	AGUS/BUAYAN
46	ITAGUM-LIBUGANON	CAGURAY	SILWAY-POPONG-SINAUAL(POLOMOLOK)
47	TUGANAY	KALIWA	DUNGCAAN(PAGBANGANAN)
48	GENERAL NAKAR-2(a)	DAET-BASUD	UMIRAY
49	LALAVINAN(REAL-2)	AGUS/BUAYAN	DAET-BASUD
50	DAET-BASUD	GENERAL NAKAR-2(a)	CAGURAY
51	TRAN	ITAGOLOAN	GENERAL NAKAR-2(a)
52	AGUS/BUAYAN	SILWAY-POPONG-SINAUAL(POLOMOLOK)	KALIWA
53	GENERAL NAKAR-2(b)	LALAVINAN(REAL-2)	TRAN
54	ITAGOLOAN	TRAN	LALAVINAN(REAL-2)
55	BONGABONG	GENERAL NAKAR-2(b)	BONGABONG
56	HIMOCAAN	BONGABONG	GENERAL NAKAR-2(b)
57	SILWAY-POPONG-SINAUAL(POLOMOLOK)	BARARO	HIMOCAAN
58	BARARO	PAMPLONA	LABO
59	PAMPLONA	TIGNOAN	SIPALAY
60	TIGNOAN	LABO	BARARO

Tab. C-2-18 Ranking of Selected 120 River Basins

Ranking by Score	River Name	Basin Area (km ²)	Score				Project Cost (MP)	Total Amount (MP)	Region	Category	Group		
			1st	B-C	B/C	Total							
1	UPPER MARIKINA	515	46	90	85	221	13,469	NCR-IV-A	P(D)	u	O	3	
2	EAST MANGAHAN	84	39	90	90	219	16,630	IV-A-NCR	P(D)	u	O+H	5	
3	SAN JUAN	90	34	90	90	214	2,260	NCR	P(D)	u	O	3	
4	CEBU/MANDAWÉ	241	31	90	90	211	2,368	VII	O(D)	u	F+O+H	5	
5	PATALAN/CAYANGA/ANGALAGAN	656	51	90	61	202	2,318	I, CAR	P	g	F+O+H	6	
6	YAWA/BASUD/QUIRANGAY(LEGAZIPI CITY)	126	36	58	90	182	475		O(D)	u	F+O+H+L	6	
7	MEYCAJAYAN	201	46	90	30	166	7,180	III, NCR	O(D)	u	O	3	
8	SANTA RITA/KALAKLAN(OLONGAPO CITY)	102	32	36	90	158	479	III	O(D)	u	F+O+H+L	6	
9	MANDALAGAN(BACLOD CITY)	187	35	32	90	157	214	VI	O	g	F+O	3	
10	MINDANAO	20,673	35	90	29	154	15,870	XII, ARMM	M	g	F+O+H	4	
11	IMUS	112	35	77	41	153	2,377	IV-A	P(D)	u	F+O	3	
12	TUMAGA	255	22	40	90	152	483	IX	P(D)	g	F+H	1	
13	UPSTREAM OF PAMPANGA(include RIO CHICO)	8,122	47	72	6	125	21,856	III	P(D)	u	F+O+H	1	
14	NANGALISAN/BAGGAO-PARED(CAGAYAN)	27,743	53	59	3	115	52,826	II, CAR	M	g	F+O+H	1	
15	AKLAN	1,010	39	16	52	107	366	VI	P	g	F+H	1	
16	DINANGGASAN(CATARMAN-1S)	29	52	6	48	106	117	X	O(D)	u	F+O+H+L	6	
17	DAVAO	1,992	29	39	35	103	1,369		XI	M	g	F+O	3
18	IPONAN	412	27	17	54	98	357	X	P	g	O+H	2	
19	LIPADAS	163	10	10	54	91	189	XI	P(D)	u	F+O+H	1	
20	MALUPA-DIAN(AGUANG)	668	36	17	37	90	540	III	P	g	F+O+H+L	6	
21	UPSTREAM OF AGNO(include AMBAYAWAN, BANILA)	5,722	47	36	5	88	11,850	I	P(D)	u	F+O+H	1	
22	GUINABASAN	131	27	16	45	88	433	VI	P(D)	u	F+O	3	
23	SINOCALAN/MAROSOY(DAGUPAN)	1,023	53	22	8	83	3,890	I, CAR	P	g	F+O+H	1	
24	KABILUGAN/VELASCO/BATO LAKE(BICOL)	2,999	57	14	3	74	12,095	V	M	g	F+O+H	1	
25	KINANLIMAN(REAL-1)	10	40	2	31	73	32	IV-A	O	g	F+O+H+L	4	
26	ABULUG	2,766	52	13	6	71	2,989	CAR, II	M	g	F+O+H+L	6	
27	UPPER AGUSAN	1,745	46	15	10	71	2,013	XI	P(D)	g	F+O+H	1	
28	DONSOL/MANLATO	413	35	3	27	65	82	V	P(D)	u	F+H	1	
29	PANAY/MAMBUSAO	2,311	38	21	5	64	6,068	VI	M	g	F+O+H	1	
30	ILOC-HIL ABANGAN	2,162	41	13	10	64	1,639	VI, VII	M	g	F+O+H	1	
31	TALOMO	279	27	9	28	64	359	XI	P(D)	g	F+H	1	
32	TUGANAY	747	25	25	13	63	2,563	XI	P(D)	g	O+H	5	
33	AGOS	483	37	8	14	59	680	IV-A	P(D)	g	O+H+L	6	
34	GUAGUA	1,605	56	1	1	58	31,715	III	O(D)	u	F+O+L	6	
35	BAGO	968	40	6	12	58	595	VI	P	g	F+O+H+L	6	
36	AMBURAYAN	1,307	55	1	1	57	676	I, CAR	P(D)	u	O+H	2	
37	BALETE	132	40	4	13	57	259	IV-B	P	g	O	3	
38	TAGUM-LIBUGANON	2,434	32	16	7	55	3,517	XI	M	g	O+H	2	
39	ABRA	4,951	52	1	1	54	2,984	I, CAR	M	g	O+H	2	
40	ANGAT	917	51	1	1	53	9,014	III	P	g	F+O+H	1	
41	ARINGAY	421	51	1	1	53	927	IV-A	P	g	F+O+H	1	
42	JALAU	1,534	37	10	5	52	3,249	I, CAR	P	g	O	3	
43	BAUANG	510	49	1	1	51	358	CAR, I	P	g	F+O+H+L	6	
44	TAGLOAN	1,762	30	9	11	50	980	X	M	g	O+H	2	
45	AGUS/BUAYAN	1,898	31	7	12	50	681	ARM, X	M	g	O	3	
46	SILWAY-POPONG-SINAUAL(POLOMOLOK)	577	29	6	14	49	406	XII	O	g	F+O	3	
47	DUNGGAAN(PAGBANGANAN)	176	43	2	4	49	89	VIII	P	g	O+H	2	
48	UMIRAY	628	46	1	1	48	192	IV-A	P	g	F+O+H+L	6	
49	DAET-BASUD	277	35	5	7	47	887	V	P	g	O	3	
50	CAGURAY	361	45	1	1	47	794	IV-B	P	g	F	3	
51	GENERAL NAKAR-2-(a)	37	38	2	7	47	17	IV-A	O	g	F+O+H	5	
52	KALIWA	468	44	1	1	46	1,003	IV-A	P	u	O+H	2	
53	IRAN	808	40	1	1	42	641	XII, ARMM	P	g	O+H	2	
54	LALAVINAN(REAL-2)	46	40	1	1	42	20	IV-A	O	g	F	3	
55	BONGABONG	574	39	1	1	41	523	IV-B	P	g	O+H	2	
56	GENERAL NAKAR-2-(b)	17	39	1	1	41	50	IV-A	O	g	F+O+H+L	6	
57	HIMOCAAN	462	36	2	2	40	374	VI	P	g	O+H	2	
58	LABO	931	37	1	1	39	1,715	V, IV-A	P	g	F+H	1	
59	SIPALAY	336	30	3	6	39	379	VI	P(D)	u	F+O+H	1	
60	BARARO	192	37	1	1	39	319	I	P	g	O	3	
61	PAMPLONA	698	37	1	1	39	280	II, CAR	P	g	F+H	1	
62	TIGNOAN	87	37	1	1	39	28	IV-A	P	g	F+O+H+L	6	
63	PALANAN-PINACANAUAN	755	36	1	1	38	1,447	II	P	g	F+O+H+L	6	
64	BALINGOQUIN/MABINI PANGSINAN	378	36	1	1	38	718	I	P	g	F+O+H	1	
65	BACARRA-VINTAR	827	36	1	1	38	556	I	P	g	O+H	2	
66	BANURBOUR(LAL-LO1)	511	36	1	1	38	328	II	O	g	O	3	
67	DAGUITAN-MARABONG	292	36	1	1	38	308	VIII	P	g	F+O	3	
68	CAGAYAN DE ORO	1,365	29	3	5	37	728	X	M	g	F+O+H	1	
69	PULA	245	35	1	1	37	610	IV-B	P	g	O+H	2	
70	SANTO TOMAS-GABOR	334	31	2	4	37	418	III	P(D)	u	F+O+L	6	
71	SILAG-SANTA MARIA	310	35	1	1	37	355	I, CAR	P	g	F+O	3	
72	TAGO	1,370	34	1	1	36	2,169	XIII	P	g	F+O+H	1	
73	PAGSANGA-AN	511	34	1	1	36	879	VIII	P	g	O+H	2	
74	BUAYAN-MALUNGUN	1,400	31	2	3	36	527	XI, XII	M	O	O	3	
75	LAKE MAINIT-TUBAY	473	32	2	2	36	214	XII	P	g	O	3	
76	ALAG/MALAYLAY-BACO	505	33	1	1	35	734	IV-B	P	g	O+H	2	
77	MAGBANDO-BUSWANGA	466	33	1	1	35	632	IV-B	P	g	F+O+H	1	
78	CLAVERIA(CABCUNGAN)	270	33	1	1	35	586	II, CAR	P	g	O	3	
79	BUAYA	246	33	1	1	35	494	I	P	g	F+O+H	1	
80	QUINALE-B	182	33	1	1	35	447	V	P	g	F+O+H+L	6	
81	BAUA	118	33	1	1	35	325	II	P	g	F+H	5	
82	POLA	140	33	1	1	35	306	IV-B	P	g	O	3	
83	BAROC	162	33	1	1	35	225	IV-B	P	g	F+O+H	1	
84	RAGAY	176	33	1	1	35	180	V	P	g	F	3	
85	ALAMINOS/TAGOONG	221	32	1	1	34	998	IV-A	P	g	F+O	3	
86	UARO-AGANAN	464	32	1	1	34	765	V, IV	P(D)	u	O+H	2	
87	SIBALOM	690	32	1	1	34	265	VI	P(D)	u	F+O+H+L	6	
88	BOSTON	43	32	1	1	34	44	XIII, XI	O	g	O+H	2	
89	CALUMPANG(KAPUMPONG)	446	31	1	1	33	3,693	IV-A	P(D)	u	O+H	2	
90	COMBADO(BALAMBAN)	237	31	1	1	33	812	VII	P	u	O+H	5	
91	BUCAO	664	31	1	1	33	508	III	P(D)	u	F+O+H+L	6	
92	NAYUM	229	31	1	1	33	481	III, I	P	g	O	3	
93	SAPANG DAKO	169	31	1	1	33	324	VII	P	u	F+O	3	
94	CATARMAN	632	31	1	1	33	56	VIII	P(D)	u	O+H	2	
95	AMNAY	495	30	1	1	32	1,149	IV-B	P(D)	u	O	3	
96	IYAM/LUCENA	158	30	1	1	32	670	IV-A	P(D)	u	F	3	
97	HIJO	842	30	1	1	32	566	XI	P	g	F+O+H	1	
98	PADADA MAINIT	1,216	30	1	1	32	480	XI, XII	P	g	O+H	2	
99	CADAC-AN	523	30	1	1	32	461	VIII	P(D)	u	F+O+H	1	
100	SURIGAO	170	30	1	1	32	318	XIII	P(D)	u	O	3	
101	DALE	169	30	1	1	32	134	VIII	P(D)	u	O	3	
102	DISACAN-MANUKAN(JOSE DALMAN PONOT1)	274	30	1	1	32	70	IX	O	g	F+H	5	
103	MACO	30	30	1	1	32	12	XI	O	g	F+O+H	1	
104	SIBUGUEY	994	29	1	1	31	2,493	IX	P	g	F+H	5	
105	DOMAGAN/TAMBAK(TAYABAS)	45	29	1	1	31	269	IV-A	O(D)	u	F+O+H	5	
106	BALATUKAN	221	25	2	4	31	165	X	P(D)	u	F	3	
107	MANANGA	86	29	1	1	31	165	VII	P(D)	u	F+O	3	
108	MATALING	420	29	1	1	31	109	ARM	P	g	O+H	2	
109	SIGUEL	358	27	2	2	31	83	XII	P	g	F+O	3	
110	BANTAYAN	89	29	1	1	31	48	VIII	O(D)	u	F+O	3	
111	MAPANGI	1,306	28	1	1	30	2,717	IX, X	P	g	O+H	2	
112	MAG-ASAWANG TUBIG	443	28	1	1	30	1,048	IV-B	P(D)	u	O+H	2	
113	MARANDING	634	28	1	1	30	626	X	P	g	O+H	2	
114	NITUAN	365	28	1	1	30	188	ARM	P	g	O	3	
115	CAIRAWAN	71	28	1	1	30	155	VI	P(D)	u	F+O+H+L	6	
116	SIPOCOG/STA.CATALINA/CAWITAN	320	27	1	1	29	315	VII	P	g	F+O+H+L	6	
117	MANDULOG	780	26	1	1	28	1,347	X, ARMM	P	g	O	3	
118	MATABER	197	26	1	1	28	187	ARM	P	g	F+H	1	
119	TIBIAO	72	24	1	1	26	78	VI	P(D)	u	F+O+H+L	6	
120	IBALANAS	184	24	1	1	26	63	VI	P(D)	u	F+O+H+L	6	

Note: M: Major River Basin, P: Principal River Basin, O: Other River Basin, (D): Dangerous River Basin
Shaded row shows the selected 56 river basins

Tab. C-2-19 Medium-Term Investment Program (1/2)

(mil. Pesos)

Project	Proposed Allocation (in thousand Pesos)						
	1999	2000	2001	2002	2003	2004	Total (1999-2004)
National Roads	24,273	22,951	28,161	29,063	39,983	41,640	186,071
Flood Control	4,384	4,791	6,089	8,285	9,641	10,773	43,963
Other Local Fund	581	2,147	458	719	905	1,950	6,760
Total	29,238	29,889	34,708	38,067	50,529	54,363	236,794

Tab. C-2-19 Medium-Term Investment Program (2/2)

(mil. Pesos)

Project	Total Cost	Previous Year	Proposed Allocation (in thousand Pesos)							Total (2005-2010)	Later Years
			2005	2006	2007	2008	2009	2010			
National Roads											
Foreign-Assisted Project	353,770*	52,376	17,122	24,270	18,834	18,819	34,014	42,163	155,222	146,676	
Locally Funded Project	142,522	1,353	9,081	11,285	18,454	37,841	30,681	33,827	141,169		
Total	496,293*	53,729	26,203	35,555	37,288	56,660	64,695	75,990	296,391		
Flood Control											
Foreign-Assisted Project	93,422	17,414	5,285	4,784	6,532	4,014	10,966	12,642	44,223	31,785	
Locally Funded Project	4,900	-	-	-	1,500	1,500	900	1,000	4,900	-	
Total	98,322	17,414	5,285	4,784	8,032	5,514	11,866	13,642	49,123	31,785	
Other Locally Funded Project	70,650	-	7,232	7,380	17,342	12,132	8,892	8,640	61,618	9,032	
Grand Total	665,265	71,143	38,720	47,719	62,662	74,306	85,453	98,272	407,132		

Note: (*) as shown in MTPIP

Tab. C-2-20 Actual Investment Amount

(mil. Pesos)

Project	1999	2000	2001	2002	2003	2004	2005	2006	Total (1999-2006)
National Roads	21,878	22,950	21,878	13,059	18,328	18,898	24,313	28,642	169,946
Flood Control	5,346	4,791	5,346	4,969	4,347	4,270	5,085	6,318	40,472
Other Local Fund	9,513	17,146	9,512	22,115	17,668	14,220	9,391	12,754	112,319
Total	36,737	44,887	36,736	40,143	40,343	37,388	38,789	47,714	322,737

Tab. C-2-21 Selected 56 River Basins by the Second Screening

No.	Ranking by Score	River Name	Basin Area (km ²)	Score				Project Cost (MP)	Total Amount (MP)	Region	Category	Group	
				1st	B-C	B/C	Total						
1	1	UPPER MARIKINA	515	46	90	85	221	13,469	NCR, IV-A	P(D)	u	O	3
2	2	EAST MANGAHAN	84	39	90	90	219	3,161	IV-A, NCR	P(D)	u	O+I	5
3	3	SAN JUAN	90	34	90	90	214	2,260	NCR	P(D)	u	O	3
4	4	CEBU/MANDAWÉ	241	31	90	90	211	2,368	VII	O(D)	u	F+O+I	5
5	5	PATALAN/CAYANGA/ANGALACAN	656	51	90	61	202	2,318	I, CAR	P	g	F+O+B	1
6	6	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	126	36	56	90	182	475	V	O(D)	g	F+O+I+B+L	6
7	7	MEYCAUAYAN	201	46	90	30	166	7,180	III, NCR	O(D)	u	O	3
8	8	SANTA RITA/KALAKLAN(OLONGAPO CITY)	102	32	36	90	158	479	III	O(D)	g	F+O+I+B+L	6
9	9	MANDALAGAN(BACOLOD CITY)	187	35	32	90	157	214	VI	O	g	F+O	3
10	10	MINDANAO	20,673	35	90	29	154	15,870	XII, ARMM	M	g	F+O+I+B	4
11	11	IMUS	112	35	77	41	153	2,377	IV-A	P(D)	u	F+O	3
12	12	TUMAGA	255	22	40	90	152	483	IX	P(D)	g	F+B	1
13	13	UPSTREAM of PAMPANGA(include RIO CHICO)	8,122	47	72	6	125	21,856	III	P(D)	g	F+O+B	1
14	14	NANGALISAN/BAGGAO-PARED(CAGAYAN)	27,743	53	59	3	115	52,826	II, CAR	M	g	F+O+B	1
15	15	AKLAN	1,010	39	16	52	107	366	VI	P	g	F+B	1
16	16	DINANGGASAN(CATARMAN-1S)	29	52	6	48	106	117	X	O(D)	g	F+O+I+B+L	6
17	17	DAVAO	1,992	29	39	35	103	1,369	XI	M	g	F+O	3
18	18	IPONAN	412	27	17	54	98	357	X	P	g	O+B	2
19	19	LIPADAS	163	27	10	54	91	198	XI	P(D)	g	F+O+B	1
20	20	MALUPA-DIAN(AGUANG)	666	36	17	37	90	540	III	P	g	F+O+I+B	4
21	21	UPSTREAM of AGNO(include AMBAYAWAN, BANILA)	5,722	47	36	5	88	11,850	I	P(D)	u	F+O	3
22	22	GUINABASAN	131	27	16	45	88	433	VII	P(D)	u	F+O	3
23	23	SINOCALAN/MAROSOY(DAGUPAN)	1,023	53	22	8	83	3,890	I, CAR	P	g	F+O+B	1
24	24	KABILUGAN/VELASCO/BATO LAKE(BICOL)	2,999	57	14	3	74	12,095	V	M	g	F+O+B	1
25	25	KINANLIMAN(REAL-1)	10	40	2	31	73	32	IV-A	O	g	F+O+I+B	4
26	26	ABULUG	2,766	52	13	6	71	2,989	CAR, II	M	g	F+O+I+B	4
27	27	UPPER AGUSAN	1,745	46	15	10	71	2,013	XI	P(D)	g	F+O+B	1
28	28	DONSOL/MANLATO	413	35	3	27	65	82	V	P(D)	g	F+B	1
29	29	PANAY/MAMBUSAO	2,311	38	21	5	64	6,068	VI	M	g	F+O+B	1
30	30	ILOG-HILABANGAN	2,162	41	13	10	64	1,638	VI, VII	M	g	F+O+B	1
31	31	TALOMO	279	27	9	28	64	359	XI	P(D)	g	F+B	1
32	32	TUGANAY	747	25	25	13	63	2,563	XI	P(D)	g	O+I	5
33	33	AGOS	483	37	8	14	59	680	IV-A	P(D)	g	O+B+L	6
34	34	GUAGUA	1,605	56	1	1	58	31,715	III	O(D)	u	F+O+L	6
35	35	BAGO	868	40	6	12	58	595	VI	P	g	F+O+B+L	6
36	36	AMBURAYAN	1,307	55	1	1	57	676	I, CAR	P(D)	g	O+B	2
37	37	BALETE	132	40	4	13	57	259	IV-B	P	g	O	3
38	38	TAGUM-LIBUGANON	2,434	32	16	7	55	3,517	XI	M	g	O+I	5
39	39	ABRA	4,951	52	1	1	54	2,984	I, CAR	M	g	O+B	2
40	40	ANGAT	917	51	1	1	53	9,014	III	P	u	F+O+I	5
41	41	ARINGAY	421	51	1	1	53	822	I, CAR	P	g	F+O+I+B	4
42	42	JALAU	1,534	37	10	5	52	3,249	VI	M	g	O	3
43	43	BAUANG	510	49	1	1	51	358	CAR, I	P	g	F+O+I+B	4
44	44	TAGOLOAN	1,762	30	9	11	50	980	X	M	g	O+B	2
45	45	AGUS/BUAYAN	1,898	31	7	12	50	681	ARMM, X	M	g	O	3
46	46	SILWAY-POPONG-SINAUAL(POLOMOLOK)	577	29	6	14	49	406	XII	O	g	F+O	3
47	47	DUNGAAN(PAGBANGANAN)	176	43	2	4	49	89	VIII	P	g	O+B	2
48	50	CAGURAY	361	45	1	1	47	794	IV-B	P	g	F	3
49	61	PAMPLONA	698	37	1	1	39	280	II, CAR	P	g	F+B	1
50	67	DAGUITAN-MARABONG	292	36	1	1	38	308	VIII	P	g	F+O	3
51	68	CAGAYAN DE ORO	1,365	29	3	5	37	728	X	M	g	F+O+B	1
52	72	TAGO	1,370	34	1	1	36	2,169	XIII	P	g	F+O+B	1
53	74	BUAYAN-MALUNGUIN	1,400	31	2	3	36	527	XI, XII	M	g	O	3
54	75	LAKE MAINIT-TUBAY	473	32	2	2	36	214	XIII	P	g	O	3
55	104	SIBUGUEY	994	29	1	1	31	2,493	IX	P	g	F+I+B	5
56	108	MATALING	420	29	1	1	31	109	ARMM	P	g	O+B	2

Note: M: Major River Basin, P: Principal River Basin, O: Other River Basin, (D): Dangerous River Basin

Tab. C-2-22 Additional 7 River Basins

Region	River Basin	Project Cost(mil. Pesos)
IV-B	CAGURAY	794
II, CAR	PAMPLONA	280
VIII	DAGUITAN-MARABONG	308
XIII	TAGO	2,169
XIII	LAKE_MAINT-TUBAY	214
IX	SIBUGUEY	2,493
ARMM	MATALING	109
Total		6,367

Tab. C-2-23 Classification of River Basins (L: Luzon, V: Visayas, M: Mindanao)

Fund Type	Ranking by Score	River Name	Basin Area (km ²)	Project Cost (MP)	Total Amount (MP)	Region	Area
Foreign Assisted Project	1	UPPER MARIKINA	515	13,469	13,469	NCR, IV-A	L
	2	EAST MANGAHAN	84	3,161	16,630	IV-A, NCR	L
	3	SAN JUAN	90	2,260	18,890	NCR	L
	4	CEBU/MANDAWE	241	2,368	21,257	VII	V
	5	PATALAN/CAYANGA/ANGALACAN	656	2,318	23,575	I, CAR	L
	7	MEYCAUAYAN	201	7,180	30,755	III, NCR	L
	10	MINDANAO	20,673	15,870	46,625	XII, ARMM	M
	11	IMUS	112	2,377	49,002	IV-A	L
	13	UPSTREAM of PAMPANGA(include RIO CHICO)	8,122	21,856	70,858	III	L
	14	NANGALISAN/BAGGAO-PARED(CAGAYAN)	27,743	52,826	123,684	II, CAR	L
	17	DAVAO	1,992	1,369	125,054	XI	M
	21	UPSTREAM of AGNO(include AMBAYAWAN, BANILA)	5,722	11,850	136,904	I	L
	23	SINOCALAN/MAROSOY(DAGUPAN)	1,023	3,890	140,794	I, CAR	L
	24	KABILUGAN/VELASCO/BATO LAKE(BICOL)	2,999	12,095	152,890	V	L
	26	ABULUG	2,766	2,989	155,878	CAR, II	L
	27	UPPER AGUSAN	1,745	2,013	157,891	XI	M
	29	PANAY/MAMBUSAO	2,311	6,068	163,959	VI	V
	30	ILOG-HILABANGAN	2,162	1,638	165,597	VI, VII	V
	32	TUGANAY	747	2,563	168,160	XI	M
	34	GUAGUA	1,605	31,715	199,875	III	L
38	TAGUM-LIBUGANON	2,434	3,517	203,392	XI	M	
39	ABRA	4,951	2,984	206,376	I, CAR	L	
40	ANGAT	917	9,014	215,390	III	L	
42	JALAU	1,534	3,249	218,640	VI	V	
72	TAGO	1,370	2,169	220,808	XIII	M	
104	SIBUGUEY	994	2,493	223,301	IX	M	
Locally Funded Project	6	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	126	475	475	V	L
	8	SANTA RITA/KALAKLAN(OLONGAPO CITY)	102	479	954	III	L
	9	MANDALAGAN(BACOLOD CITY)	187	214	1,168	VI	V
	12	TUMAGA	255	483	1,651	IX	M
	15	AKLAN	1,010	366	2,018	VI	V
	16	DINANGGASAN(CATARMAN-1S)	29	117	2,134	X	M
	18	IPONAN	412	357	2,492	X	M
	19	LIPADAS	163	198	2,690	XI	M
	20	MALUPA-DIAN(AGUANG)	666	540	3,230	III	L
	22	GUINABASAN	131	433	3,663	VII	V
	25	KINANLIMAN(REAL-1)	10	32	3,695	IV-A	L
	28	DONSOL/MANLATO	413	82	3,777	V	L
	31	TALOMO	279	359	4,136	XI	M
	33	AGOS	483	680	4,816	IV-A	L
	35	BAGO	868	595	5,411	VI	V
	36	AMBURAYAN	1,307	676	6,088	I, CAR	L
	37	BALETE	132	259	6,347	IV-B	L
	41	ARINGAY	421	822	7,169	I, CAR	L
	43	BAUANG	510	358	7,527	CAR, I	L
	44	TAGOLOAN	1,762	980	8,507	X	M
	45	AGUS/BUAYAN	1,898	681	9,188	ARMM, X	M
	46	SILWAY-POPONG-SINAUAL(POLOMOLOK)	577	406	9,594	XII	M
	47	DUNGAAN(PAGBANGANAN)	176	89	9,683	VIII	V
	50	CAGURAY	361	794	10,477	IV-B	L
	61	PAMPLONA	698	280	10,757	II, CAR	L
	67	DAGUITAN-MARABONG	292	308	11,065	VIII	V
68	CAGAYAN DE ORO	1,365	728	11,794	X	M	
74	BUAYAN-MALUNGUN	1,400	527	12,321	XI, XII	M	
75	LAKE MAINIT-TUBAY	473	214	12,535	XIII	M	
108	MATALING	420	109	12,645	ARMM	M	

Note: Shaded row shows river basins in the list of request for foreign assisted project in DPWH Mid-term program

Tab. C-2-24 Regional Distribution of River Basins (L: Luzon, V: Visayas, M: Mindanao)

Fund Type	Ranking by Score	River Name	Basin Area (km ²)	Project Cost (MP)	Total Amount (MP)	Region	Area	Nos.
Foreign Assisted Project	1	UPPER MARIKINA	515	13,469	13,469	NCR, IV-A	L	Luzon: 15 River Basins
	2	EAST MANGAHAN	84	3,161	16,630	IV-A, NCR	L	
	3	SAN JUAN	90	2,260	18,890	NCR	L	
	5	PATALAN/CAYANGA/ANGALACAN	656	2,318	21,208	I, CAR	L	
	7	MEYCAUAYAN	201	7,180	28,388	III, NCR	L	
	11	IMUS	112	2,377	30,765	IV-A	L	
	13	UPSTREAM of PAMPANGA(include RIO CHICO)	8,122	21,856	52,621	III	L	
	14	NANGALISAN/BAGGAAO-PARED(CAGAYAN)	27,743	52,826	52,826	II, CAR	L	
	21	UPSTREAM of AGNO(include AMBAYAWAN, BANILA)	5,722	11,850	64,676	I	L	
	23	SINOCALAN/MAROSOY(DAGUPAN)	1,023	3,890	68,566	I, CAR	L	
	24	KABILUGAN/VELASCO/BATO LAKE(BICOL)	2,999	12,095	80,662	V	L	
	26	ABULUG	2,766	2,989	83,650	CAR, II	L	
	34	GUAGUA	1,605	31,715	115,366	III	L	
	39	ABRA	4,951	2,984	118,350	I, CAR	L	
	40	ANGAT	917	9,014	127,364	III	L	
Foreign Assisted Project	4	CEBU/MANDAWE	241	2,368	129,732	VII	V	Visayas: 4 River Basins
	29	PANAY/MAMBUSAO	2,311	6,068	135,800	VI	V	
	30	ILOG-HILABANGAN	2,162	1,638	137,438	VI, VII	V	
	42	JALAU	1,534	3,249	140,687	VI	V	
Foreign Assisted Project	10	MINDANAO	20,673	15,870	156,557	XII, ARMM	M	Mindanao: 7 River Basins
	17	DAVAO	1,992	1,369	157,926	XI	M	
	27	UPPER AGUSAN	1,745	2,013	159,939	XI	M	
	32	TUGANAY	747	2,563	162,502	XI	M	
	38	TAGUM-LIBUGANON	2,434	3,517	166,019	XI	M	
	72	TAGO	1,370	2,169	168,187	XIII	M	
104	SIBUGUEY	994	2,493	170,680	IX	M		
Locally Funded Project	6	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	126	475	475	V	L	Luzon: 12 River Basins
	8	SANTA RITA/KALAKLAN(OLONGAPO CITY)	102	479	954	III	L	
	20	MALUPA-DIAN(AGUANG)	666	540	1,495	III	L	
	25	KINANLIMAN(REAL-1)	10	32	1,527	IV-A	L	
	28	DONSOL/MANLATO	413	82	1,608	V	L	
	33	AGOS	483	680	2,288	IV-A	L	
	36	AMBURAYAN	1,307	676	2,964	I, CAR	L	
	37	BALETE	132	259	3,224	IV-B	L	
	41	ARINGAY	421	822	4,046	I, CAR	L	
	43	BAUANG	510	358	4,404	CAR, I	L	
	50	CAGURAY	361	794	5,198	IV-B	L	
	61	PAMPLONA	698	280	5,478	II, CAR	L	
Locally Funded Project	9	MANDALAGAN(BACOLOD CITY)	187	214	5,692	VI	V	Visayas: 6 River Basins
	15	AKLAN	1,010	366	6,058	VI	V	
	22	GUINABASAN	131	433	6,491	VII	V	
	35	BAGO	868	595	7,087	VI	V	
	47	DUNGAAN(PAGBANGANAN)	176	89	7,176	VIII	V	
	67	DAGUITAN-MARABONG	292	308	7,484	VIII	V	
Locally Funded Project	12	TUMAGA	255	483	7,967	IX	M	Mindanao: 12 River Basins
	16	DINANGGASAN(CATARMAN-1S)	29	117	8,084	X	M	
	18	IPONAN	412	357	8,441	X	M	
	19	LIPADAS	163	198	9,719	XI	M	
	31	TALOMO	279	359	15,118	XI	M	
	44	TAGOLOAN	1,762	980	980	X	M	
	45	AGUS/BUAYAN	1,898	681	1,661	ARMM, X	M	
	46	SILWAY-POPONG-SINAUAL(POLOMOLOK)	577	406	3,450	XII	M	
	68	CAGAYAN DE ORO	1,365	728	5,057	X	M	
	74	BUAYAN-MALUNGUN	1,400	527	5,584	XI, XII	M	
75	LAKE MAINIT-TUBAY	473	214	21,524	XIII	M		
108	MATALING	420	109	22,233	ARMM	M		

Note: Shaded row shows river basins in the list of request for foreign assisted project in DPWH Mid-term program

Tab. C-2-25 Regional Arrangement (L: Luzon, V: Visayas, M: Mindanao)

Fund Type	Ranking by Score	River Name	Basin Area (km ²)	Project Cost (MP)	Total Amount (MP)	Region	Area
Foreign Assisted Project	1	UPPER MARIKINA	515	13,469	13,469	NCR, IV-A	L
	2	EAST MANGAHAN	84	3,161	16,630	IV-A, NCR	L
	4	CEBU/MANDAWÉ	241	2,368	18,998	VII	V
	10	MINDANAO	20,673	15,870	34,868	XII, ARMM	M
	3	SAN JUAN	90	2,260	37,127	NCR	L
	5	PATALAN/CAYANGA/ANGALACAN	656	2,318	39,445	I, CAR	L
	29	PANAY/MAMBUSAO	2,311	6,068	45,513	VI	V
	17	DAVAO	1,992	1,369	46,883	XI	M
	7	MEYCAUAYAN	201	7,180	54,063	III, NCR	L
	11	IMUS	112	2,377	56,440	IV-A	L
	30	ILOG-HILABANGAN	2,162	1,638	58,077	VI, VII	V
	27	UPPER AGUSAN	1,745	2,013	60,090	XI	M
	13	UPSTREAM of PAMPANGA(include RIO CHICO)	8,122	21,856	81,946	III	L
	14	NANGALISAN/BAGGAO-PARED(CAGAYAN)	27,743	52,826	134,772	II, CAR	L
	42	JALAU	1,534	3,249	138,022	VI	V
	32	TUGANAY	747	2,563	140,585	XI	M
	21	UPSTREAM of AGNO(include AMBAYAWAN, BANILA)	5,722	11,850	152,435	I	L
	23	SINOCALAN/MAROSOY(DAGUPAN)	1,023	3,890	156,325	I, CAR	L
	38	TAGUM-LIBUGANON	2,434	3,517	159,842	XI	M
	24	KABILUGAN/VELASCO/BATO LAKE(BICOL)	2,999	12,095	171,938	V	L
26	ABULUG	2,766	2,989	174,926	CAR, II	L	
72	TAGO	1,370	2,169	177,095	XIII	M	
34	GUAGUA	1,605	31,715	208,810	III	L	
39	ABRA	4,951	2,984	211,794	I, CAR	L	
104	SIBUGUEY	994	2,493	214,287	IX	M	
40	ANGAT	917	9,014	223,301	III	L	
Locally Funded Project	6	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	126	475	475	V	L
	8	SANTA RITA/KALAKLAN(OLONGAPO CITY)	102	479	954	III	L
	9	MANDALAGAN(BACOLOD CITY)	187	214	1,168	VI	V
	12	TUMAGA	255	483	1,651	IX	M
	16	DINANGGASAN(CATARMAN-1S)	29	117	1,768	X	M
	20	MALUPA-DIAN(AGUANG)	666	540	2,308	III	L
	25	KINANLIMAN(REAL-1)	10	32	2,340	IV-A	L
	15	AKLAN	1,010	366	2,706	VI	V
	18	IPONAN	412	357	3,064	X	M
	19	LIPADAS	163	198	3,262	XI	M
	28	DONSOL/MANLATO	413	82	3,344	V	L
	33	AGOS	483	680	4,024	IV-A	L
	22	GUINABASAN	131	433	4,457	VII	V
	31	TALOMO	279	359	4,816	XI	M
	44	TAGOLOAN	1,762	980	5,796	X	M
	36	AMBURAYAN	1,307	676	6,472	I, CAR	L
	37	BALETE	132	259	6,731	IV-B	L
	35	BAGO	868	595	7,327	VI	V
	45	AGUS/BUAYAN	1,898	681	8,008	ARMM, X	M
	46	SILWAY-POPONG-SINAUAL(POLOMOLOK)	577	406	8,414	XII	M
41	ARINGAY	421	822	9,236	I, CAR	L	
43	BAUANG	510	358	9,594	CAR, I	L	
47	DUNGCAAN(PAGBANGANAN)	176	89	9,683	VIII	V	
68	CAGAYAN DE ORO	1,365	728	10,411	X	M	
74	BUAYAN-MALUNGUN	1,400	527	10,939	XI, XII	M	
50	CAGURAY	361	794	11,732	IV-B	L	
61	PAMPLONA	698	280	12,013	II, CAR	L	
67	DAGUITAN-MARABONG	292	308	12,321	VIII	V	
75	LAKE MAINIT-TUBAY	473	214	12,535	XIII	M	
108	MATALING	420	109	12,645	ARMM	M	

Note: Shaded row shows river basins in the list of request for foreign assisted project in DPWH Mid-term program

Tab. C-2-26 Proposed Project (DPWH Medium-Term Public Investment Program (2005-2010))

Fund	Name of River Basin	JBIC loan applied	Budget Allocation	Implementation schedule	Ranking	Remarks (Present Status)
Foreign Assisted Project	Mt Pinatubo (Phase III)	27th	2006	2008-2010	-	
	Pasig-Marikina (Phase II)	27th	2007	2007-2013	-	accepted
	Cagayan	27th	2006	2009-2011	39	
	Panay (1st Stage)	27th	2008	2009-2014	17	
	Bicol	-	2006	2008-2012	21	
	Agno & allied (Phase-III)	-	2008	2009-	27	
	VOM (Meycauayan)	-	2008	2009-2013	6	
	Mayon volcano	-	2008	2009-	7	
	Lower Cotabato	-	2008	2009-2011	11	
	Davao urban drainage	-	2008	2009-2010	14	
	Tagaloan	-	2008	2009-2010	40	
	Upper Agusan	-	2008	2008-2011	33	
	Tagum-Libuganon	-	2008	2009-2011	45	
	Agus	-	2008	2009-2011	48	
	Buayan-Malungun	-	2008	2009-2011	44	
	Tarlac	-	2008	2009-2013	27	
	Iloilo (Phase-II)	-	2008	2009-2014	-	
	Ilog-Hilabangan	-	2008	2009-2010	28	
East-Mangahan	-	2009	2009-2014	2		
Local Fund Project	Kinanliman*	-	2008		25	Implementation will be started soon
	Yawa	-	2008		6	Updating of M/P and F/S is requested
	Agos*	-	2008		33	Detailed design is requested
	Dinalupihan-Hermosa-Lubao*	-	2008		-	Not included in 56 river basins

*: Not listed in the DPWH Medium-term program (2005-2010)

Tab. C-2-27 Prioritization of River Basins

Fund Type	Ranking by Score	River Name	Basin Area (km ²)	Project Cost (MP)	Total Amount (MP)	Region	Area
Foreign Assisted Project	2	EAST MANGAHAN	84	3,161	16,630	IV-A, NCR	L
	7	MEYCAUAYAN	201	7,180	54,063	III, NCR	L
	29	PANAY/MAMBUSAO	2,311	6,068	45,513	VI	V
	10	MINDANAO	20,673	15,870	34,868	XII, ARMM	M
	14	NANGALISAN/BAGGAAO-PARED(CAGAYAN)	27,743	52,826	134,772	II, CAR	L
	21	UPSTREAM of AGNO(include AMBAYAWAN, BANILA)	5,722	11,850	152,435	I	L
	30	ILOG-HILABANGAN	2,162	1,638	58,077	VI, VII	V
	17	DAVAO	1,992	1,369	46,883	XI	M
	24	KABILUGAN/VELASCO/BATO LAKE(BICOL)	2,999	12,095	171,938	V	L
	34	GUAGUA	1,605	31,715	208,810	III	L
	4	CEBU/MANDAWE	241	2,368	18,998	VII	V
	27	UPPER AGUSAN	1,745	2,013	60,090	XI	M
	1	UPPER MARIKINA	515	13,469	13,469	NCR, IV-A	L
	3	SAN JUAN	90	2,260	37,127	NCR	L
	42	JALAU	1,534	3,249	138,022	VI	V
	38	TAGUM-LIBUGANON	2,434	3,517	159,842	XI	M
	5	PATALAN/CAYANGA/ANGALACAN	656	2,318	39,445	I, CAR	L
	11	IMUS	112	2,377	56,440	IV-A	L
	32	TUGANAY	747	2,563	140,585	XI	M
	13	UPSTREAM of PAMPANGA(include RIO CHICO)	8,122	21,856	81,946	III	L
	23	SINOCALAN/MAROSOY(DAGUPAN)	1,023	3,890	156,325	I, CAR	L
	72	TAGO	1,370	2,169	177,095	XIII	M
	26	ABULUG	2,766	2,989	174,926	CAR, II	L
	39	ABRA	4,951	2,984	211,794	I, CAR	L
	104	SIBUGUEY	994	2,493	214,287	IX	M
	40	ANGAT	917	9,014	223,301	III	L
Locally Funded Project	6	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	126	475	475	V	L
	25	KINANLIMAN(REAL-1)	10	32	2,340	IV-A	L
	9	MANDALAGAN(BACOLOD CITY)	187	214	1,168	VI	V
	44	TAGOLOAN	1,762	980	5,796	X	M
	45	AGUS/BUAYAN	1,898	681	8,008	ARMM, X	M
	33	AGOS	483	680	4,024	IV-A	L
	8	SANTA RITA/KALAKLAN(OLONGAPO CITY)	102	479	954	III	L
	15	AKLAN	1,010	366	2,706	VI	V
	74	BUAYAN-MALUNGUN	1,400	527	10,939	XI, XII	M
	12	TUMAGA	255	483	1,651	IX	M
	20	MALUPA-DIAN(AGUANG)	666	540	2,308	III	L
	28	DONSOL/MANLATO	413	82	3,344	V	L
	22	GUINABASAN	131	433	4,457	VII	V
	16	DINANGGASAN(CATARMAN-1S)	29	117	1,768	X	M
	18	IPONAN	412	357	3,064	X	M
	36	AMBURAYAN	1,307	676	6,472	I, CAR	L
	37	BALETE	132	259	6,731	IV-B	L
	35	BAGO	868	595	7,327	VI	V
	19	LIPADAS	163	198	3,262	XI	M
	31	TALOMO	279	359	4,816	XI	M
	41	ARINGAY	421	822	9,236	I, CAR	L
	43	BAUANG	510	358	9,594	CAR, I	L
	47	DUNGCAAN(PAGBANGANAN)	176	89	9,683	VIII	V
	46	SILWAY-POPONG-SINAUAL(POLOMOLOK)	577	406	8,414	XII	M
	68	CAGAYAN DE ORO	1,365	728	10,411	X	M
	50	CAGURAY	361	794	11,732	IV-B	L
61	PAMPLONA	698	280	12,013	II, CAR	L	
67	DAGUITAN-MARABONG	292	308	12,321	VIII	V	
75	LAKE MAINIT-TUBAY	473	214	12,535	XIII	M	
108	MATALING	420	109	12,645	ARMM	M	

Note: Shaded row shows river basins in the list of request for foreign assisted project in DPWH Mid-term program

Tab. C-3-1 Data List For Screening

Description	File Location
Excel Data for First Screening	
1. Flood Prone City/Municipality	../EXCEL/1st screening/List of 947 FPA.xls
2. Objective River Basins	../EXCEL/1st screening/List of 1164 Rivers.xls
3. Flood Damage Data from NDCC	../EXCEL/1st screening/Flood Damage Data.xls
4. Flood Casualty Data from DSWD	../EXCEL/1st screening/Flood Casualty Data.xls
5. Poverty, Production, Tropical Cyclones, Flood Damage & Its Frequency	../EXCEL/1st screening/Provincial Data.xls
6. Population	../EXCEL/1st screening/Population Data.xls
7. Flood Casualty & Its Frequency	../EXCEL/1st screening/Flood Casualty and Frequency.xls
8. Data Arrangement (Tropical Cyclone: N1)	../EXCEL/1st screening/N1_bas.xls
9. Data Arrangement (Rainfall Intensity: N2)	../EXCEL/1st screening/r25yr_bas.xls
10. Data Arrangement (River Gradient: N3)	../EXCEL/1st screening/N3.xls
11. Data Arrangement (Hazard Zone of Volcano: N4)	../EXCEL/1st screening/N4_bas.xls
	../EXCEL/1st screening/rpprov.xls
12. Data Arrangement (Poverty, Production & Flood Damage: S1, S4 & S8)	../EXCEL/1st screening/rpprov_bas.xls ../EXCEL/1st screening/rpprov_bas1.xls ../EXCEL/1st screening/rpprov_bas2.xls
13. Data Arrangement (Population & Population Movement: S2 & S3)	../EXCEL/1st screening/pop_bas1.xls
14. Data Arrangement (Forest Cover Ratio: S5)	../EXCEL/1st screening/forest_intersect.xls ../EXCEL/1st screening/forest-bas.xls ../EXCEL/1st screening/vegetation_bas.xls
15. Data Arrangement (Built-up Area Ratio: S6)	../EXCEL/1st screening/built-up_bas.xls
16. Data Arrangement (Flood Casualties & Its Frequency: S7 & N5-C)	../EXCEL/1st screening/cas_bas.xls
17. Basin Level Data	../EXCEL/1st screening/Total_07Jan20_2-Absolute_Allocation_Ave5-15-rev.xls
18. Scoring and Ranking	../EXCEL/1st screening/Scoring Result.xls
19. Sensitivity Analysis	../EXCEL/1st screening/Sensitive_1st.xls
Excel Data for Second Screening	
1. Cost Index Data	../EXCEL/2nd screening/Project Cost.xls
2. Benefit Index Calculation	../EXCEL/2nd screening/2nd Screening/flood.xls
3. Calculation of B/C & B-C	../EXCEL/2nd screening/2nd Screening/2nd_screening.xls.xls
4. Scoring and Ranking, & Sensitivity Analysis	../EXCEL/2nd screening/2nd Screening/sensitive analysis.xls
HEC-RAS	
1. HEC-RAS Simulation File ¹	
Project Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name).prj
Plan Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name).p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name).g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name).f01
2. HEC-RAS Simulation File ²	
Project Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name).prj
Plan Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name).p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name).g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name).f01
3. HEC-RAS Simulation File ³	
Project Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name).prj
Plan Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name).p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name).g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name).f01
4. HEC-RAS Simulation File ⁴	
Project Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name).prj
Plan Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name).p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name).g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name).f01
HEC-GeoRAS	
1. HEC-GeoRAS Simulation File ¹	
2. HEC-GeoRAS Simulation File ²	
3. HEC-GeoRAS Simulation File ³	
4. HEC-GeoRAS Simulation File ⁴	
Modified HEC-RAS	
1. HEC-RAS Simulation File ¹	
Project Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name)_n.prj
Plan Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name)_n.p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name)_n.g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/HECRas30May2007/(basin name)/hec/(basin name)_n.f01
2. HEC-RAS Simulation File ²	
Project Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name)_n.prj
Plan Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name)_n.p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name)_n.g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/Additional1June2007/(basin name)/hec/(basin name)_n.f01
3. HEC-RAS Simulation File ³	
Project Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name)_n.prj
Plan Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name)_n.p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name)_n.g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/Revise25June2007/(basin name)/hec/(basin name)_n.f01
4. HEC-RAS Simulation File ⁴	
Project Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name)_n.prj
Plan Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name)_n.p01
Geometry Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name)_n.g01
Steady Flow Data	../GIS_Database/Hec_Simulation_Result/HECRas23May2007/(basin name)/hec/(basin name)_n.f01
Software	
1. HEC-RAS 3.1.3	../Software/HEC-RAS313_Setup.exe
2. HEC-GeoRAS 4.1.1 (for ArcGIS 9.1 for the Model River Basins)	../Software/HEC-GeoRAS4.1.1/HEC-GeoRAS 4.1.1.exe
3. HEC-geoRAS 3.1.1 (for ArcGIS 3.2 for the Second Screening)	../Software/HEC-GeoRAS3.1.1/heccgeoras31.exe

Note) Applying to the following river basins:

- *1) Abra, Abulug, Agos, Aguang, Agus, Aklan, Alaminos, Amburayan, Amnay, Angat, Bacolod, Bac-Vintar, Bago, Balamban, Balete, Balincuguin, Bararo, Baroc, Baua, Bauang, Bicol, Bongabon, Boston, Buaya, Buayan, Buca, Cabcungan, Cagarray, Cagaya de Oro, Catarman, Catarman 1S, Daet, Daguitan, Dagupan, Daraga, Davaga, Davao, Donsol, Guinale, Hijo, Himocan, Imus, Iponon, Iyam, Jose Dalman, Kaliwa, Kapumpung, Labo, Lake Mainit, Lal-L02, Maco, Magasawang Tubig, Magbando, Malaylay, Mandulog, Mapangi, Maranding, Mataber, Mataling, Nakar2, Nakar2b, Nayam, Nitan, Padada, Pagbangan, Pagsangahan, Palanan, Pamplona, Panay, Patalan, Pola, Polomolok, Pula, Ragay, Real1, Real2, Sapang Dako, Sibuguey, Silay Santa Maria, Sipocong, Siquil, Santa Tomas, Surigao, Tagaloan, Tago, Tagum, Tayabas, Tian, Tignoan, Turnaga, Umiray
- *2) Agno, Balatukan, Bantayan, Cadacan, Cairawan, Cebu, Chico, Dalanas, Dale, Guinabasan, Jaro Aganan, Lipadas, Mananga, Meycauyan, Pampanga, Rio Chico, Sibalom, Sipalay, Talomo, Tibiao, Tuganay, Upper Agusan, Upper Marikina
- *3) Ambayawan, Banila, Guagua, Ilog-Hilabangan, Jalaud, Mindanao, Olongapo
- *4) Aringay