D. Field Survey and Selection of River Basins by the First Screening

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D. FIELD SURVEY AND SELECTION OF RIVER BASINS BY THE FIRST SCREENING

1 PREPARATION OF FIELD SURVEY

The field survey was conducted in the 100 river basins preliminary selected in the First Screening. The objectives of the field survey are to confirm the adequacy of the 100 river basins, to collect the data and information for the further screening, and to modify the 100 river basins if necessary.

The composition of the field survey teams, field survey schedule, main survey items, and survey procedure are described below.

1.1 Composition of Teams for Field Survey

The total number of the members of the field survey teams was 13, comprised of: two (2) personnel from the Study Team; four (4) personnel from the DPWH; and seven (7) personnel from the local consultant. The local consultant was employed under the supervision of the Study Team for safety reasons and due to the limited study time schedule.

Nine (9) teams conducted the field survey, as follows:

Team-1 and 2 (two teams) : one (1) member form the Study Team and two (2) members from the DPWH for each team; and

Team-A to G (seven teams): one (1) member from the local consultant for each team.

Team-1 and 2 conducted the 13 workshops at the Regional Offices of the DPWH and the field survey for 33 river basins. In addition to this, the DPWH counterpart personnel conducted three (3) workshops at Region IX, XII and ARMM. Team-A to G conducted the field survey for the remaining 67 river basins.

1.2 Schedule for Field Survey

Team-1 and 2 conducted the field survey from the middle of January to end of February 2007, and the first week of May 2007. In addition to these, the DPWH counterpart conducted the survey at Region IX, XII and ARMM in the latter half of March 2007. On the other hand, Team-A to G conducted the field survey in February 2007. The survey schedule of Team-1 and 2 is shown in Tab. D-1-1.

1.3 Main Survey Items for Field Survey

The main survey items of the field survey were: (1) river characteristics; (2) flood types; (3) flood damages; (4) existing and planned countermeasures; (5) land acquisition for structural measures; (6) existing and planned water-use facilities; and (7) related plan. The contents of these items were, as follows:

1.3.1 River Characteristics

This identified the characteristics of the river, i.e., torrential stream or meandering stream, river with bed above ground or excavated river, riverbed degradation or riverbed aggradation, and years of flood occurrence, etc.

1.3.2 Flood Types

This identified the types of floods, i.e., flash floods, overflow, inland flooding, bank erosion, or other.

1.3.3 Flood Damages

Data on the largest flood damages in the last 20 years were collected, i.e., year/month of flood occurrence, flood depth, flood duration, flood area, damaged land use, flood casualties, numbers of affected people and houses, and damage amounts, etc.

1.3.4 Existing and Planned Countermeasures

Data on the existing and planned countermeasures were collected, i.e., purpose of flood control (safety of human life, reduction of economic damages, improvement of living conditions, others), contents of non-structural measures, contents of structural measures, and financing source for structural measures, etc.

1.3.5 Land Acquisition for Structural Measures

Data on the land acquisition conditions were collected, i.e., land category of area for structural measures (private, government, other), and present land use of area for structural measures (forest, grass land, agricultural, residential, industrial, commercial, other).

1.3.6 Existing and Planned Water-use Facilities

This identified the types of existing and planned water-use facilities, i.e., intake, dam and reservoir, pump station, diversion channel or other.

1.3.7 Related Plan

This identified the kinds of related plan, i.e., land development plan, urban plan, flood control plan, water use plan, city/municipal land use plan and other.

1.4 Survey Procedure

The procedure of the field survey consisted of: (1) preparation for the survey; (2) workshop; (3) field reconnaissance; and (4) data collection. The contents of these items were, as follows:

1.4.1 Preparation for the Survey

Each team prepared necessary materials for the field survey. These materials included:

- Topographic maps covering each river basin (scale 1:50,000 and/or 1: 250,000);
- Questionnaire containing the major survey items mentioned above; and
- Workshop materials including the results of the First Screening and others.

1.4.2 Workshop

Team-1 and 2 conducted the workshop at each DPWH Regional Office to explain and discuss the progress and results of the First Screening. In this workshop, relating data/information (e.g., flood damage records, existing countermeasures, etc.) was confirmed and collected.

1.4.3 Field Reconnaissance

The teams conducted the field reconnaissance in company with the DPWH personnel from Regional or District Offices, and/or LGU personnel. Through the field reconnaissance, flood damage area was surveyed to collect data/information on flood damages, flood depth, and flood duration, etc.

1.4.4 Data Collection

The data/information confirmed in the workshop were collected from the concerned offices and through the field reconnaissance.

2 COMPILATION OF FIELD SURVEY RESULTS

This section includes: (1) discussion with Regional Offices; and (2) major findings of the field survey, as follows:

2.1 Discussion with Regional Offices

Team-1 and 2 conducted the workshops at 13 Regional Offices of the DPWH. On the other hand, the DPWH counterpart personnel conducted the workshops at Region IX, XII and ARMM.

In these workshops, the results of the First Screening (selection of 100 river basins together with the nomination of river basins for each Regional Office) were explained, and the selected 100 river basins were agreed in principle.

On the other hand, there were comments on: (1) major river basins excluded from the 100 river basins; and (2) nomination of other dangerous river basins. Details of these comments are explained below.

2.1.1 Comments on Major River Basins Excluded

Some major river basins, such as Pampanga, Agno, Pasig-Marikina-Laguna de Bay and Agusan, were excluded from the selected 100 river basins since flood control projects have already been implemented or scheduled. For these river basins, the following discussions were made:

- The regional office requested to incorporate some river basins (shown in Tab.D-2-1), which are tributaries or main streams of these river basins, but not included in the objective areas for the implementation of a flood control projects; and
- The team-1 and 2 answered the ranking of such river basins will be confirmed and decided.

Through the confirmation of high ranks of these river basins (within the top 100 ranking), 6 river basins were added to the 100 river basins. The details are shown in Tab.D-2-1.

2.1.2 Comments on Other Dangerous River Basins

The Regional Offices have own flood damage data/information, and the following discussions were made:

- The regional offices proposed that the river basins shown in Tab.D-2-2 should be included among the dangerous river basins; and
- For this comment, the team-1 and 2 requested the Regional Offices to provide additional data to show the flood damages of the above river basins, and the teams will make the decision based on such data.

Through the confirmation of the flood damage, 16 river basins were added to the 100 river basins. The details are shown in Tab.D-2-2.

2.2 Major Findings of Field Survey

The major findings of the field survey are emphasized, as follows (see Tab.D-2-5, for the detailed results of the field survey):

- 1. Findings on flood types;
- 2. Frequency of floods;
- 3. Contents of flood inundation conditions;
- 4. Present countermeasures against floods; and
- 5. Planned countermeasures against floods.

The details of these findings are described below.

2.2.1 Findings on Flood Types

Regarding flood types, the findings are on: (1) dominant flood types; (2) plural flood types; (3) composition of flood types; and (4) classification of flood types. The details of these findings are, as follows:

(1) Dominant Flood Types

The flood types are classified into the flash floods, overflow, inland flooding, bank erosion and other. Based on this classification, the flood types for each river basin are summarized, as follows:

As shown in Figure D.2.1, the most dominant flood type is overflow, followed by bank erosion, flash flood and inland flooding in this order. Especially, over flow has been detected in most of the river basins. As for the other types, those by lahar and tidal influence are notable.

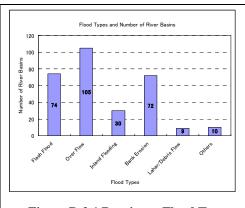


Figure D.2.1 Dominant Flood Types

(2) Plural Flood Types

The most river basins have the plural flood types (96/120). As shown in Figures D.2.2 and D.2.3, some river basins have one flood type, while other river basins have more than two types. Among these, 45 river basins out of 120 (38 %) have two types. In 6 river basins, most of flood types (5 types) are observed.

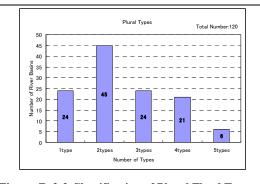
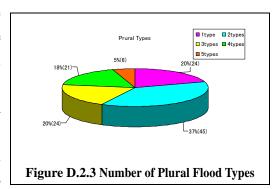


Figure D.2.2 Classification of Plural Flood Types

(3) Composition of Flood Types

The composition of plural types is shown in Figure D.2.4 (in this figure, the following abbreviations are used, F: flash flood, O: over flow, I: inland flooding, B: bank erosion, L: lahar/debris flow, Ot: others). Among these, the case of two types is dominant, and three and four types follow. In the case of two types, the dominant plural flood types are "Overflow and Bank Erosion". Even in the case of more than two



plural types, combination of "Overflow and Bank Erosion" is prominent.

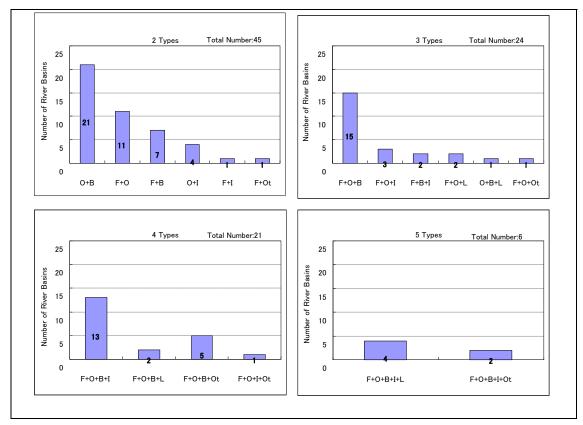


Figure D.2.4 Composition of Flood Types

(4) Classification of Flood Types

As shown in Tab.D-2-3 and Figure D.2.5, most of river basins have plural types. Among these, over flow type in combination with bank erosion and/or flash flood is dominant (F+O+B). Then, inland flooding in addition to the above combination is remarkable (F+O+B+I). Further, lahar/debris flow type is specified (F+O+B+I+L).

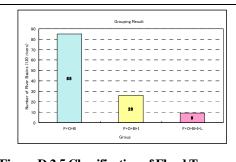


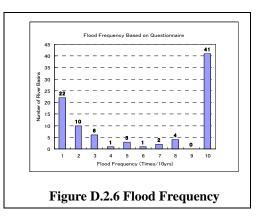
Figure D.2.5 Classification of Flood Types

2.2.2 Frequency of Floods

The findings here are regarding: (1) frequency of floods; and (2) flood casualty, as follows:

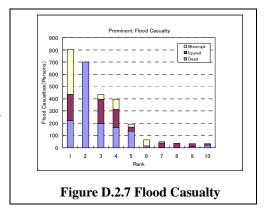
(1) Frequency of Floods

Figure D.2.6 shows that 41 river basins have experienced floods every year. This case cannot be identified from the statistical data applied to the First Screening. On the other hand, 22 river basins have experienced flood once in 10 years, and 38 river basins have less than three times in 10 years.



(2) Flood Casualty

Tab.D-2-4 and Figure D.2.7 show the flood casualties base on the questionnaire survey. The largest casualty was 806 peoples (dead 222, injured 215, missing 369) occurred at the Yawa/Basud /Quirangay River Basin, Region V, in 2006. The cause of this casualty was lahar from Mayon volcano. Other significant casualties were 700 people by flashfloods at the Daguitan-Marabong River Basin, and 436 people by overflows at the Agos River Basin.



2.2.3 Contents of Flood Inundation Conditions

In order to identify the flood inundation conditions: 1) flood duration; 2) flood depth; and 3) flood area were surveyed. The details of the conditions are, as follows:

(1) Flood Duration

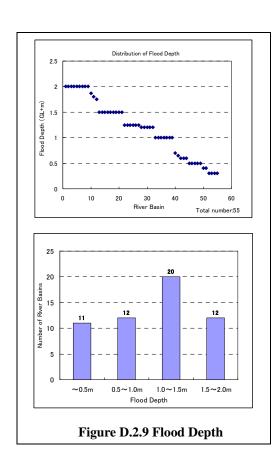
Figure D.2.8 shows the distribution of the flood duration. As shown in the figure, most of the river basins have experienced inundation of one to two days. The inundation duration in 9 among the 88 river basins is more than one week. The longest inundation duration was 30 days in the Pampanga River Basin.

(2) Flood Depth

Figure D.2.9 shows the distribution of the flood depth. As shown in the figure, the observed flood depths are in the range of 0 to 2 m. The dominant case is between 1.0 to 1.5 m.

(3) Flood Area

The collected data on this item is limited and not well arrange, hence, the survey results may not be so accurate. Figure D.2.10 shows the distribution of flood area. As far as the figure is concerned, the flood area in most cases is less than 1,000 ha, and the maximum flood area of more than 20,000 ha was detected in the Ilog-Hilabangan River Basin.



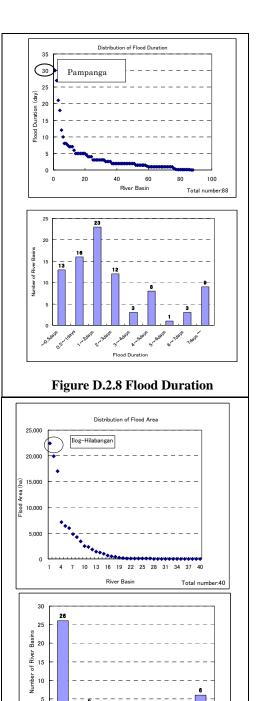


Figure D.2.10 Flood Area

2.2.4 Present Countermeasures against Floods

The survey results of the present countermeasures are summarized as: (1) general present conditions; (2) present structural measures; and (3) present non-structural measures. The details are described below.

(1) General Present Conditions

Figures D.2.11 and D.2.12 show the general conditions of the present countermeasures against floods.

As shown in the figure, 106 river basins out of 120 river basins (88%) have some countermeasures, and 80 river basins have both structural and non-structural measures. On the other hand, 14 river basins have no countermeasures.

As the financing sources for these measures, the main sources are the central or local governments, and only 46 river basins have received international fund. As the comments from the local offices, the allocated budget

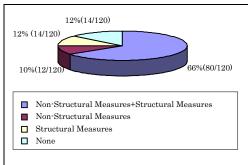
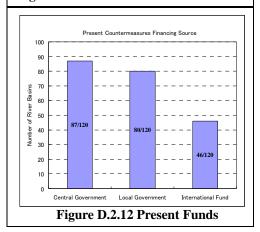


Figure D.2.11 Present Countermeasures



is not enough to cope with the flood problems, and it is expected to increase.

(2) Present Structural Measures

Figure D.2.13 shows the contents of the present structural measures. From the figure, the following conditions are identified:

- The most dominant structural measures are river improvement which covers 75 % of the total river basins.
- In some river basins, dam and/or flood way have been provided.
- Retarding pond is very few in number of river basins.

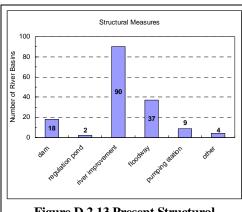
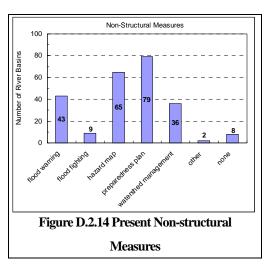


Figure D.2.13 Present Structural
Measures

(3) Present Non-structural Measures

The contents of the present non-structural measures are shown in Figure D.2.14. From the figure, the following conditions are identified:

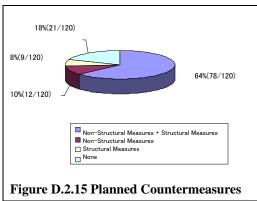
- In most of the river basins (120 river basins in total), preparedness plan including hazard map have been prepared.
- In 43 river basins, flood warning systems have been arranged, and in 36 river basins, watershed managements have been practiced.

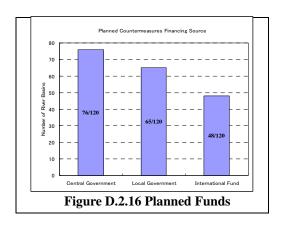


2.2.5 Planned Countermeasures against Floods

The survey results of the planned countermeasures are summarized in the same manner as the present measures.

(1) General Planned Conditions





Figures D.2.15 and D.2.16 show the general conditions of the planned countermeasures against floods.

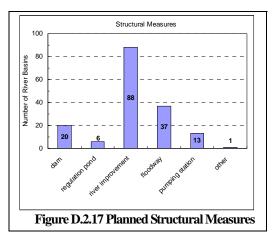
As shown in the figure, 99 river basins among 120 river basins (82%) have some plans to provide countermeasures. Especially, 78 river basins have plans to provide structural and non-structural measures. The river basins having present measures have also plans to strengthen or expand the present measures.

Regarding to the financing sources for the planned measures, the main sources are central or local governments, and only 48 river basins have plans to receive international fund.

(2) Planned Structural Measures

Figure D.2.17 shows the contents of the present structural measures. From the figure, the following conditions are identified:

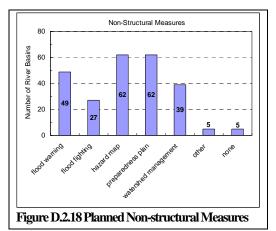
- It is planned to introduce or develop river channel improvements in most of river basins (88 river basins); and
- Some river basins have plans to introduce dam, flood way and/or regulation pond.



(3) Planned Non-structural Measures

The contents of the planned non-structural measures are shown in Figure D.2.18. From the figure, the following conditions are identified:

- Most of the river basins (124 river basins in total) have plans to introduce hazard map and/or preparedness; and
- Likewise, 49 river basins and 39 river basins have plans to introduce flood warning system and/or watershed management.



3 REVIEW OF THE FIRST SCREENING

Through the First Screening, 100 river basins are preliminarily selected. For these 100 river basins, the field survey is conducted for the verification. Based on the field survey, two river basins are judged to have less flood damage potential, and these are excluded from the 100 river basins. On the other hand, based on the discussions with the DPWH Regional Offices, the six (6) river basins regarding major river basins and 16 river basins regarding dangerous river basins are added to the 100 river basins.

As the results, a total 120 river basins (100 - 2 + 6 + 16) are identified as the objective river basins for the Second Screening. Tab.D-3-1 and Fig.D-3-1 show the list and location of these 120 river basins. The contents of the review are described below.

3.1 Preliminary Selection of 100 River Basins through the First Screening

The 100 river basins are preliminarily selected through the First Screening, and are classified into five (5) categories from the viewpoint of the guideline. The number of river basins for each category is, as follows:

Major River Basins
Dangerous River Basins
Allocated River Basins for Each Region
Allocated Principal River Basins
Allocated Other River Basins
4

In this selection, 14 major river basins are selected out of 18 major river basins, excluding the Pampanga, Agno, Pasig-Marikina-Laguna Bay and Agusan River Basins, since the flood control projects have already been implemented or scheduled to be implemented. On the other hand, 69 principal and 17 other river basins are selected.

3.2 Replacement of River Basins for those by Preliminary Selection

To confirm the adequacy of the preliminary selection of 100 river basins, field survey for the 100 river basins has been conducted. Finally, through the field survey and discussions with the DPWH regional offices, it was clarified that the following replacements among the 100 river basins were necessary:

3.2.1 Exclusion of Two River Basins

It was identified that two (2) river basins (Lubayat and Darga) have less flood damage and are not required to be provided with high priority flood control projects. The situations of these basins are explained below:

(1) Lubayat River Basin

Almost all of the Lubayat River Basin locates in Real Municipality, Quezon Province. In the First Screening, the flood casualty (S7) and flood damages (S8) of the basin were estimated based on the values of Real Municipality. However, based on the field survey, it was confirmed that there were no flood casualties and damages in the past 10 years.

This situation can be explained that the flood casualties and damages occurred in Real Municipality, but the flood area was not located in the Lubayat River Basin. However, based on the estimation method, the flood casualties and damages were distributed to the Lubayat River Basin.

(2) Daraga River Basin

The Daraga River Basin, of which location was identified from the 1/250,000 scale map, was not the actual Daraga River Basin itself. This was confirmed during the field survey using 1/50,000 scale map. Its name was the Kapantaran River Basin, and this river basin had no flood problems. On the other hand, the original Daraga River Basin is included in the Legazpi City Basin, which is one of the selected 100 river basins.

3.2.2 Inclusion of Six River Basins with regard to Major River Basin Treatment (Guideline 1)

Some river basins, such as Pampanga, Agno, Pasig-Marikina-Lagna de Bay and Agusan, are excluded, since flood control projects of these river basins have been implemented or scheduled the implementation soon. However, even in such river basins, there are areas of upstream or tributaries which are not included in the objective areas for the implementation.

The following river basins were designated as the dangerous river basins, which are upstreams or tributaries of major river basins but out of the objective areas for the above mentioned implementation. As the results, these were identified to have the necessity of inclusion judging from the severe flood damage conditions:

- Upstream of Pampanga and tributaries
- Upstream of Agno and tributaries
- Upper Marikina
- East Mangahan
- San Juan (tributaries of Pasig)
- Upper Agusan

3.2.3 Inclusion of 16 River Basins Newly Identified as Dangerous River Basins

The river basins shown in the following table are newly included in the list of dangerous river basins in accordance with the information and request from the respective Regional Offices:

Number of Classification Name of River Basin Region River Basins Cairawan, Sibalom, Dalanas, VI 6 Tibiao, Sipalay, Jaro-Aganan VII Managa, Guinabasan Principal River VIII Dale, Cadac-an 2 X Balatukan 1 ΧI Lipadas, Talomo, Tuganay 3 Ш 1 Meycauayan Other River VIII Bantayan 1 **Total** 16

Table D.3.1 List of Newly Included Dangerous River Basins

3.3 Selection of 120 River Basins through the First Screening

As the results of the First Screening, total 120 river basins have been selected as the objective river basins for the Second Screening (refer to Tab.D-3-1 and Fig.D-3-1). The composition of these 120 river basins is, as follows:

3.3.1 Viewpoint of First Screening Guideline

As the results of the replacement, the number of dangerous river basins increased by 21, while the number of allocated ones for each region decreased by one, as shown in the table below.

Table D.3.2 Types of River Basin

River Basins	Preliminary 100 River Basins	By This Replacement	Selected 120 River Basins
Major River Basin	14	No change	14
Dangerous River Basin	20	+21	41
Allocated River Basins for Each Region	47	-1	46
Allocated Principal River Basins	15	No change	15
Allocated Other River Basins	4	No change	4
Total	100		120

3.3.2 Category of River Basins

As the results of the replacement, the number of principal and other river basins increased by 19 and 1, respectively (refer to Table D.3.3).

Table D.3.3 River Basin Classification

Category of River Basins	Preliminary 100 River Basins	By This Review	Selected 120 River Basins
Major River Basin	14	No change	14
Principal River Basin	69	+19	88
Other River Basin	17	+1	18
Total	100		120

3.3.3 Regional Distribution

Through this review, all regions (including NCR) are allocated with river basins. The largest number allocated is 13 for Regions IV-A and VI. On the other hand, the smallest is two (2) for CAR and NCR. New regional distribution is shown in Tab.D-3-2.

3.3.4 Size of River Basins

The distribution of the basin sizes is shown in Tab.D-3-3. The largest and the second largest river basin numbers of basin size classes are 52 (43%) for 100-500 km² and 27 (23%) for 500-1,000 km², respectively. The average size is around 1,120km².

Tab. D-1-1 Field Survey Schedule of Team-1 and 2

Tab. D 1 11 leia bai vey benedate of 1eam 1 and 2										
Week		Team-1	Team-2							
	Region	Period	Region	Period						
1st Week	IV-A (3)	17 - 18 January	IV-A (3)	17-18 January						
2nd Week	VIII (3)	24 - 27 January	III (3)	24 - 26 January						
3rd Week	VII (3)	30 January - 2 February	I (3)	31 January - 3 February						
4th Week	VI (3)	6 - 9 February	II (3)	7 - 10 February						
5th Week	XI (3)	13 - 16 February	IV-B (3)	14 - 17 February						
6th Week	X (3)	20 - 23 February	V (3)	21 - 24 February						
7th Week XIII (0)		2 - 6 May	CAR (0)	2 - 3 May						
Total Survey Q	uantity: 13 Regi	ons and 33 River Basins								

Note: Number in parenthesis is the numbers of river basins surveyed.

Tab.D-2-1 List of River Basins Proposed by Regional Offices

Major River Basin	Tributaries/ Mainstream	Ranking	Conclusion	Remarks
	Third	-	Exclude	Locates in Guagua river basin
Pampanga	Mainstream (include Rio Chico)	17	Include	
	Toboy	-	Exclude	Locates in Patalan river basin
Agno	Mainstream (include Ambayawan, Banila Viray de Palo)	17	Include	
D . M "	Upper Marikina	21	Include	
Pasig-Marikina- Laguna de Bay	East Mangahan	44	Include	
Luguiiu de Buy	San Juan	91	Include	
Agusan	Upper Agusan	21	Include	

Tab.D-2-2 List of Dangerous River Basins Proposed by Regional Offices

140.0 2	Name of Dinger	lous River I	Da Da	onar Offices	
Region	Name of River Basins	Ranking	Casualty	Damage	Conclusion
III	Meycauayan	21	Casualty 1	35 MP	Include
IV-B	San Rafael	485			Exclude
1 V-D	Cairawan	485	10	55 MP	Include
	Sibalom	125	17	60 MP	Include
	Dalanas	957	15	240 MP	Include
VI	Tibiao	957	15	110 MP	Include
		236	5	57 MP	Include
	Sipalay Jaro-Aganan**	125	12	297 MP	Include
		349	31	297 MP 275 MP	Include
VII	Managa Sta. Ana	91	•	2/3 NIP	Exclude
VII	Guinabasan	607	35	6.25 MP	Include
	Bantayan	349	20	2.25 MP	Include
VIII	Dale	236	10	8 MP	Include
	Cadac-an	170	13	7.5 MP	Include
X	Balatukan	831	5	298 MP	Include
	Lipadas	607	2	88 MP	Include
XI	Talomo	607	30	155 MP	Include
	Tuganay	1058		14 MP	Include
	Allah	485			Exclude
	Banga	485			Exclude
3711	Bulloc	236			Exclude
XII	Small Margus	831			Exclude
	Buluan	236			Exclude
	Libungan II	485			Exclude

Note) *: Source: Questionnaire except for Jaro-Aganan.

^{**:} The data are quoted from the "Study on the Flood Control for Rivers in the Selected Urban Centers, 1995" in the form of the total amount (1982 to 1992).

^{--:} No data

Tab.D-2-3 Classification of Selected River Basin

quori	Turr	Do al	Dine Nam-				Flood			Sc	
iroup	Type	Region	River Name	Flash Flood	Over	Inland Flooding	Bank Erosion	Lahar/ Debrisflow	Other	Category	Basin A
	İ	I	SINOCALAN/MAROSOY(DAGUPAN)	Х	X		X		X(high tide)	Р	1,023
		I	PATALAN/CAYANGA/ANGALACAN BAINGCUGUIN/MABINI PANGSINAN	X	X		X		X(clogged/silted) X(clogged/silted)	P P	656 378
		I	BUAYA	X	X		X			P P	246
		1	AGNO(Include AMBAYAWAN, BANILA) NANGALISAN/BAGGAO-PARED(CAGAYAN)	X	X		X			P(D) M	5,722 27,74
		III IV-B	PAMPAMGA(include RIO CHICO)	X	X		X		X(breaching)	P(D)	8,122 400
	ı p	IV-B	MAGBANDO/BUSWANGA BAROC	X	X		X			P	162
	F+0+B	V	KABILUGAN/VELASCO/BATO LAKE(BIDOL) ILOG-HILABANGAN	X	X		X		X(confluence)	M M	2,999
	ı.	VI	PANAY/MAMBUSAO	X	x		x			М	2,311
		VIII	SIPALAY CADAC-AN	X	X		X			P(D) P(D)	336
		X	CAGAYAN DE ORO	x	x		x			M	520 1,365
		IX IX	MACO	X	X		X			P 0	642 30
		IX	LIPADAS	Х	X		Х			P(D)	163
		XII	UPPER AGUSAN TAGO	X	X		X			P(D)	1,74
		II	PAMPLONA	x	_^		x			P	698
	I _	V	DONSOL/MANLATO LABO	X			X			P(D)	413 931
	± ±	VI	AKLAN	X			X			P	1,01
	"	XI XI	TUMAGA TALOMO	X			X			P(D)	255 275
		ARMM	MATABER	X			X			Р	197
		1	ABRA AMBURAYAN		X		X			M P(D)	4,95
		i	BACARRA-VINTAR		X		X			P	1,30
		IV-A	KALIWA		X		X			P P	468
		IV-B	MAG-ASAWANG_TUBIG BONGABONG		X		X			P(D)	574
		IV-B	PULA ALAG(MALAYLAY-BACO)		X		X			P	245 508
		VI	HIMOCAAN		X		X			P	462
	Ψ.	VI VI	JARO-AGANAN COMBADO(BALAMBAN)		X		X			P(D)	46
	0	VIII	CATARMAN		X		X			P(D)	63:
_		VIII	DUNGCAAN(PAGBANGANAN) PAGSANGA-AN		X		X			ρ. α	176 511
Ψ.		IX	MAPANGI		X		×			P	1,30
H-O+E		X	TAGOLOAN MARANDING		X		X			M P	1,76
_		X	IPONAN		X		X			P	413
		XIII	PADADA_MAINIT BOSTON		X		X			P 0	1,21
		ARMM	MATALING		x		X			P	42
		+	SILAG-SANTA MARIA ALAMINOS/TAGOONG	X	X				X(high tide)	P	31 22
		IV-A	IMUS	X	X					P(D)	110
		VI	BACOLOD SAPANG DAKO	X	X					O	18
	F+0	VII	MANANGA	X	X					P(D)	86
	L L	VIII	GUINABASAN DAGUITAN-MARABONG	X	X					P(D)	13
		VIII	BANTAYAN	X	X					O(D)	88
		XI	DAVAO SILWAY-POPONG-SINAUAL(POLOMOLOK)	X	X					M O	1,99 57
		XII	SIGUEL	X	X					P	358
		II.	BARARO BANURBOUR(LAL-LO1)		X					0	193 511
		II	CLAVERIA(CABICUNGAN)		X					P	27
		- 111	MEYCAUAYAN		X					O(D)	22
			UPPER MARIKINA		X					P(D)	515
		NOR IV-B	SAN JUAN AMNAY		X					P(D) P(D)	90 495
		IV-B	BALETE		X					P	13
	0	IV-B	POLA DAET-BASUD		X					P	27
		VI	JALAUR		X					М	1,53
		X	DALE MANDULOG		X					P(D)	16: 78
		XI	BUAYAN-MALUNGUN		X					M P	1,32
		XII	TRAN SURIGAO		X					P(D)	170
		XIII	LAKE_MAINIT-TUBAY		X					P	47:
		ARMM ARMM	AGUS/BUAYAN NITUAN		X					M P	1,88 36
		IV-A	IYAM/LUCENA	X					X(flood by spillway)	P(D)	158
	ш	IV-A IV-B	LALAVINAN(REAL-2) CAGURAY	X						P	46 361
		V X	RAGAY DALATUKAN	X						P(D)	17
		X 1	ARINGAY	Х	Х	×	Х		X(high tide)	P	42
		II	PALANAN-PINACANAUAN	X	X	X	X			P	75
		III IV-A	MALUPA-DIAN(AGUANG) UMIRAY	X	X	X	X		X(confluence)	P P	62
	l _	IV-A	TIGNOAN	X	X	X	X			P	87
	F+0+B+	IV-A	KINANLIMAN(REAL-1) GENERAL NAKAR-2-(b)	X	X	X	X			0	17
	ō	VI VI	CAIRAWAN SIBALOM	X	X	X	X			P(D)	71 69
	ı.	VI	DALANAS	Х	Х	X	X			P(D)	18
Ŧ		VII.	TIBIAO SIPOCONG/STAGATALINA/GAWITAN	X	X	X	X			P(D)	72 32
m T		XII	MINDANAO	X	X	X	X			М	20,6
F+0+B+]		CAR	ABULUG BAUANG	X	X	X	X			M P	2,76
_		III	ANGAT	Х	Х	Х	^		X(high tide)	P	91
	F+O+I	IV-A IV-A	DOMACAN/TAMBAK(TAYABAS) GENERAL NAKAR-2-(a)	X	X	X				0(0)	45 37
		VII	CEBU/MANDAWE	X	X	X				O(D)	241
	F+B+I	II.	BAUA	X		X	X			P	111
	F+I	IX IX	SIBUGUEY DISAGAN-MANUKAN(JOSE DALMAN PONOT1)	X		X	X			0	27-
		IV-A	CALUMPANG(KAPUMPONG)		X	X				P(D)	44
	O+I	IV-A XI	EAST MANGAHAN TAGUM-LIBUGANON		X	X				P(D) M	2,43
		IX	TUGANAY		Х	Х				P(D)	74
		III V	SANTA RITA/KALAKLAN(OLONGAPO CITY) YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	X	X	X	X	X(lahar,detris flow) X(lahar,detris flow)		O(D)	10
Į.	F+O+B+I+L	V	QUINALE-B	X	X	X	X	X(lahar,debris flow)		P	183
Ŧ	_	X	DINAGGASAN(CATARMAN-13) BUCAO	X	X	×	X	X(lahar,debris flow) X(lahar,debris flow)		O(D) P(D)	25 664
F+O+B+(+L	Lioibir	VI	BAGO	X	X		×	X(lahar,debris flow)		P	868
-	F+O+L	III	GUAGUA SANTO TOMAS-GABOR	X	X			X(lahar,debris flow)		O(D)	1,60
			AGOS	_^	_^	_	_	X(lahar,debris flow) X(lahar,debris flow)		P(D)	334 483

Tab.D-2-4 Flood Casualty based on Questionnaire

Rank	River Name	Region	Year	Flood Casualty	Total	Flood Reason
1	Yawa/Basud/Quirangay	V	2006	Dead 222, Injured 201, Missing 369	806	Lava from Mayon Volcano
2	Daguitan-Marabong	VIII	1992	Dead 700	700	Over Flow
3	Agos	IV-A	2004	Dead 197, Injured 198, Missing 41	436	Debris Flow
4	Dinaggasan	X	2001	Dead 166, Injured 146, Missing 84	396	Pile up log Destroyed
5	Caguray	IV-B	1988	Dead 135, Injured 35, Missing 20	190	
6	Disakan-Manukan	IX	2001	Dead 15, Missing 50	65	
7	Guagua	III	2002	Injured 40, Missing 8	48	
8	Ilog-Hilabangan	VI	1990	Dead 1, Injured 36	37	
9	Guinabasan	VII	2005	Dead 10, Injured 25	35	
10	Baua	II	1989	Dead 20, Injured 15	35	

Tab.D-2-5 Field Survey Result (1/3)

_	Tab.D-2-5 Field Survey Result (1/3)															
No.	Region	River Name	Category	Basin Area			lood Caus	es	Flood Frequ	ency		Flood Information			Flo	od Casualty
140.	rtogion	Tavor Hamo	Gatagory	(km²)	Flash Flood	Over Inland flow Flooding	Bank Erosion	Other	Times of Flood During Last 20 Years	Average Flood Times	Largest Flood Year	Flood Depth	Flood Area	Flood Duration	Flood Casualities	Number of Affected People and Houses
1	I	ABRA	М	4,951		Х	Х		6 No answer	every 5 to 10 years durin every 5 to 10 years durin						
2	I	AMBURAYAN	P(D)	1,307		X X	X X		5 No answer Every time during heavy rain	every typhoon 1-2times/year	 June1998	 5-6tf	 55ha	2-3days 12-24days 2-3days	 Dead:2/Injured:3	600household
3	I	SINOCALAN/MAROSOY(DAGUPAN)	Р	1,023	X	X	Х	X(high tide)	Every time during heavy rain	5-6times/year 1time/year	2004/1999/1996 typhoon Gading Sep.1998	GL+1m 1-2m in upper area-3-5m at lower area		5-7days 5-10days	Dead:1/Injured:2	residents of 24 brgys houseC500P620/3,200Family
4	I	PATALAN/CAYANGA/ANGALACAN ARINGAY	P P	656 421	X X X	X X X X	X X X	X(clogged/silted) X(dam release) X(high tide)	5 No answer 6	1-2times/year 2times/year 2-3times/year	typhoon Gading Sep.1998 typhoon Gading Sep.1998 July2001	1-2m in lower area-1-4m at lower area 0.3-1m 7m	3.022ha 3,400ha	1-2days 1-3days 8days	Injured:3 Dead:2	houseC410P1,048/3,075Persons houseC115P305/2,949Persons
6	i I	BARARO BACARRA-VINTAR	P P	192 627		X	Х		1 Every time during heavy rain	1-2times/year	typhoon Feria July1.2001	5m 			Injured:25	houseC26P218/8,600Persons
8	I	BAIINGCUGUIN/MABINI PANGSINAN	Р	378	X	X X X	Х	X(clogged/silted)	No answer Every time during heavy rain 2	1time/year 1time/year rainy season	typhoon Gading Sep.1998 typhoon Gading Sep.1998		110ha 100ha	1day 1day 	Dead:1 	houseC86P168/1,833Persons houseC86P168/1,833Persons
9	I	SILAG-SANTA_MARIA	Р	310	Х	X		X(high tide)	None 3							
10		BUAYA ALAMINOS/TAGOONG	P P	246 221	X	X X X	X		No answer 3 2	every typhoon 1time/year 2-3times/year	typhoon Gading Sep.1998 during heavy rain	6m from original water surface	7,136ha Brgy Paniki	2days 5days		houseC9P123/2,192persons houseC50/more than 200persons
						X	X		1 No answer	2-3times/year	during typhoon and heavy rain	2-5m 	SanMariano,part of B.Solven	1-3days 2-3days		houseC100/more than 1,000persons
12	II	NANGALISAN/BAGGAO-PARED(CAGAYAN)	М	27,743	X	X	X		No answer No answer No answer		2006		Brgy Paniki,Municipality of Bagabag			
		PAMPLONA	P	698	X	x	X		No answer 4	1time/year	 1997	 5m	 17,000ha	sometimes up to 4days 3days		 houseC208P8,500/10,800persons
14 15 16	II	PALANAN-PINACANAUAN BANURBOUR(LAL-LO1)	P 0	755 511	Х	X X	Х		2 4	1-2times/year 1time/year	2005/2004 June2004	2-3m river bank+1m	380ha	1-2days 2days		houseP160/1,595persons
	II II	CLAVERIA(CABICUNGAN) BAUA GUAGUA	P P O(D)	270 118 1,605	X	X	Х	X(lahar siltation)	No answer 2 Every time during heavy rain	1time/year	1989 2002	0.5m 2m 1.87m	500ha 4,200ha	1hr 2days 27days	Dead:20/Injured:15 Injured:40/Missing:8	houseC12 houseC154P1,487/100,771persons
19	Ш	SANTA RITA/KALAKLAN(OLONGAPO CITY)	O(D)	102	X	X X	X	X(lahar siltation) X(lahar siltation)	10 10	1time/year 	Aug.1997 Aug.1997	1.6m 1.8m	9ha 15ha	1day 1day		
	<u> </u>	SANTO TOMAS-GABOR BUCAO ANGAT	P(D) P(D) P	334 664 917	X X	X X X X	Х	X(lahar siltation) X(lahar siltation) X(high tide/dam release)	10 No answer 1	1time/year 1time/year	July2006 July2006 Aug.27.2004	1.5m 1.2m 1.2m	2,498ha 1,250ha 633ha	12days 4days	Injured:14 Dead:1	houseC2,580P993/16,430persons houseC115P285/7,250persons houseC7,454/36,379persons
23 24	III	MALUPA-DIAN(AGUANG) NAYUM	P P	666 229	X	X X	Х	X(confluence of the river)	2 None		Sep.,Nov./1995,1994 	1-4m 		1day 	Dead:10	1,000persons
26	IV-A	AGOS IMUS CALUMPANG(KAPUMPONG)	P(D) P(D) P(D)	483 112 446	Х	X X X X	Х	X(debris flow)	4 No answer None	1time/year	Nov.29.2004 heavy rain	5m 1-1.5m		1day	Injured:30	houseC11P74/800persons
		IYAM/LUCENA DOMACAN/TAMBAK(TAYABAS)	P(D) O(D)	158 45	X	X		X(flood by spillway)	No answer No answer	1-2times/year 	Nov.1995 Nov.1995	3m from top of spillway 2m from ground				 houseP1/6persons
30	IV-A	UMIRAY KALIWA	P P	628 468	X	X X	X		No answer 2 No answer	1-2times/year	2005/2004	2m from floor slab 2-3m		1-2days	Dead:1	houseC148P741/889persons
32 33	IV-A IV-A	LUBAYAT TIGNOAN	P P	80 87	Х	X X	X		None 2	1-3times/year	 2005/2004	1–3m		 1day		
35	IV-A	LALAVINAN(REAL-2) KINANLIMAN(REAL-1) GENERAL NAKAR-2-(b)	0 0	46 10 17	X X X	X X	X		No answer 2 2	1-3times/year 1-3times/year 1-3times/year	2005/2004 2005/2004	1-1.5m 1-2m 1-2m		2day 1day		
37		GENERAL NAKAR-2-(a)	0 P(D)	37 495	X	X X			2 2 Every time during heavy rain	1-3times/year 1time/year	2005/2004	1-2m 1-1.5m		1day 4hrs		
39	IV-B	MAG-ASAWANG_TUBIG	P(D)	443	_	X	X		2 2		2005/2004 Dec.1988	2-5m 2-5m(GL+1.0m) 4m	Calapan area	3weeks 	 Dead:135/Injured:35/Missing:20	houseC85/500pareons
41		CAGURAY BALETE	P	361 132	_ X	X X			2 2	2-3times/year 1-3times/year 1-3times/year	Dec.1988 during heavy rain during typhoon and heavy rain	4m 1-1.5m 5m(GL+1.2m)	6,000ha 	1day 2-3days	Dead:135/Injured:35/Missing:20 Dead:1/Injured:5	houseC85/500persons houseC2,101P955/34,380persons
43	IV-B		P P	574 245		X	X		2 Every time during heavy rain		typhoon Reming Nov.30.2006	0.6m 0.6m		4days 3days		
45 46	IV-B IV-B	ALAG(MALAYLAY-BACO) MAGBANDO/BUSWANGA BAROC	P P P	505 466 162	X	X X X	X X X		Every time during heavy rain No answer 5	2times/year 3times/year	 July2001	0.5m 1.2m	 2,344ha	4days 3days	 Dead:3/Injured:9/Missing:2	 houseC156P365/2,608persons
47	IV-B	POLA	Р	140	X	X	X		Every time during heavy rain Every time during heavy rain		Nov.1995	0.4m water level is Invert of bridge girder		1-2days		 houseC6,564P1,473/50,622persons
48	٧	KABILUGAN/VELASCO/BATO LAKE(BICOL)	М	2,999	X	X	Х	X(confluence of the river) X(lahar siltation)	Every time during heavy rain Every time during heavy rain 3	every year 1time/year	Nov.1995 Nov.1995 typhoon Reming Nov.30.2006	1.5m from top slab of bridge girder 8 8.5m	 1,800ha	 0.5day	 Dead:117/Missing:162	houseC60P80/300persons
49	٧	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	O(D)	126	X	X X	Х	X(lahar siltation) X(lahar siltation)	3 2	2times/year 2times/year	typhoon Reming Nov.30.2006 typhoon Reming Nov.30.2006	3—— 3—5m	 6-8ha	 1 day	Dead:105/Injured:215/Missing:207	housesC8,545P9,833/79,089persons 6brgys
50 51	V	DONSOL/MANLATO KAPANTARAN (DARAGA)	P(D) O(D)	413 47	X		X		No answer No answer None	1-2times/year	typhoon Reming Nov.30.2006 typhoon Reming Nov.30.2006	15m from concrete wall 3m from river bed		1 day 1 day 		
52 53	V	LABO DAET-BASUD	P P	931 277	Х	Х	Х		Every time during heavy rain No answer	1time/year 1-2times/year						houseC14/70persons
54 55	v	QUINALE-B RAGAY	P P	182	X X	X X	X	X(lahar siltation)	Every time during heavy rain No answer No answer	2-3times/year	Nov.1986	2m 	268.691ha	5-7days 	Dead:3	
56	VI	ILOG-HILABANGAN	M	2,090	X	Х	Х		Every time during heavy rain 16	 5imes/year	during heavy rain Nov.1990	 8m	 22,400ha	 5days	 Dead:1/Injured:36	housesC908/78,380persons
57		JALAUR	М	1,534	Х	X	×		14 Every time during heavy rain Every time during heavy rain	5imes/year 2times/year 1-2times/year	Nov.1996 rainy season	7m 1-1.5m		4-5days 5days		
58	VI	PANAY/MAMBUSAO	М	2,311	Х	x	Ê		Every time during heavy rain No answer	1-2times/year 2times/year	rainy season	1-1.5m 1m		4-5days 		
59 60		BAGO AKLAN BACOLOD	P P 0	868 1,010 187	X X X	X	X	X(mud flow)	Every time during heavy rain Every time during heavy rain Every time during heavy rain	8times/year 1-2times/year	Nov.1991 	0.6m 0.3m from street level 1-1.5m		5days several hours 1day	Dead:5 	
62	VI	HIMOCAAN CEBU/MANDAWE	P O(D)	462 241	X	X X X	Х		Every time during heavy rain Every time during heavy rain	1-2times/year 4times/year	August28.2006	1-3m 3-4m		1-3days 3-4hrs	 Dead:6	
64 65		COMBADO(BALAMBAN) SAPANG DAKO	P P	237 169	Y	X X X X X X	Х		Every time during heavy rain 4 2	20-30times/year 15times/year 10times/year	Nov.1992 Nov.1992	0.5m 4m 5m	0.22ha 40ha 100ha	0.5day 1-2days 1day		3,500persons
66	VII	SIPOCONG/STA.CATALINA/CAWITAN	P	320	X	XXX	X		2 Every time during heavy rain	more 2 times/year	June19-20.2004	1.5m 	30ha	2days	Dead:8/Injured:9/Missing:1	houseC93P87/2,000Persons
		CATARMAN DUNGCAAN(PAGBANGANAN) DAGUITAN-MARABONG	P(D) P	632 176	_	X X	X		No answer 13	5times/year 5imes/year	Dec.2006 Dec.1972 Nov.1992	1-1.5m 	10ha	1-1.5days 2days 3days	 Dead:700	80Persons housesC250/10,000persons housesP450/4,000persons
70	VIII	PAGSANGA-AN TUMAGA	P P(D)	292 511 255	X	X	X		Every time during heavy rain No answer	4imes/year 1time/year	June-Nov.			2-3days 1day	Dead:700	nousesP430/4,000persons
72 73	IX IX	DISACAN-MANUKAN(JOSE DALMAN PONOTI) SIBUGUEY MAPANGI	0 P	274 994 1.306	X	X	X		Every time during heavy rain No answer Every time during heavy rain	1-2times/year 1-3times/year 1-3times/year	Aug.11-12.2001 1999		191ha 	3days 7days	Dead:15/Missing:50	houseP129/55persons house11,000
75		TAGOLOAN CAGAYAN DE ORO	M M	1,762 1,365	Х	X X	X		No answer Every time during heavy rain	0.25time/year 1-2times/year	1989	2m 3m		3days 1-2hours		
77 78	Х	DINAGGASAN(CATARMAN-1S) MARANDING IPONAN	0(D) P P	25 634 412	Х	XX	X	X(debris flow)	1 No answer		June5.2001	0.7m 1.5-2m	Entire Camiguin island	1 day 1 day	Dead:166/Injured:146/Missing:84 	
80 81		MANDULOG BUAYAN-MALUNGUN	P M	780 1,321		X X X	Х		4 Every time during heavy rain No answer	1time/year 1-2times/vear 	Dec.1999 	1.2m		3days 2davs 		
82	XI XI	DAVAO TAGUM-LIBUGANON PADADA MAINIT	M M P	1,992 2,434 1,216	X	X X X			No answer No answer	1time/year 1time/year	01000	1m 1.5m(field)/0.6m(road)		2-5hrs 7days(field)/2days(road)		100-200
85 86	XI	HIJO	P 0	642 30	X	X X	X		No answer Every time during heavy rain	1-2times/year 1time/year	every year during rainy season Jan.2002	1-3m 1m	 1,436ha	1-2days 2-3days		100-200persons housesC23/62,900persons
87	XII	MINDANAO TRAN SII WAY-POPONG-SINAHA! (POLIONO: 21/2)	M P O	20,673 808 577	X	X X X X X X	Х		Every time during heavy rain No answer	1-2times/year		1-6m 		1-3days 		
90 91	XII	SILWAY-POPONG-SINAUAL(POLOMOLOK) SIGUEL SURIGAO	P P(D)	358 170	X	X			None None Every time during heavy rain	1-2times/year		0.1-0.5m		 1-2hours		
92 93	XIII	TAGO LAKE_MAINIT-TUBAY	P P	1,370 473	X	X	X		Every time during heavy rain Every time during heavy rain	1-3times/year 1-2times/year		1-2m 0.1-0.5m		1-4hours 1-2hours		
94 95	ARMM	BOSTON AGUS/BUAYAN	O M	43 1,898	L	X	L X		No answer Every time during heavy rain Every time during heavy rain	1time/year 1-2times/year		0.1-0.5m 0.5m		1-2hours 6hrs		
	ARMM	MATALING NITUAN	P P	420 365		X X	X		Every time during heavy rain Every time during heavy rain	1-2times/year 1-3times/year		3m from river bed 1-2m		1-2hours 1-2days		
98 99 100	CAR	MATABER ABULUG BAUANG	P M P	197 2,766 510	X X X	X X	X X X		No answer Every time during heavy rain 6	1-2times/year 1-3times/year 2-3times/year	 July2001	2-4m(GL+0.4m) 7m		1hr 8days		
101	I	AMBAYAWAN/UMINGAN CABALISAN	P(D)	422	X	X X	X		No answer	1	July.12.2006 July.2000	60.5m(reference:60.0m) 12.5m	1000ha 150ha	2days 2days	Dead:1/Missing:1	1,500persons housesP40/2,000persons
102	I	BANILA VIRAY DE PALO	P(D)	643	X	Х	X X X		1 1 2	1 1 2	July.2000 July.2000 June-September	20.5m(reference:20m) 0.5m 3m	120ha 90ha	2days 2days 3days		housesP50/1,000persons housesP30/2,000persons
103	I	MAIN STREAM OF AGNO	P(D)	5,722	Х	Х	Х		No answer	1	July.2000 1990	42.5m(reference:42m) 41m(reference:40m)	500ha 100ha	2days 2days 2days		2000persons 1,000persons
104	III	RIO CHICO	P(D)	3,269	X X X	X X	X	X(breaching)	No answer 4 Every time during heavy rain	2 2	Aug.2004 Oct.1972	5m 2m	466.28ha 2.500ha	14days 3-5days	Dead:1/Injured:5	housesC2,030/10,150persons housesP1,500/1,500persons
						X	Х		Every time during heavy rain 2	2	Aug.2000 2004	1.5m	6,400ha 2,495ha	5days 2days		housesC11,939P14/59,659persons
105	Ш	MAIN STREAM OF PAMPANGA	P(D)	4,853	X	X	X		Every time during heavy rain	2 every5-6yrs	2004 Dec.2004	1m 2m	6,000ha 4,288ha 30ha	10days 1-2days 5days	 Dead:2/Missing:4	housesP3,000/30,000persons
					X X	Х	X	X(breaching)	10 12	1 1	Sep.1993 Sep.2006	1.8m 	3,500ha	5days 7days 30days		
	NCR	MEYCAUAYAN UPPER MARIKINA	O(D) P(D)	249 515		X		X(opening of dam,encroach	1 3	2times/year	May.2002	0.5m 	almost all brgys. exc	5days	Dead:1	housesC300P6,300/19,800persons
109	IV-A NCR VI	EAST MANGAHAN SAN JUAN JARO-AGANAN	P(D) P(D) P(D)	84 90 464		X X X X X X	X		No answer 2 No answer	2times/year						
111	VI VI	CAIRAWAN SIBALOM	P(D)	71	X	X X	X		Every time during heavy rain Every time during heavy rain	5	Oct.2006 August-November	5m 3.5m(from river bed)	20ha 12ha	5days 2days	Injured:10	housesC20P20/100persons housesP50/100-1000persons
113		DALANAS TIBIAO	P(D) P(D)	184 72	X X	X X X X X X X	X X X		Every time during heavy rain Every time during heavy rain 15	4 5 5	Oct.2006 Oct.2006 Oct.2006	5m 8m 5m	50ha 100ha 70ha	5days 10days 7days	Injured:7/Missing:10 Injured:15 Injured:15	housesC100P200/300persons housesC75P150/250persons housesC3P70/125persons
115 116	VI VII	SIPALAY MANANGA	P(D) P(D)	336 86	X	X	X		16 3	5 8	Nov.1990 1990/1995/2000	3m	4800ha 12ha	2days 2-3days	Dead:5 Dead:3/Injured:25/Missing:3	housesC215/26,112persons housesC300P150-170/80-100families
117		GUINABASAN BANTAYAN DALF	P(D) O(D) P(D)	131 89 169	X	X X			10 2 2	6 1 2	Dec./Jan./Feb 1989/2006	2-3m 6m 3m	120ha 5ha 3ha	1day 2days 2days	Dead:10/Injured:25 Injured:20 Injured:10	housesP425/3000persons housesC15P8/1000persons housesC2P1
120	VIII	CADAC-AN	P(D)	523	X	X X	Х		15 2	2	1995 1989/2006	3m 2m	5ha 10ha	2days 2days	Dead:2/Injured:10/Missing:1 Injured:10	houseC5P10/100persons houseC20P120/120families
		BALATUKAN TUGANAY LIPADAS	P(D) P(D) P(D)	221 747 163	X	X X	x		3 Every time during heavy rain 7	once every 4 yrs 2-3times/year 2	Aug.2006 Oct.2006 Jan.2001	 1m(from pavement)	37ha 75% of barangay 20ha	2days 1-2days	Dead:2/Missing:3 Dead:1/Missing:1	houseC22P10/201families houseC50P100/15persons
124 125	XI XI	TALOMO UPPER AGUSAN	P(D) P(D)	279 1,745	X	X	X		12 No answer	2-3times/year 	Jan.2001 Jan.2001 1996–2007	0.2m(below bridge girder)	30ha 19,900ha	7days 	Dead:15/Injured:15 Dead:6	houseC30P100/13persons houseC15P100/15persons house2
			_		_	_	-						_	_		_

Tab.D-2-5 Field Survey Result (2/3)

			Tab.D-2-5 Field Survey Result (2/3)																			
No. F	egion	River Name	Floo	od Damage	Damage Amount		Existin	ng Measure P		Existing	Measure		Measure Financi	ng Source	Planed	Measure F	T	Planed I	Measure		Measure Financi	ing Source
NO. 1	egion	NVO Name	Land use damage and Infrastructure damage	Infrastructure	Agriculture	Private Propertiies	Human Life	Economic Damage	Living Condition	Structural Measure	Structural Measure	Central Government	Local Government	International Fund	Human Life	Economic Damage	Living Condition	Structural Measure	Structural Measure	Central Government	Local Government	International Fund
1	I	ABRA					0	0	0	0	0	0	0		0	0	0	0	000	0	0	0
2	I	AMBURAYAN	Agriculture:rice,corn/Dike Road/Riprap/SpurDike/ProtectionWall	2.5M	 11M		0	0	00	0	000	0	0		0	0	0	0	0	0	0	
3	1	SINOCALAN/MAROSOY(DAGUPAN)	24brgys/School/Road 	3.8M 1.3M	'04:7.9M/'99:20.4M/'96:57.8M 36M 2.867M		0	0	0	0	0	0	0		0	0	0		0	0	0	0
4 5 6		PATALAN/CAYANGA/ANGALACAN ARINGAY BARARO	Road/FloodControlStructure/DrainageCanal Agricultural/Residential/Road/Bridge	34.6M	66.44M 4.68M	10M 	0	0	0	0	0	0	0		0	0	0	0	0	0	8	
	İ	BACARRA-VINTAR BAIINGCUGUIN/MABINI PANGSINAN	Road/FloodControlStructure	1.8M	3.7M		Ö	Ö		0	ŏ	0	ŏ				0	Ö	0	ŏ	0	0
9		SILAG-SANTA_MARIA	Road/FloodControlStructure/DrainageStructure DiversionDam/BridgeCollapse(BurgosBaileyBr.)	1.8M 	23M 		0	0	0	0	0	0	0			0		0	0	0	0	
10	I	BUAYA	Post (Charles Charles (Industry		 76.1M		0	Ö	0	0	0	0	0		0	0	0	0	0		0	
		ALAMINOS/TAGOONG	Road/FloodControlStructure/Irrigation Land use damage 70%	19.62M 	0.5M 		0			0	0				0	0	0	0	0	0	0	0
12	п	NANGALISAN/BAGGAO-PARED(CAGAYAN)	Crop damage																		<u> </u>	+
40		PAMPLONA	House/Crop/Road/Bridge	 13M	 15M	 37M	0	0		0	0	0	0		0	0		0	0			0
14 15	II I	PALANAN-PINACANAUAN BANURBOUR(LAL-LO1)	Bridge/ConcreteRevetment Agricultural/Road/Bridge	 5M	 3M	2M	0	0	0	0	ŏ	0	ŏ	0	0	0	0	0	0	0	0	0
16 17 18		CLAVERIA(CABICUNGAN) BAUA GUAGUA	 Agricultural/Residential/Tourism/Bridge/Dam Commercial/Residential/Industrial/Agricultural/Road/Dike	10M 343M(2000-2005)	20M 159M(2000-2005)	8M 1.25B(2000-2005)	0	0	0	0	0	0	0	0	0	0	000	0	0	0	0	0
19	ш	SANTA RITA/KALAKLAN(OLONGAPO CITY) SANTO TOMAS-GABOR	Road Commercial/Residential/Revetment/DrainageChannel			 37.5M	0	0	0000	0	0	0	0	0	0	0	000	0	0000	0		
21 22	III I	BUCAO ANGAT	Agricultural/Residential/Dike/Road/Drainage Agricultural/Residential/Dike/Road/Bridge Agricultural/Fishpond	32.9M 27.5M 	32.2M 23.6M 2.63M	21.0M	0	0	0	0	0	0	0		0	0	0	0	0	0	0	
23 24 25	Ш		Residential/Agricultural	100M 	50M 	100M 	0	0	0	0	0	0	0	0	0	0	000	000	000	8	8	0
26 27	V-A V-A	IMUS CALUMPANG(KAPUMPONG)	Built up areas/Agricultural				Ö	ŏ	0	ŏ	0	Ö	Ö	0					ŏ			
29	V-A	IYAM/LUCENA DOMACAN/TAMBAK(TAYABAS)					0	0	0	0	0	0 0 0	0	0				0	0	0	0	0
30 31 32	V-A	UMIRAY KALIWA LUBAYAT	# 6 m				0	0	0	0	0	0	0	0			0	Ō	Ō	Ô	Ô	0
33 34	V-A V-A	TIGNOAN LALAVINAN(REAL-2)	House/Agricultural/Infrastructural Forest, Agriculture				0	0	0	0	0	0	0	0	0	0	0	<u> </u>	0	0	ŏ	0
37	V-A V-A	GENERAL NAKAR-2-(b) GENERAL NAKAR-2-(a)	House/Agricultural/Infrastructural House/Agricultural/Infrastructural House/Agricultural/Infrastructural	500M 50M	100M 75M	50M 50M	0	0	0	0	0	0	0	0	0	000	0	0	000	0	0	0
38	V-B		Agricultural/Fishpond Crop/Some structure	500M	15M	200M			Ö	0	0	0	0	0	0	0	0	0	0	0	0	0
40		CAGURAY	Agricultural/Fish farm/Road/Drainage system/Houses	6M	94.5M 	10M	0	0	0	0	0	0	0		0	0	0	000	00	0	0	0
42	V-B	BONGABONG PUI A	Building/Road/SmallDam Bridge Crop/Some structure	592.1M 	67.5M 	14.6M 	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	V-B V-B	ALAG(MALAYLAY-BACO) MAGBANDO/BUSWANGA BAROC	Crop/ Sea wall Residential/Agricultural/Dike/Bridge/Spillway	 18M	 12M	 7M	0	0	0	0	0	0	0	ŏ	0	0	0	0	0	0	8	=
47	V-B	POLA	Residential/Agricultural/Dike/Bridge/Spillway Agriculture		1 Z [V]	/M 	0	J	0	8	0	0	0	0	J	J		0	0		Ŭ	
48	٧	KABILUGAN/VELASCO/BATO LAKE(BICOL)	Residential/Commercial/Agricultural/Dike/Road/Bridge	369.885M	 15.617M	 50M	0	0	0	0	0	0	0	0	0	0	0	0	0	000	0	0
49	٧ .	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	Residential/School/Dike	394.5M 20M	 5M	 5M	0	0	0	0	0	0		0	0	0	0	0	0	0		0
51	V	DONSOL/MANLATO KAPANTARAN (DARAGA)	10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.56M 0.64M 	1.82M 0.45M	3.89M 0.97M	0	0		0	0	0	0	0	0	0	0	0				
52 53 54		LABO DAET-BASUD QUINALF-B	Residential/Industrial/Commercial/Agricultural/Irrigation/Road/Bridge/School	 84M	 4.8M,	 35M	0	0	0	000	0	0	8	0	0	0	0	0	0	0		\equiv
	v	RAGAY	mandeman andate an Committee registation at a rigidout rode, directly denote				Ŭ		Ŭ	0	0	0	0	0	Ŭ		ŏ	0	0	Ö	8	8
		ILOG-HILABANGAN JALAUR	Commercial/Agricultural/Industrial/House/Bridge/Road/Telecom facility	20M	400M	5M	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
58	VI	PANAY/MAMBUSAO	Rice field Rice and Crop area/Road/Bridge				0	00	000	0	0	0	0		0	0	000	000	0	0	0	\equiv
59			Fishpond/Paddy/Sugar cane/House							ő	0	0		0	0	0	ő	ő	0	0	ŏ	0
		AKLAN BACOLOD HIMOCAAN	Built-up/Agriculture Residential/Agricultural				0	0		0	0	0	0	0	0	Ŏ	0	0	0	0	0	0
		CEBU/MANDAWE COMBADO(BALAMBAN)	Grouted Riprap/Wall/Houses Agricultural/Residential/Ricefield	 40M	 10M	 2M	0	000	0	0	0	0			0	0	000	000	0	000		0
65	VII VII	SAPANG DAKO SIPOCONG/STA.CATALINA/CAWITAN	Agricultural/Industrial/Bridge/House/Building Agricultural/Residential/Houses/Dike	80M 2M	5M 1M	2.5M 0.3M	ŏ	ŏ	00	0	ŏ	ŏ			0	0	00	0	0	0	0	
67		CATARMAN DUNGCAAN(PAGBANGANAN)	Dike				0	0	0	0	0	0	0		0	0	0	0	000	0	0	=
69 70	VIII	DAGUITAN-MARABONG PAGSANGA-AN TUMAGA	Agricultural/Bridge Agricultural/Residential/Bridges/Revetment Agriculture	8M 50M	10M 65M	6M 25M	0	8		0	0000	0	8		8	8		0	0	0	0	8
72 73	IX I	DISACAN-MANUKAN(JOSE DALMAN PONOTI) SIBUGUEY	 Crop,Infra,Livestock,Fisheries		5.57M 		0	0	0	0	0	0	0	0	0			Ō	0			
	X	MAPANGI TAGOLOAN CAGAYAN DE ORO	Agriculture/Few resident Agricultural/Residential/Commercial				0	0	0	0	0		0			0		0	0		0	=
	X	DINAGGASAN(CATARMAN-1S) MARANDING IPONAN	Agricultural/Infrastructural/Built up areas Crop/Some structure	12M 	41M 		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80 81	X XI	MANDULOG BUAYAN-MALUNGUN	95.00 95.00				0	0	0	0	0	0	0	0	0	U	0	000	0	0	0	0
83 84	XI XI	DAVAO TAGUM-LIBUGANON PADADA MAINIT	 Agricultural		 5-10M		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85 86	XI XI		Residential/Agricultural Agricultural/Residential/Road/Canal/RiverBank/Culvert Infrastructure/Agriculture/Built-up area	6.17M	13.19M	0.14M	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
88 89	XII :	TRAN SILWAY-POPONG-SINAUAL(POLOMOLOK)	Intrastructure/ Agriculture/ Built-up area Agriculture				Ĭ	Ĭ			0	0	0	0			Ĕ			0	0	0
91 92	XIII	SIGUEL SURIGAO TAGO	Fisheries/Residential Agricultural/Residential				0	0	000	0	0	0	0	0	0	0	0	0	0	0	0	
93 94	XIII	LAKE_MAINIT-TUBAY BOSTON	Agricultural/Residential Agricultural				Ö	0	0	0	Ö	0	0		0	0	0	0	0	0	0	+ = 1
96	RMM	AGUS/BUAYAN MATALING	Agricultural				0	0	8	0	8		8	_	0	0	ő	0	0	0	0	0
98 A	CAR .	NITUAN MATABER ABULUG	Agriculture Agriculture				0	0	0	0	000	0	0	0	0		0	0	0			0
100	CAR	BAUANG AMBAYAWAN/UMINGAN CABALISAN	Agricultural/Residential/Road/Bridge Agricultural/Residential Agricultural/Flood Control	80M 2.75M	1M 0.38M	2M 2M	0	0	0	0	0	0	0		0	0	Ö	0	0	0	0	ŏ
102	I	BANILA VIRAY DE PALO	, griculturar Flood Control	1.75M 2.2M	0.38M 0.16M 0.27M	2.8M 2.5M	0	Ö	0	0	0	0	Ĕ		0	0	0	0		ŏ	Ĕ	\pm
103	I	MAIN STREAM OF AGNO	Dike Agricultural/Residential	10M 10M	4M 5M	2M 3M	0	0	0	0	0	0	0	0	0	0	0	0	0			
104	Ш	RIO CHICO	Agricultural/Residential/Industrial/Road/Flood Control Agricultural/Road/Slope Protection/Bridge/revetment	3M 50-100M	2.5M 10-20M	1.9M 15-30M	8	8	0	8	8	8	0	0	0	0	8	0	0		0	0
			Road/School/Building	5,775M	40M 23,400M	 4M	00	00	0	0	ŏ	0		ŏ	0	0	0	0	ö	ŏ	0	8
105	III	MAIN STREAM OF PAMPANGA	Agricultural/Residential Agricultural/Houses Road/Bridge/River Embankment	5M 5M	8M 10M	4M 4M	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
100	III.	MEYCAHAYAN	Agricultural/Road/Bridge Agricultural/Fishpond	10M 3.5M	5M 10M	2M 2.5M	0	000	0	Ö	ŏ	0	ŏ		ŏ	ŏ O	ŏ	Ö	0	0	ŏ	
107	V-A	EAST MANGAHAN	# 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10M 	10M 	15M 	Ö	Ō	0	Ō	Ö	0	Ō		Ö	ŏ	Ō	Ö	0	Ö		0
	VI .	SAN JUAN JARO-AGANAN CAIRAWAN	 Agricultural/Residential/River Control/Bridge	 15M	 30M	 10M	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
112	VI	SIBALOM DALANAS	Agricultural/Residential/Bridge/Flood Control Structur Agricultural/River Control/Bridge	50M 20M	10M 30M 75M	5M 10M	0	0	0	0	0	0		0	0	0	0	0	0	0		0
114 115	VI VI	TIBIAO SIPALAY	Agricultural/Residential/River Control Agricultural/Residential/River Control/Bridge Agricultural/Commercial/housing/Roads/Revetments	150M 85M 5M	15M 50M	15M 10M 2M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116 117	VII VII	MANANGA GUINABASAN BANTAYAN	Agricultural/House Agricultural/Revetment/Pavement	80M-100M 5M 0.25M	100M-150M 1M 1M	60M 0.25M 1M	0	0	ŏ	0	000	0	ŏ	0	ŏ o	ŏ	0	Ö	0	Ö O	0	0
119	VIII	DALE CADAC-AN	Agricultural/Road Agricultural/Revetment/Pavement Agricultural/Commercial/Residential/Revetment	5M 3M	2M 3M	1M 1M 1.5M	0	0	0	0	0	0			0	0	00	0	00	0		
121 122	X XI	BALATUKAN TUGANAY	Agricultural Agricultural/Residential/Revetment/School/House	40M 4.85M	8M 9.148M	250T	0	0		0	0	0	0		0	0	0	0	0	0	0	
123	XI I	LIPADAS	Agricultural/Industrial/Pavement/Revetment Revetment	80M 100M	5M 50M	3M 5M	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0
		TALOMO UPPER AGUSAN	Revetment	1M	5.35M						- 0		1 0							-	-	+

Tab.D-2-5 Field Survey Result (3/3)

			Tab.D-2-5 Field Survey Result (3/3) Land For Planned Structural Measures Water-Use Facilities Related Plan																
No.	Region	River Name		Land Category		Lan	d For Planned 8		ures resent Land Us	10				Planned	Land	III an Dina	Flood Control	Water Use	City/Municipal
			Private	Government	Other	Forest	Grass Land	Agricultural	Residential	Industrial	Commercial	Other	Existing Facilities	Facilities	Development Plan	Urban Plan	Plan	Plan	City/Municipal Land Use Plan
2	I	ABRA AMBURAYAN	0	0			0 0	0	000		0		0 0	0	0	0	0	00	0
3	<u>.</u>	SINOCALAN/MAROSOY(DAGUPAN)	0	0			0	0	0	0	0		000	0	0	0	0	0	0
4	I	PATALAN/CAYANGA/ANGALACAN		0			Ĭ	Ť	Ĭ	Ŭ	Ĭ		Ĭ	Ť			0	Ĭ	
5	I I	ARINGAY BARARO	0	0			0	0						0	0	0	0	0	0
- 7 8	I	BACARRA-VINTAR BAIINGCUGUIN/MABINI PANGSINAN						0	0		0		0		0				0
9	I	SILAG-SANTA_MARIA	0	0				0	0				Ö Ö					0	0
10 11	I	BUAYA ALAMINOS/TAGOONG	0										0	0				0	
			0	0				0	00	0	0						0		0
12	II	NANGALISAN/BAGGAO-PARED(CAGAYAN)																	
13	II	PAMPLONA	0			0	0	0	0	0	0		0	0					0
14 15 16	II	PALANAN-PINACANAUAN BANURBOUR(LAL-LO1) CLAVERIA(CABICUNGAN)	0			0	0	0	000	0	0			0	0		8		0
17 18	II	BAUA GUAGUA	0	8	0	0	ŏ	ŏ	00				0	8	8	8	8	0	8
19 20	Ш	SANTA RITA/KALAKLAN(OLONGAPO CITY) SANTO TOMAS-GABOR	0						0		0		0				0		
21 22 23	III III	BUCAO ANGAT MALUPA-DIAN(AGUANG)		0		0	0	0	0		0		0		0				0
24 25	III IV-A	NAYUM AGOS	0	0		ŏ	0	0	0	0	0		0	0			8		0
27	IV-A IV-A	IMUS CALUMPANG(KAPUMPONG) IYAM/I UCFNA						000	000	000	0				0	0	0		0
29	IV-A	DOMACAN/TAMBAK(TAYABAS)	0	0				0	0	0	0				0		0		0
31 32	IV-A	UMIRAY KALIWA LUBAYAT																	Ö
33	TV-A	TIGNOAN LALAVINAN(REAL-2) KINANLIMAN(REAL-1)				0		0	0		0				0		0		0 0 0
36 37	IV-A IV-A	GENERAL NAKAR-2-(b) GENERAL NAKAR-2-(a)				0		0	0		0						0		0
39	IV-B	AMNAY MAG-ASAWANG_TUBIG	0	0				000	0	0	0		00		0	0	0		0
40	IV-B	CAGURAY BALETE	0	0		0	0	0	0				ŏ	0	ŏ		0	00	0
42 43	IV-B IV-B	BONGABONG PULA	0	0	0	J		0	0000							0	0		0
44 45	IV-B	ALAG(MALAYLAY-BACO) MAGBANDO/BUSWANGA	0	0		0	0	0	0		0		0	0			0		0
47	IV-B	POLA	0	0			ŏ	ŏ	ŏ								9		ŏ
48	٧	KABILUGAN/VELASCO/BATO LAKE(BICOL)	0	0			0	0	0	0	0						0		
49	٧	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	0	0		0	0	0	0		Ō		0	0	0	0			0
50 51	V	DONSOL/MANLATO KAPANTARAN (DARAGA)		0					0	0							0		
52 53 54	V	LABO DAET-BASUD QUINALE-B	0	0		0		000	000	0	0		0	0	0		0		0
55	v	RAGAY	0	0				0	0	0	Ŭ						0	0	0
56 57	VI VI	ILOG-HILABANGAN JALAUR	0	0		0	0	000	000	000	0		0	0	0	0	0	0	0
58	VI	PANAY/MAMBUSAO	0	0	0	0	00	000	000	000	000	0	000	0	0		0		0
59	VI	BAGO	0	0		0		0	0		0		0	0	Q		0	0	0
60 61 62	VI VI VI	AKLAN BACOLOD HIMOCAAN	0	0				000	000	0	0		0	0	0	0	0		0
63	VII	CEBU/MANDAWE COMBADO(BALAMBAN)	0	0				0	0		0		0	0	0		8		0
		SAPANG DAKO SIPOCONG/STA.CATALINA/CAWITAN	0	0	_			0	0	0		0	0		0		0		0
67 68	VIII	CATARMAN DUNGCAAN(PAGBANGANAN)	0	0	0			Ō	0		0						0		0
69	VIII	DAGUITAN-MARABONG PAGSANGA-AN TUMAGA	0	8				0	0000		0		0	0	0		0		0
72 73	IX IX	DISACAN-MANUKAN(JOSE DALMAN PONOTI) SIBUGUEY				0		0	0						0				
74 75 76	X	MAPANGI TAGOLOAN CAGAYAN DE ORO	0	0	0		0	0	000	0	0		0		0		0		0
77 78 79	X X X	DINAGGASAN(CATARMAN-1S) MARANDING IPONAN	0	0		0		0	000		00		0		0		0		0
80 81	X	MANDULOG BUAYAN-MALUNGUN						0	0		0				0				8
82 83 84	XI	DAVAO TAGUM-LIBUGANON PADADA_MAINIT	0	0				0	0						0				0
85 86	XI XI	HIJO MACO MINDANAO	0	0			0	0	000	0	0		0	0	0	0	0	0	0
88 89	XII	TRAN SILWAY-POPONG-SINAUAL(POLOMOLOK)						0	0	0	0				0				0
92	XIII	SIGUEL SURIGAO TAGO		0	0	0	0	000	000		0				0	0		0	0
93 94	XIII	LAKE MAINIT-TUBAY BOSTON		8	0	0	00	0	0						0		0		0
95 96	ARMM ARMM	AGUS/BUAYAN MATALING		0			0	0	0	0	0				0			0	0
98	ARMM	NITUAN MATABER ABULUG				0	0	0	000	0	0				0				0
100	CAR	BAUANG AMBAYAWAN/UMINGAN CABALISAN	0	0			0	00	0				0	0	ŏ	0	0	0	0
102	I	BANILA VIRAY DE PALO	0	0			000	0	0										
		MAIN STREAM OF AGNO	0	0				o o	0	0	0		0	0	0	0	0		0
		MAIN STREAM OF AGNO RIO CHICO		0				0	00	0	0								<u> </u>
			0	- 0			0	0	0		0								
105	Ш	MAIN STREAM OF PAMPANGA		0			0	0	0	0	0								
			0	0				0	0	0	0								
106 107	NCR	MEYCAUAYAN UPPER MARIKINA FAST MANGAHAN	0	0					0	0	0		0	0					0
109 110	NCR VI	EAST MANGAHAN SAN JUAN JARO-AGANAN	0	0					0	0									
111	VI VI	CAIRAWAN SIBALOM	0 0 0	0		0		0	000				0	0	0		0	0 0	
113 114	VI VI	DALANAS TIBIAO	0	0		0		0	00				0	0	0		0	000	
115 116	VI VII VII	SIPALAY MANANGA GUINABASAN	0	0			0	0	0	0	0		0	0	0		0	0	0
118 119	VIII	BANTAYAN DALE	0	0			0	0			_		0	0			0		_
120 121		CADAC-AN BALATUKAN	0	0		0	0	000	0		0		0	0			0	0 0	0
122 123 124	XI XI	TUGANAY LIPADAS TALOMO	0	0		0	0	0	0	0	0		0	0	0	0	0	_	0
125		UPPER AGUSAN													I	I	ı		

Tab.D-3-1 Selected 120 River Basins (Result of 1st Screening)

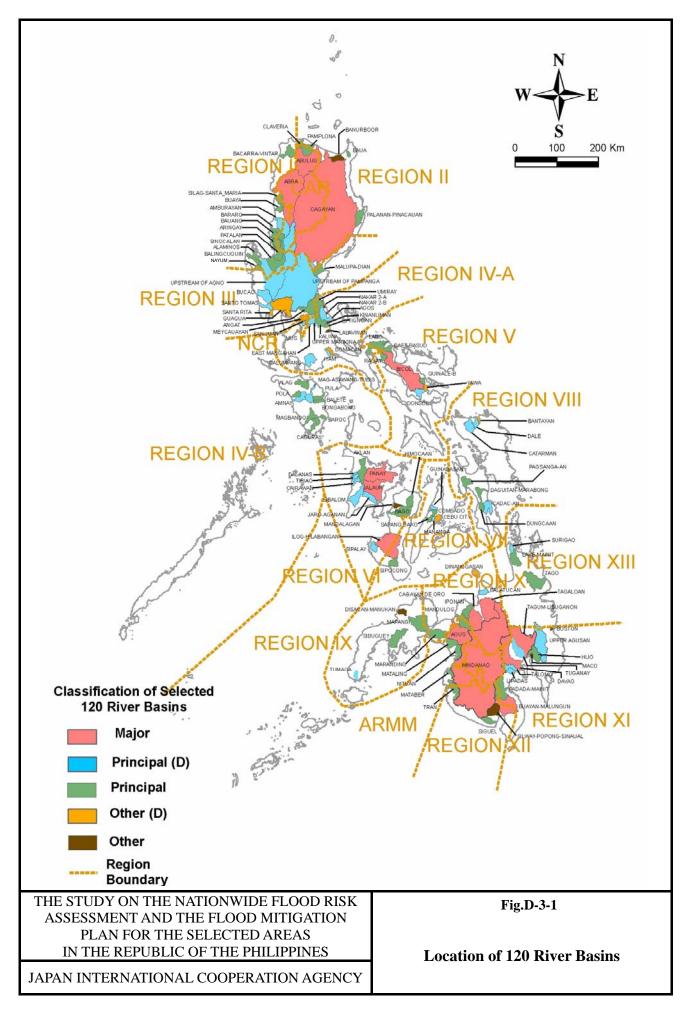
No.	River Name	Region	Basin Area	Category	1st Screen	ing Result	No.	River Name	Region	Basin Area	Category	1st Screen	ing Result
- 1.0.			(km2)	g,	Score	Rank	- 1.00			(km2)	· · · · · · · · · · · · · · · · · · ·	Score	Rank
	ABRA	I	4,951	M	52	7	61	SIBUGUEY	IX	994	P	29	349
	AMBURAYAN	I	1,307	P(D)	55	3		MAPANGI	IX	1,306	P	28	485
	SINOCALAN/MAROSOY(DAGUPAN)	I	1,023	P	53	6		TAGOLOAN	X	1,762	M	30	236
	PATALAN/CAYANGA/ANGALACAN	I	656	P	51	10		CAGAYAN DE ORO	X	1,365	M	29	349
	ARINGAY	I	421	P	51	10		DINANGGASAN(CATARMAN-1S)	X	25	O(D)	52	7
	BARARO	Į,	192	P P	37 36	59		MARANDING	X	634	P P	28 27	485
	BACARRA-VINTAR BALINGCUGUIN/MABINI PANGSINAN	_ I	627 378	P P	36	69 69		IPONAN MANDULOG	X	412 780	P	26	607 721
	SILAG-SANTA MARIA	I	3/8	P	35	81		BUAYAN-MALUNGUN	XI	1.400	M	31	170
	BUAYA	1	246	P	33	101		DAVAO	XI	1,400	M	29	349
	ALAMINOS/TAGOONG	Ť	221	P	32	125		TAGUM-LIBUGANON	XI	2,434	M	32	125
	NANGALISAN/BAGGAO-PARED(CAGAYAN)	II	27,743	M	53	6		PADADA MAINIT	XI	1,216	P	30	236
	PAMPLONA	II	698	P	37	59		HUO	XI	642	P	30	236
	PALANAN-PINACANAUAN	II	755	P	36	69		MACO	XI	30	Ö	30	236
	BANURBOUR(LAL-LO1)	II	511	0	36	69		MINDANAO	XII	20,673	M	35	81
	CLAVERIA(CABICUNGAN)	II	270	P	33	101		TRAN	XII	808	P	40	36
	BAUA	II	118	P	33	101		SILWAY-POPONG-SINAUAL(POLOMOLOK)	XII	577	0	29	349
	GUAGUA	III	1,605	O(D)	56	2		SIGUEL	XII	358	P	27	607
19	SANTA RITA/KALAKLAN(OLONGAPO CITY)	III	102	O(D)	32	125		SURIGAO	XIII	170	P(D)	30	236
20	SANTO TOMAS-GABOR	III	334	P(D)	31	170		TAGO	XIII	1,370	P	34	91
	BUCAO	III	664	P(D)	31	170		LAKE MAINIT-TUBAY	XIII	473	P	32	125
	ANGAT	III	917	P	51	10	82	BOSTON	XIII	43	0	32	125
	MALUPA-DIAN(AGUANG)	III	666	P	36	69		AMNAY	IV-B	495	P(D)	30	236
	NAYUM	III	229	P	31	170		MAG-ASAWANG TUBIG	IV-B	443	P(D)	28	485
	AGOS	IV-A	483	P(D)	37	59		CAGURAY	IV-B	361	P	45	25
	IMUS	IV-A	112	P(D)	35	81		BALETE	IV-B	132	P	40	36
	CALUMPANG(KAPUMPONG)	IV-A	446	P(D)	31	170		BONGABONG	IV-B	574	P	39	44
	IYAM/LUCENA	IV-A	158	P(D)	30	236		PULA	IV-B	245	P	35	81
	DOMACAN/TAMBAK(TAYABAS)	IV-A	45	O(D)	29	349		ALAG(MALAYLAY-BACO)	IV-B	505	P	33	101
	UMIRAY	IV-A	628	P	46	21		MAGBANDO/BUSWANGA	IV-B	466	P	33	101
	KALIWA	IV-A	468 87	P P	44 37	26 59		BAROC POLA	IV-B IV-B	162 140	P P	33 33	101 101
	TIGNOAN LALAVINAN(REAL-2)	IV-A IV-A	46	P 0	40	36		POLA AGUS/BUAYAN	ARMM	1.898	M M	33	170
	LALAVINAN(REAL-2) KINANLIMAN(REAL-1)	IV-A	10	0	40	36	9:	MATALING	ARMM	420	P P	29	349
	GENERAL NAKAR-2-(b)	IV-A	17	0	39	44		NITUAN	ARMM	365	P	28	485
	GENERAL NAKAR-2-(a)	IV-A	37	0	38	52		MATABER	ARMM	197	P	26	721
	KABILUGAN/VELASCO/BATO LAKE(BICOL)	V	2,999	M	57	1	97		CAR	2,766	M	52	7
	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	v	126	O(D)	36	69		BAUANG	CAR	510	P	49	15
	DONSOL/MANLATO	V	413	P(D)	35	81		UPSTREAM of AGNO(include AMBAYAWAN, BANILA)	I	5722	P(D)	47	17
	LABO	v	931	P P	37	59		UPSTREAM of PAMPANGA(include RIO CHICO)	ÍΠ	8122	P(D)	47	17
	DAET-BASUD	V	277	P	35	81		MEYCAUAYAN	III	154	O(D)	46	21
	QUINALE-B	V	182	P	33	101		UPPER MARIKINA	NCR	515	P(D)	46	21
43	RAGAY	V	176	P	33	101	103	EAST MANGAHAN	IV-A	84	P(D)	39	44
	ILOG-HILABANGAN	VI	2,162	M	41	33		SAN JUAN	NCR	90	P(D)	34	91
	JALAUR	VI	1,534	M	37	59		JARO-AGANAN	VI	464	P(D)	32	125
	PANAY/MAMBUSAO	VI	2,311	M	38	52		CAIRAWAN	VI	71	P(D)	28	485
	BAGO	VI	868	P	40	36		SIBALOM	VI	690	P(D)	32	125
	AKLAN	VI	1,010	P	39	44		DALANAS	VI	184	P(D)	24	957
	MANDALAGAN(BACOLOD CITY)	VI	187	0	35	81		TIBIAO	VI	72	P(D)	24	957
	HIMOCAAN	VI	462	P	36	69		SIPALAY	VI	336	P(D)	30	236
	CEBU/MANDAWE	VII	241	O(D)	31	170		MANANGA	VII	86	P(D)	29	349
	COMBADO(BALAMBAN)	VII	237	P	31	170		GUINABASAN	VII	131	P(D)	27	607
	SAPANG DAKO	VII	169	P	31	170		BANTAYAN	VIII	89	O(D)	29	349
	SIPOCONG/STA.CATALINA/CAWITAN	VII	320	P	27	607		DALE	VIII	169	P(D)	30	236
	CATARMAN	VIII	632	P(D)	31	170		CADAC-AN	VIII	523	P(D)	30	236
56	DUNGCAAN(PAGBANGANAN)	VIII	176	P P	43	28		BALATUKAN	X	221	P(D)	25	831
	DAGUITAN-MARABONG	VIII	292	P	36	69 91		TUGANAY	XI	747	P(D)	25 27	831 607
	PAGSANGA-AN	IX	511 255	P(D)	34 22	91 1121		LIPADAS TALOMO	XI XI	163 279	P(D)	27	607
	TUMAGA DISACAN-MANUKAN(JOSE DALMAN PONOTI)	IX	255	P(D)	30	236		UPPER AGUSAN	XI	1745	P(D)	46	21
UU	Major River Basin, P: Principal River Basin, O: O					230	120	JULI LIK AGUJAN	ΛI	1/43	r(D)	40	- 41

Tab.D-3-2 Regional Distribution

	1ab.D-3-2 Regional Distribution												
Regional Distribution	Preliminary 100 River Basins	By This Review	Selected 120 River Basins										
Region I	11	+1	12										
Region II	6	No change	6										
Region III	7	+2	9										
Region IV-A	13	No change	13										
Region IV-B	10	No change	10										
Region V	8	-1	7										
Region VI	7	+6	13										
Region VII	4	+2	6										
Region VIII	4	+3	7										
Region IX	4	No change	4										
Region X	6	+1	7										
Region XI	6	+4	10										
Region XII	4	No change	4										
Region XIII	4	No change	4										
Region CAR	2	No change	2										
Region ARMM	4	No change	4										
Region NCR	0	+2	2										

Tab.D-3-3 Size of River Basins

IUDID 0 0 DI	ec of farter Dubins
Size of River Basins	Selected 120 River Basins
- 100 km2	17 (14%)
100 – 500 km2	52 (43%)
500 – 1,000 km2	27 (23%)
1,000 – 5,000 km2	20 (17%)
5,000 – 10,000 km2	2 (2%)
20,000 – 30,000 km2	2 (2%)
Average	1,116



E. Grouping	and	Selection	of	Model	River	Basins

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E. GROUPING AND SELECTION OF MODEL RIVER BASINS

1 GENERAL

120 river basins are selected through the First Screening, and these 120 river basins are narrow down to 56 river basins through the Second Screening, as described in Supporting Report C.

In this Supporting Report, these selected river basins are classified into several groups considering the combinations of plural flood damage types. Following to these groups, one (1) model river basin is selected from each group, as shown in the following diagram:

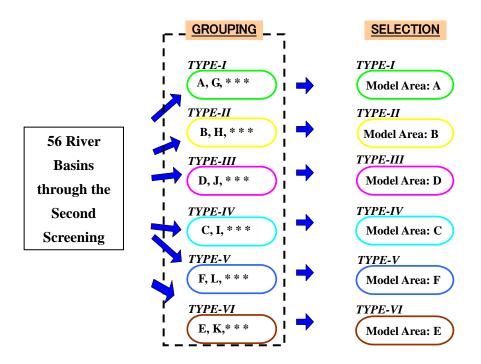


Figure E.1.1 Grouping and Selection of Model River Basins

2 GROUPING

In principle, grouping is conducted on the basis of the flood damage types. However, as identified in the field survey results (refer to Supporting Report D), most of the river basins suffer from not only one flood damage type but also combination of plural flood damage type, such as debris flow and flash flood in the upstream, bank erosion and overflow in the middle and downstream, and inland flooding in the downstream. Finally, these combinations of plural flood damage types can be classified into the following three groups:

- Group (1) Combination of flash flood type (F), overflow type (O) and/or bank erosion (B): F+O+B type for 85 river basins (some of these river basins have only one or two flood damage types);
- Group (2) Inland flood type (I) in addition to combination under the above item (1): F+O+B+I type for 26 river basins; and
- Group (3) Lahar type including debris flow (L) in addition to the combination in the above item (2): F+O+B+I+L type for 9 river basins.

Among these combinations, first combination (Group (1): F+O+B type) is dominant with 85 river basins, and the second combination (Group (2): F+O+B+I) includes 26 river basins, as shown in Figure E.2.1.

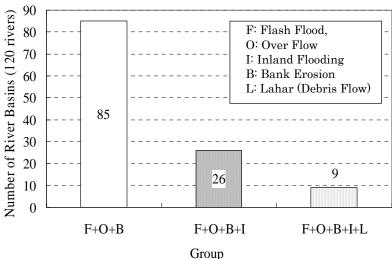
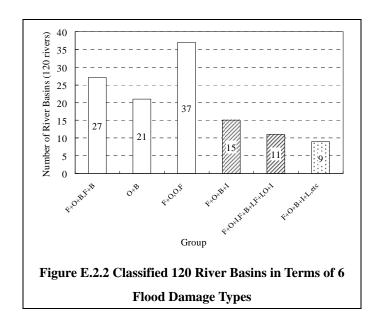


Figure E.2.1 Classified 120 River Basins in Terms of 3 Flood Damage Types

Considering the number of each combination, these first and second combinations are further classified into three (3) and two (2) combinations, respectively. Finally, six (6) groups are formulated in total, as shown in Figure E.2.2 and Tab. E-2-1.



Following to the above grouping, the selected 56 river basins are classified into the 6 groups, as shown in Tab. E-2-2.

3 SELECTION OF MODEL RIVER BASINS

Based on the Tab. E-2-2, one (1) model river basin is selected from the respective six (6) groups under the following principle:

- Two (2) model river basins are selected form each region (Luzon, Visayas and Mindanao);
- In principle high priority is given to a higher-ranking river basin; and
- Also, high priority is given to a river basin with enough data and information.

As a result, the following river basins are selected as the model river basins (refer to Table E.3.1):

Catchment Area Group Name of River Basin Region Ranking (km²)F+O+B, F+B Type Ilog-Hilabangan VI,VII (Visayas) 30 2,162 O+B Type Dungcaan VIII (Visayas) 176 47 F+O, O, F Type Meycauayan III,NCR (Luzon) 201 F+O+B+I, F+I Type Kinanliman IV-A (Luzon) 10 25 F+O+I, F+I+B, F+I Type Tuganay XI (Mindanao) 747 32 F+O+B+I+L Type 29 Dinanggasan X (Mindanao) 16

Table E.3.1 Model River Basins

The locations of the six (6) model river basins are shown in Fig. E-3-1.

Tab. E-2-1 Group Classification by Plural Flood Types

Group	No.	Type	Number
	1	F+O+B	27
	1	F+B	21
Group (1)	2	O+B	21
F+O+B		F+O	
	3	0	37
		F	
_		Sub-Total	85
	4	F+O+B+I	15
		F+O+I	
Group (2)	5	F+B+I	11
F+O+B+I		3	F+I
		O+I	
		Sub-Total	26
		F+O+B+I+L	•
Group (3)	6	F+O+B+L	9
F+O+B+I+L	Ü	F+O+L	9
		O+B+L	
		Sub-Total	9
		Total	120

Tab. E-2-2 Selected Model River Basins

Group	Grouping			Luzon			Visayas			Mindanao	Total
No.		Rank	Region	River name	Rank	Region	River name	Rank	Region	River name	Number
		5	I,CAR	PATALAN/CAYANGA/ANGALACAN	15	VI	AKLAN	12	IX	TUMAGA	
		13	Ш	UPSTREAM of PAMPANGA(include RIO CHICO)	29	VI	PANAY/MAMBUSAO(Major River Basin)	19	XI	LIPADAS	
		14	II,CAR	CAGAYAN(Major River Basin)	30	VI,VII	ILOG-HILABANGAN(Major River Basin)	27	XI	UPPER AGUSAN	
1	F+O+B/F+B	21	I	UPSTREAM of AGNO(include AMBAYAWAN,BANILA)				31	XI	TALOMO	17
1	FTOTB/FTB	23	I,CAR	SINOCALAN/MAROSOY(DAGUPAN)				68	X	CAGAYAN DE ORO(Major River Basin)	17
		24	v	BICOL(Major River Basin)				72	XIII	TAGO	
		28	v	DONSOL/MANLATO							1
		61	II,CAR	PAMPLONA							
		36	I,CAR	AMBURAYAN	47	VIII	DUNGCAAN(PAGBANGANAN)	18	X	IPONAN	
2	O+B	39	I,CAR	ABRA(Major River Basin)				44	X	TAGOLOAN(Major River Basin)	6
								108	ARMM	MATALING	
		1	NCR,IV-A	UPPER MARIKINA	9	VI	MANDALAGAN(BACOLOD CITY)	17	XI	DAVAO(Major River Basin)	
		3	NCR	SAN JUAN	22	VII	GUINABASAN	45	ARMM,X	AGUS/BUAYAN(Major River Basin)	
3	F+O/O/F	7	III,NCR	MEYCAUAYAN	42	VI	JALAUR(Major River Basin)	46	XII	SILWAY-POPONG-SINAUAL(POLOMOLOK)	15
3		11	IV-A	IMUS	67	VIII	DAGUITAN-MARABONG	74	XI,XII	BUAYAN-MALUNGUN(Major River Basin)	13
		37	IV-B	BALETE				75	XIII	LAKE_MAINIT-TUBAY	
		50	IV-B	CAGURAY							
		20	Ш	MALUPA-DIAN(DAGUPAN)				10	XII,ARMM	MINDANAO(Major River Basin)	
		25	IV-A	KINANLIMAN(REAL-1)							
4	F+O+B+I	26	CAR,II	ABULUG(Major River Basin)							6
		41	I,CAR	ARINGAY							
		43	CAR,I	BAUANG							
		2	IV-A,NCR	EAST MANGAHAN	4	VII	CEBU/MANDAWE	32	XI	TUGANAY	
5	F+O+I/F+B+I/F+I/O+I	40	Ш	ANGAT				38	XI	TAGUM-LIBUGANON(Major River Basin)	6
								104	IX	SIBUGUEY	
		6	V	YAWA/BASUD/QUIRANGAY(LEGAZPI CITY)	35	VI	BAGO	16	X	DINANGGASAN(CATARMAN-1S)	
6	F+O+B+I+L/F+O+B+L/	8	Ш	SANTA RITA/KALAKLAN(OLONGAPO CITY)							6
	F+O+L/O+B+L	33	IV-A	AGOS] "
		34	III	GUAGUA							
	Total Number			27			10			19	56

Note: Shaded row shows the selected model river basins

