フィリピン国農業用小規模ため池整備計画事前調査報告書

昭和63年4月

国際協力事業団

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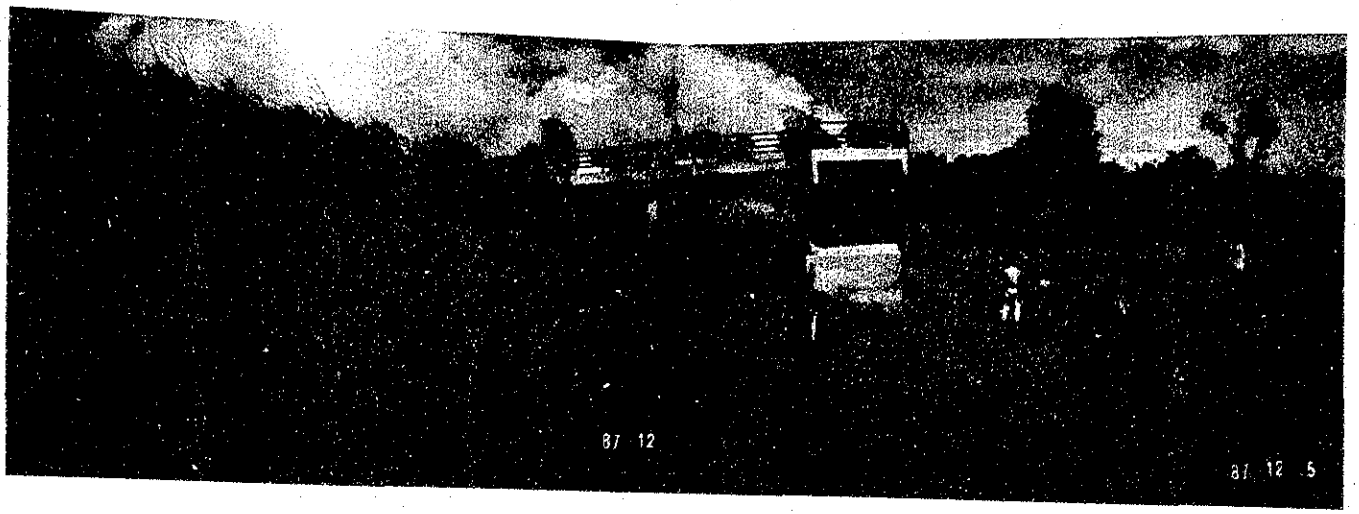
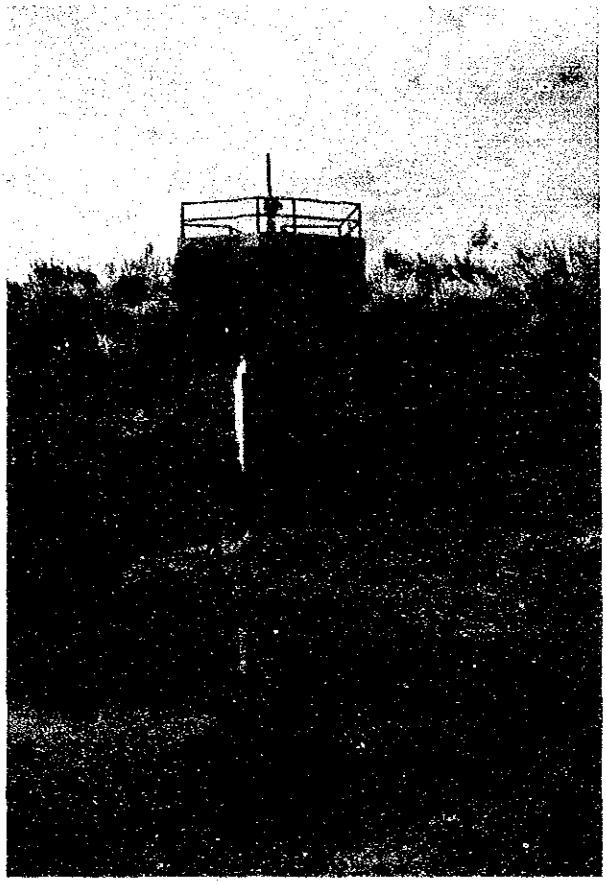
Santa Cruz ダム遠景



取水塔側面



取水塔正面

序　　文

1986年2月に誕生したアキノ政権は，同年12月「中期開発計画（1987～1992）」を発表し，①貧困の撲滅，②雇用の創出，③平等と社会正義の推進，④持続的経済成長の達成の4点を開発目標に掲げており，特に，農村・都市間の格差是正，貧困の撲滅のための農業・農村開発に積極的に取り組む姿勢を示している。

小規模溜池整備事業は，農地・水資源開発を通じ農業・農村開発を行う目的で1976年から実施されている事業であるが，中期開発計画の中で農村部の開発が重視されていること，小規模で速効性があること等の理由により小規模溜池整備事業の重要性が再認識され，フィリピン国政府は，本事業を農村部における経済活性化を図るための重要施策として積極的に推進しようとしている。

このため，フィリピン国政府は1987年6月の年次協議の際に第14次円借款による事業実施のための資金協力と同時に，円滑に事業を実施するためのマスタープラン作成についての開発調査を要請してきたものである。

この要請に基づき，国際協力事業団は1987年12月2日から11日まで(財)日本農業土木総合研究所調査研究第一部長　岩本荘太氏を団長とする事前調査団をフィリピン国に派遣し，現地調査を行うとともにフィリピン国政府関係機関と調査実施細則（I/A）に関する協議を行い，これに署名した。

本報告書は，この事前調査結果を取り纏めたものである。本報告書が，本格調査を実施するに当たっての参考資料として広く関係者に活用されることを願うものである。

最後に，調査の実施に際し，ご協力を賜ったフィリピン国及び我が国の関係機関の関係各位に対し深甚なる謝意を表する次第である。

1988年4月

国際協力事業団

理事　山極栄司

目　　次

I 序　　章

1. 要請の背景

小規模ため池整備事業（SWIM事業）は，農業用水資源開発，洪水防御，土壌保全を通じ農業・農村開発を推進することを目的として，1976年から開始された事業である。この事業制度のもとでこれまで約40カ所のため池が建設されてきた。

一方，1986年に誕生したアキノ政権は，同年12月「1987－1992中期開発計画」を発表し，①貧困の撲滅，②雇用の創出，③平等と社会正義の推進，④持続的経済成長の達成の4点を開発目標に掲げた。また具体的な開発計画の推進方向として農村部と都市部の較差是正，貧困の撲滅等の観点から農業・農村開発を重視している。この農業・農村開発の一環として，フィリピン国政府は，マルコス政権時代にスタートした小規模で，速効性のあるSWIM事業を推進することの重要性を再認識し，農村部における経済の活性化を図るための重要施策として本事業を積極的に進めようとしている。

しかしながら，事業推進にあたっては次の点に留意しなければならない。すなわち本事業の実施機関として多くの省庁が参加している。また，それぞれ各実施機関がそれぞれ多くの独自の事業候補地を有している。また，事業候補地が重複し，それぞれの機関方針に沿った事業目的が掲げられている場合もある。したがって取りあげるべき候補地を多省庁間の調整のうえで整理し，SWIM事業実施の全体計画を策定しておくことが，事業の円滑な推進のために必要となっている

フィリピン国政府は昭和62年6月の対比年次協議の席上，第14次円借款による本事業実施についての資金協力と同時に，上記の全体計画策定を目的としたマスタープラン作成についての開発調査を要請してきたものである。

2. 調査の目的

本調査の目的は，本格調査の円滑な実施に資するため次の項目についての調査と，フィリピン国政府関係者との協議を行うことである。

(1) フィリピン国政府の要請の内容及び背景の確認
(2) 建設済事業地区，計画地区の現地踏査
(3) 本格調査実施に必要な関連情報・資料の収集
(4) I/Aの協議及び議事録の交換
(5) 本格調査実施にあたっての留意事項の提言

3. 調査団の構成

団長／総括　　岩本　荘太　（財）日本農業土木総合研究所調査研究第一部長
水　利　用　　石川　　守　　農林水産省経済局国際協力課海外技術協力官

溜池計画	田尻　照久	農林水産省中国四国農政局吉井川農業水利事業所設計係長
農　　業	佐野　資郎	農林水産省東海農政局企画調整室企画官
業務調整	小原　基文	国際協力事業団農林水産計画調査部農林水産技術課

4. 主要面会者

(1) 公共事業道路省（Department of Public Works and Highways）

Teodoro T. Encarnacion	Under Secretary
Manuel M. Bonoan	Assistant Secretary
Jose C. Guanzon	Chief Civil Engineer Project Evaluation Div.
Trino-Trinidad Meris	Chief of Service Planning Service Div.
Fernando S. Nabong	Manager, PMO-SWIM
Conrado P. Escobar	Assistant Manager, PMO-SWIM
Thomas Buen	Assistant Manager, PMO-SWIM
Raul Tubianosa	Head Civil Engineer, PMO-SWIM
Lourdes Santiago	Senior Economist, PMO-SWIM

(2) 国家かんがい庁（National Irrigation Administration）

Avelino S. Rivera	Project Manager

(3) 林業開発局（*Bureau of Forest Development*）

Sergio Abuan	
Godfrey Cawis	District Forester, Baguio
Moises Bai	Forester, Conservation / Watershed, Baguio

(4) 予　算　省（Department of Budget and Management）

Romeo Q. Solis	Regional Coordination Staff

(5)

Alberto R. Dalusung Ⅲ	Planning Services

(6) 国家水資源開発委員会（National Water Resource Board）

Frances Halarie	Supervising Economist

(7) 在フィリピン日本国大使館

中条　康郎	一等書記官

(8) 海外経済協力基金

佐中　義雄	次席駐在員

(9) 国際協力事業団

大島　勝彦	フィリピン事務所次長
小沢　勝彦	〃　所員

	三　島　康　彦	かんがい排水専門家，ＮＩＡ
	川　上　俊　器	洪水防御専門家，ＤＰＷＨ
(10)	そ　の　他	
	Jose B, del Rosario, Jr	元ＮＩＡ次官

Ⅱ 調 査 結 果

1. 小規模ため池整備事業の概要

(1) 小規模ため池の定義

現在フィリピン国政府は，この事業で造成する小規模ため池を，提高30m以下，総貯水量50,000千㎥以下の規模の貯水池と定義している。

(2) 事業実施体制

小規模ため池整備事業は，1976年5月に発表された大統領令により規定された事業である。洪水防御を第一目的とし，その他，かんがい，飲料水供給，発電，養殖等を目的として含む事業として開始された。

この大統領令を補足するかたちで，同年小規模ため池事業実施体制を定める大統領令が発表された。この大統領令により政策決定，開発目標の決定，調整を行うための，次の機関の首脳から成る委員会が設立された。

公共事業省（MPW）…… 議　長
国民定住省（MHS）…… 次　長
エネルギー省（MOE）
農業省（MOA）
天然資源省（MNR）
大蔵省（MOB）

さらに，この委員会の下部組織として以下の実施機関の技術者で構成される作業部会が設立され，公共事業省内に事務局（Project Management Office：PMO−SWIM)が設置された。

国家灌漑庁（NIA）
農村組織開発公社（FSDC）
国家電力庁（NEA）
土壌局（BS）
公共事業省（MPW）
林野開発局（BFD）
その他関係機関

小規模ため池事業は，各実施機関が選定した候補地の調査費及びため池本体の建設資金をSWIMファンドが支出し，付帯施設整備資金を各事業実施機関が負担している。したがってSWIM事業としての認定や調整は上記の委員会・作業部会が行うこととなっている。

(2) 現在までの事業概要

小規模ため池整備事業の開始にともない1978年に，国家水資源開発委員会（NWRC）が関係機関の協力を得て，1/50,000地形図，航空写真等を利用して，861カ所の貯水池

候補地を選定した。

（Survey/Inventory on Water Impounding Resorvoirs, NWRC, 1978）

その後，継続して関係機関による貯水池候補地の選定が進められてきた結果，1983年9月時点で906の候補地がリストアップされるに至った。この906の候補地は，下表のとおり規模別に区分し整理されている。表によれば堤高30m以下の候補地は467カ所で，うち64カ所の貯水池が，建設済もしくは建設中である。

Overall Inventory of water-impounding projects as of September 1983.

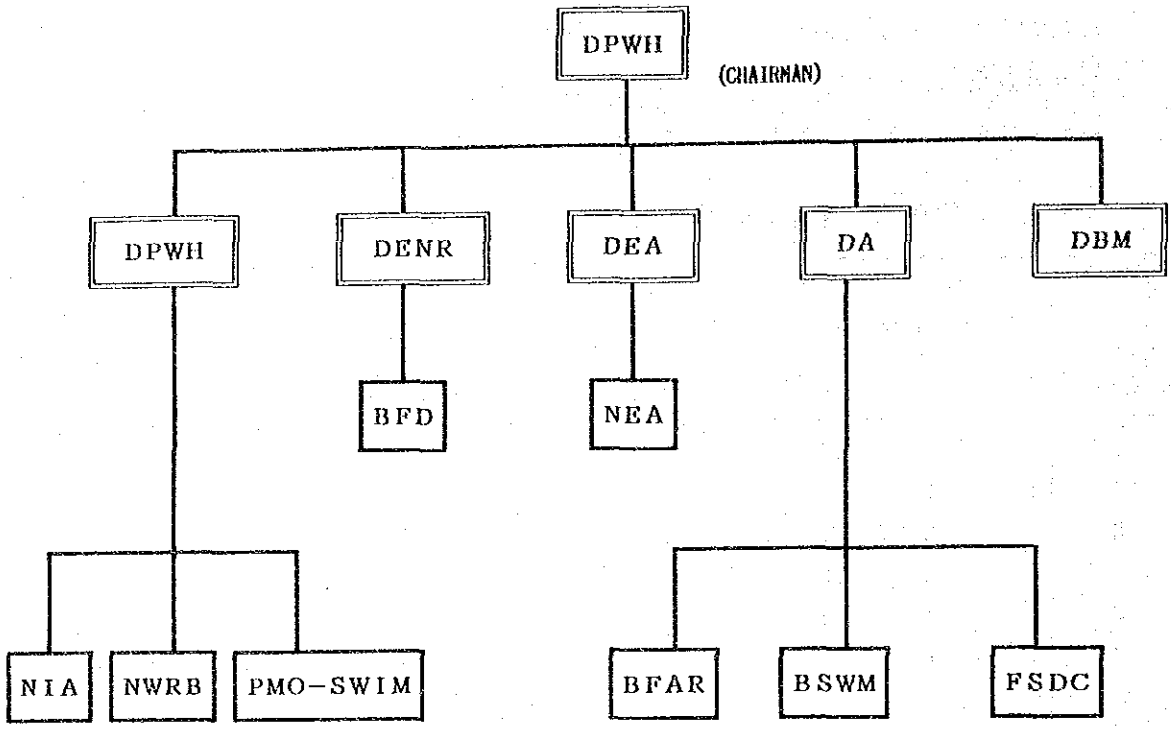
W. R. Region	Major (H>30m)					Intermediate (15>H<30m)					Small (H<15m)					Total				
	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total	A	B	C	D	Total
I		7	8	61	76			1	91	92	7	14		5	26	7	21	9	158	195
II	1	3	43	9	56			2	2	4	9		10	4	23	10	3	55	15	83
III	5	1	48	7	61	2		12	5	19	12	14	12	3	41	19	15	72	15	121
IV	1		10	44	55	1	1	1	7	10	4	5	2	6	17	6	6	13	57	82
V			4	8	12			1	3	4	7	8	5	1	21	7	8	10	12	37
VI	1	3	6	30	40			3	5	8	2	22	7	17	48	2	25	16	52	95
VII		1	4	10	15	2		3	6	11	5	22	1	9	37	7	23	8	25	63
VIII			9	22	31			2	6	8	3	24	6	9	42	3	24	17	37	81
IX		1		16	17			1	3	4	1	7	1	1	10	1	8	2	20	31
X		9	23	3	35	1			4	5	2	6		1	9	3	15	23	8	49
XI			2	17	19	1			2	3		6		1	7	1	6	2	20	29
XII		8	12	1	21	5	2		3	10		6		2	8	5	16	12	6	39
Total	8	33	169	228	438	12	3	26	137	178	52	134	44	59	289	72	170	239	424	905

A – Project Completed/Under Construction
B – Project Scheduled for Construction
C – Project Under Investigation and Study
D – Identifled Projects for Future Investigation and Study

当初フィリピン国政府は，1980－1985に426のため池建設を行い，2,740haへのかんがい用水補給と，25,330 KWの発電を行うこととした。しかし①事業実施予算の不足，②実施機関が多くの省庁の合同機関であるためプロジェクト実施にあたっての省庁間の調整と予算配分の問題，③SWIM事業として認定するための統一された審査基準の不備等により事業の円滑な実施が妨げられているのが現状である。

そこで，これらの事業実施上の障害を除き，事業の円滑な実施を図るために今回新たにSWIM運営委員会（STEERING COMMITTEE）が発足した。（図1参照）新運営委員会発足に伴い作業部会（TWG）も刷新された。

ORGANIZATIONAL STRUCTURE for SWIM PROJECT



NOTE :

Members of Steering Committee

Members of Technical Working Group-SWIM PROJECT

D P W H : Dept. of Public Works & Highways
D E N R : Dept. of Environmental Natural Resources
D E A : Dept. of Energy Affairs
D A : Dept. of Agriculture
D B M : Dept. of Budget Management
N I A : National Irrigation Administration
N W R B : National Water Resources Board
PMO-SWIM : Project Management Office - SWIM
B F D : Bureau of Forest Development
N E A : National Electrification Administration
B F A R : Bureau of Fish Aquatic Resources
B S W M : Bureau of Soils & Water Management
F S D C : Farm Systems Development Corporation

(4) 今後の事業実施予定

1978年に国家水資源開発委員会が行った貯水池候補地の選定及びその後各実施機関が行った候補地の選定の結果，現在までに相当数のため池候補地が選定されていることが確認されている。しかし事務局であるPMO－SWIMはこれら候補地の全体像を把握していないのが現状である。

このような状況の中にあって，今後の調査を効率的に進めるためには，比側がすでに選定している候補地の全体像を把握することが調査の第一歩であると認識した。そのため今回の調査の一環として，今後10年間に各機関が実施を予定している計画候補地のリストアップを依頼した。NIA, DPWH, BS, BFD, NEA から総計 209 カ所の候補地リストが提出された。（付属資料参照）

このリストには，FSDC所管の計画候補地が含まれていないので，実際には候補地数はもっと多いことと思われる。しかし，マスタープラン調査開始までにFSDCからの候補地の提示があればそれも加えて調査対象地区が決定されるが，現時点では予断を許さない。したがってマスタープラン調査の対象はこのリストに含まれるプロジェクトが中心となり，補足的に行う各機関からの聴き取りの後決定することとなろう。

なお，今後10年間の実施予定地区は調査団帰国後，比側から提出された。そのデータを大まかに分析し，簡単な考察を行った結果は以下のとおりである。

1. 資 料 総 覧

AGENCY	F/S未着手	ONGOING F / S	F/S完了	F/S D/D完了	不　明	計
NIA	34		2	15		51
DPWH			8	6	1	15
BSWM				113		113
BFD	8	7	2			17
NEA	13					13
計	55	7	12	134	1	209

2. 考察及び提案

① 比国側から要望されたプロジェクトは，総数 209 である。

② FSDC からの要望が出されていないが，問題はないのか。

③ マスタープランとして 209 プロジェクトを採用するか否かは，各AGENCY への

聞取後確定する必要がある。（特にF/S未着手分55プロジェクトについて）

④ F/F，D/D完了分の報告書の存在の有無の確認（特にNIA，DPWH，BFD）
D/D完了プロジェクトのうち施工中 or 施工済みの調査

⑤ ポストエバリュエーション
施工済みの中からの選択……成功例，失敗例，両方を採用する必要あり。

⑥ NIAからの要望のあったプロジェクトについてみると，30m以上の堤高のプロジェクトが2件あり，SWIMのカテゴリーからはずれるが，これの取り扱いを比国側と協議し，確認しなければならない。

⑦ ダムの堤高，堤長と堤体積の関係
土地改良事業計画設計基準フィルダムP99によると$V=0.56H^{2.24}\times L$ or $V=1.2H^2L$の関係が見られる。別添資料に$V=\alpha H^2L$のαの値を計算しているがかなりのバラツキがある。極端に大きな（小さな）値はデータの記入ミスによるとおもわれる。
（DPWHのNo.1，No.15，BSWMのNo.10，No.13）

⑧ 築堤単価について
工事費を築堤容積で除した単純な築堤単価について，堤高との関連性を見ようとしたが相関はうすい。極端な値についてはチェックが必要。

AGENCY NIA　　ダム高さによる並べかえ（番号はＮＩＡ提出の番号に相当する）

番号	HEIGHT (H) m	LENGTH (L) m	A=H² ×L	VOLUME (V) m³	COST ₱×10⁶ (C)	V/A	C/V
15	14.0	373.0	73108	212500.0	18.69	2.91	88
6	14.75	132.0	28718	65645.0	17.63	2.29	269
5	18.0	330.0	106920	134500.0	31.10	1.26	231
4	21.0	141.0	62181	168000.0	28.20	2.70	168
8	21.0	260.0	114660	224000.0	34.90	1.95	156
11	22.2	200.0	98568	149160.0	82.51	1.51	553
14	23.8	120.0	67973	314360.0	174.18	4.62	554
13	25.0	160.0	100000	140000.0	24.73	1.40	177
16	26.0	65.0	43940	68500.0	33.39	1.56	487
9	26.00	132.0	89232	140000.0	49.22	1.57	352
17	27.0	80.0	58320	148300.0	118.29	2.54	798
10	30.0	110.0	99000	160900.0	52.77	1.63	328
12	30.0	245.0	220500	445000.0	25.08	2.02	56
1	30.00	198.00	178200	289000.0	86.43	1.62	299
2	30.00	255.00	229500	334900.0	60.53	1.46	181
7	31.60	125.0	124820	131300.0	77.51	1.05	590
3	33.00	220.0	239580	439000.0	58.63	1.83	134

AGENCY NIA　　築堤単価による並べかえ（番号はＮＩＡ提出の番号に相当する）

番号	HEIGHT (H) m	LENGTH (L) m	A=H² ×L	VOLUME (V) m³	COST ₱×10⁵ (C)	V/A	C/V
12	30.0	245.0	220500	445000.0	25.08	2.02	56
15	14.0	373.0	73108	212500.0	18.69	2.91	88
3	33.00	220.0	239580	439000.0	58.63	1.83	134
8	21.0	260.0	114660	224000.0	34.90	1.95	156
4	21.0	141.0	62181	168000.0	28.20	2.70	168
13	25.0	160.0	100000	140000.0	24.73	1.40	177
2	30.00	255.00	229500	334900.0	60.53	1.46	181
5	18.0	330.0	106920	134500.0	31.10	1.26	231
6	14.75	132.0	28718	65645.0	17.63	2.29	269
1	30.00	198.00	178200	289000.0	86.43	1.62	299
10	30.0	110.0	99000	160900.0	52.77	1.63	328
9	26.00	132.0	89232	140000.0	49.22	1.57	352
16	26.0	65.0	43940	68500.0	33.39	1.56	487
11	22.2	200.0	98568	149160.0	82.51	1.51	553
14	23.8	120.0	67973	314360.0	174.18	4.62	554
7	31.60	125.0	124820	131300.0	77.51	1.05	590
17	27.0	80.0	58320	148300.0	118.29	2.54	798

AGENCY　DPWH　ダム高さによる並べかえ（番号はDPWH提出の番号に相当する）

番号	HEIGHT (H) m	LENGTH (L) m	A=H² ×L	VOLUME (V) m³	COST ₱×10⁶ (C)	V/A	C/V
13	16.0	58.0	14848	26860.0	10.0	1.81	372
9	16.5	70.0	19058	26800.0	7.0	1.41	261
2	17.0	320.0	92480	208600.0	25.0	2.26	120
14	17.0	254.0	73406	221643.0	26.0	3.02	117
7	18.0	130.0	42120	136400.0	40.0	3.24	293
6	18.5	180.0	61605	221643.0	27.029	3.60	122
12	18.8	180.0	63619	94300.0	30.0	1.48	318
5	19.0	120.0	43320	85130.0	15.6	1.97	183
11	22.0	129.0	62436	119500.0	33.445	1.91	280
10	23.0	195.0	103155	108100.0	25.0	1.05	231
15	23.5	117.5	64889	1240000.	42.188	19.11	34
1	24.0	163.5	94176	134.0	20.0	0.00	149254
8	25.0	153.0	95625	197000.0	40.0	2.06	203
4	28.0	115.0	90160	135680.0	40.68	1.50	300
3	29.0	1080.0	908280	2022600.	60.0	2.23	30

AGENCY　DPWH　築堤単価による並べかえ（番号はDPWH提出の番号に相当する）

番号	HEIGHT (H) m	LENGTH (L) m	A=H² ×L	VOLUME (V) m³	COST ₱×10⁶ (C)	V/A	C/V
3	29.0	1080.0	908280	2022600.	60.0	2.23	30
15	23.5	117.5	64889	1240000.	42.188	19.11	34
14	17.0	254.0	73406	221643.0	26.0	3.02	117
2	17.0	320.0	92480	208600.0	25.0	2.26	120
6	18.5	180.0	61605	221643.0	27.029	3.60	122
5	19.0	120.0	43320	85130.0	15.6	1.97	183
8	25.0	153.0	95625	197000.0	40.0	2.06	203
10	23.0	195.0	103155	108100.0	25.0	1.05	231
9	16.5	70.0	19058	26800.0	7.0	1.41	261
11	22.0	129.0	62436	119500.0	33.445	1.91	280
7	18.0	130.0	42120	136400.0	40.0	3.24	293
4	28.0	115.0	90160	135680.0	40.68	1.50	300
12	18.8	180.0	63619	94300.0	30.0	1.48	318
13	16.0	58.0	14848	26860.0	10.0	1.81	372
1	24.0	163.5	94176	134.0	20.0	0.00	149254

AGENCY BSWM　　ダムの高さによる並べかえ（番号はBSWM提出の番号に相当する）

番号	HEIGHT (H) m	LENGTH (L) m	A=H² ×L	VOLUME (V) m³	COST ₱×10⁶ (C)	V/A	C/V
10	5.0	142.5	3563	38000.0	1.793	10.67	47
94	5.5	90.0	2723	6000.0	0.933	2.20	156
50	6.0	174.0	6264	13000.0	1.071	2.08	82
77	6.0	132.0	4752	37000.0	1.870	7.79	51
14	6.5	150.0	6338	9700.0	1.136	1.53	117
59	6.8	131.0	6057	12600.0	1.085	2.08	86
99	6.85	95.0	4458	6100.0	0.701	1.37	115
17	7.0	125.0	6125	14800.0	1.157	2.42	78
19	7.0	220.0	10780	32000.0	3.501	2.97	109
20	7.0	186.0	9114	31000.0	1.519	3.40	49
53	7.0	90.0	4410	21000.0	1.408	4.76	67
60	7.0	115.0	5635	16000.0	0.953	2.84	60
63	7.0	71.0	3479	9400.0	1.103	2.70	117
88	7.0	186.0	9114	34300.0	1.886	3.76	55
92	7.0	86.0	4214	9000.0	0.739	2.14	82
112	7.0	114.0	5586	11400.0	1.029	2.04	90
87	7.5	157.0	8831	20000.0	1.277	2.26	64
28	8.0	78.0	4992	8000.0	0.81	1.60	101
29	8.0	152.0	9728	32000.0	1.863	3.29	58
75	8.0	118.5	7584	9800.0	0.778	1.29	79
76	8.0	130.0	8320	13600.0	1.098	1.63	81
90	8.0	131.0	8384	19600.0	1.221	2.34	62
113	8.0	170.0	10880	20000.0	1.78	1.84	89
41	8.4	162.0	11431	17000.0	1.056	1.49	62
58	8.5	97.0	7008	28400.0	0.971	4.05	34
108	8.5	178.0	12861	34000.0	2.11	2.64	62
39	8.7	180.8	13685	26000.0	1.536	1.90	59
56	8.8	109.5	8480	22500.0	1.221	2.65	54
22	9.0	98.0	7938	9800.0	0.813	1.23	83
44	9.0	128.0	10368	12600.0	1.358	1.22	108
54	9.0	115.0	9315	18000.0	1.237	1.93	69
93	9.0	178.5	14459	20000.0	1.265	1.38	63
57	9.2	99.0	8379	14100.0	1.03	1.68	73
106	9.2	226.0	19129	33500.0	2.299	1.75	69
62	9.4	80.0	7059	11800.0	1.061	1.67	90
27	9.5	92.0	8303	9500.0	0.973	1.14	102
30	9.5	78.8	7112	16000.0	0.999	2.25	62
51	9.5	85.0	7671	19000.0	1.136	2.48	60
78	9.5	84.0	7581	16800.0	1.244	2.22	74
79	9.5	118.0	10650	17100.0	1.04	1.61	61

89	9.5	82.0	7401	10800.0	1.095	1.46	101
102	9.5	172.0	15523	32000.0	2.022	2.06	63
25	9.51	188.0	17003	37800.0	2.061	2.22	55
52	9.65	123.0	11454	15200.0	1.241	1.33	82
13	9.7	10.6	997	15000.0	0.786	15.05	52
26	9.72	124.0	11715	14400.0	1.142	1.23	79
4	9.8	134.0	12869	23500.0	1.342	1.83	57
68	9.8	89.5	8596	11800.0	1.161	1.37	98
3	10.0	159.5	15950	31000.0	1.826	1.94	59
11	10.0	76.5	7650	11250.0	1.278	1.47	114
37	10.0	71.8	7180	11500.0	1.119	1.60	97
109	10.0	263.0	26300	48300.0	1.722	1.84	36
48	10.01	119.0	11924	28000.0	1.603	2.35	57
32	10.15	136.0	14011	22000.0	1.58	1.57	72
33	10.15	200.0	20605	42500.0	2.952	2.06	69
1	10.2	276.0	28715	30000.0	1.918	1.04	64
31	10.2	161.0	16750	33000.0	1.686	1.97	51
34	10.3	192.0	20369	42700.0	1.678	2.10	39
21	10.5	92.0	10143	21000.0	1.233	2.07	59
23	10.5	195.0	21499	34000.0	1.948	1.58	57
35	10.5	170.0	18743	29000.0	1.831	1.55	63
46	10.5	96.0	10584	19000.0	1.113	1.80	59
67	10.5	116.5	12844	17000.0	1.055	1.32	62
74	10.5	141.0	15545	30800.0	1.875	1.98	61
98	10.5	112.0	12348	24000.0	1.68	1.94	70
105	10.5	188.0	20727	39400.0	2.521	1.90	64
2	10.6	133.0	14944	31000.0	1.623	2.07	52
45	10.6	267.0	30000	38500.0	1.649	1.28	43
24	10.7	101.5	11621	17400.0	2.034	1.50	117
12	11.0	178.0	21538	53000.0	2.361	2.46	45
15	11.0	140.0	16940	33800.0	1.691	2.00	50
36	11.0	110.0	13310	28500.0	1.731	2.14	61
40	11.0	92.0	11132	15300.0	1.241	1.37	81
55	11.0	111.0	13431	36000.0	1.691	2.68	47
69	11.0	149.0	18029	26800.0	1.927	1.49	72
73	11.0	107.0	12947	33500.0	1.802	2.59	54
81	11.0	94.5	11435	20300.0	1.186	1.78	58
82	11.0	38.0	4598	15800.0	1.062	3.44	67
86	11.0	126.0	15246	12700.0	1.654	0.83	130
97	11.0	186.0	22506	41500.0	2.189	1.84	53
111	11.0	246.0	29766	55000.0	4.138	1.85	75

16	11.25	74.0	9366	18000.0	1.188	1.92	66
9	11.71	169.0	23174	32000.0	1.827	1.38	57
91	11.83	95.0	13295	18300.0	1.161	1.38	63
18	12.0	170.5	24552	55000.0	2.651	2.24	48
49	12.0	162.0	23328	34000.0	2.095	1.46	62
61	12.0	135.0	19440	24400.0	1.273	1.26	52
64	12.0	50.5	7272	10300.0	0.948	1.42	92
83	12.0	105.0	15120	26500.0	1.4	1.75	53
84	12.0	92.0	13248	17300.00	1.497	1.31	87
100	12.0	122.0	17568	43400.0	0.876	2.47	20
101	12.0	51.0	7344	11800.0	0.994	1.61	84
103	12.0	158.0	22752	47000.0	2.874	2.07	61
47	12.31	114.0	17275	38800.0	1.67	2.25	43
66	12.5	83.0	12969	14000.0	1.191	1.08	85
96	12.5	160.0	25000	58000.0	2.664	2.32	46
80	12.56	130.0	20508	20200.0	1.68	0.98	83
38	13.0	80.0	13520	21000.0	1.431	1.55	68
43	13.0	164.0	27716	43800.0	2.033	1.58	46
95	13.4	118.0	21188	41500.0	2.099	1.96	51
5	13.5	136.0	24786	32300.0	1.835	1.30	57
6	13.5	103.0	18772	27800.0	1.346	1.48	48
8	13.5	141.0	25697	51500.0	2.516	2.00	49
42	13.5	70.0	12758	23300.0	1.442	1.83	62
65	13.5	136.0	24786	24000.0	1.922	0.97	80
70	13.5	88.0	16038	19000.0	1.882	1.18	99
85	13.6	80.0	14797	19000.0	1.352	1.28	71
71	14.0	162.0	31752	45000.0	1.819	1.42	40
110	14.5	64.0	13456	19600.0	1.17	1.46	60
104	15.0	98.5	22163	43000.0	3.013	1.94	70
7	15.5	117.0	28109	46000.0	1.224	1.64	27
72	15.6	60.0	14602	26600.0	1.521	1.82	57
107	15.6	102.5	24944	39000.0	2.329	1.56	60

AGENCY BSWM　　築堤単価による並べかえ（番号はBSWM提出の番号に相当する）

番号	HEIGHT (H) m	LENGTH (L) m	A=H² ×L	VOLUME (V) m³	COST P×10⁶ (C)	V/A	C/V
100	12.0	122.0	17568	43400.0	0.876	2.47	20
7	15.5	117.0	28109	46000.0	1.224	1.64	27
58	8.5	97.0	7008	28400.0	0.971	4.05	34
109	10.0	263.0	26300	48300.0	1.722	1.84	36
34	10.3	192.0	20369	42700.0	1.678	2.10	39
71	14.0	162.0	31752	45000.0	1.819	1.42	40
45	10.6	267.0	30000	38500.0	1.649	1.28	43
47	12.31	114.0	17275	38800.0	1.67	2.25	43
12	11.0	178.0	21538	53000.0	2.361	2.46	45
96	12.5	160.0	25000	58000.0	2.664	2.32	46
43	13.0	164.0	27716	43800.0	2.033	1.58	46
55	11.0	111.0	13431	36000.0	1.691	2.68	47
10	5.0	142.5	3563	38000.0	1.793	10.67	47
18	12.0	170.5	24552	55000.0	2.651	2.24	48
6	13.5	103.0	18772	27800.0	1.346	1.48	48
8	13.5	141.0	25697	51500.0	2.516	2.00	49
20	7.0	186.0	9114	31000.0	1.519	3.40	49
15	11.0	140.0	16940	33800.0	1.691	2.00	50
31	10.2	161.0	16750	33000.0	1.686	1.97	51
95	13.4	118.0	21188	41500.0	2.099	1.96	51
77	6.0	132.0	4752	37000.0	1.870	7.79	51
2	10.6	133.0	14944	31000.0	1.623	2.07	52
61	12.0	135.0	19440	24400.0	1.273	1.26	52
13	9.7	10.6	997	15000.0	0.786	15.05	52
97	11.0	186.0	22506	41500.0	2.189	1.84	53
83	12.0	105.0	15120	26500.0	1.4	1.75	53
73	11.0	107.0	12947	33500.0	1.802	2.59	54
56	8.8	109.5	8480	22500.0	1.221	2.65	54
88	7.0	186.0	9114	34300.0	1.886	3.76	55
25	9.51	188.0	17003	37800.0	2.061	2.22	55
48	10.01	119.0	11924	28000.0	1.603	2.35	57
23	10.5	195.0	21499	34000.0	1.948	1.58	57
9	11.71	169.0	23174	32000.0	1.827	1.38	57
5	13.5	136.0	24786	32300.0	1.835	1.30	57
72	15.6	60.0	14602	26600.0	1.521	1.82	57
4	9.8	134.0	12869	23500.0	1.342	1.83	57
81	11.0	94.5	11435	20300.0	1.186	1.78	58
29	8.0	152.0	9728	32000.0	1.863	3.29	58
3	10.0	159.5	15950	31000.0	1.826	1.94	59
21	10.5	92.0	10143	21000.0	1.233	2.07	59

46	10.5	96.0	10584	19000.0	1.113	1.80	59
39	8.7	180.8	13685	28000.0	1.536	1.90	59
110	14.5	64.0	13456	19600.0	1.17	1.46	60
107	15.6	102.5	24944	39000.0	2.329	1.56	60
60	7.0	115.0	5635	16000.0	0.953	2.84	60
51	9.5	85.0	7671	19000.0	1.136	2.48	60
74	10.5	141.0	15545	30800.0	1.875	1.98	61
36	11.0	110.0	13310	28500.0	1.731	2.14	61
103	12.0	158.0	22752	47000.0	2.874	2.07	61
79	9.5	118.0	10650	17100.0	1.04	1.61	61
67	10.5	116.5	12844	17000.0	1.055	1.32	62
49	12.0	162.0	23328	34000.0	2.095	1.46	62
42	13.5	70.0	12758	23300.0	1.442	1.83	62
90	8.0	131.0	8384	19600.0	1.221	2.34	62
41	8.4	162.0	11431	17000.0	1.056	1.49	62
108	8.5	178.0	12861	34000.0	2.11	2.64	62
30	9.5	78.8	7112	16000.0	0.999	2.25	62
35	10.5	170.0	18743	29000.0	1.831	1.55	63
91	11.83	95.0	13295	18300.0	1.161	1.38	63
93	9.0	178.5	14459	20000.0	1.265	1.38	63
102	9.5	172.0	15523	32000.0	2.022	2.06	63
1	10.2	276.0	28715	30000.0	1.918	1.04	64
105	10.5	188.0	20727	39400.0	2.521	1.90	64
87	7.5	157.0	8831	20000.0	1.277	2.26	64
16	11.25	74.0	9366	18000.0	1.188	1.92	66
82	11.0	38.0	4598	15800.0	1.062	3.44	67
53	7.0	90.0	4410	21000.0	1.408	4.76	67
38	13.0	80.0	13520	21000.0	1.431	1.55	68
33	10.15	200.0	20605	42500.0	2.952	2.06	69
54	9.0	115.0	9315	18000.0	1.237	1.93	69
106	9.2	226.0	19129	33500.0	2.299	1.75	69
98	10.5	112.0	12348	24000.0	1.68	1.94	70
104	15.0	98.5	22163	43000.0	3.013	1.94	70
85	13.6	80.0	14797	19000.0	1.352	1.28	71
32	10.15	136.0	14011	22000.0	1.58	1.57	72
69	11.0	149.0	18029	26800.0	1.927	1.49	72
57	9.2	99.0	8379	14100.0	1.03	1.68	73
78	9.5	84.0	7581	16800.0	1.244	2.22	74
111	11.0	246.0	29766	55000.0	4.138	1.85	75
17	7.0	125.0	6125	14800.0	1.157	2.42	78
75	8.0	118.5	7584	9800.0	0.778	1.29	79
26	9.72	124.0	11715	14400.0	1.142	1.23	79

65	13.5	136.0	24786	24000.0	1.922	0.97	80
40	11.0	92.0	11132	15300.0	1.241	1.37	81
76	8.0	130.0	8320	13600.0	1.098	1.63	81
50	6.0	174.0	8264	13000.0	1.071	2.08	82
92	7.0	86.0	4214	9000.0	0.739	2.14	82
52	9.65	123.0	11454	15200.0	1.241	1.33	82
80	12.56	130.0	20508	20200.0	1.68	0.98	83
22	9.0	98.0	7938	9800.0	0.813	1.23	83
101	12.0	51.0	7344	11800.0	0.994	1.61	84
66	12.5	83.0	12969	14000.0	1.191	1.08	85
59	6.8	131.0	6057	12600.0	1.085	2.08	86
84	12.0	92.0	13248	17300.00	1.497	1.31	87
113	8.0	170.0	10880	20000.0	1.78	1.84	89
112	7.0	114.0	5586	11400.0	1.029	2.04	90
62	9.4	80.0	7069	11800.0	1.061	1.67	90
64	12.0	50.5	7272	10300.0	0.948	1.42	92
37	10.0	71.8	7180	11500.0	1.119	1.60	97
68	9.8	89.5	8596	11800.0	1.161	1.37	98
70	13.5	88.0	16038	19000.0	1.882	1.18	99
28	8.0	78.0	4992	8000.0	0.81	1.60	101
89	9.5	82.0	7401	10800.0	1.095	1.46	101
27	9.5	92.0	8303	9500.0	0.973	1.14	102
44	9.0	128.0	10368	12600.0	1.358	1.22	108
19	7.0	220.0	10780	32000.0	3.501	2.97	109
11	10.0	76.5	7650	11250.0	1.278	1.47	114
99	6.85	95.0	4458	6100.0	0.701	1.37	115
24	10.7	101.5	11621	17400.0	2.034	1.50	117
14	6.5	150.0	6338	9700.0	1.136	1.53	117
63	7.0	71.0	3479	9400.0	1.103	2.70	117
86	11.0	126.0	15246	12700.0	1.654	0.83	130
94	5.5	90.0	2723	6000.0	0.933	2.20	156

2. 現地踏査の結果

今回の調査では，FSDCが建設したSta，Cruzダム，及びNIAが建設を予定しているBanilaダム予定地の現地視察を行った。この2カ所の現地踏査の結果を以下に示す。

(1) Sta，Cruzダム（建設済，FSDC施工）

本ダムは，かんがいと内水面漁業を目的とする多目的ダムとして建設されている。現地調査の際の聞き取りによると，かんがい，漁業の他，レクリェーション施設としても利用されていることがわかった。内水面漁業については貯水規模が小さく，漁獲が不安定なため特定の受益権者が居るのではなく，周辺の住民が自由に利用している様子であった。かんがいについても計画では，ダム近辺の120haを対象地域としているが，現状はダムから1km以内の35haのみにかんがいが実施されているのが実情であった。

かんがいの対象作物は水稲のみであるが，かんがいによって水稲の年二期作を行っている。SWIMによるこの小規模ダムが出来る前は，水稲二期作を行う農家は5戸のみであったが，ダムが完成しかんがいができるようになって35戸に増加した。水稲の一期作目の収量は60 cavans/ha，二期作目は40 cavans/ha 程度である（1 cavan ＝もみ50kg）。

水利組合には45戸が参加しており，経営規模は最大3ha程度である。

溜池を利用したかんがい面積が計画通りとなっていない理由として，貯水容量が小さく，貯留のための水管理が行われていない，溜池からの水路が計画地域下流部に達していないなどが挙げられる。これらのことは，事業計画時点でのダム計画及び水利用計画の不備が根本にあると思われる。

ダム計画としては，集水面積，降雨量等による貯留量の確定，築堤材料の確保など，また水利用計画としては，水利用可能量からかんがい面積の算出，ダムのゲート管理等の水管理計画，水路計画の確立などが必要である。

(2) Banilaダム（計画中プロジェクト，NIA）

本ダムは，流域面積34Km²，有効貯水量270万m³，堤高30mのアースダムである。またF/Sレポート等詳しい調査報告書が整備されている。

F/Sレポートによると，本ダムは，かんがい，発電，漁業等の多目的ダムである。完成後のかんがい面積は1,685 haになる計画である。

本プロジェクトの受益地には民間電力会社の所有地があり，この土地を農地開発し，主として水稲，転換作物としてタマネギ，ニンニク，サトウキビ等を栽培することとしている。

3. 現地調査地区における問題点等

SWIMプロジェクト対象地区が全国にわたり，数も膨大である上事業形体も多様なものであるのに対し，今回の現地調査地区は実施済のもの1地区と計画地区1地区のみであった。これをもって全体的結論は述べ難いが，今回の現地調査の印象として，次の点がSWIM計画の問題点としてあげられる。即ち，ダムの整備とあわせて行うべき水路等周辺施設の整備，

適作物，技術の導入，水管理・作付計画等の適正な営農計画等が伴っておらず，地域の持つポテンシャルが充分発揮されていないように感じられた。

したがって，SWIMプロジェクトが充分な効果を発揮するためには，計画段階からダム整備を中心として，周辺施設整備，営農計画策定，技術導入・普及教育，農民の組織化等，ハード・ソフト両面での総合的な地域開発計画としていくことが望ましい。また，このためには，計画策定時に充分な調査が行われる必要があろう。

4. 提言及び留意事項

マスタープラン調査の実施手順は別紙のとおりであるが，各段階における留意点を次に述べる。

(1) インベントリー調査

資 料 総 覧

AGENCY	F/S未着手	ONGOING F / S	F/S完了	F/S D/D完了	不 明	計
NIA	34		2	15		51
DPWH			8	6	1	15
BSWM				113		113
BFD	8	7	2			17
NEA	13					13
計	55	7	12	134	1	209

① 比国側から今回要望されたプロジェクトは，総数209である。

② FSDCからの要望が出されていないが，問題はないのか。

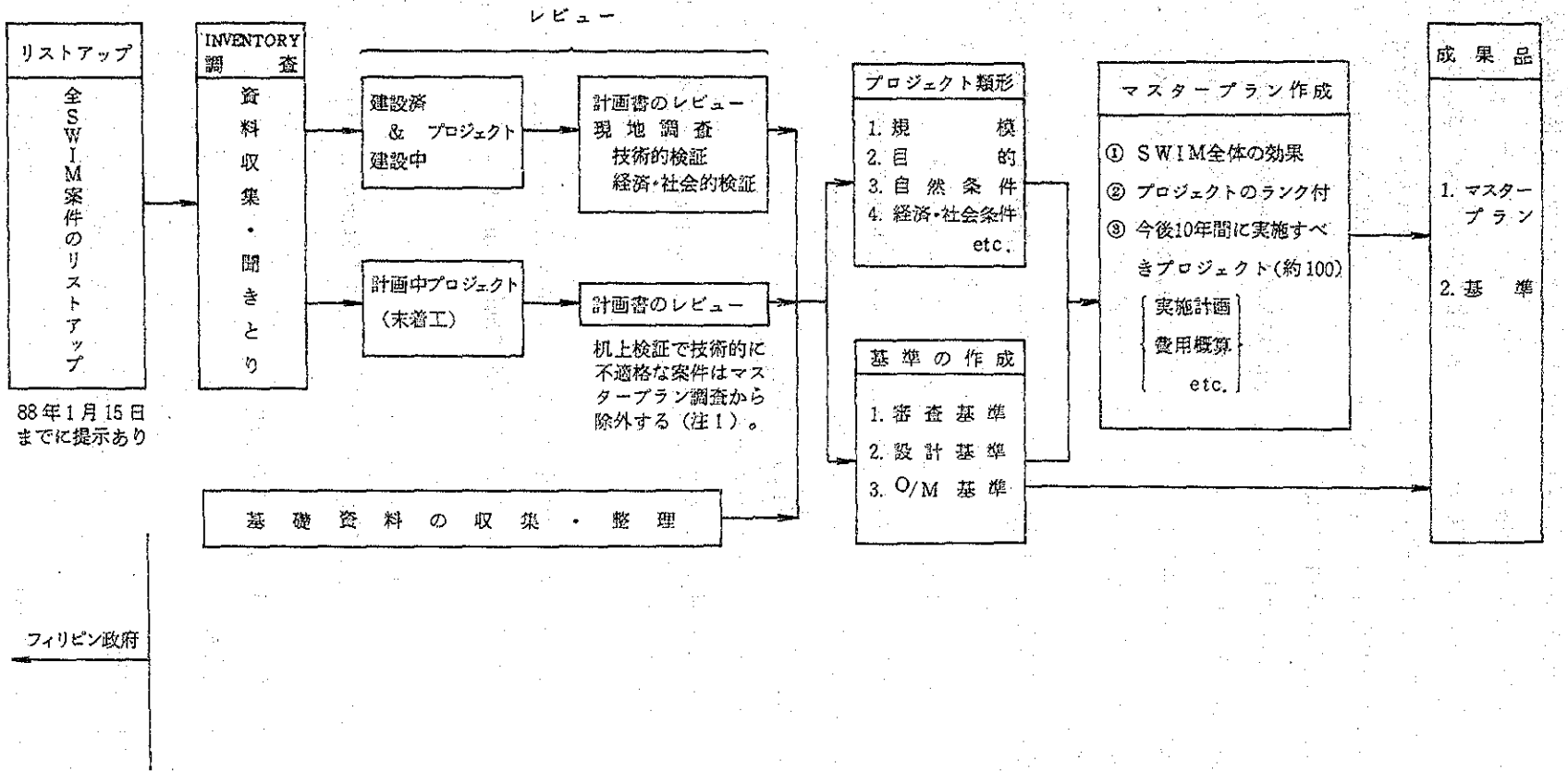
③ マスタープランとして209プロジェクトを採用するか否かは，各AGENCYへの聞取後確定する必要がある。（特にF/S未着手分55プロジェクトについて）

④ F/F，D/D完了分の報告書の存在の有無の確認（特にNIA，DPWH，BFD）

⑤ D/D完了プロジェクトのうち施工中or施工済みの調査

⑥ SWIM全体の効果測定が可能となる指標の検討，作成（ハード&ソフト両面）

⑦ NIAからの要望のあったプロジェクトについてみると，30m以上の堤高のプロジェクトが2件あり，SWIMのカテゴリーからはずれるが，これの取り扱いを比国側と協議し，確認しなければならない。



（注1）データが不明確or明らかに
計画に間違いが見うけられる場合

(2) 既存計画のレビュー

① インベントリー調査後確定したプロジェクト（マスタープラン調査の対象とする）全部について，内業を主として実施する。

② 計画で考慮している要素，使用データ，計画立案手法の妥当性等の検討を行う。

③ SWIMプロジェクトは多目的プロジェクトである為，かんがいと発電等，各利用目的相互の水利用計画の整合性のチェックを行う。

④ ダムの堤高，堤長と堤体積の関係

土地改良事業計画設計基準フィルダムP99によると$V=0.56H^{2.24}\times L$ or $V=1.2H^2L$ の関係が見られる。別添資料に$V=\alpha H^2L$のαの値を計算しているがかなりのバラツキがある。極端に大きな（小さな）値はデータの記入ミスによるとおもわれる。（DPWHのNo.1，No.15，BSWMのNo.10，No.13）

⑤ 築堤単価について

工事費を築堤容積で除した単純な築堤単価について，堤高との関連性を見ようとしたが相関はうすい。極端な値についてはチェックが必要。

(3) ポストエバリュエーション

① 施工済プロジェクトのうち，F/S，D/Dレポートの入手可能な計画の中から選択する。（成功例，失敗例両方を採用する必要あり）

② 出来る限り，各AGENCYから選択すること。

③ 調査プロジェクト数は，約20程度とする。

④ 現地調査（聴き取り調査含む）が多くなるため，現地調査用チェックリストを作成する等，効率的に実施すること。

(4) プロジェクト類型化

規模，目的，自然条件等により類型化するが，かんがい目的のものについては，更に，自給作物地域か，換金作物地域か，主要作物の種類別等で類型化することも検討する必要があろう。

(5) 指針の作成

プロジェクト実施のための必要最低限のものとし，多くは期待しない。

① 審査指針

SWIM事業としての資格審査基準の作成

有効基礎資料の賦存性

多目的性

堤高，有効貯水容量

事業効果

事業実施（施工）の容易性

② 設計指針

設計に係る基礎的条項について基準作りを行う。

小ダムということで施工管理が，不十分なために目的効果が発揮されていないのではないか。（大ダムであればそれなりにコンサルタント等による管理が実施されるであろう。）

従って，施工管理面についても最低限の基準を述べておく必要がある。

③ O/M 指針

ダム完成後の施設（ダム本体含む）のO/M指針の作成を行う。

施設・水の管理主体，運営体制にも留意する必要がある。SWIMプロジェクトでは，地域住民が管理運営に主体的な役割を担うものと考えられるため，水利組合の組織化，運営についても指針の中に位置づける必要があろう。

(6) マスタープラン

A. SWIMの全国的全体の効果をそれぞれの項目（灌漑，電力，水産 etc ）で述べるものとする。

B. プロジェクトのランク付けは，全体を 4～5 ランクに集団的に優先度を付ける。

C. 今後10年間に実施すべきであろうと提言するプロジェクト数については，現地調査時にフィリピン側とよく煮つめていくこと。

付　属　資　料

1. M/M 及び I/A

2. 今後10年間に実施予定の候補地リスト

3. 収集資料リスト

1. M/M 及び I/A

MINUTES OF DISCUSSION

ON

MASTER PLAN STUDY ON SMALL WATER

IMPOUNDING MANAGEMENT PROJECT

D A T E : 9 December 1987

P L A C E : Office of the Undersecretary Teodoro T. Encarnacion Port Area, Manila

ATTENDANCE : Please see attached Annex I

The Mission had a series of reconnaissance surveys, discussions and exchange of views with the authorities concerned on the Study.

GOP and JICA finally agreed upon the Implementing Arrangements for the Study as shown in Annex II.

In addition, GOP requested JICA to provide the following items for the implementation of the Study, to be turned over to GOP upon the termination of the Study: 4 computers, sets of survey equipment, 1 copying machine, 4 vehicles, and others to be specified later.

GOP also requested JICA to include in the Progress Report projects with adequate feasibility studies.

FOR JICA

MR. SOTA IWAMOTO
Leader of the Preliminary Study Team

FOR DPWH

~~HON.~~ TEODORO T. ENCARNACION
Undersecretary, DPWH
Chairman, SWIM

STEERING COMMITTEE MEETING
December 9, 1987
Attendance

	NAME	AGENCY
1.	Teodoro T. Encarnacion	DPWH
2.	Fernando S. Nabong	SWIM
3.	Avelino S. Rivera	NIA
4.	Yasuhiko Mishima	JICA-NIA
5.	Jose C. Guanzon	DPWH
6.	Sergio Abuan	BFD
7.	Romeo Q. Solis	DPH
8.	Alberto R. Dalusung III	OLS
9.	Francis Hilario	NWRB
10.	Lourdes Santiago	SWIM
11.	Nakajo San	1st Secretary of Embassy of Japan
12.	Sota Iwamoto	JICA
13.	Mamoru Ishikawa	JICA
14.	Teruhisa Tajiri	JICA
15.	Shiro Sano	JICA
16.	Motofumi Kohara	JICA

Annex II

IMPLEMENTING ARRANGEMENT ON THE TECHNICAL COOPERATION

BETWEEN

JAPAN INTERNATIONAL COOPERATION AGENCY

AND

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

FOR

MASTER PLAN

ON

SMALL WATER IMPOUNDING MANAGEMENT PROJECTS

IN

THE REPUBLIC OF THE PHILIPPINES

AGREED

BETWEEN

JAPAN INTERNATIONAL COOPERATION AGENCY

AND

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

HON. TEODORO T. ENCARNACION
Undersecretary, DPWH
Chairman, SWIM

MR. SOTA IWAMOTO
Leader of the Preliminary
Study Team,
Japan International Cooperation
Agency

I. INTRODUCTION

In response to the request of the Government of the Republic of the Philippines (hereinafter referred to as "GOP"), the Government of Japan (hereinafter referred to as "GOJ") has decided to conduct the Master Plan Study on Small Water Impounding Management Projects in the Republic of the Philippines (hereinafter referred to as "the Study"), and exchanged the Notes Verbales with GOP concerning the implementation of the Study.

Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of GOJ, will undertake the Study, in accordance with the relevant laws and regulations in force in Japan.

On the part of GOP, Department of Public Works and Highways (hereinafter referred to as "DPWH") shall act as a counterpart agency to the Japanese study team and also as a coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document constitutes the implementing arrangement between JICA and DPWH under the above mentioned Notes Verbales exchanged between two governments.

II. OBJECTIVE OF THE STUDY

The objective of the Study is to formulate a master plan for the small water impounding management projects, aiming at orderly utilization of the nation's water and land resources.

III. STUDY AREA

The Study area covers the entire Philippines.

IV. SCOPE OF THE STUDY

The Study will consist of following three phases:

Phase I

(1) Inventory of small water impounding management projects.
(2) Review of previous studies.
(3) Post-evaluation of the completed projects.

Phase II

(1) Categorization of projects.
(2) Preparation of guidelines for project implementation and managment.

Phase III

(1) Formulation of the Master Plan.

1. Phase I

(1) An inventory of small water impounding management projects will be compiled by collecting existing data and information.

(2) The previous studies will be reviewed on the following items:

a. Topography
b. Meteorology and Hydrology
c. Geology
d. Soil
e. Agriculture
f. Irrigation and Drainage
g. Flood control
h. Electric power and Water supply
i. Aquaculture
j. Watershed management and environmental aspects
k. Design of major structure
l. Construction materials
m. Costs and benefits
n. Impact/effect
o. Others

(2) Post-evaluation of the completed projects will be made on the items listed above and the following aspects.

a. Current status
b. Prospect of operation and maintenance
c. Benefits accrued from the projects

2. Phase II

(1) Based on the results of the Phase I Study, factors and elements grouping the projects will be identified and the projects will be grouped in accordance with these factors and elements.

(2) The following preliminary guidelines for project implementation and management will be prepared on the basis of the previous grouping.

a. Design guidelines of major structures
b. Screening (or qualification) guidelines
c. Operation and maintenance guidelines

3. Phase III

(2) Based on the results of previous studies, the Master Plan of the projects will be formulated including:

a. Recommendation of development sequence
b. Preliminary estimate of the project cost and benefits

V. REPORTS

JICA shall prepare and submit the following reports in English to GOP:

1. Plan of Operation
   Thirty (30) copies at the commencement of the Phase I Study

2. Inception Report
   Thirty (30) copies at the middle of the Phase I Study

3. Progress Report
   Thirty (30) copies at the end of the Phase I Study

4. Interim Report
   Thirty (30) copies at the end of the Phase II Study

5. Draft Final Report
   Thirty (30) copies at the end of the Phase III Study
   GOP shall provide JICA with its comments within one (1) month after the receipt of the Draft Final Report.

6. Final Report
   Fifty (50) copies within two (2) months after the receipt of the Philippines Government's comments on the Draft Final Report.

VI. STUDY SCHEDULE

The tentative work schedule is shown in the Appendix.

VII. UNDERTAKING OF GOP

In accordance with the Notes Verbales exchanged between GOJ and GOP, GOP shall accord privileges, immunities and other benefits to the Japanese study team and, through the authorities concerned, take necessary measures to facilitate smooth conduct of the Study.

1. GOP shall be responsible for dealing with claims which may be brought by third parties against the members of the Japanese study team and shall hold them harmless in respects of claims or liabilities arising in the course of, or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims or liabilities arise from gross negligence or willful misconduct of the above-mentioned members.

2. DPWH shall, at its own expense, provide the Japanese study team with the following, if necessary, in cooperation with other agencies concerned:

(1) Available data and information related to the Study;
(2) Counterpart personnel;
(3) Suitable office space with necessary equipment in Metro Manila;
(4) Credentials or identification cards to the members of the Japanese study team;

3. DPWH shall make necessary arrangements with other governmental and non-governmental organizations concerned for the following:

(1) to secure the safety of the Japanese study team;

(2) to permit the members of the Japanese study team to enter, leave and sojourn in the Philippines for the duration of their assignment therein;

(3) to exempt the members of the Japanese study team from taxes, duties, fees and other charges on equipment, machinery and other materials brought into the Philippines for the conduct of the Study;

(4) to exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emolument or allowance paid to the members of the Japanese study team for their services in connection with the implementation of the Study;

(5) to provide necessary facilities to the Japanese study team for remittance as well as utilization of the funds introduced into the Philippines from Japan in connection with the implementation of the Study;

(6) to secure permission for entry into private properties or restricted areas for the conduct of the Study;

(7) to secure permission to take all data and documents (including photographs) related to the Study out of the Philippines to Japan by the Study team;

(8) to provide medical services as needed and its expenses will be chargeable against the members of the Japanese study team.

VIII. UNDERTAKING OF GOJ

In accordance with the Notes Verbales exchanged between GOJ and GOP, through JICA, shall take the following measures for the implementation of the Study:

1. to dispatch, at its own expense, study team to the Philippines;

2. to pursue technology transfer to the Philippine counterpart;

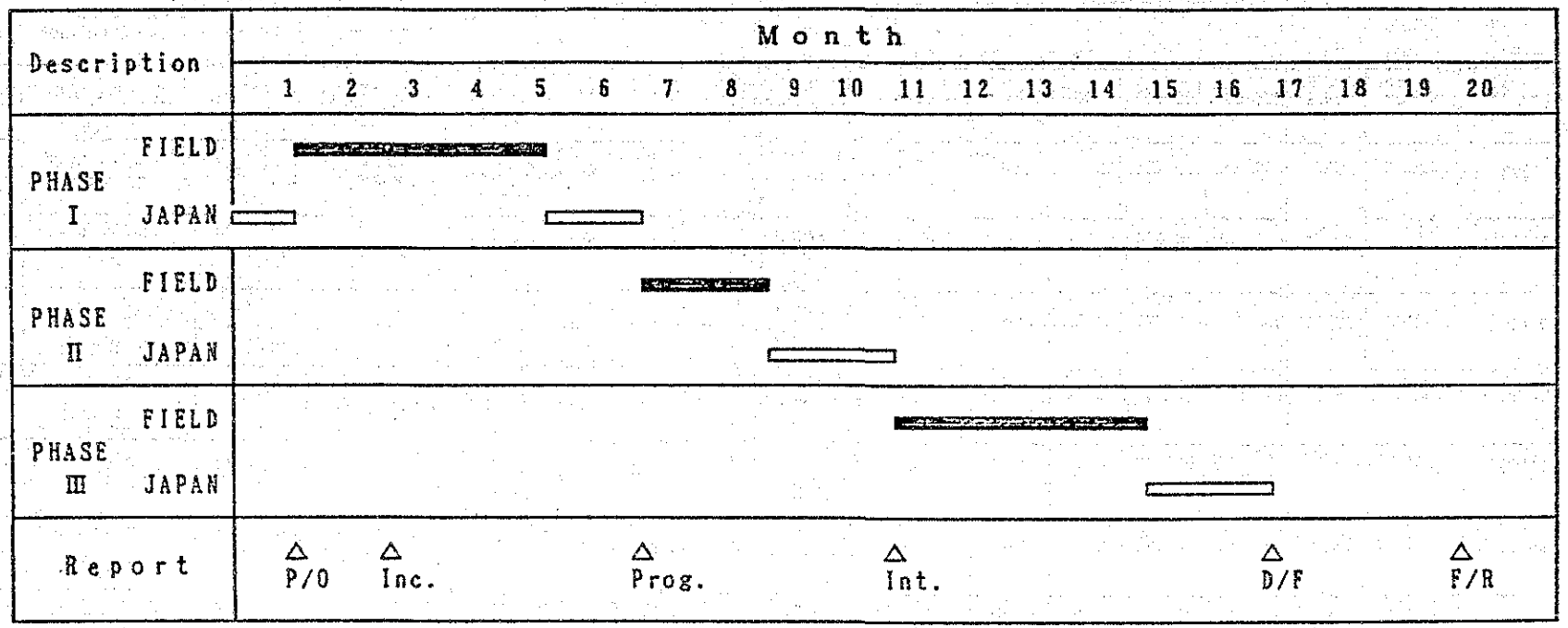
3. to provide necessary equipment for the implementation of the Study, which will remain the property of JICA unless otherwise agreed.

IX. CONSULTATION

JICA and DPWH shall consult with each other in respect of any matter that may arise from or in connection with the Study.

APPENDIX

Tentative Schedule



P/O : Plan of Operation
Inc : Inception Report
Prog: PROGRESS Report
Int : Interim Report
D/F : Draft Final Repòrt
F/R : Final Report

: Field Work

: Home Office Work

2. 今後10年間に実施予定の候補地リスト

SWIM Projects for Master Plan

projects which are completed and expected to be executed within ten(10) years

Agency NIA

No 1

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (A REPORT EXISTENCE)				COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL		A	B	C	D		DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY M³X1000	CATCHMENT AREA (Km²)	
1	Banila SWIM Project	I	Pangasinan	Umingan	I,P,F,O Irrigable area = 1,685 ha Installed cap.= 520 kW	/	/	F/S	D/D	86.43	Earthfill embankment	30.00	198.00	289,000	2,700	34.00	2,338.0
2	Cabacanan SWIM Project	I	Ilocos Norte	Pagudpud	I,P,F,O Irrigable area = 550 ha Installed cap. = 200 kW	/	/	F/S	D/D	60.53	-do-	30.00	255.00	334,900	1,910	9.40	2,265.3
3	San Clemente SWIM Project	III	Tarlac	San Clemente	I,P,F,O Irrigable area = 1,160 ha Installed cap. = 480 kW	/	/	F/S		58.63	-do-	33.00	220.00	439,000	1,970	27.00	2,310.1
4	Parpagoja SWIM Project	IV	Romblon	San Andres	I,P,F,O Irrigable area = 500 ha Installed cap. = 225 kW	/	/	F/S	D/D	28.20	-do-	21.00	141.00	168,000	3,150	37.00	2,137.8
5	Potot SWIM Project	IV	Masbate	Milagros	I,P,F,O Irrigable area = 200 ha Installed cap. = 80 kW	/	/	F/S	D/D	31.10	-do-	18.00	330.00	134,500	3,140	10.34	1,860.3
6	Caramoan SWIM Project	V	Camarines Sur	Caramoan	I,P,F,O Irrigable area = 350 ha Installed cap. = 100 kW	/	/	F/S	D/D	17.63	-do-	14.75	132.00	65,645	586	23.00	2,768.0
7	Tagum-Angas SWIM Project	V	Marinduque	Sta. Cruz	I,P,F,O Irrigable area = 530 ha Installed cap. = 300 kW	/	/	F/S	D/D	77.51	-do-	31.60	125.00	131,300	2,865	25.00	1,657.0
8	Alapasco SWIM Project	VI	Iloilo	Batad	I,F,O Irrigable area = 680 ha	/	/	F/S	D/D	34.90	-do-	21.00	260.00	224,000	4,160	7.50	1,967.6
9	Calango SWIM Project	VII	Negros Oriental	Zamboanguita	I,P,F,O Irrigable area = 675 ha Installed cap. = 300 kW	/	/	F/S	D/D	49.22	-do-	26.00	132.00	140,000	585	23.00	1,242.7
10	Nasig-id SWIM Project	VII	Negros Oriental	Zamboanguita	I,F,O Irrigable area = 500 ha	/	/	F/S	D/D	52.77	-do-	30	110.00	160,900	508	9.60	1,275.3

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonage of fishery harvest per year, ecc
STATUS OF STUDY, A= before starting feasibility Study (F/S)
B= ongoing F/S
C= F/S completed
D= Detail Design (D/D) completed

SWIM Projects for Master Plan

projects which are completed and expected to be executed withinten(10) years

Agency NIA

No 2

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY				COST (ESTIMATED)	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL		A REPORT EXISTENCE	B	C	D	P 10 ⁶	DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M^3)	STORAGE CAPACITY M^3X1000	CATCHMENT AREA (Km^2)	
11	Dumanjug-Ronda SWIM Project	VII	Cebu	Dumanjug and Ronda	I,P,F,O Irrigable area = 550 ha Installed cap. = 200 kW			F/S	D/D	82.51	Earth-fill embank-ment	22.20	200.00	149,160	1,500	62.00	1,778.0
12	Tugas SWIM Project	VII	Bohol	Candijay	I,F,O Irrigable area = 250 ha			F/S	D/D	25.08	-do-	30.00	245.00	445,000	1,960	5.10	2,075.5
13	Ilaya SWIM Project	VII	Bohol	Ubay	I,F,O Irrigable area = 350 ha			F/S	D/D	24.73	-do-	25.00	160.00	140,000	1,500		
14	Hibulangan SWIM Project	VIII	Northern Leyte	Matagob	I,P,F,O Irrigable area = 3,000 ha Installed cap. = 450 kW			F/S	D/D	174.18	-do-	23.80	120.00	314,360	21,180	40.00	2,550.0
15	Sagudsuron SWIM Project	VIII	Northern Samar	Catubig	I,F,O Irrigable area = 250 ha			F/S	D/D	18.69	-do-	14.00	373.00	212,500	1,570	10.00	3,319.0
16	Bucacao SWIM Project	IX	Zambo-anga del Sur	Alicia	I,P,F,O Irrigable area = 470 ha Installed cap. = 180 kW			F/S	D/D	33.39	-do-	26.00	65.00	68,500	1,810	23.35	2,617.9
17	Miral SWIM Project	XI	Davao del Sur	Bansalan	I,P,F,O Irrigable area = 1,500 ha Installed cap. = 380 kW			F/S	D/D	118.29	-do-	27.00	80.00	148,300	390	33.50	1,797.0

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonage of fishery harvest per year, exc
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
B= ongoing F/S
C= F/S completed
D= Detail Design (D/D) completed

SWIM Projects for Master Plan

projects which are completed and expected to be executed in next ten(10) years

Agency NIA

No_2

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A B C D	COST (ESTIMATED) P 10⁶	DAM PLAN						
		REGION	PROVINCE	MUNICIPAL				DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY (M³X1000)	CATCHMENT AREA (Km²)	ANNUAL RAIN FALL (mm)
1	Carolina SWIM Project	IV	Romblon	Looc	I,O	F/S								
2	Singalong SWIM Project	IV	Rizal	Antipolo	I,O	F/S								
3	Quinlogan SWIM Project	IV	Palawan	Quezon	I,O	F/S								
4	Matikiw SWIM Project	IV	Laguna	Pakil	I,O	F/S								
5	Catungawan SWIM Project	VII	Bohol	Guindul-man	I,O	F/S								
6	Abejilan SWIM Project	VII	Bohol	Candijay	I,O	F/S								
7	Candijay SWIM Project	VII	Bohol	Candijay	I,O	F/S								
8	Boyo-an SWIM Project	VII	Bohol	Candijay	I,O	F/S								
9	Calamingaw SWIM Project	VII	Bohol	Candijay	I,O	F/S								
10	Lungsoda-an SWIM Project	VII	Bohol	Candijay	I,O	F/S								

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonnage of fishery harvest per year, etc
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
B= ongoing F/S
C= F/S completed
D= Detail Design (D/D) completed

SWIM Projects for Master Plan

projects which are completed and expected to be executed in next ten(10) years

Agency NIA

No 3

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A B C D	COST (ESTIMATED) P 10 ⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL				DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY 1M³X1000	CATCHMENT AREA (Km²)	
11	Tubod SWIM Project	VII	Bohol	Candijay	I,O	F/S								
12	Junas SWIM Project	VII	Bohol	Alicia	I,O	F/S								
13	Camba-ol SWIM Project	VII	Bohol	Alicia	I,O	F/S								
14	Progreso SWIM Project	VII	Bohol	Alicia	I,O	F/S								
15	Cabatang SWIM Project	VII	Bohol	Alicia	I,O	F/S								
16	Untaga SWIM Project	VII	Bohol	Alicia	I,O	F/S								
17	Dita SWIM Project	VII	Bohol	Ubay	I,O	F/S								
18	Biabas SWIM Project	VII	Bohol	Ubay	I,O	F/S								
19	Bongbong SWIM Project	VII	Bohol	Ubay	I,O	F/S								
20	Cabulao SWIM Project	VII	Bohol	Mabini	I,O	F/S								

NOTE : PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonnage of fishery harvest per year, etc
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
B= ongoing F/S
C= F/S completed
D= Detail Design (D/D) completed

SWIM Projects for Master Plan

projects which are completed and expected to be executed in next ten(10) years

Agency NIA

No 4

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL							DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY 1M³X1000,	CATCHMENT AREA (Km²)	
21	Cabidian SWIM Project	VII	Bohol	Mabini	I,O	F/S											
22	Kanasuhan CIP	VII	Cebu	Carcar	I,O	F/S											
23	Tungkod CIP	VII	Cebu	Minglanilla	I,O	F/S											
24	Luyang CIP	VII	Cebu	Carmen	I,O	F/S											
25	Danao CIP	VII	Cebu	Danao	I,O	F/S											
26	Masaplod CIP	VII	Negros Oriental	Dauin	I,O	F/S											
27	Guihulngan CIP	VII	Negros Oriental	Guihulngan	I,O	F/S											
28	Guinobaan CIP	VII	Negros Oriental	Guihulngan	I,O	F/S											
29	Bayawan CIP	VII	Negros Oriental	Bayawan	I,O	F/S											
30	Domanjog CIP	VII	Siquijor	Siquijor	I,O	F/S											

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonage of fishery harvest per year, etc
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
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C= F/S completed
D= Detail Design (D/D) completed

CIP - Communal Irrigation Project

SWIM Projects for Master Plan

projects which are completed and expected to be executedih next ten(10) years

Agency NIA

No 5

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL							DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY (M³X1000)	CATCHMENT AREA (Km²)	
31	Senona CIP	VII	Siquijor	Lazi	I,O	F/S											
32	Tigbao CIP	VII	Siquijor	Lazi	I,O	F/S											
33	Lotlotan CIP	VII	Siquijor	Maria	I,O	F/S											
34	Gabawan SWIM Project	IV	Romblon	Odiongan	I,O	F/S											

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonage of fishery harvest per year, etc
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
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D= Detail Design (D/D) completed

CIP - Communal Irrigation Project

SWIM Projects for Master Plan

Project studies which are completed, on-going or expected to be executed in next ten(10) years

Agency DEPARTMENT OF PUBLIC WORKS & HIGHWAYS

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE)				CONSTRUCTION COST (ESTIMATED)	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPALITY		A	B	C	D	P 10⁶	DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	VOLUME OF Embankment (M³)	NORMAL STORAGE CAPACITY M³X1000	CATCHMENT AREA (Km²)	
1	Saytan Dam & Reservoir Project	I	La Union	Saytan, Pugo	Irrigation - 100 has. Power Plant - 120 kw. Aquaculture - 3 has.			x		20	zoned embank-ment	24.0	163.50	134.00	0.284	4.50	1,805
2	Bolo Dam & Reservoir Project	II	Kalinga, Apayao	Tabuk	Irrigation - 430 has. Power plant - 178 kw Aquaculture - 26 has.			x		25	earth embank-ment	17.0	320.0	208,600	1.400	19.0	1,820.6
3	Aulo Dam & Reservoir Project	III	Nueva Ecija	Palayan	Irrigation - 500 has. Power Plant - 90 kw-firm enery, 180 kw-Installed capacity Fishery - 28. 7 has.			x	x	60	zoned earth fill dam	29	1,080	2,022,600	6.064	20	2,598
4	Bulu Dam & Reservoir Project	III	Bulacan	Malibay San Miguel	Irrigation - 1,000 has. power plant - 120 kw. installed capacity Fishery - 19 has.					40,680	zoned embank-ment	28	115	135,680	11.12	47	1,911.5
5	Sacrifice Valley Dam & Reservoir Project	III	Bataan	Hermosa	Fishery - 4.5 has.			x	x	15,600	zoned embank-ment	19.0	120	85,130	0.182	6.5	2,797.77
6	Burdeos River Dam & Reservoir Project	IV	Quezon	Polillo Island	Irrigation - 250 has. Power plant - 1,014,000 kw Fishery - 11 has.			x	x	37,029	zoned earth embank-ment	18.50	180	221,643	0.730	15	
7	Cubacub Dam & Reservoir Project	IV	Rizal	Pililla	Irrigation - 450 has.			x	x	40	earth dam	18	130	136,400	.5	9.60	

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SWIM Projects for Master Plan

Agency DEPARTMENT OF PUBLIC WORKS & HIGHWAYS — Project studies which are completed, on-going or expected to be executed in next ten(10) years — No.

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE)				CONSTRUCTION COST (ESTIMATED)	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPALITY		A	B	C	D	P 10 ³	DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	VOLUME OF Embankment (M³)	NORMAL STORAGE CAPACITY 1M³X1000	CATCHMENT AREA (Km²)	
8	Tulariquin Dam & Reservoir Project	IV	Palawan	Roxas	Aquaculture - 22 m in 29 has. fishpond Power plant - 600 kw			x		40	earth fill	25.0	153.0	197,000	2.43	32.0	1,603.5
9.	San Jose Dam & Reservoir Project	IV	Rizal	Morong	Irrigation - 20 has. Aquaculture - 5.5 has.			x		7	earth fill	16.50	70.0	26,800	0.30	1.80	1,864.8
10	Nabua Dam & Reservoir Project	V	Camarines Sur	Nabua, Iriga	Irrigation - 464 has. Aquaculture - 100 has.			x		25	zoned embank-ment	23.0	195.0	108,100	2.000	36.10	2,171.0
11	Debesmac Dam & Reservoir Project	V	Masbate	Mandaon	Irrigation - 200 has. Power plant - 350 kw Aquaculture - 2.0 has (min.) 12.0 has.(max.)			x		~~33,445~~	zoned earth embank-ment	22.0	129.0	119,500	2.350	27.5	2,623
12	Macagtas Dam & Reservoir Project	VII	Samar	Catarman	Irrigation - 500 has			x	x	30	zoned earth fill dam	18.8	180	94,300	4.60	3.6	3,322.9
13	Guimba Dam & Reservoir Project	XII	Lanao del Sur	Marawi	Irrigation - 60 has. power plant - 90 kw Fishery - 2.0 has.			x	x	10	earth dam	16	58	26,860	0.4881	3,030	2,514
14	Magpet Dam & Reservoir	XII	North Cotabato	Magpet	Irrigation - 500 has. Aquaculture - 7 has.			x		26	zoned earth embank-ment	17.0	254.0	221,643	0.755	14.0	2,536
15	Banayal Dam & Reservoir Project	XII	North Cotabato	Tulunan	Power - 300 kw Irrigation - 450 has.			x		42,188	zoned earth fill	23.5	117.5	1.24 x 10^6	1.24	36.0	1,803

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SWIM Projects for Master Plan

Agency: Bureau of Soils & Water Management — projects which are [illegible] to be executed in next ten(10) years

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY				COST (ESTIMATED)	DAM PLAN						
		REGION	PROVINCE	MUNICIPAL		A	B	C	D	P 10⁶	DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY (M³)	CATCHMENT AREA (Km²)	ANNUAL RAIN FALL (mm)
						REMARKS: EXISTENCE											
1	Bingao II	I	Ilocos N.	San Nicolas	Soil Conservation Irrigable area - 40 has.			X	X	P 1.918	EARTH	10.20	276	30,000	555.679	1.426	1,903
2	Caparispisan	I	Ilocos N.	Pagudpud	-do- - 50 has.			X	X	1.623	EARTH	10.60	333	31,000	155.756	0.62	1,903
3	Samac	I	Ilocos N.	San Nicolas	-do- - 20 has.			X	X	1.826	EARTH	10	159.50	31,000	98.662	0.3759	1,903
4	San Agustin	I	Ilocos N.	-do-	-do- - 32 has.			X	X	1.342	EARTH	9.8	134	23,500	107.076	0.74	1,903
5	San Cristobal	I	Ilocos N.	Sarrat	-do- -100 has.			X	X	1.835	EARTH	13.50	136	32,300	321.938	2.62	1,903
6	Sucsuquen	I	Ilocos N.	Dingig	-do- - 38 has.			X	X	1.346	EARTH	13.50	103	27,800	179.749	1.127	1,903
7	Balingaon	I	Ilocos S.	Candon	-do- - 50 has.			X	X	1.224	EARTH	15.50	117	46,000	175.185	0.35	2,336
8	Olo-Olo I	I	Ilocos S.	Santiago	-do- - 35 has.			X	X	2.516	EARTH	13.50	141	51,500	184.036	0.67	2,336
9	Olo-Olo II	I	Ilocos S.	Santiago	-do- - 60 has			X	X	1.827	EARTH	11.71	169	32,000	78.549	0.70	2,336
10	Patong	I	Ilocos S.	Magsingal	-do- -100 has			X	X	1.793		5.0	142.50	38,000	128.995	0.90	2,336

COST ESTIMATES AS OF 1983 PRICE.

NOTE: PURPOSE: Irrigation, FC-Flood Control, W-Domestic Water Supply, P-Power Generation, F-Fishery, S-Soil Conservation, W-Watershed Management, Others
SPECIFICATION will be described in the following items: Irrigable area, Kilo watt per hour, Tonnage of fishery harvest per year, etc.
STAIUS OF STUDY: A= before starting Feasibility Study (F/S)
B= ongoing F/S
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D= Detail Design (D/D) completed

SWIM Projects for Master Plan

projects which are - ... 3 and expected to be executed in next ten(10) years

Agency Bureau of Soils & Water Management

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P 10⁶	DAM PLAN DAM TYPE	DAM HEIGHT (M)	DAM CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY (M³/SEC)	CATCHMENT AREA (KM²)	ANNUAL RAINFALL (mm)
		REGION	PROVINCE	MUNICIPAL													
01	Mabini	I	Pangasinan	Balingac	Soil Conservation Irrigable Area - 80 has.			x	x	₱ 1.278	EARTH EARTH	10.00	76.50	11,250	180.869	1.02	2,275
02	Oda	I	-do-	Agno	-do- -100 has.			x	x	2.361	EARTH	178	11	53,000	395.002	1.1633	2,275
03	Pamaranum	I	-do-	Malasiqui	-do- - 50 has.			x	x	0.786	EARTH	9.7	10.6	15,000	90.272	1.151	2,275
04	Puqaro	I	-do-	Manaoag	-do- - 75 has.			x	x	1.136	EARTH	6.50	150	9,700	214.025	0.94	2,275
05	Apang	II	Cagayan	Claveria	-do- - 40 has.			x	x	1.691	EARTH	11	140	33,800	79.574	0.42	582.17
06	Pata	II	-do-	-do-	-do- -100 has.			x	x	1.188	EARTH	11.25	74	18,000	33.442	0.637	582.17
07	Lanneg	II	-do-	Solana	-do- - 35 has.			x	x	1.157	EARTH	I	125	14,800	250.601	0.5335	582.17
08	Cabuluyan	II	-do-	Alcala	-do- -100 has.			x	x	2.651	EARTH	12	170.5	55,000	402.941	1.85	582.17
09	Anneg	II	Isabela	Magsaysay	-do- -250 has.			x	x	3.501	EARTH	7	220	32,000	345.750	4.09	582.17
20	Cabannungan	II	Isabela	Ilagan	-do- - 70 has.			x	x	1.519	EARTH	7	186	31,000	274.720	1.795	679.07

COST ESTIMATES AS OF 1983 PRICE

NOTE : PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, W:Watershed Management, Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonne of fishery harvest per year, etc
STATUS OF STUDY, A:Before starting Feasibility Study (F/S)
B: ... F/S
C: F/S completed
D: Detail Design (E/D) completed

SWIM Projects for Master Plan

projects which are [illegible] expected to be executed in the next [illegible] years

XXXX Agency Bureau of Soils & Water Management

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (A B C D) REPORT EXISTENCE				COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL		A	B	C	D		DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY (M³/100)	CATCHMENT AREA (Km²)	
					Soil Conservation			x	x								
21	Malalam	II	Isabela	Ilagan	Irrigable Area - 70 has.	/	/	x	x	P 1.233	EARTH	10.5	92	21,000	390.152	0.75	679.07
								x	x								
22	Marana	II	Isabela	Ilagan	-do- - 30 has.	/	/	x	x	0.813	EARTH	9	98	9,800	75.243	0.28	679.07
								x	x								
23	Minagbag	II	-do-	Quezon	-do- - 60 has.	/	/	x	x	1.948	EARTH	10.5	195	34,000	193.684	0.63	679.07
								x	x								
24	Naganacan	II	Isabela	Sta. Maria	-do- - 70 has.	/	/	x	x	2.034	EARTH	10.7	101.50	17,400	213.020	3.11	679.07
								x	x								
25	Trinidad	II	Isabela	Mallig	-do- - 50 has.	/	/	x	x	2.061	EARTH	9.51	188	37,800	181.771	2.57	679.07
								x	x								
26	Abian	II	Nueva Vizcaya	Bamban	-do- - 40 has.	/	/	x	x	1.142	EARTH	9.72	124	14,400	84.650	0.18	679.07
								x	x								
27	Balakwit	II	-do-	Villaverde	-do- -100 has.	/	/	x	x	0.973	EARTH	9.50	92	9,500	102.242	0.89	679.07
								x	x								
28	Balete	II	-do-	Diadi	-do- - 35 has.	/	/	x	x	0.810	EARTH	8	78	8,000	44.303	1.44	679.07
								x	x								
29	Diadi	II	-do-	Diadi	-do- - 95 has.	/	/	x	x	1.863	EARTH	8	152	32,000	79.738	3.56	679.07
								x	x								
30	Kirang	II	-do-	Aritao	-do- -120 has.	/	/	x	x	0.999	EARTH	9.50	78.80	16,000	59.027	0.06	679.07

COST ESTIMATES AS OF 1983 PRICE.

NOTE : PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, Soil Conservation, W.M.:Watershed Management, Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonne of fishery harvest per year, etc
STATUS OF STUDY, A: Before starting Feasibility Study (F/S)
B: Ongoing F/S
C: F/S completed
D: Detail Design (D/D) completed

SWIM Projects for Master Plan

Agency Bureau of Soils & Water Management — Projects which are [illegible] to be executed in next ten(10) years

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY A	B	C	D	COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL		REPORT EXISTENCE					DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLME (M³)	STORAGE CAPACITY (M³X1000)	CATCHMENT AREA (KM²)	
31	San Antonio	II	Nueva Vizcaya	Bamban	Soil Conservation Irrigable Area -100 has.			x	x	P 1.686	EARTH	10.20	161	33,000	197.220	0.80	679.07
32	Butio	III	NUEVA Ecija	Talugtug	-do- -100 has.			x	x	1.58	EARTH	10.15	136	22,000	322.431	0.70	,880.42
33	Maasin	III	-do-	-do-	-do- -100 has.			x	x	2.952	EARTH	10.15	200	42,500	405.389	2.06	,880.40
34	Mangandingay	III	-do-	Munoz	-do- - 80 has.			x	x	1.678	EARTH	10.3	192	42,700	214.786	0.50	1880.4
35	Sampeloc	III	-do-	Talugtug	-do- - 40 has.			x	x	1.831	EARTH	10.5	170	29,000	297.237	0.796	1880.4
36	Sta. Catalina	III	-do-	Talugtug	-do- - 50 has.			x	x	1.731	EARTH	11	110	28,500	165.076	0.36	1880.4
37	Sto. Domingo I	III	-do-	-do-	-do- - 70 has.			x	x	1.319	EARTH	10	71.80	13,500	308.736	0.612	1880.40
38	Sto. Domingo II	III	-do-	-do-	-do- - 50 has.			x	x	1.430	EARTH	13	80	21,000	292.895	0.405	1880.40
39	Sto. Domingo III	III	-do-	-do-	-do- -100 has.			x	x	1.536	EARTH	8.7	180.8	26,000	413.354	0.80	1880.40
40	Villa Boado	III	-do-	-do-	-do- -100 has.			x	x	1.241	EARTH	11	92	15,300	229.950	0.75	1880.40

COST ESTIMATES AS OF 1983 PRICE.

NOTE: PURPOSE, Irrigation, Flood Control, Domestic Water Supply, Power Generation, Fishery, Soil Conservation, Watershed Management, Others
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STATUS OF STUDY, A= before starting Feasibility Study (F/S)
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SWIM Projects for Master Plan

projects which are ... and expected to be executed in the next fourteen (10) years

Agency: Bureau of Soils & Water Management

No.	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P 10^6	DAM PLAN: DAM TYPE	DAM HEIGHT (m)	CREST LENGTH (m)	DAM VOLUME (M m³)	STORAGE CAPACITY (MCM)	CATCHMENT AREA (km²)	ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL													
41	Villa Isla	III	Nueva Ecija	Munoz	Soil Conservation Irrigable Area -100 has.	/	/	x	x	₱ 1.056	EARTH	8.4	162	17,000	245.361	0.81	1880.40
42	Maniniog	III	Tarlac	Mayantoc	-do- - 50 has.	/	/	x	x	1.442	EARTH	13.5	70	23,300	49.984	2.00	1880.40
43	Bitungol	III	Bulacan	Norzagaray	-do- -100 has.	/	/	x	x	2.033	EARTH	13	164	43,800	204.990	0.6135	1880.4
44	Masalipit	III	Bulacan	San Miguel	-do- -100 has.	/	/	x	x	1.358	EARTH	9	128	12,600	530.671	21.16	1880.4
45	Pulo	III	Bulacan	San Rafael	-do- -100 has.	/	/	x	x	1.649	EARTH	10.6	267	38,500	211.224	0.7527	1880.4
46	Bayuin	IV	Or. Mindoro	Socorro	-do- - 45 has.	/	/	x	x	1.113	EARTH	10.5	96	19,000	97.928	0.187	1854.70
47	Lagunlong	IV	-do-	Baco	-do- - 50 has.	/	/	x	x	1.67	EARTH	12.31	114	38,800	227.201	0.248	1854.70
48	Pakala II	IV	-do-	-do-	-do- - 75 has.	/	/	x	x	1.603	EARTH	10.01	119	26,000	167.648	0.257	1854.70
49	Camburay	IV	Occidental Mindoro	San Jose	-do- - 50 has.	/	/	x	x	2.095	EARTH	12	162	34,000	285.055	1.135	7645.7
50	Cabawan	V	Albay	Daraça	-do- -100 has.	/	/	x	x	1.071	EARTH	6	174	13,000	170.316	0.76	3175.4

COST ESTIMATES AS OF 1983 PRICE.

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SWIM Projects for Master Plan

projects which are: and expected to be executed in next ten(10) years

Agency: Bureau of Soils & Water Management

No.

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P 10^6	DAM PLAN: DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M^3)	STORAGE CAPACITY m^3X1000	CATCHMENT AREA (Km^2)	ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL													
51	Bulbao	V	Camarines Norte	Labo	Soil Conservation			x	x								
					Irrigable Area — 50 has.	/	/	x	x	P 1.136	EARTH	9.5	85	19,000	77.472	0.5175	3442.6
52	Dalnac	V	Camarines Norte	Paracale	Soil Conservation			x	x								
					Irrigable Area 50 "	/	/	x	x	1.241	EARTH	8.65	123	15,200	89.845	0.50	3442.6
53	Burgos	V	Catan-duanes	Viga	Soil Conservation			x	x								
					Irrigable Area 25 "	/	/	x	x	1.408	EARTH	7	90	21,000	23.544	0.32	4029
54	Buenasuerte	V	Mabbate	Usom	Soil Conservation			x	x								
					Irrigable Area 25 "	/	/	x	x	I.237	EARTH	9	115	18,000	97.772	0.3738	1879.2
55	Aranas	VI	Aklan	Balete	Soil Conservation			x	x								
					Irrigable Area 100 "	/	/	x	x	I.69I	EARTH	11	111	36,000	102.133	0.91	3311.9
56	Feliciano Arcangel	VI	Aklan	Balete	Soil Conservation			x	x								
					Irrigable Area 50 "	/	/	x	x	I.221	EARTH	8.8	109.5	22,500	70.208	0.74	3311.9
57	Pinonoy	VI	Aklan	Libaco	Soil Conservation			x	x								
					Irrigable Area 25 "	/	/	x	x	I.03	EARTH	9.2	99	14,100	72.701	0.44	3311.9
58	San Roque	VI	Aklan	Malinao	Soil Conservation			x	x								
					Irrigable Area 40 "	/	/	x	x	0.971	EARTH	8.5	97	23,400	76.547	0.85	3311.9
59	Sibaliw Toralba	VI	Aklan	Toralba Banga	Soil Conservation			x	x								
					Irrigable Area 25 "	/	/	x	x	1.085	EARTH	6.8	131	12,600	68.761	0.74	3311.9
60	Buenavista	VI	Antique	Belleson	Soil Conservation			x	x								
					Irrigable Area 50 "	/	/	x	x	953	EARTH	7	115	16,000	64.201	0.I45	3749

Cost Estimate as of 1983 Price

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SWIM Projects for Master Plan

Agency _____ projects which are: _____ and expected to be executed in next ten(10) years. No. _____

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P. 10⁶	DAM PLAN: DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY M³X1000	CATCHMENT AREA (Km²)	ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL													
61	Panlagangan	VI	Antique	Sibalom	Soil Conservation Irrigable Area 50 Has.			✓	✓	P1.273	EARTH	12	135	24,400	78.555	0.18	3749
62	Traciano	VI	Capiz	Dumarao	Soil Conservation Irrigable Area 50 "			✓	✓	1.061	EARTH	9.4	80	11,800	33.791	0.64	2212.40
63	BongBong I	VII	Bohol	Ubay	Soil Conservation Irrigable Area 100 "			✓	✓	1.103	EARTH	7	71	9,400	100.339	1.0	1243.81
64	Bongbong II	VII	Bohol	Ubay	Soil Conservation Irrigable Area 100 "			✓	✓	0.948	EARTH	12	50.5	10,300	118.750	0.486	1243.81
65	Dita I	VII	Bohol	Ubay	Soil Conservation Irrigable Area 50 "			✓	✓	1.922	EARTH	13.5	136	24,000	131.943	0.48	1243.81
66	Dita II	VII	Bohol	Ubay	Soil Conservation Irrigable Area 35 "			✓	✓	1.191	EARTH	12.5	83	14,000	119.575	0.3372	1243.81
67	Calanggaman	VII	Bohol	Ubay	Soil Conservation Irrigable Area 40 "			✓	✓	1.055	EARTH	10.5	116.5	17,000	61.867	0.37	1243.81
68	San Jose II	VII	Bohol	Mabini	Soil Conservation Irrigable Area 30 "			✓	✓	1.161	EARTH	9.8	89.5	11,800	50.561	0.61	1243.81
69	Sto. Niño	VII	Bohol	Talibon	Soil Conservation Irrigable Area 110 "			✓	✓	1.927	EARTH	11	149	26,800	202.700	1.655	1243.81
70	Bagtic	VII	Negros Or.	Mabinay	Soil Conservation Irrigable Area 100 "			✓	✓	1.882	EARTH	13.5	88	19,000	56.473	2.49	1215.54

Cost Estimate as of 1983 Price

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SWIM Projects for Master Plan

projects which are ( ) and expected to be executed in next ten(10) years

Agency _____ No. _____

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P '10 '	DAM PLAN DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY M³X1000	CATCHMENT AREA (Km²)	ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL													
71	Nabilog	VII	Negros Or.	Ayungan	Soil Conservation Irrigable Area 50 Has			X	X	PI.819	EARTH	I4	162	45,000	44.990	I.33	1215.50
72	Nangka	VII	Negros Or.	Bayawam	Soil Conservation Irrigable Area 35 "			X	X	1.521	EARTH	15.6	60	26,600	78.722	0.22	1215.50
73	Jubasan	VIII	Northern Samar	Allen	Soil Conservation Irrigable Area 25 "			X	X	1.802	EARTH	II	107	33,500	69.717	0.56	3029.80
74	Inamburacay	VIII	Northern Samar	Bonbon	Soil Conservation Irrigable Area 50 "			X	X	1.875	EARTH	10.5	I4I	30,800	123.583	0.28	3029.8
75	Polangi	VIII	Eastern Samar	Taft	Soil Conservation Irrigable Area 50 "			X	X	0.778	EARTH	8	118.5	9,800	82.950	0.48	4020.10
76	Sta. Fe	VIII	Eastern Samar	Borongan	Soil Conservation Irrigable Area 125 "			X	X	1.098	EARTH	8	I30	13,600	207.200	0.66	4020.10
77	Casabahan	VIII	Western Samar	Gandara	Soil Conservation Irrigable Area 100 "			X	X	1.870	EARTH	6	132	17,000	III.610	0.5208	2911.63
78	Campin	VIII	Leyte	Mahaplag	Soil Conservation Irrigable Area 58 "			X	X	1.244	EARTH	9.5	84	16,800	408.14	0.45	2129.51
79	Laboon	VIII	Southern Leyte	Maasin	Soil Conservation Irrigable Area 25 "			X	X	1.040	EARTH	9.5	118	17,100	66.28	0.18	2129.51
80	Buenavista	IX	Zamboanga City	Curuan	Soil Conservation Irrigable Area 100 "			X	X	1.68	EARTH	12.56	130	20,200	53.570	0.52	2511.20

Cost Estimate as of I983 Price

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SWIM Projects for Master Plan

projects which are ' and expected to be executed in next ten(10) years.

Agency _____ No. _____

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (REPORT EXISTENCE) A	B	C	D	COST (ESTIMATED) P 10⁶	DAM PLAN DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY M³X1000	CATCHMENT AREA (Km²)	ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL													
81	Goling	IX	Zamboanga City	Diplahan	Soil Conservation Irrigable Area 100 Has	/	/	X	X	P1.186	EARTH	11	94.5	20,300	83.850	0.2162	2511.2
82	Lamare I	IX	Zamboanga Sur	Bayog	Soil Conservation Irrigable Area 80 "	/	/	X	X	1.062	EARTH	11	38	15,800	77.881	0.52	2995
83	Lamare II	IX	Zamboanga Sur	Bayog	Soil Conservation Irrigable Area 60 "	/	/	X	X	1.4	EARTH	12	105	26,500	74.071	0.6784	2995
84	Lungmot	IX	Zamboanga Sur	Dumalinao	Soil Conservation Irrigable Area 80 "	/	/	X	X	1.497	EARTH	12	92	17,300	112.244	0.565	2995
85	Sumadat	IX	Zamboanga Sur	Dumalinao	Soil Conservation Irrigable Area 80 "	/	/	X	X	1.352	EARTH	13.6	80	19,000	63.951	0.28	2995
86	Woodland	IX	Zamboanga Sur	Dumalinao	Soil Conservation Irrigable Area 100 "	/	/	X	X	1.654	EARTH	11	126	17,700	93.560	1.97	2995
87	Alubijid	X	Agusan del Norte	Buena-vista	Soil Conservation Irrigable Area 150 "	/	/	X	X	1.277	EARTH	7.5	157	20,000	95.166	0.667	2316.3
88	Dumalagan	X	Agusan del Norte	Butuan City	Soil Conservation Irrigable Area 170 "	/	/	X	X	1.886	EARTH	7	186	34,300	229.860	0.945	2316.3
89	Malapong	X	Agusan del Norte	Buena-vista	Soil Conservation Irrigable Area 200 "	/	/	X	X	1.095	EARTH	9.5	82	10,800	78.799	0.76	2316.3
90	Mintuod	X	Agusan del Norte	Buena-vista	Soil Conservation Irrigable Area 100 "	/	/	X	X	1.221	EARTH	8.0	131	19,600	136.486	0.80	2316.3

Cost Estimate as of 1983 Price

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SWIM Projects for Master Plan

projects which are [illegible] and expected to be executed in next [illegible] (10) years

Agency _____ No. _____

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		REGION	PROVINCE	MUNICIPAL													
91	Talaganahao	X	Agusan del Norte	Buena-vista	Soil Conservation Irrigable Area 60 Has.			X	X	P1.161	EARTH	11.83	95	18,300	96.500	0.55	2316.3
92	Apulang	X	Bukid-non	Kibawe	Soil Conservation Irrigable Area 140 "			X	X	0.739	EARTH	7	86	9,000	168.408	0.34	5055.74
93	Kitao-tao	X	Bukid-non	Kitao-tao	Soil Conservation Irrigable Area 200 "			X	X	1.265	EARTH	9	178.5	20,000	129.887	2.13	5055.74
94	Labuagan	X	Bukid-non	Kibawe	Soil Conservation Irrigable Area 150 "			X	X	0.933	EARTH	5.5	90	6,000	68.537	0.96	5055.74
95	Balibayon	X	Surigao del Norte	Surigao City	Soil Conservation Irrigable Area 80 "			X	X	2.099	EARTH	13.4	118	41,500	34.619	0.68	3905.80
96	Talao-ao	X	Agusan del Norte	Buena-vista	Soil Conservation Irrigable Area 155 "			X	X	2.664	EARTH	12.5	160	58,000	313.366	0.80	2316.30
97	Bukay-Pait	XI	South Cotabato	Tanta-ngan	Soil Conservation Irrigable Area 105 "			X	X	2.189	EARTH	11	186	41,500	189.959	2.88	950.8
98	Dumadalig	XI	South Cotabato	Tanta-ngan	Soil Conservation Irrigable Area 45 "			X	X	1.68	EARTH	10.5	112	24.000	84.558	2.435	950.8
99	Libudan	XI	Davao Oriental	Mati	Soil Conservation Irrigable Area 30 "			X	X	0.701	EARTH	6.85	95	6,100	26.890	0.30	3905.84
100	San Rafael	XI	Davao Oriental	Cateel	Soil Conservation Irrigable Area 35 "			X	X	0.876	EARTH	17	122	43.400	222.112	0.64	3905.84

Cost Estimate as of 1983 Price

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SWIM Projects for Master Plan

projects which are [illegible] and expected to be executed in next ten(10) years

Agency: [illegible] No. [illegible]

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		REGION	PROVINCE	MUNICIPAL													
101	Dauman	XI	Davao del Norte	Monte-vista	Soil Conservation			x	x								
					Irrigable Area 40 Has.	/	/	x	x	P0.994	EARTH	12	51	11,800	147.145	0.50	2639.4
102	Florida	XI	Davao del Norte	Capalong	Soil Conservation			x	x								
					Irrigable Area 150 "	/	/	x	x	2.022	EARTH	9.5	172	32,000	341.145	1.47	2639.4
103	Libasan	XI	Davao del Norte	Nabun-turan	Soil Conservation			x	x								
					Irrigable Area 190 "	/	/	x	x	2.874	EARTH	12	158	47,000	607.037	4.12	2639.4
104	Bolton	XI	Davao del Sur	Malalag	Soil Conservation			x	x								
					Irrigable Area 120 "	/	/	x	x	3.013	EARTH	15	98.5	23,000	75.804	2.29	950.8
105	San Nicolas	XI	Davao del Sur	Digos	Soil Conservation			x	x								
					Irrigable Area 80 "	/	/	x	x	2.521	EARTH	10.5	188	39,400	154.025	2.83	950.8
106	Dalingawen	XII	North Cotaba-to	Pikit	Soil Conservation			x	x								
					Irrigable Area 250 "	/	/	x	x	2.299	EARTH	9.2	226	33,500	262.351	0.93	1571.10
107	Pedtad	XII	North Cotaba-to	Kabacan	Soil Conservation			x	x								
					Irrigable Area 80 "	/	/	x	x	2.329	EARTH	15.6	102.5	39,000	80.035	0.50	1571.1
108	Tinibtiban	XII	North Cotaba-to	Pikit	Soil Conservation			x	x								
					Irrigable Area 120 "	/	/	x	x	2.11	EARTH	8.5	178	34,000	112.285	0.42	1571.1
109	Looy	XII	Maguin-danao	Upi	Soil Conservation			x	x								
					Irrigable Area 85 "	/	/	x	x	1.722	EARTH	10	263	38,300	110.456	0.998	1255.9
110	Busok	XII	Sultan Kudarat	Bagum-bayan	Soil Conservation			x	x								
					Irrigable Area 100 "	/	/	x	x	1.17	EARTH	14.5	64	9,600	95.683	0.776	1255.9

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SWIM Projects for Master Plan

projects which are ___ and expected to be executed in next ten(10) years

Agency ___ No. ___

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		REGION	PROVINCE	MUNICIPAL													
111	Kalandagan	XII	Sultan Kudarat	Tacurong	Soil Conservation			X	X								
					Irrigable Area 530 Has	/	/	X	X	₱ 4.138	EARTH	11	246	55,000	788.275	3.3345	1255.9
112	Lancheta	XII	Sultan Kudarat	Tacurong	Soil Conservation			X	X								
					Irrigable Area 20 "	/	/	X	X	1.029	EARTH	7	114	11,400	62,408	0.18	1255.9
113	New Carmen	XII	Sultan Kudarat	Tacurong	Soil Conservation			X	X								
					Irrigable Area	/	/	X	X	1.78	EARTH	8	170	20,000	307.484	0.996	1255.9
						/	/										
						/	/										
						/	/										
						/	/										
						/	/										
						/	/										

S W I M Projects for Master Plan

projects which are completed, on-going and expected to be executed in next ten (10) years

Agency BUREAU OF FOREST DEVELOPMENT

NO.	NAME OF WATERSHED REHABILITATION PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY A B C D REPORT EXISTENCE	COST (ESTIMATED) P 10 ^{6}	WATERSHED REHABILITATION PLAN STRUCTURAL MEASURES VOLUME OF CHECKDAMS (m^3)	WATERSHED REHABILITATION PLAN BIOLOGICAL MEASURES AREA IN HECTARES	CATCHMENT AREA (HAS.)	ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL							
1	Naguilian Watershed	1	La Union	Naguilian	I, PS, S, WM	B	5.230	3,500	700	1,900	202.8
2	Santiago Watershed	2	Isabela	Cordon	FC, WM	B	4.890	3,015	790	11,900	211.2
3	Manga River Watershed	2	Nueva Vizcaya	Dupax del Norte	I, S, WM	C	1.450	1,090	100	280	202.2
4	Tangbao Watershed	3	Tarlac	Mayantoc	S, WM	B	5.500	7,020	630	1,800	199.2
5	Sinapaoan Watershed	2	Nueva Vizcaya	Sta. Fe	S, WM	B	5.470	8,580	770	2,200	204.0
6	Banila Watershed	1	Pangasinan	Umingan	S, WM	B	11.320	11,310	1,015	2,900	204.0
7	Abued River Watershed	1	Benguet	Tuba	S, WM	B	36.770	23,000	3,100	14,800	202.8
8.	Balog-balog Watershed	3	Tarlac	Sula	S, WM	B	15.640	11,500	1,020	2,940	

NOTE: PURPOSE, I: Irrigation, FC: Flood Control, W: Domestic Water Supply, P: Power Generation, F: Fishery, S: Soil Conservation, WM: Watershed Management, O: Others

SPECIFICATION will be described in the following items: Irrigable area, Kilo watt per hour, Tonnage of fishery harvest per year, etc.

STATUS OF STUDY, A - before starting Feasibility Study (F/S)
B - ongoing F/S
C - F/S completed
D - Detail Design (D/D) completed

S N I M P r o j e c t s f o r M a s t e r P l a n

projects which are completed, on-going and expected to be executed in next ten (10) years

Agency BUREAU OF FOREST DEVELOPMENT — NO. 2 of 4

O.	NAME OF WATERSHED REHABILITATION PROJECT	LOCATION: REGION	PROVINCE	MUNICIPAL	PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY: A;B;C OR D; REPORT EXISTENCE	COST (ESTIMATED) P*10^6	WATERSHED REHABILITATION PLAN: STRUCTURAL MEASURES: VOLUME OF CHECKDAMS (m³)	BIOLOGICAL MEASURES: AREA IN HECTARES	CATCHMENT AREA (HAS.)	ANNUAL RAIN FALL (mm)
9	Kulabnao	3	Tarlac	Tatlac	S, WM	C	5,100	3,120	420	1,250	
10	Binasagon	5	Camarines Sur	Pili	S, WM	A	2,750	2,730	250	700	
11	Butuan-Sinanguan	6	Negros Occidental	Murcia	S, WM	A	8,080	8,100	720	2,080	
12	Consolacion	7	Cebu	Consolacion	S, WM	A	10,070	11,080	990	2,840	
13	Tigbao River	8	Leyte	Tigbao	S, WM	A	7,600	7,600	680	1,950	
14	Pulunan	9	Zamboanga del Sur	Ipil	S, WM	A	9,410	9,400	840	2,420	
15	Cusa	10	Cagayan de Oro	Cusa	S, WM	A	11,340	11,200	1,000	4,800	
16	Talomo	11	Davao City	Talomo	S, WM	A	9,210	9,240	820	2,370	
16	Pugnon	12	Lanao del Norte	Lalipuga	S, WM	A	6,560	8,900	800	2,300	

NOTE: PURPOSE, I; Irrigation, FC: Flood Control, W: Domestic Water Supply, P: Power Generation, F: Fishery, S: Soil Conservation, WM: Watershed Management, O: Others

*SPECIFICATION will be described in the following items: Irrigable area, Kilo watt per hour, Tonnage of fishery harvest per year, etc.

STATUS OF STUDY, A - before starting Feasibility Study (F/S)
B - ongoing F/S
C - F/S completed
D - Detail Design (D/D) completed

SWIM Projects for Master Plan

Agency national Electrification Adm. — projects which are completed and expected to be executed in next ten(10) years — No.

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (A B C D) REPORT EXISTENCE	COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL				DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY 1¾*X1000	CATCHMENT AREA (Km²)	
	Cantingas River	IV	Romblon	San Fernando	P-800 KW	X	P 30							
	Calabgan River	IV	Aurora	Casiguran	P-800 KW	X	30							
	Estrella Falls	IV	Palawan	Narra	P-1000 KW.	X	42.6							
	Manalili River	IV	Palawan	Narra	P-900 KW	X	38.3							
	Tarabanan River	IV	Palawan	Puerto Princesa	P-800 KW	X	34.1							
	Magcasa Falls	VIII	Southern Leyte	San Juan	P-810 KW	X	29.6							
	Maud River	VIII	Northern Samar	San Isidro	P-1800 KW	X	73.4							
	Tinuy-an Falls	X	Surigao Del Sur	Bislig	P-960 KW	X	38.2							
	Hubo River	X	Surigao Del Sur	San Agustin	P-2000 KW	X	79.5							
	Kanapnapan Falls	XII	Lanao del Sur	Malabang	P-3000 KW	X	109.8							

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonage of fishery harvest per year, etc.
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
B= ongoing F/S
C= F/S completed
D= DeLail Design (D/D) completed

SWIM Projects for Master Plan

projects which are completed and expected to be executed in next ten(10) years

Agency _____ No ____

NO	NAME OF PROJECT	LOCATION			PURPOSE OF PROJECT AND SPECIFICAL DESCRIPTION	STATUS OF STUDY (A B C D) REPORT EXISTENCE	COST (ESTIMATED) P 10⁶	DAM PLAN						ANNUAL RAIN FALL (mm)
		REGION	PROVINCE	MUNICIPAL				DAM TYPE	DAM HEIGHT (M)	CREST LENGTH (M)	DAM VOLUME (M³)	STORAGE CAPACITY M³X1000	CATCHMENT AREA (Km²)	
	Matling River	XII	Lanao del Sur	Malabang	P-2250	X	≠ 91.8							
	Tubungan River	IX	Basilan	Lamitan	P-400	X	16.0							
	Manican River	IX	Basilan	Lamitan	P-400	X	16.0							

NOTE: PURPOSE, I:Irrigation, FC:Flood Control, W:Domestic Water Supply, P:Power Generation, F:Fishery, S:Soil Conservation, WM:Watershed Management, O:Others
SPECIFICATION will be described in the following items; Irrigable area, Kilo watt per hour, Tonage of fishery harvest per year, etc
STATUS OF STUDY, A= before starting Feasibility Study (F/S)
B= ongoing F/S
C= F/S completed
D= Detail Design (D/D) completed

3. 収集資料リスト

資料名	内容
① Feasibility Study Report BANILA SWIM Project	NIA JUNE/11/1982 全文
② FINAL Feasibility Study Report of PARPAGOJA SWIM Project	NIA APRIL/6/1982 全文
③ Proposed Small Water Impounding Management Technical and Financial Assistance	PMO-SWIM-MPWH 11ケ所のSWIMプロジェクトのプロポーザル 11ケ所の概要，SWIMプロジェクトリスト PMO-SWINの組織図，機能等
④ T/R for Feasibility Study	T/Rの参考例 5ページ
⑤ PHILIPPINE Water Resources Summary Data	Volume 1 Streamflow and Lake or River Stage by National Water Resources Council 452ページ，Region 1～12の主要河川の指標，約10年間の月別平均流量等
⑥ AGNO River Basins	REGION 3のAGNO川及び流域に係る詳細データ 310ページ
⑦ PAMPANGA River Basins	〃 PAMPANGA川 〃 299ページ
⑧ Small Water Impounding Management Project Year-End Report CY-1986	Calender Year 1986年にPMO-SWIMで実施したプロジェクト状況
⑨ MEDIUM TERM (1987-1992) PUBLIC INVESTMENT PROGRAM	1986年12月 一部
⑩ FINAL FEASIBILITY STUDY REPORT BOLO DAM AND RESERUOIR PROJECT	DPWH 全文
⑪ WATER IMPOUNDING PROJECTS FEASIBILITY STUDY PACKAGE－Ⅲ REGION Ⅲ-CENTRAL LUZON	BS (Butid, Maasin, Mangadingay 他12ケ所) 全文