

フィリピン共和国

ダバオデルノルテ州

**リブガノン川灌漑システム改修計画調査
プロジェクトファイナディング調査報告書**

平成 14 年 7 月

社団法人 海外農業開発コンサルタンツ協会

序 文

日本技研株式会社および太陽コンサルタンツ株式会社は、(社)海外農業開発コンサルタンツ協会(ADCA)の補助金を受け、平成14年6月25日から7月4日までの10日間にわたり、フィリピン国、ミンダナオ島、ダバオデルノルテ州に位置し、リブガノン川水系のLALIK(Lasanag, Libiganon, Kiplikuの3地区)国営灌漑地区のシステム改修計画に係わるプロジェクトファイナンス調査を実施した。本報告書はこのプロジェクトファイナンス調査結果を取りまとめたものである。

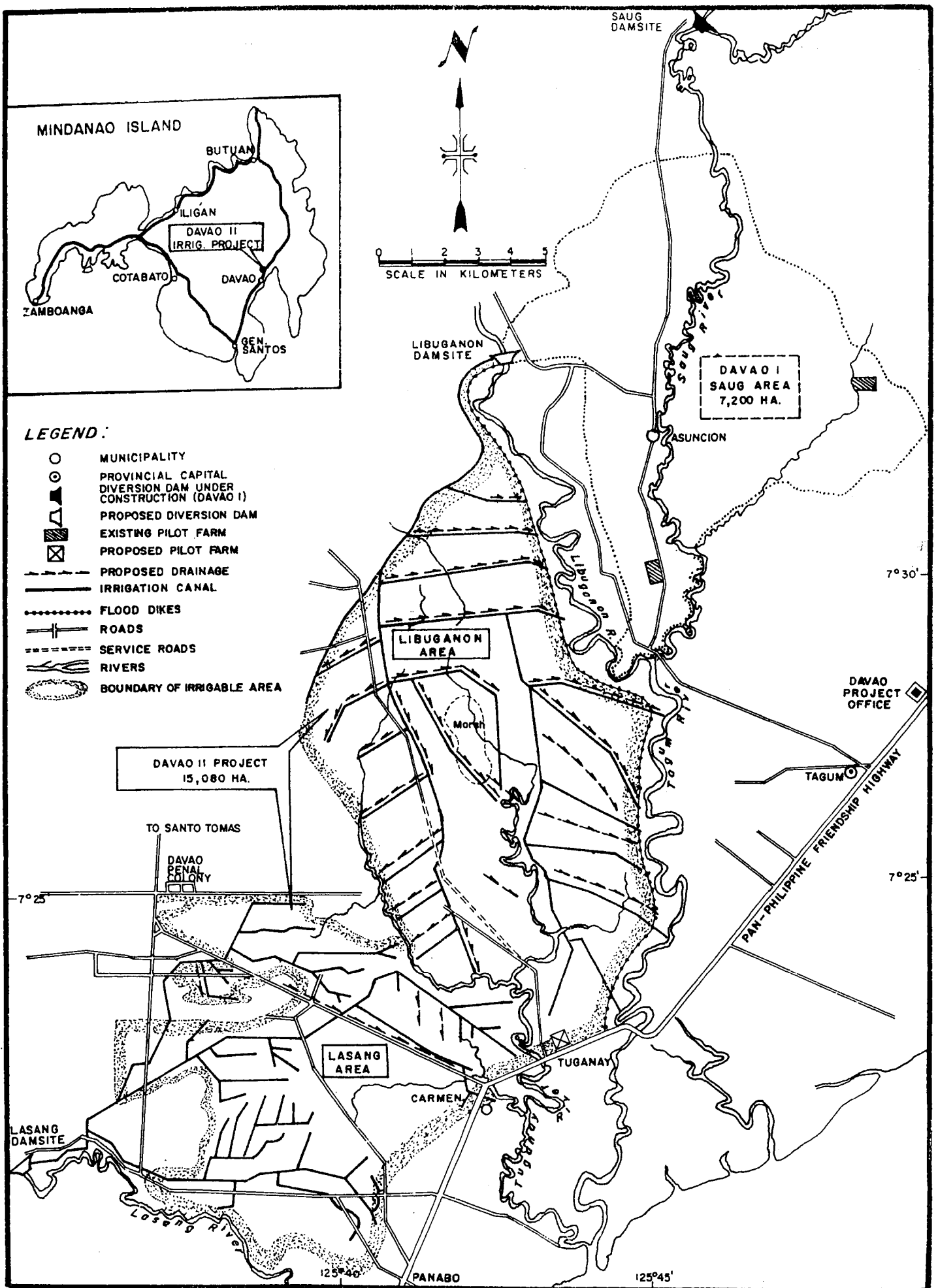
フィリピン共和国では、長い間ミンダナオ島、特にモスリム自治区(ARMM地区)における平和と秩序が不安定な状態におかれ、ラモス大統領時代に反政府勢力と積極的な対話推進によりモロ国民自由戦線(MNLF)との和平を成功させた。また、モロイスラム自由戦線(MILF)との交渉も順調に進められてきたが、アフガンでのアルカイダの事件後の影響もあって、以来停滞気味の状況である。しかし、このミンダナオでの和平問題解決はフィリピン政府の最重要課題の一つであり、国策としてミンダナオ開発を精力的に推し進めているところである。ダバオ市周辺は、ミンダナオ開発の発信拠点として最も重要と位置づけられる地域であり、この社会、経済の安定がひいてはミンダナオ全体の安定に繋がるものといえる。

本計画の対象であるLALIK(Lasanag, Libiganon, Kiplikuの3地区)国営灌漑地区は、ミンダナオ最大の都市、ダバオ市の北に位置し、ADB融資により1989年に完工したが、このうちLibiganon地区は、灌漑可能面積約12,000haで、水源のLibiganon川はこれを灌漑するのに十分な流量を有し、バランガイMabantaoに位置する頭首工から取水され、裨益する町村はDujari, Carmen, Sto.Tomas及びKapalongである。その流域面積は9500km²と大きい反面、流域管理が不十分なため、雨期には一部灌漑エリアにまで洪水が氾濫し、農地が流亡したり、土砂で埋まり農作物に大被害を及ぼしている。また、河川堤防はあるものの完全なものではなく、豪雨時には破堤し、湛水による被害と共に土砂流が取水工や水路などの灌漑施設の機能を失わせている。このため、当初計画の灌漑受益地12,000haのうち7,000haが灌漑されているのみであり、本計画が事業化されることにより、農地保全のための施設(堤防の嵩上げ、道路補修等)及び灌漑施設の補修と整備により、5,000haの農地の回復と保全された農地による安定した営農が約束され、農家収入の安定とひいては民生の安定に繋がるものとなる。

最後に、本調査に際し、ご協力いただいた国営灌漑公社、第11地域事務所、JBIC事務所、JICA事務所、JICA専門家、その他関係機関の関係者各位に対し深甚の謝意を表する次第である。

平成14年7月
調査団団長 湯川 義光

調査対象位置図





NIA 中央事務所



Libuganon 川頭首工



Libuganon 取水口



調査対象地域の水田



Libuganoin 川堤防決壊状況



対象地域支線水路分水工

現地写真集

フィリピン国ダバオデルノルテ州リブガノン川灌漑システム改修計画調査
プロジェクトファインディング調査報告書

—目 次—

序文

調査対象位置図

現地写真集

1. 計画の背景、経緯	1
1) 一般概況	1
2) 自然条件	1
3) 社会条件	3
4) 農業	4
5) 灌漑	4
2. 計画概要	5
1) 調査の必要性	5
2) 調査の目的	5
3) 調査対象地域	5
4) 調査の内容	6
5) 調査スケジュール	6
6) 実施機関の活動目的と権限調査の内容	6
7) 総合所見	7
添付資料	9
A-1 調査日程	11
A-2 面会者リスト	12
A-3 収集資料リスト	13
A-4 現地調査報告書	14
A-5 要請書（案）	19

1. 計画の背景、経緯

1) 一般概況

フィリピン国は永らく続いたマルコス体制から脱却して、アキノ、ラモス大統領の民主化政権が同国内の政治、経済体制の改善を図ってきた。特にラモス政策（1992～98）下では、NIEs、中国とともに世界の成長センターの一角を占め、最近はアジアの金融危機の影響を受けてはいるが、順調な経済成長を遂げている。

しかし、農村部を中心とする貧困層は未だ人口の 40.6%を占め、地域によっては 50～60%を占めており、地域格差が大きい。1998年 5月に選出されたエストラダ大統領は貧困撲滅、そのための農業振興、農村地域の開発を最優先課題としている。

国営灌漑公社（NIA）は、1963年に設立され、フィリピンの灌漑施設の水源開発から灌漑施設の維持管理までを担当している。13の地域事務所を有し、180の国営灌漑事業（NIS）を運営管理している。なお、NIAは、国営灌漑地区のニーズに応えようとする構想を持っているが、効率的な維持管理体制が継続できるような、運営体制の強化を図る必要がある。

2) 自然条件

フィリピンは北緯 5～21°、東経 117～127° に分布する7,109の島から成る、面積 299,767平方キロメートル、人口 71百万人の共和国で、13のリージョンに分かれている。

気候は高温多湿の熱帯性気候で、モンスーンの影響により主に4つに区分される。

第1の型は、乾期が11月から4月、雨期5月から12月と明瞭で、主に南シナ海側（ミンダナオ島を除く）の海岸地帯がこれに属する。

第2の型は、はっきりした乾期はなく、雨期が11月から1月に集中する型で、太平洋側海岸地域が属する。

第3の型は、特に季節の差は明らかでなく、11月から4月は乾燥気味の地帯で、カガヤン、バル、ビサヤ諸島、ミンダナオ島の一部がこれに属する。

第4の型は、特に季節の差はなく、雨量も年間を通して平均している地域で、ミンダナオ島西部がこれに属する。

ルソン（マニラ）、ビサヤ（セブ）、ミンダナオ（ダバオ）における最低及び最高気温、月別平均降水量を表1、表2に示す。

表1 月別最低、最高気温 (°C)

月	ルソン		ビサヤ		ミンダナオ	
	最低	最高	最低	最高	最低	最高
1月	20.3	30.8	21.7	31.3	21.6	31.8
2月	20.7	31.7	22.0	35.3	21.9	31.9
3月	21.5	35.9	22.4	32.3	22.0	33.5
4月	22.5	38.1	23.0	33.2	22.9	34.2
5月	23.6	34.8	23.2	34.1	23.0	33.8
6月	21.6	32.9	22.5	33.6	22.8	32.6
7月	23.0	31.2	22.8	32.8	21.9	33.8
8月	22.8	30.9	22.6	34.2	21.2	31.0
9月	22.7	31.3	20.4	31.8	22.8	31.2
10月	21.3	30.8	21.7	32.3	22.3	31.4
11月	20.4	30.5	21.9	32.9	21.6	33.2
12月	18.2	29.8	20.6	30.2	20.7	31.4

表2 月別平均降水量及び雨天日数 (mm)

	ルソン		ビサヤ		ミンダナオ	
	降雨量	雨天日数	降雨量	雨天日数	降雨量	雨天日数
1月	42.1	4	95.3	10	65.3	10
2月	53.5	2	46.9	9	95.3	9
3月	12.2	2	27.4	6	126.5	12
4月	25.4	3	94.6	5	75.3	8
5月	86.4	9	98.3	8	94.7	12
6月	283.7	14	147.5	14	125.8	15
7月	312.8	19	209.8	12	153.2	14
8月	367.5	21	149.7	10	182.6	18
9月	244.4	15	186.0	11	245.2	13
10月	196.3	14	141.4	18	198.6	11
11月	154.9	9	183.6	17	127.5	8
12月	48.3	6	152.8	13	69.4	9
合計	1827.5	118	1533.3	133	1559.4	139

3) 社会条件

フィリピンの人口は2001年で 77,131千人で、1990年からの人口増加率は年 2.32%となっている。その内の農業従事者は 11,930千人である。その他の主要経済指標を表3に示す。

表3 主要経済指標

1.主要産業	農林水産業(全就業人口の約37%が従事)
2.GNP(億米ドル)	685(98年)、802(99年)、790(00年)、757(01年)、820(02年)
3.一人当りGNP(米ドル)	912(98年)、1045(99年)、1007(00年)、945(01年)
4.経済成長率(%)	-0.6(98年)、3.4(99年)、4.4(00年)、3.2(01年)、4.6(02年)
5.物価上昇率(%)	9.8(98年)、6.7(99年)、4.4(00年)、6.0(01年)
6.失業率(%)	10.0(98年)、9.8(99年)、11.2(00年)、11.1(01年)
7.総貿易額(億米ドル)	(1)輸出 350.4(99年)、380.8(00年)、321.5(01年)、350.7(02年) (2)輸入 307.4(99年)、344.9(00年)、330.6(01年)、334.7(02年)
8.貿易品目	(1)輸出:電子・電気機器、輸送用機器等 (2)輸入:通信・電気機器、電子部品、発電用重電機器等
9.貿易相手国(シェア順)	(1)輸出 (1)米国、(2)日本、(3)オランダ (02年) (2)輸入 (1)日本、(2)米国、(3)韓国 (02年)
10.為替レート	1ペソ=約2.3円(03年4月現在)
11.経済概況	アジア通貨危機以降は緩やかな回復基調。02年のGDP成長率4.6%増を記録、政府目標値4.0%を上回った。政府は03年のGDP成長率を4.2%~5.2%増と予測。今後、持続的な成長を維持していくには、経済構造改革、財政赤字解消、不良債権処理、治安回復によるフィリピン経経への信頼回復が課題である。

4) 農 業

フィリピンの国土面積は約 30百万haで、現在の農地面積は国土面積の約 30%、919万haである。これに総合農地改革計画 (CARP) で新たに開墾される約 1 百万haが加わる。更に、CARP 対象面積の約半分の約 4 百万haは林業地域と言われているものの、実態は樹木のない原野であり、当然何らかの農業活動が行われることが想定される。つまり、CARP後は、約 15百万ha (国土の約 50%) で何らかの農業活動が展開されることが想定される。

表 4 土地の配分計画 (単位：千ha)

土地の区分	当初計画 1987年	変更計画 1996年	構成比	配分実績 1996年	進捗率
DAR所管	3,821	4,290	53%	2,562	60%
私有農地	3,266	2,766	34%	1,144	41%
(地主保有限度超分)					
(政府所有地)	556	1,525	20%	1,418	32%
DENR以外の政府所有地	77	888	11%	755	85%
国営入植地	479	637	9%	663	104%
DENR所管 (政府所有地のみ)	6,475	3,771	47%	1,902	50%
譲渡処分可能公有地	4,595	2,502	31%	927	37%
(DENR所有地傾斜度 18%未満)					
総合社会林業地	1,880	1,269	16%	975	77%
(DENR所有地傾斜度 18%以上)					
合 計	10,296	8,062	100%	4,464	56%

5) 灌 漑

現在稼働中の施設の大半はNIAによって建設されたものであり。2001年 3月現在 NIAの把握している灌漑施設とその利用状況は表5の通りである。

表 5 主要灌漑事業の実態 (単位：ha)

		NIS	CIS	合 計
地区数		180	9,245	9,425
地区面積		669,697	659,891	1,329,588
雨期作	計画灌漑面積	510,876	494,796	1,005,672
	実灌漑面積	460,423	328,791	789,214 (78%)
乾期作	計画灌漑面積	411,724	254,411	666,135
	実灌漑面積	396,548	220,450	616,996 (61%)
年 間	実灌漑面積	856,971	549,241	1,406,212
	作付け率	168	111	140

2. 計画概要

1) 調査の必要性

フィリピンにおいて、国家灌漑庁（National Irrigation Association: NIA）を相手国受入機関とする開発調査を含む農業・農村開発に係る開発調査は、現在までに多数実施されてきた。その殆どが、資金協力事業を前提とする灌漑施設の整備もしくは改修を主体としたものであった。その結果として、多くの灌漑開発計画が策定され、その内の幾つかは既に事業が完了もしくは現在実施中である。また近年、我が国ODAの目指す方向が、「施設」から「人」へ、「量」から「質」へと転換して行く中で、NIAに対する技術協力も、水管理、施設維持管理の強化や水利費徴収システム構築に係る開発調査が実施されるようになってきて、その結果として、灌漑水管理組織の強化や、水利費徴収システムの構築がモデル的に既に実施されている。

このような状況の下、今後のフィリピンへの開発援助の目的として、持続可能な開発を実現するため「貧困緩和と地域格差の是正」が挙げられており、今までの成果に基づき、住民参加型の新たな地域開発手法の確立を目指した調査の実施が望まれている。

2) 調査の目的

短期目標：零細な経営の稲作農家の生計向上を図るとともに、NIAは灌漑事業を主体的に実施してきたが、排水計画、湛水防除の経験は不十分であり、当該対象地域の最も重大な課題である排水改良に対する計画を策定しながら、技術移転を実施することにより、NIAによる本地域の類似地域の排水改良計画の策定が可能となる。

長期目標：現在、主食である米の供給は輸入に頼っているが、この米の自給を達成し、国家経済に貢献する。

3) 調査対象地域

LALIK RIS（RIS：河川灌漑システム）はダバオ北部州のLasang川、Libuganon川、Kipaliku川の3川を夫々の水源とする3つの灌漑システムで構成されており、ADBのローンにより1989年に完成した灌漑事業地区である。このうち、最も事業地域の大きいlibuganon RISは13,305haの受益地を有するが、施設完成後12年を経過し、水路の堆砂、崩壊等により乾季には約6,000haが灌漑不能となっているほか、雨期には湛水のため、約5,000haが耕作不能となっており、残りの7,000ha余りが、事業の恩恵を受けている。

以下に各RISの現況及び事業実施後の作付け状況を示す。

作付け面積 (ha)

	Lasang RIS		Libuganon RIS		Kipaliku RIS		Total	
	雨期	乾季	雨期	乾季	雨期	乾季	雨期	乾季
現況	4,433	4,195	7,094	7,095	2,010	2,026	13,537	13,316
実施後	4,450	4,450	12,152	12,152	2,317	2,317	18,919	18,919

注) : 対象作物はすべて水稲

4) 調査の内容

調査の内容は以下のとおり。

- ・ 本調査を通じて、NIA に灌漑用水管理費徴収システムと同様な排水管理および管理費徴収システムを設定する。
- ・ 対象地域内の灌漑排水路と分水工、ゲート、アクセスロード、ダイク、水管理施設の調査と必要とされる改修箇所の評価
- ・ 農家経済調査の実施

5) 調査スケジュール

調査に必要な専門家とその派遣スケジュールは以下のように想定される。

	1	2	3	4	5	6	7	8	9	10	11	12	Site Survey	Analysis	
	-----Phase I-----					-----Phase II-----									
- Term leader/Rural Development	■					■							6.5	4.0	
- Irrigation and Drainage management specialist	■					■							6.5	4.0	
- Agro-economist	■				□	■							6.5	3.5	
- Farmers' organization specialist	■				□	■							6.5	3.5	
- Sociologist	■			□	■				□					5.0	3.0
- Agronomist	■			□	■				□					5.0	3.0
- Structure Design and cost estimation engineer	■			□	■				□					4.5	3.5
- Project evaluation engineer								■				□	2.0	4.0	
- Environmentalist	■		□					■				□	4.0	3.0	
													46.5	31.5	
													78.0		

6) 実施機関の活動目的と権限

NIAの活動の目的と権限は以下の法律(抜粋)で規定されている。大統領令 第552 (President Decree No.552) 注¹⁾:共和国令第3601「国家灌漑庁設立に係る法令」の修正条項

¹⁾) : A Comprehensive History of Irrigation in the Philipines, pp155

フィリピンの水資源を包括的に開発、利用、管理するため宣言された政策、及びこの政策を追求するため、国家灌漑庁の主目的の一つは、灌漑事業を統合して実施することにより、水資源の最適、多角的利用、管理を達成するための経済的手段を構築することにある。

国家灌漑庁は政府の灌漑事業統合計画の実施、共和国令第3601に描かれた「灌漑の時代」の達成に、主たる責任を負う。

包括的水資源開発に沿った多目的開発事業を効果的に実施するには、洪水防御、排水、開拓、水力開発、上水、道路建設、植林等の付随事業と、生態均等維持事業を、関係省庁と協力して実施できるよう広範な職務範囲と権限をNIAに付与する必要がある。

多目的水資源開発に沿った多目的開発事業の建設には、農民が責任を果たし業務に応ずることが可能となるよう、農民の財政向上のために農業生産の増加を図る政府資金の実質的投資が必要である。

ここに、私、フィリピン共和国大統領フェルナンド・E・マルコスは、憲法により与えられた権限により、共和国令第3601「国家灌漑庁設立に係る法令」の一部条項を改定する。

第一項 共和国令第3601、第二項は、以下の通り改定する。

第二項：権限及び活動目的-NIAは以下の権限および活動目的を有する。

- (a) 灌漑を主たる目的とする水資源の調査、解析、灌漑事業の計画、設計、施工を行う。
- (b) 灌漑受益者より水利費を徴収する。
- (c) 第一に灌漑、第二に水力開発、洪水防御、排水、開墾、上水道、道路、植林等のために、多目的水資源開発事業の建設を実施する。
- (d) 公共事業局と協力して、永続的または、一時的冠水により、生産が不可能、または生産性が低い土地の調査を行なう。そして、農業生産性の向上、最大化のために必要となる排水施設、冠水防御工の計画、設計、工事を行う。また、政府の方針に従い、維持管理費、受益者負担と認められる一部工事費を、排水改良事業により利益を得る土地の所有者より徴収する。

7) 総合所見

フィリピンにおいては、長い間ミンダナオ島、特にモスリム自治区（ARMM地区）における平和と秩序が不安定な状態におかれ、ラモス大統領時代に反政府勢力と積極的な対話推進によりモロ国民自由戦線（MNLF）との和平を成功させた。また、モロイスラム自由戦線（MILF）との交渉も順調に進められてきたが、アフガンでのアルカイダの事件後の影響もあって、以来停滞気味の状況である。しかし、このミンダナオでの和平問題解決はフィリピン政府の最重要課題の一つであり、国策としてミンダナオ開発を精力的に推し進めているところである。我が国、政府によるODAもこれに同調した形で、安定した地区において協力がなされている。本件の位置するダバオ周辺についてはこのような治安上の問題が無く、ミンダナオ開発の発信拠点として最も重要と位置付けられる地域であり、ここの社会、経済の安定がひいてはミンダナオ全体の安定に繋がるものといえる。

添 付 資 料

添 付 資 料

A-1 調査日程

日 程

1.	6月 25日 (火)	移動 (成田→マニラ)、NIA表敬
2.	26日 (水)	移動 (マニラ→ダバオ)、NIA第11地域事務所打合せ
3.	27日 (木)	現地踏査および資料収集
4.	28日 (金)	現地踏査および資料収集
5.	29日 (土)	移動 (ダバオ→マニラ)
6.	30日 (日)	資料収集
7.	7月 1日 (月)	NIAと協議
8.	2日 (火)	現地報告書作成
9.	3日 (水)	JICA、大使館に調査結果報告
10.	4日 (木)	移動 (マニラ→ダバオ)

調査団員

湯川 義光 (団長、日本技研株式会社、専務取締役)

岩本 彰 (副団長、太陽コンサルタンツ株式会社、海外事業本部企画営業部長)

守分 亮 (団員、銭高組国際事業部、マニラ営業所)

A-2 面会者リスト

Names of Attendant	Title
Mr. Jusus Emmanuel M. Paras	Administrator
Mr. Edilberto B. Punzal	Manager, Project Development Dept.
Mr. Wilfred D. Silva	Division Manager, Project Development Dept.
Mr. Domingo F. Alcaraz	Division Manager, Chief of Operation, NIA RegionXI
Mr. Jovencio Z. Napoles	Site Engineer of NIA RegionXI
Mr. Edwin T. Chaves	Site Engineer of NIA Lalik River Irrigation System
Mr. Filomeno M. Acran	Site Engineer of NIA Lalik River Irrigation System
Mr. Renato E. Cosmod	Water Resources Facilities Technician
Mr. Napoleon R. Bato	Surpervising Engineer A
Mr. Jovencio Z. Napoles	Site Engineer of NIA RegionXI
Mr. Edwin T. Chaves	Site Engineer of NIA Lalik River Irrigation System
Mr. Filomeno M. Acran	Site Engineer of NIA Lalik River Irrigation System
Mr. Renato E. Cosmod	Water Resources Facilities Technician
Mr. Napoleon R. Bato	Surpervising Engineer A

日本人関係者

- | | |
|----------|---------------------|
| 1. 植野 栄治 | 在フィリッピン日本国大使館 一等書記官 |
| 2. 中垣 長睦 | 国際協力事業団フィリピン事務所所長 |
| 3. 竹内 兼蔵 | J I C A 専門家 |
| 4. 宮里 哲朗 | アジア開発銀行 |

A-3 収集資料リスト

- Project Digest for Libuganon River Irrigation Project
- Project Digest for Lasang River Irrigation Project
- Project Digest for Kipaliku River Irrigation Project
- Pictorials – Flood Damages Feb 16-21, 2001
- Pictorials – Kipaliku Dam
- Hydro-meteorological Data and Layout Map of Libuganon River Irrigation System t

**Outline of Findings
through
the Site Survey
for
LALIK NIS**

**on
July, 2002**

**by
Project Finding Mission
of
The Agriculture Development Consultants Association
(ADCA)**

Outline of Findings through the Site Survey for LALIK NIS on July 3, 2002

by

Project Finding Mission of The Agriculture Development Consultants Association

The ADCA Mission, led by Mr. Yoshimitsu YUKAWA, carried out site survey for LALIK NIS in Davao del Norte Province from 25 June to 4 July 2002.

Schedules and visited sites of the survey are as follows.

1. Schedule of the Survey

25 June (Tue)

14:00 Mission arrived at Manila

15:00 Meeting with Mr. Kanezo TAKEUCHI (JICA Expert) and Mr. William Silva at NIA

16:00 Pay courtesy call to Mr. Jesus Emmanuel M. Paras, Administrator of NIA

26 June (Wed)

9:00 Discussion about the site survey with Mr. Takeuchi and Mr. Silva

13:00 Meeting in the Mission members

16:30 Leaving Manila to Davao

19:00 Meeting with staffs of the NIA regional office XI

27 June (Thu)

9:00 Briefing for LALIK NIS by staffs and discussing about field survey

10:30 1st site survey for LIMIK NIS

- collapsed point of the Tuganay river dyke system

13:30 2nd site survey for LALIK NIS

- Libuganon RIS, Tagum river dyke system, Lateral "H" canal, Lateral "F" canal, Main Canal, Lateral "D" canal, Libuganon Intake Head Work
- Kipaliku RIS, Lunga Check Gate, Lateral "A" left canal,
- Lasang RIS, Lateral "F" canal

28 June (Fri)

9:00 Collecting data and information at NIA LALIK NIS office

13:30 3rd site survey for LALIK NIS

- Libuganon RIS, Siphon structure on main canal, Lateral "F" canal, Community pumping station, Lateral "D" canal, Rainfed area

15:30 Discussing about proposed project components

29 June (Sat)

8:10 Leaving Davao to Manila

11:00 Mission member meeting

13:00 Data adjustment

1 July (Mon)

Discussion of Findings of the survey with NIA HQ staffs

2 July (Tue)

Preparation of Field Report

3 July (Wed)

Pay courtesy call to Embassy of Japan and JICA

4 July (Thu)

Leaving Manila to Tokyo

2. Topics of Findings through the Survey

(1) Confirmation of Potentiality and development issues of LALIK National Irrigation System (herein after NIS)

The LALIK NIS, consisted of three River Irrigation Systems (herein after RIS) namely Libuganon RIS, Kipaluku RIS and Lasang RIS, those RIS have independently water resources through each Intake head works on deferent rivers however they locate in border with each other. Outlines of each RIS are shown as follows.

1) Libuganon RIS

The Libuganon RIS was originally implemented by NIA-Second Davao Irrigation Project which was financed by Asian Development Bank. It was constructed in 1977 and was completed in 1989.

The water source of the system is Libuganon River with an area of 12,152 ha as designed. The catchment area of this river is 9,497 sq. km., thus discharge of the river in dry season is stable but flash flood occurs especially during the wet season and it inundates part of the irrigated area.



During its 12 yrs. of operation, the area irrigated was only 7,093.83 ha, for both wet and dry season. There is a total of approximately 5,000 ha, which is to be potentialied if the irrigation facilities will be rehabilitated and improved.

The dike along the river that has been constructed by NIA during its implementation is now being over topped every time there is flood. The protection dike constructed along Libuganon River during the implementation of the project which needs improvement (heightening its embankments) is 28.12 km. The rapid accumulation of the silt deposits from the river can not be controlled in entering the intake; to the conveyance canals and to the farmlands. Thus, causing a high maintenance cost for the system.



2) Kipaliku RIS

Kipaliku RIS, located in the North-western part of the NIS, started operation in 1993 and it has a firm-up service area of 2,317 ha. It has a potential area of 4,400 ha, however, this vision will remain only as a dream unless we can address the perennial problem of flash floods which always inundates some 200 ha of Kipaliku RIS. The average yield is still very low ranging from 3.73tons/ha to 3.86 tons/ha which is still far from the Provincial target of 5.00/tons/hectare. The problem of draining excess water to the already heavy silted creeks and rivers within the service area has been a grave concern for NIA and the IAs..



3) Lasang RIS

Lasang RIS, located in the South-western part of the NIS, started operation in 1983 and has been a consistent viable system and has annually reaped awards as outstanding irrigation system since its start of systems operation. It has a firm-up service area of 4,450 ha in a potential area of 5,237 ha.

However, it can address the perennial problem of flash floods which always inundates some 800 hectares of Lasang RIS. The average yield is still very low ranging from 3.51tons/ha to 3.76 tons/ha. Certain sections of Tuganay River Protection Dike (Alemag Portion) are always topped by the flood waters which aggravated the problem of draining excess water to the heavy silted creeks and river within the service area.

- (2) Considerable development issues or constraints to be solved in the NIS
- 1) Silt sedimentation occurred on all canals
 - 2) Damaged protection dyke systems
 - 3) Some service or access roads are damaged and has been not accessible
- (3) Required improvement items or components
- 1) Irrigation canal systems for potential irrigable area shall be improved
 - 2) Drainage canal systems for siltation shall be upgraded
 - 3) Drainage cost sharing system with people's participation shall be introduced
 - 4) Road network in the NIS shall be rehabilitated

3. Comprehensive Recommendation from ADCA Mission

Due to realize objectives of the NIS, to increase of agriculture production and farmer's livelihood and to uplift of farmer's living standard, considerable development issues or constraint to be solved in the NIS as mentioned above shall be improved and rehabilitated in adequately. The ADCA mission confirmed priority of the LALIK NIS, especially the Libuganon RIS can be considered as higher priority than the other two RISs from economical, sustainable development, and environmental viewpoints. Nevertheless, there are quit complicated hydrological relations among the three RIS, therefore proposed study area shall include in the three RIS.

Existing land use in the LALIK NIS is consisted of mainly only two kinds of product ie. paddy rice cultivation and banana plantation. Banana plantation areas in the NIS are located on rather higher elevation area than that of paddy rice cultivation, where are having more advantage to prevent from flood damage. Banana plantation areas have set up their drainage systems already facilitated by themselves. Therefore, there is no serious drainage problem in that area. On the other hand, surrounding lower elevation areas consisting of paddy cultivation have been received additional discharged water from the banana plantation. In this point of view, drainage service fee for the operation and maintenance cost of drainage facilities shall be shouldered by discharger of banana plantation. However such cost sharing system has been set up for irrigation system only. Therefore it is recommended that new concept of drainage cost sharing system shall be introduced.

A-5 要請書 (案)

**DRAFT
APPLICATION
FOR
TECHNICAL COOPERATION
BY
THE GOVERNMENT OF JAPAN**

**FEASIBILITY STUDY
OF
LASANG, LIBUGANON AND KIPALIKU (LALIK) RIVER IRRIGATION SYSTEM (RIS)
REHABILITATION/IMPROVEMENT PROJECT
IN
DAVAO DEL NORTE**

SEPTEMBER 2002

**NATIONAL IRRIGATION ADMINISTRATION (NIA),
DEPARTMENT OF AGRICULTURE**

**THE TECHNICAL COOPERATION
(DEVELOPMENT STUDY)
BY THE GOVERNMENT OF JAPAN**

APPLICATION

By the Government of Republic of Philippines for the Development Study of "Feasibility Study of Lasang, Libuganon, and Kipalik (LALIK) River Irrigation System (RIS) Rehabilitation / Improvement project in Davao Del Norte" to the Government of Japan.

I. PROJECT DIGEST

1. Project Title

Feasibility Study on Lasang, Libuganon, and Kipaliku (LALIK) River Irrigation System (RIS) Rehabilitation / Improvement Project

2. Location

Carmen, Davao del norte, Mindanao

The area is 41km from the center of the Davao city

3. Implementing Agency

-Name of the Agency:

National Irrigation Administration (NIA), Department of Agriculture

-Number of the Staff of the Agency:

Central: 8,840 stuffs

Regional: 2,560 stuffs

Total: 11,400 stuffs

-Organization Chart:

Attached herewith is the organizational chart of the NIA as an Agency & Regional Office per region of assignment. (Attached: NIA Organizational Chart)

4. Proposed Date of Commencement of the Project

-Year 2003

5. Prospective Funding Source

-The Government of Japan, (JICA)

6. Justification of the Project

-Present Condition of the Agricultural Sector:

Republic of the Philippines has given priority to the field of the agriculture and rural development to supply the demand for food and to relieve the poverty in the country. Especially the development of irrigation and drainage is essential for the continuous and stable growth of agricultural production, and constant efforts have been made for that.

Modernization of the agricultural and fishery sectors is of urgent necessity for the Philippine government, and the regulation of agriculture and fishery modernization in 1997 requires the further independence of the beneficiary farmers, as was suggested in the regional autonomy law in 1991.

As for the management of the irrigation facilities, the organization of water utilization of the beneficiary farmers is expected to manage the secondary major canals and to share the related tasks with the government and cooperate together to promote the systems effectively.

-Present Condition of LALIK RIS

The LALIK RIS was originally implemented by NIA-Second Davao Del Norte Irrigation Project. It was constructed in 1977 and was completed in 1989. The water source of the system is Libuganon River with an area of 13,305 ha as designed.

The catchment area of this river is 9,497 sq. km., thus discharge of the river in dry season is stable but flash flood occurs especially during the wet season and it inundates part of the irrigated area.

During its 12 yrs. of operation, the area irrigated was only 7,093.83 ha, for both wet and dry season. There is a total of approximately 6,000 ha, which is to be potential if the irrigation facilities will be rehabilitated and improved.

The dike along the river that has been constructed by NIA during its implementation is now being over tapped every time there is flood. The protection dike constructed along Libuganon River during the implementation of the project which needs improvement (heightening its embankments) is 28.12 km. The rapid accumulation of the silt deposits from the river can not be controlled in entering the intake; to the conveyance canals and to the farmlands. Thus, causing a high maintenance cost for the system.

-Problems to be solved in the Sector

Mindanao, under-developed with the disputes with the Muslim regions, has been given top priority by the Government. This concerned area spreads over 13,000ha along the Libuganon River in Davao Del Norte in Mindanao, and the existing irrigation facilities of the area was built in 1989 funded by ADB Loan. Banana plantations by private enterprises and fully irrigated farms are found in some areas, while lots of small-scale farms of paddy rice are seen in the other areas.

In the latter, poor drainage, caused by local rainfall and inflow from surrounding areas, has enabled them to have about 5,000ha less beneficiary areas than planned. It is necessary to expand the farming areas and establish the infrastructure for production by drastically rehabilitating the local drainage system.

7. Sectoral Development Policy

The national government is providing maintenance and operational cost for the system. However, due to the economic condition of the government, budgeted funds/allocations is so meager that it can not cope up with the maintenance needs of the system thus, it redounds to accumulation of the system's physical problems.

II. Outline of the Project

1) Objectives of the Project

The project has following objectives:

a) Short-term objectives

- The target of this project is to make the constable regional agriculture maintenance plan based on the keystone of the medium-term development plan and agricultural and fishery modernization.
- NIA have promoted irrigation project mainly, however due to lack of experience of drainage planning, drainage problem area is still undeveloped. On this matter, concerning the poor drainage problems which are biggest problems in that area, the drainage improvement plan and also comprehensive regional agriculture development plan which is a combination of the drainage improvement plan and irrigation system improvement plan concerning poor drainage problems in that area, under concerned resident's participation shall be drawn up. This shall create a precedent for establishment of development plan at similar region after that.

b) Long-term objectives

The staple food for the Pilipino people, rice, cannot be fully supplied domestically and they depend highly on imports now. This is to contribute to the economy of the nation by increasing the rice production so as to lower its dependence upon overseas countries, and to help to ensure the stable supply of food for its people.

8. Project Areas

The expected project area will select through the study, however the study area shall be the project area of LALIK RIS. The LALIK RIS is consisted by 3 RISs, namely Lasang, Libuganon, and Kipaliku RIS. Those 3 RISs have own water intake work independently, however their project boundaries are connected and their drainage situations are related each other. Libuganon RIS is the largest irrigation system in the LALIK RIS, however the area has received drained water from these 2 surrounding project. Therefore, Lasang and Kipaliku RIS shall be included into the study area to analyze drainage situation among the three RIS. The study area is shown in attached map.

9. Project Components

- a) Improvement of Irrigation and drainage canal systems facilities
- b) Improvement of agricultural support services such as rural road network, agricultural extension services and agricultural credit
- c) Strengthen of water management and O&M system of the facilities

10. Prospective Beneficiaries

When the project will be implemented, concerned beneficiary group of agriculture development plan based on drainage development are directly 8,359 rice planters. This promotes agricultural development and growth of rice production to 50,000 ton. As rice is the staple food, this growth helps to relieve food shortage in this country.

11. Priority of the Project in National Development Plan

The medium-term development plan in 1998 says that the new development of irrigation of 340,000ha and the rehabilitation of the existing irrigation systems are to be carried out during the term and that the whole irrigated areas are to cover up to the targeted 1,680,000ha in the last year of the term.

2) Outline of Implementation Agency

a) Responsibility

The implementing agency is the National Irrigation Administration (NIA), a government owned and controlled corporation which was created and mandated to take charge of all irrigation activities in the country. To study, prepare and implement projects from whatever financing source it might emanate. It is at present attached with the Department of Agriculture.

The NIA personnel hierarchy is headed by an Administrator and with a Deputy Administrator. Assisting both are four (4) Assistant Administrators representing different sectors within the organization. The department which is in charge of the project studies is the Project Development Department (PDD) whose office is located at Central Office, Manila. This department coordinates closely with Regional Offices as to data gathering, preparation of proposals and other technical data needed for evaluation before the

feasibility studies are being done.

b) Staff

Central: 8,840 stuffs

Regional: 2,560 stuffs

Total: 11,400 stuffs

c) Budget allocation in 2002

Local currency: Php. 3.58billion

Foreign currency: Php. 3.42 billion

Total: Php. 7.00 billion

d) Organization Chart

Refer to attachment

1. TERM OF REFERENCE OF THE STUDY

1.1 Objectives of the Study

1. To set up drainage management and drainage fee charging system, same as irrigation water management system, in NIA
2. To evaluate, validate and prioritize the irrigation and drainage canals that needs de-silting and or concreting;
3. To evaluate, validate and prioritize the head gates and turnout gates that needs repair/rehabilitation;
4. To evaluate, validate and prioritize the service and access roads that needs improvement;
5. To evaluate, validate and prioritize the sections of Libuganon River Right Protection Dike and Tuganay River Left Protection Dike that needs improvement;
6. To evaluate, validate and prioritize the equipment complement need for the systems operation & maintenance activities;
7. To evaluate and determine if there is still excess available water at the diversion dam to irrigate the additional irrigated area of 5,000 hectares during the long dry spell;
8. To evaluate and determine the demographics of the rice farmers and the cost and return analysis of pady production through an agro-socio economic survey;
9. To correct the operational constraints due to infrastructure deficiencies and inadequacies such as silting in the canal system, sloughing of inside canal side slope, inadequate on farm facilities, inadequate drainage system, non-functional gates and poor or inadequate all-weather service/access roads.

The proposed study will benefit the small rice farmers since the proposed study will give a detailed account of the present situation of the area and standard of living of the small rice farmers. These wealth of information will be essential not only to the intended funding institution but also to the National and Local Government officials so that they will be aware of the specific needs of the small rice farmers.

1.2 Justification of the Japanese Technical Cooperation

This project is under important field of aid, collection of regional differences. Japanese government decided to concentrate to promote the peace of Philippine and wrestle with undeveloped area. This project is match with our principle of foreign aid.

1.3 Study Area

Carmen, Davao del norte, Mindanao

Libuganon RIS: 12,000ha,

Lasang RIS: 2,300ha

Kipalik RIS: 4,450ha

Total area: 18,7500ha

1.4 Scope of the Study

The study will be divided into three phases:

Phase- I : Inventory study on existing irrigation and drainage canals and proposed irrigation and drainage schemes. Phase- II : Feasibility study on selected model projects.

The scope of the study is as follows:

1) Phase- I Study

- To collect and review data and reports.
- To carry out field surveys on the present condition of water utilization, drainage and inundation situations, agricultural practices, soil, land utilization, farm economy, marketing, farmers intention to the projects, sociological aspects, environmental impacts. etc.
- To review inundation situation in the project sites
- To fix the areas to be drained in the project sites
- To prepare preliminary design of irrigation and drainage schemes and cost estimation
- To set a criteria for prioritizing projects.
- To prepare development programme for future implementation
- To prioritize projects and select priority projects for feasibility study
- To prepare topographic map over the selected areas on a scale of 1 to 5,000 with a contour interval of 0.5m.

2) Phase-II Study

- To collect and review additional data and information
- To conduct field survey on the selected model projects
- To conduct detailed study and analysis on irrigation and drainage systems, agriculture, post harvest, marketing and environmental issues
- To prepare guideline for expected drainage fee charging system
- To prepare a report for the Feasibility study

1.5 Study Schedule

The study period estimated at 12 months.

The following foreign experts will be required for the Study:

- Term leader/Rural Development
- Irrigation and Drainage management specialist
- Agro-economist
- Farmers' organization specialist
- Sociologist
- Agronomist
- Structure Design and cost estimation engineer
- Project evaluation engineer
- Environmentalist

1.6 Expected Major Output of the Study

- 1) Setting up a criteria of priority for future development
- 2) Feasibility study report on the selected projects
- 3) Guideline of drainage fee charging system
- 4) Guideline of facility operation and maintenance

1.7 Possibility to be implemented / Expected funding sources

Japan International Cooperation Agency (JICA)

1.8 Request of the Study to other donor agencies, if any

Nil

2. FACILITIES AND INFORMATION FOR THE STUDY TEAM

1) Assignment of counterpart personnel of the implementing agency for the Study

- A] Chief Counterpart (Manager of Project Development Department, NIA)
- B] Hydrologist
- C] Financial Annalist
- D] Irrigation Engineer
- E] Drainage Engineer
- F] Agriculturist
- G] Economist

The agency will be recommending counterpart personnel. These personnel may come from the field or from Central Office with expertise on different fields of the study.

2) Available data, information, documents, maps etc. related to the Study

- A] Maps of project
- B] Geo-Hydro Data
- C] Socio-Economic data
- D] Land resources
- E] Agriculture records/data

3) Information on the security condition on the study area

Security in the proposed sites is no problem.

There was no record of lawlessness reported in the area. The area considered for study is in between two(2) cities; Panabo City and Tagum City. However, it is forty one (41) kms. from Davao City. The diversion works is fifty three (53) kms from the NIA Office at Carmen, Davao del Norte.

3. GLOBAL ISSUES

1) Environmental issue

The study must include a flood control component since area is a flood prone area which led to damages of crops indicated by a low yield, having an average yield of 67.07

cavans/ha for a ten-year trend (1990-2000) for wet season and 70-80 cavans/ha for the dry season.

Watershed Management component is also vital in the sustainability of the irrigation systems downstream of the water resources within the catchments area. Proper environmental management at the upland portion will minimize erosion, siltation, denudation and even inundation at the critical areas such as the service area.

2) Anticipated environmental impacts by the Project, if any

Having the two components in addition to the irrigation and drainage function of the project, environmental impacts will inevitably occur: It could be categorized as natural and social.

Natural:

1. Perennial flooding will be under control
2. Optimum utilization of water
3. Total eradication of crop damages due to flooding
4. Sustainable water resources due to proper management of watershed
5. Service area will be fully irrigated planted and benefited

Social:

1. Short term manpower generation for skilled and unskilled persons
2. Increase in yield for the farmers/tillers
3. Availability of food for the people
4. Better quality of life for the beneficiaries
5. Evolution of economic activities within area
6. Multiplier effect of its economic activities to the adjacent areas

3) Women in development

The different project components identified need not require a special consideration for women. Both genders can be effective enforcer of any activities and may participate in all aspects of the project's various stages such as in the pre-construction implementation, operation and maintenance and abandonment

4) Anticipated impacts on women caused by the project

Implementation of the project could open answers for women to become entrepreneurs, thus will spur economic activities. Women's participation on matters of health, education, information dissemination and coordination are expected and should be encouraged

5) Poverty reduction components of the project

The irrigation benefits brought about by the project are meant to alleviate poverty among the beneficiaries. Livelihood projects may also evolved if people will be innovative in exploring opportunities to create wealth

6) Any constrains against the low income people caused by the project

If fully financed and timely implemented, the project would enhance the income of the so called low-income people though generally short term in nature.

4. UNDERTAKING OF THE GOVERNMENT

In order to facilitate the smooth and efficient conduct of the study, the Government of Philippines shall take necessary measures:

- 1) To secure the safety of the Study Team.
 - 2) To permit the members of the Study Team to enter, leave and sojourn in Philippines in the connection with their assignment therein, and exempt them from foreign registration requirements and consular fees.
 - 3) To exempt the Study Team from taxes, duties and any other charges from equipment, machinery and other materials bought into and out of the Philippines for the conduct of the Study.
 - 4) To exempt the Study Team from income tax and charges of any kind imposed on or in connection with the implementation of the Study.
 - 5) To provide necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in Philippines from Japan in connection with the implementation of the Study.
- 5.** The Government of (Philippines) shall bear claims, if any arise against member(s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study.
- 6.** NIA act as counterpart agency to Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study
- 7.** NIA will, as the executing agency of the project, take responsibilities that may arise

from the products of the Study.

- In case that Detail Design Study is requested

The Government of the Philippines assures that the matters referred to in this form will be ensured for the smooth conduct of the Development Study by the Japanese Study Team.

Signed: _____

Title: _____

On behalf of the Government of _____

Date: _____