

フィリピン共和国

中央ルソン農地改革活性化計画
ムレタ河灌漑地区農村総合開発計画
農業研究開発・普及体制整備計画
作物流通および市場情報整備計画

プロジェクト・ファインディング調査報告書

平成8年6月

社団法人 海外農業開発コンサルタント協会

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プロジェクトファインディング調査報告書

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添 付 資 料

1. TOR (案)

中央ルソン農地改革活性化計画調査
ムレタ河灌漑地区農村総合開発計画
農業研究開発・普及体制整備計画
作物流通および市場情報整備計画

2. 調査団長の経歴

3. 調査行程表

4. 面会者リスト

5. 収集資料リスト

6. 現地写真集

1. まえがき

海外農業開発コンサルタンツ協会はフィリピン共和国における農業農村開発に関する現地調査及び資料収集のために、1996年5月9日より5月28日までプロジェクトファインディング調査団を派遣した。派遣調査団は以下の2名より構成されている。

| | | |
|----------|------|----------|
| 団長／農業・経済 | 深坂友一 | 日本工営株式会社 |
| 灌漑・農村施設 | 濱田信一 | 日本工営株式会社 |

調査団はフィリピン国政府の依頼により、(1)中央ルソン農地改革活性化計画、(2)ムレタ河灌漑地区農村総合開発計画、(3)農業研究開発・普及体制整備計画、(4)作物流通および市場情報整備計画の4件に対して、以下の各州の代表的地区を踏査した。

- 1) 中央ルソン農地改革活性化計画
 ザンバレス州(イバ郡周辺の総合農地改革支援対象地区)
 パンパンガ州(マガラン郡周辺の総合農地改革支援対象地区)
- 2) ムレタ河灌漑地区農村総合開発計画
 ブキドゥノン州 マラマッグ郡
- 3) 農業研究開発・普及体制整備計画
 ヌエバエシハ州ムニオス郡(フィリピン稲作研究所)
 パンパンガ州マガラン郡(第Ⅲ管区地域農業試験場)
- 4) 作物流通および市場情報整備計画調査
 ヌエバエシハ州(食糧庁地方事務所および施設)

さらに調査団は、上記計画に関する各種資料および情報の収集を行うとともに、現地政府関係者との協議を行なった。本報告書は、上記の計画に関する現地踏査および討議の結果を取りまとめたものである。

尚、本調査を行なうに当たり、調査団は、フィリピン国政府関係機関、特に受け入れ窓口である農地改革省(DAR)政策計画局次官 Mr. Solimanをはじめ、同事業管理部長 Mr. Ponce、国家灌漑庁(NIA)長官 Dr. Undan、同計画開発部長 Mr. Punsal、農業省計画評価部長 Mr. Villaのご協力を頂き、業務を円滑に遂行することが出来た。又、今回の調査を行なうにあたっては、在フィリピン国日本大使館、ならびに、農業省農業研究開発局の下方専門家に多大なる助言とご協力を頂いた。これらの方々に対し、深甚なる謝意を表する次第である。

平成8年6月

フィリピン共和国
プロジェクトファインディング調査団長
深坂 友一

2. 計画の背景

2.1 フィリピン共和国の概要

(1) 国土・気候

フィリピン国は約7,107の諸島からなり、その総面積は約300,000km²である。これらの諸島は行政上の15管区 (Region) に区分され、さらに76の州 (Province)、64の市、1,532の郡 (Municipality) および41,153の村 (Barangay) に細分されている。1995年現在のフィリピン国の人口は約7千30万人で、人口密度は234人/km²である。労働力人口は2千750万人で就業者率は64%である。森林面積が1千590万haに対して耕地面積は1千410万haである。道路総延長は約161,000kmで、その約83%が地方道である。

(2) フィリピン国の最近の経済状況

1990年から1994年にかけての実質経済成長率は年率2.4%であった。同年の一人当たりGNPは482ドルであり1993年の483ドルを僅かに下回ったが、これはドルに対するペソの下落によるものである。同期間のインフレ率は平均して年率11.7%であったが、1992年から1994年のインフレ率は毎年一桁に止まっている。この期間の経済状況は、政府の施策もあって際立った改善がみられる。人口増加率は年率2.6%であるが、失業率は8.6%となっている。この人口増加率は、アジア諸国の中でも最高である。

上記の期間について検討する場合、1990年代から1992年中期のラモス政権の誕生までと、それ以降を区分してみることができる。前半の90年代初期は、数度に及ぶ地震と第III管区 (Central Luzon) の土地資源に大打撃を与えた、ピナツボ山の噴火等の自然災害が、フィリピン国の経済に打撃を与えた。この影響は1990年の国内総生産(GDP)の急落に端的に示されており、特に農業セクターの停滞は際立っており、1990年から1991年の農業生産額の成長率は1.4%であり、過去5ヵ年間の実質成長率は1.6%であった。

1992年のラモス政権誕生以降の期間は、民営化、自由化および規制緩和を中心とする制度改革が実施された期間であった。1992年の後半以降、同国の経済は成長の度合を強め、1994年末にはGNPの成長率は5.2%を遂げ、インフレも一桁に抑制されている。1990年代に於いて始めて経済の成長率が人口の伸びを上回った。

| 項目 | 1990 | 1991 | 1992 | 1993 | 1994 | Growth 1990-94(%) |
|----------------------|------|------|------|------|------|----------------------|
| GNP 1985年ベース 百万ペソ | 724 | 726 | 737 | 756 | 795 | 2.4 |
| GDP 1985年ベース 百万ペソ | 721 | 717 | 719 | 734 | 766 | 1.5 |
| 一人当たりGNP(\$) | 483 | 418 | 445 | 452 | 482 | -0.1 |
| インフレ率(%) | 14.2 | 18.7 | 8.9 | 7.6 | 9.0 | 11.7* |
| 失業率(%) | 8.1 | 9.0 | 8.6 | 8.9 | 8.4 | 8.6* |
| GNPに対する貯蓄率(%) | 18.6 | 18.3 | 19.0 | 18.0 | 20.0 | 19.0* |
| 人口(百万) | 62.0 | 63.7 | 65.3 | 66.9 | 68.6 | 2.6 |

資料: 1995 Philippine Statistical Yearbook * 平均

2.2 農業・農村開発政策

(1) フィリピン国2000年および中期フィリピン開発計画

ラモス政権は「フィリピン国2000年」と呼ばれる開発ビジョンを定めた。このビジョンは、フィリピン国が2000年までに「国内および国際問題に適切に対処し、かつ、利益を十分に享受出来るようにする」ことを目指している。具体的には、2000年までに「十分な食糧、衣料、住宅、および国威」を備えることを意味している。

フィリピン国2000年の構造的枠組みは、中期開発計画（MTPDP）に盛られている。MTPDPは1993年から1998年までの広範な開発指針を定めており、2つの基本的戦略、即ち住民重視と競争原理をベースにしている。住民重視政策は、慢性的な貧困問題を解決するため、地域住民の発意に基づき、直接的かつ総合的な努力の必要性を強調している。一方、競争原理は国内生産者、特に小農が世界市場或いは国内市場において輸入品と競争し得るような生産を行うことの必要性を強調している。

政府はまた、フィリピン国2000年およびMTPDPと調和しかつ貧困セクターの解消を目的とした包括的な戦略として社会改革計画（Social Reform Agenda: SRA）を定めた。SRAは資産改革による社会的平等の推進、成長便益の公平な分配、政治的、経済的な問題に対する住民参加を通じた経済発展に焦点を当てている。

上記の戦略を成功裡に実施するため、MTPDPは地方分権、NGOの意見の尊重と民主的協議、実費主義、社会的公平、およびマクロ経済の安定を指向している。

| | | (単位: %) | |
|------------|----------|----------|--|
| 指 標 | 1994 | 1998 | |
| 世帯ベース貧困率 | 39.2* | 30 | |
| 失業率 | 9.1 | 6.6 | |
| 実質GNP成長率 | 3.5-4.5 | 8.5-10.0 | |
| 実質GDP成長率 | 3.4-4.4 | 8.1-9.8 | |
| インフレ率 | 9.0-10.0 | 4.0 | |
| GNPに対する投資率 | 24.5 | 29.5 | |
| GNPに対する貯蓄率 | 19.8 | 27.8 | |
| 人口増加率 | 2.36 | <2.0 | |

資料: Medium-Term Philippine Development Plan, 1993-1998

* 1991年を基準年としている。

(2) 農産加工業の持続的開発

MTPDPは、農・工両セクター間の連携の重要性に鑑み、農・工共通の開発の枠組みを設定している。この枠組みの下で、生産・流通面で工業との密接な連携を図った農産加工業の創出が、農村開発の核として期待されている。この連携は、地元で生産される工業原料作物を利用し、国際競争力を備えた製造業を創出するものであり、また地元住民に雇用機会を与えるものでもある。この政策は、農業セクターの発展を工業セクターと切り離して進めてきた従来型の政策の変更を意味している。

上記政策の変化を反映するため、農業および工業の成長目標に対して必要な調整が図られ、GDPの農業シェアを1994年の22.5%から1998年の19.8%に低減し、工業のシェアを34.8%から36.0%に増加させている。この趨勢は、経済が次第に農産加工業へ移行する変化の象徴である

(3) 水資源開発

灌漑および簡易給水はMTPDPの水資源部門における最重要事業である。灌漑に関しては現在、全国310万ヘクタールの灌漑可能地のうち約50%（1.55 million ha）が灌漑されている。これを1998年までに193万haまで増加させることが計画されている。

政府は現在、地方分権および実費主義の原則に則った共同灌漑事業に力点を置いている。この灌漑事業の実施機関は地方政府であり、NIAは建設および維持管理面で技術的な支援を行なうこととなる。

給水整備の必要性は高い。メトロ・マニラ以外の地方都市部では、レベルII（共用栓給水）およびレベルIII（戸別給水）は僅か47%の家庭を対象にしているに過ぎない。他方、農村部でのレベルI（井戸）の普及率は全農村家族数の72%である。政府の1998年までの給水整備計画は、簡易給水によって都市部で71%、郡部で85%まで整備することを目的としている。地方政府は地方自治法によってこれらの給水事業を実施する権限を付与されている。

(4) 地域総合計画

地域開発に関して現在政府が指向している基本姿勢は、セクター間のバランスのとれた事業の実施であり、これによって限られた資源の効率的活用をはかり、地域経済の成長を促進することである。これらの事業の多くは既に地方政府にその実施権限が委譲されている。このため、地方政府の長が計画実施に果たす役割は極めて重要となっている。中央政府の政策が地方政府によって実施されることを確実にするため、通常、関係中央機関と地方政府の長との間で合意文書が取り交わされ、これに対して中央政府からの資金の一部が交付されている。

2.3 農村開発上の基本的な問題

フィリピン国の農村開発において現在抱えている基本的な問題は、技術的、制度的、および資金的な問題に区分できる。

技術的な問題としては、プロジェクト構成要素間の補完、相乗作用の欠如に関連したものである。ほとんどの農村開発プロジェクトは、未だに特定分野に片寄ったものとなっている。構成要素が特定分野に片寄っていない場合であっても、有機的な関連付けを保証するものではないことが挙げられる。もう一つの技術的な問題としては、適切な環境配慮を欠いたまま計画が実施された結果、その維持管理に問題を生じることである。

制度上の問題は、計画実施に関係する中央政府と地方政府との間の調整に関する問題である。地方政府に付与された権限を含め、主管庁概念はこの問題に対する一つの答えではあるが、機能的な調整という面で問題を残している。さらに受益農民の参加方法・形式が確立されていない。またプロジェクト施設建設のための土地の供出、建設費の償還義務、水利費の支払い、施設の維持管理費等の受益者義務の理解が不十分である。

財政上の問題は、不十分な財政支援の問題である。また、国の直営計画間の絶えざる競合があり、財政上、優先付けをせざるを得ない問題もある。

2.4 灌漑事業の拡充必要性和国家灌漑庁(NIA)の抱える問題

国家灌漑庁（NIA）は新中期開発計画の農業開発基本方針を受け、NIA 10ヵ年計画（1993-2002）を作成し、全国の灌漑事業基本開発案と財政事情を考慮した基本計画を示している。これによれば2002年までに、新規灌漑開発を約23万ha、既存灌漑施設の改修開発を約40万ha計画し、その必要事業費を約405億ペソと見積っている。

NIAは全国に168地区、総面積645,000 haにおよぶ国営灌漑事業を展開している。しかし適時に適量の農業用水を供給するという灌漑本来の機能を維持できない地区が増加しており、低い用水供給機能→低い水利費の徴収率→維持管理財源の不足→不適切な維持管理→低い用水供給機能という悪循環に陥っている。既存国営灌漑事業地区の機能低下は灌漑事業への投資意欲を減退させる要因ともなり、新規灌漑開発事業への展開が困難な状況にある。灌漑機能の水準と水利費の徴収率には密接な関係があり、既存国営灌漑地区の機能の維持と向上が、健全な灌漑開発を促進する重要な要素となっている。さらに森林破壊による流域の環境変化が、雨期の洪水頻発、乾期の渇水等の問題を引き起こしており、流域保全の改善対策も重要な課題となっている。

NIAでは、全国の国営灌漑組織の改善事業として、IDA、OECD, USAIDの援助により灌漑運営支援事業 (IOSP) を、ADBの援助により灌漑組織改善計画 (ISIP) をそれぞれ実施している。IOSPの基本方針は農民水利組織強化、NIAの維持管理担当職員の教育訓練にあり、事業費の多くはソフト面の強化に使用されている。このため、施設の改修は最低必要程度の施設に限定しており、実質的な改修事業の予算はほとんど無い。従って、これらの事業だけでは必要とされている改修事業を十分実施できない状態にある。

3. 中央ルソン農地改革活性化計画

3.1 背景

農地改革省(DAR)が中心となり推進している総合農地改革事業(CARP)は、農業・地域経済発展のための重要な国家施策として位置付けられる。CARPは、土地配分、農業・農村基盤整備、農民組織化等を一体的に推進するため、農地改革共同体(Agrarian Reform Community: ARC)を組織し、これを核とした総合的農村開発事業として位置付けられる。

さらに政府は、フィリピン国2000年およびMTPDPと調和し、貧困セクター解消を目的とした包括的な戦略として、社会改革計画 (Social Reform Agenda: SRA)を定めている。SRAは資産改革による社会的平等の推進、成長便益の公平な分配、政治的、経済的な問題に対する住民参加を通じた経済発展に主眼を置いている。したがって、SARの農村地域における具体的事業としてCARPは位置付けられ、DARはSARの推進政府機関として重要な立場に置かれている。

CARPおよびSARに対する国際機関が行なっている最近の支援事業の内、日本国政府関連事業には、OECDの農地改革インフラ支援計画(Agrarian Reform Infrastructure Support Program)、JICAのレガスピ西部地区灌漑農村開発計画(実施主管はNIA)、辺境地貧困農民対策計画等が上げられる。さらにDARは、CARP推進に不足している、技術支援と開発資金を補うために、世銀、ECに対しても、積極的に支援要請を行なっている。

プロジェクト・ファインディング調査は、中央ルソンの内、DARから要請のあったザンバレス州を対象として行なった。ザンバレス州は、中央ルソンの他地域に比べ、農外雇用機会が少なく、経済開発に遅れが目立つ。さらにピナツボ火山の被災を南部地域に抱え、その復興が緊急課題となっている。

3.2 ザンバレス州の概要とCARP

(1) 州の概要

ザンバレス州の総人口は、1990年に563,000人、人口密度151.6人/km²、人口増加率は年2.4%である。州の総面積は3,714 km²で、その内、林地および保全地域が2,557km² (69%)、農地および他用途転用地が1,157km² (31%)を占める。林地および保全地域の内、森林が55%を占め、保全状況は他州に比べて高い。ピナツボ火山噴火前の農地面積は397km² (11%)で、その内訳は、水田が54%、マンゴ等の果樹が39%、野菜、根菜類が7%であった。ピナツボ火山の噴火による火山灰および泥流による被害は、州の南部に大きく、州内の農地面積の約半数に被害をもたらしている。

州の気候は、明確に雨期(5月から10月)と乾期(残りの月)に区分され、年間降雨量は沿岸部の2,500mmから山間部の3,000mmに分布している。

1991年の家計調査によれば、州の年間世帯所得は71,469ペソ(オロンガポ市を除く)で、約3割の世帯が農業を主な収入源としている。雇用機会は、オロンガポ市や中部ルソンと比較して少なく、農村部から市街地への人口移動、さらに首都圏への出稼ぎが顕著である。市街地の人口増加は、ピナツボの被災民の移住によっても加速している。

(2) CARPの現状

1996年6月時点の農地解放進捗状況は、第Ⅲ管区の目標面積 369,217 haに対して74%、その内、ザンバレス州では目標面積 21,625 haに対して60%、受益農家は約 3,000戸である。一方、1995年における州の農地解放証明書は、約1,940 ha、受益農家1,615戸に対して発行済みである。

DARが管轄するピナツボ被災民の入植地は、州内に12地区ある。入植地区の概要は以下のとおりである。

表 3.1 入植地概要

| 入植地区 | 郡/市 | 総面積(ha) | 受益戸数 |
|---------------|-------------|---------|-------------|
| 丘陵地 | | | |
| Baquilan | Botolan | 396 | 1,540 |
| Loob Bunga | Botolan | 298 | 1,565 |
| Cawag | Olongapo | 824 | 472 |
| Iram | Olongapo | 100 | 508 |
| Dampay Salaza | Palauig | 652 | 1,115 |
| 低平地 | | | |
| Taugtog | Botolan | 81 | 3,485 (区画) |
| Carrd | Botolan | - | - |
| Bulawen | Palauig | 419 | 422 (SAR) |
| Pangolingan | Palauig | 340 | 60 |
| Amungan | Iba | - | - |
| Castillejos | Castillejos | 120 | 1,870 (区画) |
| Maloma | San Felipe | 1,360 | 2,641 (SAR) |
| 合計 | | 4,590 | 13,678 |

農地解放受益農家を中心に、農地改革共同体(Agrarian Reform Community : ARC)を組織し、対象地区の農村総合開発を推進する事業を、DARは社会改革計画 (Social Reform Agenda: SRA) の一環として推進している。州内のSRA対象地区は、上記入植地2ヶ所(MalomaおよびBulawen)とPalauig郡のDapla-Salaza地区の3ヶ所である。

州南部の農地解放地区の多くは、ピナツボ火山の被災地であり、受益農家は上記入植地へ移住したり、被災民の避難キャンプに仮住まいを余儀なくされている。さらに被災

農地の復旧工事は、Sto. Tomas 川、Bucac 川を水源とする灌漑施設を対象に開始されている。しかし堆積した火山灰の泥流被害が今後も継続するため、抜本的な復旧は困難な状況にある。

DARによる入植地およびSAR 開発、ピナツボ被災地の復旧事業等、州内の農業・農村復旧開発の必要性と緊急性は高く、同様の被害を受けている中部ルソン各州の対応に比べ、計画作成、事業実施の面で立ち遅れている。

(3) SRA開発の方向性

州内の農地解放の進捗は目標面積 21,625 haに対して60%であるが、解放農地の約半数を占める南部地域の解放農地が、ピナツボ被災地である。したがって、州では、新たな農地開発と被災民の入植事業の促進が緊急課題となっている。

州内の、入植者を対象とした農地開発可能地区の多くは丘陵地に点在し、水源開発の難しい土地である。開発対象地区は、地主保有限度を越える私有農地であり、農地の配分は、既存の小作農が優先されるため、新規入植者に配分される地区は、条件の悪い農地であることが多い。

一方、環境天然資源省(DENR)の所管する、放牧貸与地(Pasture Lease)が、州内に27ヶ所、約9,690 haあり、その内、利用期限の切れる地区、未利用の地区がある。放牧地貸与地には、東側の山脈からの水源開発、ため池開発等の開発可能性の高い農地が多く、私有地の農地開放地区に比べ、開発ポテンシャルが高いと考えられる。

SRAとしての総合農地改革事業の促進と、それに伴う農地改革共同体(ARC)の組織化は、州内の農業・農村開発の推進において、中核的な役割を担う。したがって各ARC間およびARC周辺地区との連携、生産分野と農産加工・流通分野との有機的結合が考慮した、計画立案、事業実施が必要である。

3.3 計画調査のスコープ

本計画調査では、ザンバレス州を対象に、ピナツボ火山噴火後の農業土地資源、水資源の現状を調査し、農業農村開発上の土地および水資源評価を行ない、開発基本計画を策定する(マスタープランのレベル)。さらに、開発基本計画に基づき、復旧優先地区、被災地以外の農業・農村開発優先地区を選定する。計画対象となる優先地区選定に当たっては、以下の点を考慮する。

- 1) DARが推進する農地配分、入植およびARC事業の対象地区、CARP受益農家の組織化を含めた事業の進捗状況。
- 2) DENR管轄の放牧貸与地の利用状況。
- 3) 将来の地域的連携と開発波及効果を考慮し、中核的な拠点として相応しい地区。
- 4) 丘陵農地開発および水田を主体とする各地区を含み、ピナツボ被災地復旧事業およびSAR事業として、モデル性の高い地区。

上記基準に沿い選定する計画対象優先地区は、ピナツボ被災地復旧事業とSRA事業それぞれ2ヶ所を最低限とし、丘陵農地開発および水田を主体とする地区をそれぞれ含む様行なう。さらに各事業実施計画は、以下の内容を網羅し立案する。

- (1) 復旧および開発方針と戦略
- (2) 農業生産、加工、流通計画
- (3) 生産基盤整備計画 (小規模溜池、浅井戸等による灌漑、農地保全対策、農道等)
- (4) 加工・流通施設計画 (乾燥、貯蔵、調製加工、運搬施設、対象地区内外の農産物流通改善上効果の大きい道路を含む)
- (5) 農民組織および施設維持管理計画 (水利組合、生産、流通、金融等のARC農協、郡および州単位のARC連合組織)
- (6) 関連政府機関、NGOによるARC支援計画 (農民組織化、施設整備、生産、加工流通に係わる技術指導、制度融資)
- (7) 事業評価 (事業費および便益、事業効果)
- (8) 事業実施計画

本調査は、ザンバレス州の農地・水資源基本計画策定と計画対象優先地区の選定に8ヵ月、優先地区の事業計画策定から最終報告書提出までに11ヵ月、計19ヵ月の予定で行なう事が効率的と考えられる。

4. ムレタ河灌漑地区農村総合開発計画

4.1 背景

国家灌漑庁（NIA）は、1963年に設立されて以来、30年間（1963年～1993年）で、フィリピン国全体の灌漑面積を54万 ha（1963年）から153万 ha（1993年）へと3倍に増やし、国家食糧安定に貢献してきた。しかしながら、1980年代初頭から国営灌漑事業において以下に示す問題が露呈してきた。

- 1) 頭首工および水路内の堆砂問題（上流域荒廃による土壌侵食、取水施設における不十分な土砂吐／沈砂機能）
- 2) 灌漑地域内の低地部分にける滞水問題（不十分な排水施設および水管理）
- 3) 実灌漑面積の減少（上流域荒廃に起因する流出形態の変化による水不足および洪水）
- 4) 水利費徴収総額の低下（作付率の低下、不十分な灌漑用水供給）および維持管理費の増大（堆砂問題、施設の老朽化）

以上のような問題を解決するために、NIAは以下に示す方策を行ってきた。

- 1) 排砂および施設改修計画の立案・実施
- 2) 新規水源開発計画の立案・実施
- 3) 水利組合の育成・強化および同組合への施設移管（水利組合による維持管理の実施）
- 4) 植林計画の立案・実施（上流域形態の回復）

しかしながら、過去数年にわたる以上のような方策にもかかわらず、乾期における灌漑水供給および水不足の問題は引き続き生じており、基本的な解決策として国営灌漑事業地区の上流部に溜池を建設し、雨期に貯水し、乾期に放水するという計画に力点が置かれるようになってきた。

さらに、昨今、農業開発計画の焦点は灌漑にのみ置かれるのではなく、農道／流通用道路、収穫後処理施設および流通システムにも置かれるべきであり、これらを統合した農村総合開発の推進が、農村部の雇用機会の創設と農家所得の増大に必要となっている。

プロジェクト・ファインディング調査は、NIAから要請のあったミンダナオ島の内、既存のムレタおよびロハス-クヤ河国营灌漑事業地区を対象として行なった。同灌漑事業地区は、計画灌漑面積の内、わずか半分程度しか灌漑されておらず、灌漑面積の拡大と米の増産のために、主とし灌漑用水安定供給および新規灌漑地区拡張を目的とする、溜池建設が必要課題となっている

4.2 ムレタ／ロハス-クヤ河国营灌漑事業地区の現状

(1) ムレタ／ロハス-クヤ河国营灌漑事業地区の概要

ムレタ・ロハス-クヤ河灌漑事業地区（Muleta and Roxas-Kuya River Irrigation Systems /MRIS and RKRIS）はミンダナオ島内、第10管区の中心都市であるカガヤン・デ・オロ（Cagayan de Oro）市の南約 80 kmにあるブキドノン（Bukidnon）州のマラマゲ（Maramag）郡およびドン・カルロス（Don Carlos）郡に位置する。同地区は、ブキドノン州内で米の主要産地の中心であるバレンシア（Valencia）郡の南約 20 kmにある。

同灌漑事業は、1977年にアジア開発銀行（ADB）の技術協力により「Mindanao Irrigation Study」の中で案件形成がなされ、建設工事は1981～1989年に行われた。事業運営は1990年に開始され現在に至っている。建設当時のMRISとRKRISの計画灌漑面積は各々、6,376 ha、1,250 haであるが、最近3カ年の平均では水不足等の問題により各々、3,323 ha、835 haとほぼ半減している。

同灌漑事業の水源は、ムレタ（Muleta）、クヤ（Kuya）、クラマン（Kulaman）およびドロゴン（Dologon）河であり、これらの水源からの取水施設として以下の5施設が使われている。

- 1) ムレタ頭首工（ムレタ河）
- 2) クヤ頭首工（クヤ河）
- 3) サン・ホセ（San Jose）（クヤ・ロハス）頭首工（クヤ河）
- 4) クラマン頭首工（クラマン河）
- 5) ドロゴン頭首工（ドロゴン河）

ムレタ頭首工は、ムレタ河から送水路を經由して分岐点（水路によるクラマン・ドロゴン方面地区への送水およびクヤ河への残水の放水）として建設されたクヤ頭首工まで送水している。サン・ホセ頭首工はムレタ河からの分水を加え、ドン・カルロス郡のロハス・クヤおよびムレタ地区に配水している。クラマン・ドロゴン地区へはムレタ河からの分水に加えて、クラマン頭首工・ドロゴン頭首工によりクラマン河・ドロゴン河の水を各々の地区へ配水している。

ムレタ河流域は同灌漑事業地区の灌漑に十分な水量を保有しているにもかかわらず、全域への灌漑がなされていない。灌漑面積の最大限化を目的に、灌漑用水安定供給のための溜池建設が必要とされている。

(2) 開発計画の現状

同地区は現在、ムレタ溜池計画としてNIAによりムレタ河の水資源に関する基本調査が実施されており、同計画は農業生産増産のみならず農村住民の生活向上を目的としている。

NIA案は、灌漑用水および生活用水のためのムレタ河水源の最大利用を目的としており、灌漑面積を10,000 ha（既存地区：7,600 ha、新規灌漑地区：2,400 ha）、マラマグ郡およびドン・カルロス郡への生活用水（1.0 m³/s）の供給を基本計画としている。

溜池の計画地点はドン・カルロス郡のアドトゥガン（Adtugan）村であり、計画諸元は溜池の堤高：75m、流域面積：197km²、貯水量：5,582.5万m³となっている。

新規灌漑地区はムレタ河と既存MRIS地区との間に位置し、現況作付はトウモロコシとココナツのプランテーションであり、新規灌漑地区への送水は既存ムレタ送水路およびムレタ頭首工の5.9km下流の既存ムレタ送水路から分水する新規幹線水路により行われることになっている。

NIAは既に溜池計画地点と新規灌漑地区の地形図（縮尺 1/4,000）を作成しており、溜池計画地点の土地収用問題についても十分な配慮がなされている。

4.3 計画調査のスコープ

本計画調査では、ムレタ／ロハス-クヤ河国営灌漑事業地区を対象に、既存灌漑事業地区および水資源に関する現状を調査し、開発基本計画を策定する（マスタープランのレベル）。さらに、開発基本計画に基づき、以下を主要課題とする農村総合開発計画を策定する。

- 1) 灌漑用水安定供給および新規灌漑地区拡張のための水資源開発計画（NIA案の見直しを含む）
- 2) 既存灌漑事業施設の改修・改良（頭首工土砂吐ゲートの機械化等）
- 3) ハード・ソフトの両面における水管理システムの改善・改良
- 4) 農村基盤開発計画（収穫後処理施設、農村道路、農村給水等）
- 5) 農業関連産業開発計画（農業生産、加工、流通計画）
- 6) 農民組織、農業支援、施設維持管理組織／体制の強化
- 7) 環境・流域保全計画

さらに事業実施計画は、以下の内容を網羅し立案する。

- 1) 計画対象灌漑地区の決定
- 2) 総合農村開発計画の策定（水資源開発計画、既存施設改修・改良計画、水管理計画、農村基盤開発計画、農業関連産業開発計画、農民組織および施設維持管理計画、環境・流域保全計画）
- 3) 計画施設の設計
- 4) 事業評価（事業費および便益、事業効果）
- 5) 事業実施計画

本調査は、ムレタ／ロハス-クヤ河国営灌漑事業地区の現地調査および開発基本計画の策定に9ヵ月、農村総合開発計画の策定から最終報告書提出までに7ヵ月、計16ヵ月の予定で行なう事が効率的と考えられる。

5. 農業研究開発・普及体制整備計画

5.1 背景

地方分権化政策(Local Government Code)の施行に伴い、これまで農業省(Department of Agriculture)が直接管理していた州および郡農業普及事務所は、州政府と各郡事務所に移管され、各地方行政単位の予算で普及活動が展開されている。さらに農業研究施設の一部は、州政府に移管される計画にある。

税収が少なく、予算規模の小さい地方自治体(都市部を持たない後背農村地域)は、農業普及活動に配分できる予算に限りがある。さらに普及員の削減とともに、普及活動が実質的に行われていない自治体が存在する。さらに種子更新、新品種・作物の導入、栽培・収穫後処理技術の改善、生産出荷組合活動の促進等、生産者の要求に答える体制に無い自治体が多い状況にある。

一方、農業省の研究開発組織は、研究開発局が各専門局(米；Philippine Rice Research Institute、果樹および畑作物；Bureau of Plant Industry、ココナッツ；Philippine Coconut Authority、砂糖キビ；Sugar Regulatory Administration、土壌；Bureau of Soil、等)の試験研究成果を総合し、農業訓練所(Agricultural Training Center)を通じ、地方普及員、農民に研修、訓練を行なう役割を担う。各専門局の直営試験施設の他、農業省管区/地域事務所(Regional Field Unit)が管轄する、地方農業試験研究場およびその分場が各地に置かれており、その他、国立大学(State University)農学部が管理する試験研究施設がある。農業省傘下の各試験研究組織は、研究開発局の調整の下、国家および地域のニーズに適合する研究開発を行なう事となっているが、現実には限られた予算配分、研究活動の調整不足、重複する研究活動、組織間の研究開発成果の共有化不足、研究施設の維持管理の不備等、多くの問題を抱えている。

5.2 農業研究開発普及体制の現状

(1) 試験研究、普及実施体制

フィリピン全国には、農業講座を有する国立大学が52校あり、教育、試験研究の他、地方自治体とは別に、パイロット・プロジェクトとして独自に農業普及活動を行なう例が多い。農業省には、7つの局(Staff Bureau)と23の附属機関(Attached Agencies)があり、その内、13機関が試験研究を行ない、これらをNational Research Centers(NRCs)と呼んでいる。試験研究の主体は、技術創出型を中心とし、技術適応型、技術実証型も実施し、大学と同様に普及活動を独自に行なう機関が多い。

農業省の各管区(Region)事務所は、各管区毎に、許認可、検査、試験研究、技術指導を行なっている。13の管区事務所の下、地域総合農業試験場(Regional Integrated Agricultural Research Center ; RIARC)があり、各RIARCは、支場(Research Outreach Center ; ROC)を5-6ヶ所、平均して各州に1ヶ所程度支場を持つ。さらにROCがその支場(Satellite Station、Experiment Farm)を持つという多重組織となっている。多くのRIARCおよびROSは、種苗、稚魚等の農家への配付、農民向けの普及、研修活動、学生の現地実習、他機関への資材供給等を行なっている。

地方自治体(主に州)レベルの試験研究活動は、品種適応性試験、種苗等の生産が大半を占め、農業省、農業大学に比較してあまり活発ではなく、開発途上にある。

(2) 農業研究局(Bureau of Research : BAR)と試験研究評価

BARは1987年大統領令第116号により設立され、農業省傘下の全ての試験研究活動について、調整、統合、企画、指導、評価を行なっている。BARは3課で構成され、各主要業務は以下のとおりである。

- 1) 研究調整課 (Research Coordinating Division)
 - 各試験研究部局のレビュー
 - DAの管区事務所の行なう活動、予算案の作成援助
 - 試験研究プロジェクトのモニタリング
 - 試験研究に対する技術的援助
- 2) 事業開発課 (Program Development Division)
 - 各試験研究部局の活動・予算案の評価
 - 試験研究活動の取りまとめ、予算要求
 - 試験研究研修評議会、技術援助委員会の事務
- 3) 情報管理課 (Management Information Systems Division)
 - DAの試験研究情報の整理分類、管理、記録、出版

農業省の各試験研究機関は、終了した案件の概要(タイトル、担当者、目的、予算、試験設計、実施スケジュール、結果、考察等)を記載し、BARに提出する。新しい研究テーマは、各管区(Region)は7月までに資料をBARに提出し、10月には来年度予算に含めるか、BARから通知される。その後12月の国会で予算法(General Appropriations Act)に加えられる。

(3) 課題

農業省の試験研究、普及体制は、NRCsを中央試験場と位置付け、ここで創出された技術を、RIARCおよびROSにおいて各地域毎の適応性、有効性を検証した後に、州の

普及事業に受け渡すシステムへ移行している。農業省の試験研究体制上の課題は、以下の点にある。

- 1) 農業試験研究予算の不足と不適切な配分
- 2) 研究者の資質が低い
- 3) 試験研究機関同士の調整不足
- 4) 地方政府、大学、農業省部局の実施する普及活動の調整不足
- 5) 総合的普及体制の不備 (複数研究機関にまたがる作物および畜産を対象とし、生産から流通加工、農民組織を網羅した普及)

5.3 計画調査のスコープ

本開発調査は、フィリピン国の農業研究開発・普及活動の現状と課題を精査し、農業政策の促進に必要な農業研究開発・普及体制整備の方策を計画、立案することを目的とする。具体的には、統廃合を含む農業研究開発組織体制の整備、研究開発ネットワークの構築、地方自治体との連携強化による研究開発成果の普及体制整備、地域ニーズの研究開発への一層の反映、NGOおよび大学組織との協力体制の強化等のための基本計画(マスタープラン)を策定する。さらに優先計画を選定し、その事業実施計画を策定する(フィージビリティ調査)。

基本計画(マスタープラン)は、以下の内容を網羅し立案する。

- (1) 農業試験研究組織計画
- (2) 農業訓練普及組織計画
- (3) 農業試験研究情報整備計画
- (4) 農業試験研究基盤整備計画
- (5) 農業試験研究予算管理計画
- (6) 地方自治体農業普及活動支援強化計画
- (7) NGOおよび大学組織との農業普及共同実施計画
- (8) 上記計画の概略事業費、事業効果の算定、概略評価
- (9) 基本計画の実施計画

優先事業実施計画は、以下の内容を網羅し立案する。

- (1) 優先事業および地区の現状と解析
- (2) 改善計画の策定
- (3) 優先事業実施組織計画
- (4) 事業実施計画
- (5) 事業費の積算
- (6) 事業効果の算定と事業評価

本調査は、基本計画に10ヵ月、優先事業実施計画から最終報告書提出までに9ヵ月、計19ヵ月の予定で行なう事が効率的と考えられる。

6. 作物流通および市場情報整備計画

6.1 経緯および調査対象地域の特定

国家食糧庁 (NFA) は、米粉およびトウモロコシの生産者組織からの購入と市場への販売を通じて、国内の食糧安全保障体制の確立とともに、生産者と消費者所得の安定と向上を促すという重要な役割を果たしてきた。1991年度の穀物購入支出は37.5億ペソで、これはNFA全予算の56%を占めていたが、その割合は年々減少し、1992年に30%、1993年に23%、1994年に8%に落ち込んでいる。この背景は、政府の財政難、NFA予算全体の削減とともに、農業省が新中期国家開発計画(1993 - 1998年)として実施中である「穀物生産振興計画 (Grains Production Enhancement Program)」に基づき、米粉の政府購入割合を全生産量の6%から1998年には3%に減少し、さらにトウモロコシの購入を1995年に実質廃止したことによる。

比国政府は、新中期開発計画(1993-98年)においても、主要穀物の自給体制の確立を国家目標としている。1995年に首都圏を中心に生じた米不足と価格高騰を背景に、政府は1996年に食糧安全保証計画を採択している。これに基づき、国内の食糧自給体制の確立、適正規模の緩衝在庫の確保、投機的な食糧流通の抑制、適切な食糧流通体制の構築の重要性が再認識されている。さらに穀物の政府機関による直接売買とともに、これに替わる新しい流通サービスを、生産者と消費者へ提供することが緊急に求められている。

NFAは現在、精米施設 (55箇所/220トン/時) および乾燥施設、食糧倉庫 (155箇所/55,900トン) を所有し、これら施設の運営とともに、民間所有の食糧倉庫の賃貸、集荷米粉の民間精米所への依託精米、米、トウモロコシ輸入の管理を通常業務としている。さらに生産物の直接売買に代わって、NFAの所有する一部施設の農業/流通協同組合への貸与 (全国で2ヶ所/ムニオスおよびダバオ)、生産および価格情報の提供等、新しい形態の流通サービスを試行するとともに、これを穀物生産振興計画の実施計画に取り上げている。しかし農業協同組合の脆弱な運営財務体質、未熟な加工・流通技術、市場価格変動による経済性の低下等、解決すべき課題が多い。さらに、政府の加工流通技術、流通価格情報等に関するサービス体制の充実が必要となっている。

農業省は食糧自給および安全保障体制の確立、適正な作物流通機構/システムの整備を目的として、生産および市場価格情報網の整備強化を含めた、NFA既存施設の有効利用方を模索している。さらに生産および市場価格情報を収集、公報している農業統計局(BAS)の活動現況と問題、NFAによる農業流通活動現況と問題、作物流通上の生産者および消費者側からの問題、制度融資を含む加工流通に関わる政府支援制度の現況と問題、農業省の流通政策等を総合的に検討するとともに、作物流通および市場情報整備を目的とするモデル事業を実施し、これを全国的に拡大することを希望している。

調査団は、国家食糧庁(NFA)および農業省計画評価部とともに、平成5年度に実施したADCAプロジェクト・ファインディング調査時点との状況との相違を確認した。さらに調査スコープの見直しを行ない、基本的なスコープの変更が必要ない事を確認した。対象モデル州は、前回同様に、首都圏に対する主要穀倉地帯である、第II管区のイサベラ州、第III管区のヌエバエシハ州、パンガシナン州の3州とした。以下に「穀物流通自立計画／Project Self-Reliance (PSR)」の概要と現況について述べる。

6.2 「穀物流通自立計画 Project Self-Reliance (PSR)」の概要

NFAの旧来からの米とトウモロコシの購入・販売を通じた価格補助制度に代わり、「穀物流通自立計画／Project Self-Reliance (PSR)」は、農業協同組合による流通事業を促進し、生産者利益の安定と向上を図る事を目的として、1991年にNFA、農業省、土地銀行(Land Bank of the Philippines)の共同で試行的に着手されている。本計画実施の背景として、(i)1986年にはじまるアキノ政権の財政難による財政支出、特に補助金の縮小政策の実施、(ii)流通の自由化、民間事業への政府関与の縮小にたいする世論の高揚、(iii)大規模な穀物の購入・販売に対する補助金制度の経済性への疑問等が上げられる。NFAによるPSRのパイロット実施地区および実施予定地区は以下の通りである。

パイロット実施地区

- (1) 北ダバオ州
(ダバオ農業協同組合州連合会、1991年10月着手)
- (2) ムニオス郡、ヌエバエシハ州
(ムニオス単位農業協同組合連合会、1992年2月着手)
- (3) イサベラ州
(イサベラ農業協同組合州連合会、1992年9月着手)
- (4) サンミゲール郡、ブラカン州
(ランバキン多目的農業協同組合、1992年9月着手)

PSRの内容、実施体制は以下の通りまとめられる。

- 農業協同組合もしくは連合組合を計画の実施主体とする。
- 政府機関は計画の実施に必要となる以下の支援方策(生産、流通、金融等)を供与する。
 - a. 生産支援(普及、研修、種子等の生産資材供給)
 - b. 流通支援(NFA施設の貸与、収穫後処理技術研修、組織事業開発、市場情報の提供)
 - c. 農地銀行による金融サービス、組合の財務管理に関する研修の提供

- 運営委員会(Management Committee)を組織し、計画の調整、監理を行なう。運営委員会は農業省の出先事務所長(地域農政局長、州出先事務所長)を議長とし、地方政府長(州知事、郡長)と対象農協理事長を副議長とする。
- NFAは計画地区内では、原則的に米とトウモロコシの購入販売活動を行わない。

PSRの課題は、当初、国家食糧安全保障、農民生産者の利益確保を、NFA等の政府機関の関与無しに、如何に実現するかと言う点に置かれていた。しかしパイロット事業の評価結果によれば、対象農協の多くは、財務的、技術的な自立を果したとは言えず、今後もNFA等の政府支援を必要としている。対象農協は、自立への第一歩を踏み出した状況にある。

6.3 計画策定上の留意点

国家食糧庁(NFA)がアキノ政権の開始に伴い農業省の傘下に入り、さらに農業統計局(BAS)は農産物市場価格のモニタリング活動に着手し、その拡充を計画している。一方、地方分権化政策の推進に伴い、NFA、BASの地方出先事務所と地方政府との間で、支援施策推進のための体制作りが進められている。このような状況化において本計画調査は、作物流通と市場情報整備に係わる改善策の提示に留まらず、フィリピン国における穀物を主体とした価格、流通施策の将来的在り方を提示する目的を持ち、この点に関する調査、解析に留意する必要がある。

対象とする3州はルソン島の穀倉地帯に属し、さらに最終市場マニラに対し、それぞれ異なる市場立地条件下にある。米、トウモロコシ等の穀類の収穫時期に関しては、地域内外で差があり、市場への物理的距離とともに、生産地の市場立地条件を規定する要因となっている。調査にあたっては、各州内外の市場立地条件について、多面的解析を行ない、それぞれの特徴を明らかにする必要がある。さらに市場立地の上で不利となる条件に対し、生産者所得と消費者効用の両面の拡大を目的に、その対応策について具体化する必要がある。本調査においては、3州の地域性を考慮し、標本調査を通じた統計的現状把握が必要である。

6.7 計画調査のスコープ

本計画では、ルソン島の主要穀倉地帯であるパンガシナン、イサベラ、ヌエバエシハの3州を代表とし、政府による作物流通の適性化のため、流通と市場情報サービスを内容とした基本計画(Basic Plan)を作成する。さらに作物流通と市場情報システムの整備に係わる優先事業を選定し、それをモデル事業として計画する。

作物流通および市場情報システム整備基本計画(Basic Plan)の内容としては、以下の項目が必要と考えられる。

- (1) 流通および市場情報システム整備のための開発目標、開発戦略
- (2) 基本開発項目、プログラム
- (3) 作付多様化を考慮した基本開発計画 (米・トウモロコシ流通基本計画、多用化作物流通基本計画)
- (4) NFA、BASの支援施策の強化基本計画
- (5) 実施組織基本計画
- (6) 10年間の開発実施基本計画
- (7) 投資基本計画

基本計画にもとづき、適性な作物流通と市場情報システムの整備に係わる優先計画は、3州の代表的地区(必要であれば主要消費地首都圏マニラ)から選定し、これをモデル事業として計画する。その内容として以下の項目が必要と考えられる。

- (1) 総合開発基本構想
- (2) 加工流通、運搬施設整備計画 (NFAおよび組合所有の乾燥、調整、精米、貯蔵、運搬施設)
- (3) 市場情報ネットワーク施設整備計画 (通信、コンピューター、公報施設)
- (4) 施設運営、維持管理計画
- (5) 優先計画の実施のためのNFA、BAS組織強化計画
- (6) 優先計画の実施のための農民組織強化計画
- (7) 政府支援制度強化計画 (加工流通に係わる技術指導、制度融資)
- (8) 事業評価 (事業費および便益、事業効果)
- (9) 事業実施計画

本調査は、基本計画(Basic Plan)の策定に9ヵ月、優先計画を対象としたモデル事業計画の策定から最終報告書提出までに9ヵ月、計18ヵ月の予定で行なう事が効率的と考えられる。

添付資料

TERMS OF REFERENCE (DRAFT)
FOR FEASIBILITY STUDY ON
THE DEVELOPMENT OF VIABLE AGRARIAN REFORM COMMUNITY (ARC)
IN CENTRAL LUZON (ZAMBALES PROVINCE)

| | |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| PROJECT TITLE | : The Feasibility Study on the Development of Viable Agrarian Reform Community (ARC) in Central Luzon (Zambales Province) |
| LOCATION | : Zambales Province, Region III, Philippines |
| EXECUTING AGENCY | : Department of Agrarian Reform Government of the Republic of the Philippines |
| PROPOSED SOURCE OF ASSISTANCE | : Government of Japan |

I. PROJECT BACKGROUND

I.1. National Strategy

The Government of the Philippines has launched medium-term (1993-1998) development plan whose main thrust is "World Competitiveness through People Empowerment". Under the plan, the country would have attained an annual growth rate in GNP of 6-8%, a per capita GNP of \$1,000 and poverty incidence reduced to 30%.

| | | |
|--------------------------------|---------|------------|
| 1) Annual Growth Rate in GNP : | 1987-92 | 4.1 % |
| | 1992-98 | 6 - 8 % |
| 2) per Capita GNP : | 1990 | US\$ 730 |
| | 1998 | US\$ 1,000 |
| 3) Poverty Incident : | 1991 | 40.7 % |
| | 1998 | 30.0 % |

The world economic competitiveness means that the country's local producers are able to sell their products or services effectively in the international market on equal terms with all competitors worldwide. People empowerment means the upliftment of people's well-being which is the ultimate goal of development. This priority goal is to alleviate poverty, which is widespread in the backward regions of the countryside.

According to the Philippine Human Development Report produced by the United Nations Development Program (UNDP) in 1994, the incidence of poverty (number of poor families as a proportion of total number of families) increased between 1971 and 1985. However, the picture improved slightly in 1991 with the poverty incidence going down from 44.2 to 40.7 percent. Instead of decreasing of the poverty incidence, with the complicating effects of population growth, the total number of poor families rose from 4.36 million in 1985 to 4.88 million in 1991 indicating that two out of every five Filipino households are poor. About 60 percent of poor families earn their income primarily in agriculture, either as farmers, landless agricultural workers, fishermen and forestry workers.

The Philippines continues to be a predominant agricultural economy. Agricultural sector still accounts for about half of total employment, about 22% of the gross domestic product, and more than one-third of export revenues. Two-third of the country's population live in the rural areas and are directly or indirectly dependent on agriculture for their livelihood.

GNP & GDP by Industrial Origin
(1985 Constant Prices)

| INDUSTRIAL ORIGIN | 1991 | 1992 | 1993 | 1994 | 1995 |
|------------------------------------|---------|---------|---------|---------|---------|
| (IN MILLION PESOS) | | | | | |
| 1. Agriculture, Fishery & Forestry | 162,937 | 163,571 | 167,053 | 171,472 | 172,999 |
| 2. Industrial Sector | 248,718 | 247,384 | 251,459 | 265,972 | 285,219 |
| 3. Service Sector | 304,867 | 307,986 | 315,644 | 329,006 | 345,232 |
| GDP | 716,522 | 718,941 | 734,156 | 766,450 | 803,450 |
| (Growth Rate) | -0.58% | 0.34% | 2.12% | 4.40% | 4.83% |
| % of Agriculture to Total GDP | 22.74% | 22.75% | 22.75% | 22.37% | 21.53% |
| Growth Rate in Agri GDP | 1.37% | 0.39% | 2.13% | 2.65% | 0.89% |
| 4. Net Factor Income | | | | | |
| From Abroad | 10,297 | 18,198 | 12,765 | 19,768 | 26,045 |
| GNP | 726,819 | 737,139 | 746,921 | 786,218 | 829,495 |
| (Growth Rates) | 3.36% | 1.42% | 1.01% | 5.26% | 5.50% |

SOURCE : 1996 Philippine Statistical Yearbook
National Statistical Coordination Board

Under these economic background of agricultural sector, the Philippines government focuses on improvement of rural economy through agri-industrial development in the countryside. An agri-industrial development strategy highlights the links between the agriculture and industry sectors where the former produces commodities that are processed by the latter into high-value products. The strategy, therefore, aims to develop a highly productive agriculture sector that is

composed of viable farm enterprises with strong production and marketing linkages with industry. This strategy also aims to create a strong and competitive manufacturing sector which uses local raw materials and provides employment for the majority of the population. As a result, the age-old problem of poverty would be alleviated through improvements in income and productivity. The growth in income levels is then expected to result in increases in human and physical capital.

The Philippines has imported 1.2 million ton of rice from its Asian neighbors and United States between July 1995 and June 1996 to meet the shortfall in domestic production. Furthermore, the country will import up to 650,000 ton of rice in 1997. The imported rice is priced at \$300 per tone. This means that the country spends \$360 million to \$195 million for shopping the rice, though the Philippines has the potential to achieve self-sufficiency of rice. It is essential to spend these amount for the improvement of agricultural productivity and benefiting Filipino farmers.

I.2. ARC Based Rural Development in Zambales

The government of the Philippine through its executive branches has undertaken the introduction of countryside development approach to make the country strong and economically competitive by the year 2000. This aimed at uplifting the poor living conditions of the majority of the population in the rural areas through increased agricultural productivity, anchored on the active people's Participation.

Cognizant with the national policy program thrust, the Comprehensive Agrarian Reform Program which is basically the foundation of economic efforts has been accelerated in order to provide the landless qualified farmers and farmworkers with lands of their own to till. Support Services program were provided to ensure farm utilization and maximization to increase incomes. However, previous assessments of CARP, which is to upgrade the present living conditions of the rural communities was on snail-pace due to inadequate provision of the timely support services like farm to market roads, post harvest facilities, irrigation, credit assistance among others were not area focused.

Zambales is economically depressed province compared to other province which composed the Central Luzon Region. This situation was exacerbated when the world renown Mt. Pinatubo has adversely affected almost half of the agricultural area of the province at its southern portion. Furthermore, Zambales has suffered another economic setback when the United States Naval Base at Subic which used to employ a great number of Zambalenos was suddenly pulled-out as a result of the U.S. Military Base Treaty rejection by the Philippine House of Senate. These aggravating circumstances had signaled a strong pressure to the government to create more jobs for affected Filipino workers and farmers borne-out from both the abrupt closure of U.S. Military Installation and the eruption of Mt. Pinatubo.

As far as the CARP coverage of the province, out of the 39,678 ha of declared agricultural lands, 30,849 ha or roughly 78% was cultivated to rice and corn, fruit trees and other allied agricultural crops prior to the eruptions of Mt. Pinatubo. However, after the volcanic eruptions, half of this area, specifically at the southern part of the province was generally covered with ash falls and volcanic debris which led the previously productive agricultural lands to temporarily idle. From the area previously cultivated, 70.1% has been validated for CARP coverage of which as of December 1994, a total area of 12,932 ha or roughly 60% was already distributed provincewide, involving about 3,000 farmer beneficiaries. Practically almost half of the FBs whose land allocations are situated at the southern part of the province still could not return to their farming activities until the lands return to the previous fertility. Some affected FBs has transferred to resettlement areas of the government, while some are still temporarily at the evacuation centers. To date, the lahar affected municipalities of the province are still pronounced as high risk areas on lahar flows which would strike at any given time depending on its movement.

On the basis of the cited multifarious problems and issues besetting the province, and CARP in particular, the need to undertake a comprehensive development planning on the proposed ARC Project area is of high priority, to be spearheaded by foreign technical experts who will explore the technical as well as its economic viability of the proposed site. This proposed ARC is intended to serve as Growth Center in Zambales, and planned to influence the other adjacent barangays.

II. OBJECTIVE OF THE STUDY

The proposed study is intended to formulate a viable Agrarian Reform Community Development Plan in Zambales province that will show-cased the productive and complimentary efforts of the government and non-government organizations under the Social Reform Agenda. The study is geared toward the attainment of economic development through advancement of social equity in terms of asset reforms, just sharing of the benefits of growth, and peoples participation in the development process through ARC development. Particular emphasis of the study shall be on :

- a) To review and assess the conditions prevailing the ARC proposed sites including the resettlement areas and other CARP areas with emphasis on agriculture, economic, social, ecological, physical infrastructures, and institutional aspects ;
- b) To formulate a land-use plan at the proposed ARC and other potential project areas, taking into consideration the possibility of absorbing economically displaced farmers worked by lahar from Mt. Pinatubo ;

- c) To formulate ARC based integrated rural development plans including agro-industrial development and resettlement programs , and
- d) To verify the technical and economic viability for the formulated plans.

III. SCOPE OF THE STUDY

The study will be carried out in the following two (2) work stages:

- Work-I : Formulation of a Basic Plan for ARC Based Integrated Rural Development in Zambales province through data collection, field surveys and investigations, assessment on land and water resources and socio-economic issues, and selection of priority development areas and schemes, and
- Work-II : Formulation of development plans for the selected priority development areas and schemes at feasibility level.

Through the study, beneficiaries' participatory approach will be applied to the execution of the works, as much as possible. The scope of works in the respective Works are mentioned below.

A. Work-I: Formulation of a Basic Plan for ARC Based Integrated Rural Development in Zambales Province, and Selection of Priority Development Area and Schemes

- (1) Collection and review of previous studies and existing data and information
 - a) Natural conditions
 - Location, area and topography
 - Meteorology and hydrology
 - Geology and soil mechanics
 - Vegetation and forest
 - Others
 - b) Socio-economic conditions
 - Economic indices
 - Demographic conditions
 - National, regional and provincial development plan
 - Social infrastructure
 - CARP, ARC and resettlement programs
 - Others
 - c) Local Government units and institutions
 - Organizations and activities of local government units
 - Roles and activities of local government units for rural development projects
 - Organizations and activities of agricultural cooperatives, ARCs, irrigators associations, village communities, and NGOs
 - Coordination status between local government units and other institutions

- d) Agriculture and Forestry
 - Present land use
 - Soils and land capability
 - Farming practices
 - Agricultural economy
 - Supporting services
 - Agro-industries
 - Reforestation and afforestation
 - Others
 - e) Irrigation and drainage
 - Potential water resources
 - Present irrigation conditions and practices
 - Inventory reports of the existing irrigation and drainage facilities
 - Design and construction drawings/data of the existing irrigation and drainage facilities
 - Others
 - f) Rural infrastructures
 - Post harvest facilities
 - Rural roads, accessibility and O&M conditions
 - Domestic water supply and electrification
 - Public facilities
 - Others
- (2) Execution of field surveys and investigations
- a) Field reconnaissance survey
 - Existing ARC and resettlement sites
 - Potential and proposed areas for ARC and resettlement areas
 - Potential and proposed water resources development areas
 - b) Soil, land use and vegetation survey
 - c) Land holding and tenure survey including progress on land reform and tenurial improvement under CARP
 - d) Survey on farming practices and post-harvest activities including processing and marketing
 - e) Questionnaire/interview survey to farmers and/or members of the existing institutions
 - Farm economy and farmers' concerns
 - Farmers' organizations and activities
 - Farmers' concerns and requirements for rural developments including agro-industry and community development
 - Agricultural support services
 - Opinions and comments on the prevailing development activities
 - Others
- (3) Interpretation and analyses of data and information collected
- a) Meteorology and hydrology
 - b) Soil and land use
 - d) Regional socio-economy
 - e) Agriculture and agro-economy
 - f) Beneficiaries(farmers)' requirements and concerns
 - g) Environmental and watershed management
 - h) Others

- (4) Formulation of a Basic Plan for ARC Based Integrated Rural Development in the existing and potential sites of Zambales province covering
 - a) Land and water resource development including preliminary delineation of the project areas
 - b) Agricultural development including crop diversification program
 - c) Rural infrastructure development
 - d) Agro-industrial development
 - e) Community development for ARCs
 - f) Development for project organizations
 - g) Development of major facilities
 - h) Preliminary project evaluation
 - i) Selection of priority projects and schemes based on ;
 - Progress of DAR's land reform, resettlement, ARC development programs
 - Status on the pasture lease land under the DENR
 - Suitability as a nucleus site for spreading development effect to and linkage with surrounding project areas
 - Typical sites for upland and lowland development
 - Model projects for Pinatubo resettlement and SRA programs
- (5) Generation of a large scale topographic map using results of PIADP aerial photo survey

B. Work-II: Formulation of Development Plans for the Selected Priority Development Areas and Schemes at feasibility level

- (1) Execution of field surveys and investigations
 - a) Topographic survey for infrastructure development
 - b) Detailed soil, land use and vegetation surveys
 - c) Land holding and tenure survey including systems and progress on CARP and other support services
 - d) Survey on farming practices and post-harvest activities including processing and marketing
 - e) Public consultation surveys covering ;
 - Explanation and social preparation meetings
 - Farm economy and farmers' concerns
 - Farmers' organizations and activities
 - Farmers' concerns and requirements for rural developments including agro-industry and community development
 - Agricultural support services
 - Opinions and comments on the prevailing development activities
 - Others
- (2) Formulation of development plans covering
 - a) Agricultural development
 - Immediate and long-term plans for the major crops and livestock identified
 - Suitable short gestation crops/livestock/programs as source of subsistence requirements
 - Cost and income expectations (farmer, farmer associations/cooperatives)
 - b) Agricultural infrastructure
 - Improvements on existing processing capabilities and capacities (machinery and equipment)
 - Enhancements on productivity (tractors, irrigation, etc.)
 - Storage and distribution (depot facilities, warehouses, etc.)

- Efficient flow of farm, intermediate and processed products (rural and farm roads, vehicles, etc.)
- Development of farmhouse/lots and household facilities (rural water supply and electrification, etc.)
- c) Post harvest and marketing services
 - Demand and supply projections
 - Product distribution channels (farmer and cooperatives to dealers, processors and consumers)
 - Marketing strategies and management
- d) Rural enterprise development
 - Skills development program
 - Suitable short term entrepreneurial activities to provide suitable requirements
 - Medium and long term enterprise and rural industry development program
- e) Project implementation plan and schedule
- f) Financial plan
 - Investment requirements
 - Income and cost expectations (individual FBs, farmer associations of cooperatives)
 - Cash flow analysis
 - Comparative financial analysis under alternative development cases
- g) Institutional development
 - Organization plan for farmer beneficiaries
 - Cooperative and ARC development
 - Training and technology transfer programs
 - Turn-over schemes to FBs
- h) Organization and management
 - Project implementation organizations
 - Coordinating organizations and systems covering the central government organizations, LGUs, NGOs, etc.
- i) Environmental impact assessment

IV. TRANSFER OF TECHNOLOGY

Throughout the course of the Study, transfer of technology and training will be provided to counterpart experts by foreign experts in the following field;

- Field survey and investigations for soil & land use, geology, soil mechanics, topography, hydrology, irrigation, agriculture, agro-economy and environmental aspects
- Planning and design for rural development

The above transfer of technology will be carried out in the form of on-the-job training and seminar during the course of the Study. Overseas training will also be programmed.

V. SCHEDULE OF THE STUDY AND REPORTS

The period required for the study is estimated at 19 months in total. The tentative schedule of the study is shown in Attachment - 1.

The following reports will be prepared and submitted to the Government.

- (1) Inception Report : at the end of the one month after commencement of the Study.
- (2) Progress Report : at the end of 8th month after the commencement of the Study.
- (3) Interim Report : at the end of 14th month after the commencement of the Study.
- (3) Draft Final Report : at the end of 17th month after the commencement of the Study.
- (4) Final Report : within one month after receiving comments of the DAR on the Draft Final Report.

VI. EXPERTS INPUTS

The engineers or experts required for the study are as follows:

- Rural Development Planner
- Irrigation and Drainage Engineer
- Rural Infrastructure Engineer
- Agronomist
- Livestock Expert
- Agro-economist
- Sociologist
- Institutional development expert
- Meteo-hydrologist
- Forestry Engineer
- Geologist
- Project Economist
- Environmental Expert

The required manpower input as engineers or experts will be about 100 man-months in total.

VII. UNDERTAKINGS OF THE GOVERNMENT OF THE PHILIPPINES

The DAR shall, at its own expense, provide the 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, and
- (4) credentials or identification cards to the member of the Study Team.

Whenever necessary, the DAR shall make arrangements with other concerned agencies, at its own expense, in order to :

- (1) secure the safety of the Study Team ;
- (2) permit the member of the Study Team to enter, leave and sojourn in the Philippines for the duration of their assignment therein ;
- (3) exempt the member of the Study Team from taxes, duties, fees and other charges of equipment, machinery and other materials to be brought into the Philippines for conduct of the Study ;
- (4) exempt the member of the Study Team from income tax and charges of any kind imposed on or in connection with any emolument or allowance paid to the member of the Study Team for his/her services in connection with the implementation of the Study ;
- (5) provide necessary facilities to the member of the Study Team for remittance as well as utilization of the funds brought into the Philippines from Japan in connection with the implementation of the Study ;
- (6) secure permission for entry into private properties or restricted areas for the conduct of the Study ;
- (7) secure permission to take all data and documents (including photographs) related to the Study out of the Philippines to Japan by the Study Team ; and
- (8) provide medical services as needed and expenses for such will be chargeable against the member of the Study Team.

Attachment - 1

**TENTATIVE WORK SCHEDULE OF THE FEASIBILITY STUDY
ON
THE DEVELOPMENT OF VIABLE AGRARIAN REFORM COMMUNITY (ARC) IN CENTRAL LUZON
(ZAMBALES PROVINCE)**

| Description | Month in Order | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------|----------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1. Work - I | | | | | | | | | | | | | | | | | | | |
| (1) Collection and review of data and information | ■ | ■ | | | | | | | | | | | | | | | | | |
| (2) Execution of field surveys and investigations | | | ■ | ■ | ■ | | | | | | | | | | | | | | |
| (3) Interpretation and analysis | | | | | ■ | ■ | ■ | | | | | | | | | | | | |
| (4) Formulation of a basic plan | | | | | | | ■ | ■ | ■ | | | | | | | | | | |
| (5) Generation of topographic map | | | | | | | | ■ | ■ | ■ | | | | | | | | | |
| 2. Work - II | | | | | | | | | | | | | | | | | | | |
| (1) Execution of field surveys and investigations | | | | | | | | | | | ■ | ■ | ■ | ■ | | | | | |
| (2) Formulation of development plans | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | |
| (3) Explanation of Draft Final Report | | | | | | | | | | | | | | | | | | ■ | |
| 3. Reports for Work -II | | | | | | | | | | | | | | | | | | | |
| (1) Inception Report | ▼ | | | | | | | | | | | | | | | | | | |
| (2) Progress Report | | | | | | | | ▼ | | | | | | | | | | | |
| (3) Interim Report | | | | | | | | | | | | | | ▼ | | | | | |
| (4) Draft Final Report | | | | | | | | | | | | | | | | | ▼ | | |
| (5) Final Report | | | | | | | | | | | | | | | | | | | ▼ |

TERMS OF REFERENCE (DRAFT)
FOR FEASIBILITY STUDY ON
THE MULETA RIVER BASIN AGRICULTURAL DEVELOPMENT PROJECT
FOR ACCELERATION OF RURAL IMPROVEMENT

| | |
|-------------------------------|-------------------------------------------------------------------------------------------------|
| PROJECT TITLE | : The Muleta River Basin Agricultural Development Project for Acceleration of Rural Improvement |
| LOCATION | : Municipalities of Maramag and Don Carlos, Bukidnon Province, Mindanao, Philippines |
| EXECUTING AGENCY | : National Irrigation Administration (NIA) Government of the Republic of the Philippines |
| PROPOSED SOURCE OF ASSISTANCE | : Government of Japan |

I. PROJECT BACKGROUND

I.1. National Strategy

The Government of the Philippines has launched medium-term (1993-1998) development plan whose main thrust is "World Competitiveness through People Empowerment". Under the plan, the country would have attained an annual growth rate in GNP of 6-8%, a per capita GNP of \$1,000 and poverty incidence reduced to 30%.

| | | |
|--------------------------------|---------|------------|
| 1) Annual Growth Rate in GNP : | 1987-92 | 4.1 % |
| | 1992-98 | 6 - 8 % |
| 2) per Capita GNP : | 1990 | US\$ 730 |
| | 1998 | US\$ 1,000 |
| 3) Poverty Incident : | 1991 | 40.7 % |
| | 1998 | 30.0 % |

The world economic competitiveness means that the country's local producers are able to sell their products or services effectively in the international market on equal terms with all competitors worldwide. People empowerment means the upliftment of people's well-being which is the ultimate goal of development. This priority goal is to alleviate poverty, which is widespread in the backward regions of the countryside.

According to the Philippine Human Development Report produced by the United Nations Development Program (UNDP) in 1994, the incidence of poverty (number of poor families as a proportion of total number of families) increased between 1971 and 1985. However, the picture improved slightly in 1991 with the poverty incidence going down from 44.2 to 40.7 percent. Instead of decreasing of the poverty incidence, with the complicating effects of population growth, the total number of poor families rose from 4.36 million in 1985 to 4.88 million in 1991 indicating that two out of every five Filipino households are poor. About 60 percent of poor families earn their income primarily in agriculture, either as farmers, landless agricultural workers, fishermen and forestry workers.

The Philippines continues to be a predominant agricultural economy. Agricultural sector still accounts for about half of total employment, about 22% of the gross domestic product, and more than one-third of export revenues. Two-third of the country's population live in the rural areas and are directly or indirectly dependent on agriculture for their livelihood.

GNP & GDP by Industrial Origin
(1985 Constant Prices)

| INDUSTRIAL ORIGIN | 1991 | 1992 | 1993 | 1994 | 1995 |
|------------------------------------|---------|---------|---------|---------|---------|
| (IN MILLION PESOS) | | | | | |
| 1. Agriculture, Fishery & Forestry | 162,937 | 163,571 | 167,053 | 171,472 | 172,999 |
| 2. Industrial Sector | 248,718 | 247,384 | 251,459 | 265,972 | 285,219 |
| 3. Service Sector | 304,867 | 307,986 | 315,644 | 329,006 | 345,232 |
| GDP | 716,522 | 718,941 | 734,156 | 766,450 | 803,450 |
| (Growth Rate) | -0.58% | 0.34% | 2.12% | 4.40% | 4.83% |
| % of Agriculture to Total GDP | 22.74% | 22.75% | 22.75% | 22.37% | 21.53% |
| Growth Rate in Agri GDP | 1.37% | 0.39% | 2.13% | 2.65% | 0.89% |
| 4. Net Factor Income | | | | | |
| From Abroad | 10,297 | 18,198 | 12,765 | 19,768 | 26,045 |
| GNP | 726,819 | 737,139 | 746,921 | 786,218 | 829,495 |
| (Growth Rates) | 3.36% | 1.42% | 1.01% | 5.26% | 5.50% |

SOURCE : 1996 Philippine Statistical Yearbook
National Statistical Coordination Board

Under these economic background of agricultural sector, the Philippines government focuses on improvement of rural economy through agri-industrial development in the countryside. An agri-industrial development strategy highlights the links between the agriculture and industry sectors where the former produces commodities that are processed by the latter into high-value products. The strategy, therefore, aims to develop a highly productive agriculture sector that is

composed of viable farm enterprises with strong production and marketing linkages with industry. This strategy also aims to create a strong and competitive manufacturing sector which uses local raw materials and provides employment for the majority of the population. As a result, the age-old problem of poverty would be alleviated through improvements in income and productivity. The growth in income levels is then expected to result in increases in human and physical capital.

The Philippines has imported 1.2 million tonnes of rice from its Asian neighbors and United States between July 1995 and June 1996 to meet the shortfall in domestic production. Furthermore, the country will import up to 650,000 tonnes of rice in 1997. The imported rice is priced at \$300 per tonne. This means that the country spends \$360 million to \$195 million for shopping the rice, though the Philippines has the potential to achieve self-sufficiency of rice. It is essential to spend these amount for the improvement of agricultural productivity and benefiting Filipino farmers.

I.2. Agriculture and Irrigation Development

Agricultural development shall be aim at increasing farmers' income and promoting agri-based industries through improvement of productivity. And the effective development of land and water resources is essential to improve agricultural productivity. Irrigation development, which is to develop water and land resources, shall be rationalized to respond to the needs of both economic development and resource conservation. It is required to utilize these resources effectively and to conserve the natural environment through improving the quality of irrigation systems with providing the advanced irrigation and drainage facilities.

The National Irrigation Administration (NIA) has been implementing many irrigation development projects since this agency was established in 1963 under the Republic Act No. 3601. The irrigation service area was increased by about three time during 30 years from 1963 to 1993, 540,000 ha in 1963 to 1,530,000 ha in 1993. The efforts of NIA have exactly contributed to supply the food to a nation steadily. With increasing of the irrigation service area, however, the following constraints in the management of national irrigation systems (NISs) have been conspicuous since the early stage of 1980's.

- 1) Some of NISs suffer from severe sedimentation and siltation at the diversion dam and major irrigation canals. These problems are caused by soil erosion in the upstream watershed and insufficient function and/or lack of sand sluiceway and settling basin at diversion dam and intake structures.
- 2) The lower portions in the irrigation service area are inundated by the excess irrigation water due to luck of drainage facilities and insufficient water management such as no measurement of irrigation water.

- 3) Actual areas to be irrigated are decreased due to water shortage and flood. The denudation of watersheds has affected the quality and quantity of water resources, and has caused serious flood or drought.
- 4) The collection ratio of irrigation service fee is low because of low cropping intensity and insufficient supply of irrigation water. Against the low collection efficiency, operation and maintenance costs for irrigation systems are increasing by the desiltation and rehabilitation works of the facilities.

In order to solve above problems, NIA has formulated and is executing the following programs and projects.

- 1) Rehabilitation projects including desiltation works and repair of deteriorated facilities.
- 2) Additional water resources development projects.
- 3) Organizing and strengthening of irrigators' associations (IAs) and turnover of facilities to IAs for O&M works.
- 4) Reforestation projects for recovering watersheds

During the past years, a number of projects had been pursued for the rehabilitation and improvement of NISs. However, this primordial problem of inadequate water supply or lack of it especially during dry months continues to exist. It becomes even more urgent at present considering that the country is reeling under the alternating effects of typhoon and the recent occurrence of drought. The basic solution is the construction of impounding or storage reservoir at the upper reaches of these NISs where water can be stored during rainy season and released during the dry season. Storage dam is an insurance against the effect of drought.

The focus of agricultural development programs would center on not only irrigation but also farm-to-market roads, post-harvest facilities and marketing system. Although the irrigation and drainage development would be a top priority, the integrated development of these components should be required for the sustainable growth of agricultural sector and promotion of agro-industries.

I.3. The Project Area

The project area is located in the municipalities of Maramag and Don Carlos in the province of Bukidnon about 80 km south of Cagayan de Oro City. It is also 20 km south of Valencia where is the center town of the major rice production area in the province.

There is the existing Muleta and Roxas-Kuya River Irrigation Systems (MRIS and RKRIS) in the project area. The Muleta River Irrigation Project was formulated through the Mindanao Irrigation Study by the technical assistance of the Asian Development Bank (ADB) in 1977. The construction for the project was started in 1981 and completed in 1989. The MRIS has been operated since 1990. The RKRIS combined with the MRIS were originally designed to irrigate 7,626 ha (MRIS = 6,376 ha, RKRIS = 1,250 ha). However, records from the system office show that the average area irrigated during the last three years was 4,158 ha (MRIS = 3,323 ha, RKRIS = 835 ha) due to the water shortage.

The water resources of the system are the Muleta, Kuya, Kulaman and Dologon rivers. In order to intake these water resources to the irrigation area, the following five (5) diversion dams are constructed.

- (1) Muleta Diversion Dam : Muleta River
- (2) Kuya Pick-up Dam : Kuya River
- (3) San Jose (Kuya Roxas) Diversion Dam : Kuya River
- (4) Kulaman Diversion Dam : Kulaman River
- (5) Dologon Checkgate : Dologon River

The Muleta diversion dam diverts water from the Muleta River into an open channel to augment the flow of the Kuya River where a pick-up dam is constructed as a bifurcation point. From that point the canal continues onto the Panadtran and Dologon areas where the Kulaman and Dologon Rivers are also checked with concrete dams to provide additional water supply. Also from the Kuya pick-up dam, water is released into the Kuya River to be diverted downstream at the San Jose (Kuya Roxas) diversion dam for the irrigation of the Roxas-Kuya and Muleta portion of Don Carlos (see Location Map).

The Muleta river basin has enough water for the irrigation of MRIS. However, the designed area can not be fully irrigated by these river-run-of systems. In order to maximize the irrigation area and increase the rice production, NIA proposes further water resources development in the Muleta river basin.

I.4. Core Development Plan

The NIA carried out preliminary study to assess the water resource in the Muleta river. As a result, the Muleta Reservoir Project was proposed to improve not only agricultural productivity but also living conditions of rural folks.

The Muleta Reservoir Project is envisaged for the maximum utilization of Muleta River for the purposes of irrigation and domestic water supply. The project shall provide irrigation water to

about 10,000 ha (existing MRIS : 7,600 ha, expansion area : 2,400 ha) of prime agricultural lands and 1.0 cu.m/sec of domestic water supply within the municipalities of Maramag and Don Carlos.

The proposed scheme of development envisions the construction of a 75 m high dam located across the river in Barangay Adtugan, municipality of Don Carlos. The drainage area is about 197 sq.km. The storage dam would be capable of storing 55.825 million cu.m of water.

The proposed expansion irrigation area is located between the Muleta River and the existing MRIS service area. The present land use is corn and coconut plantation. The irrigation water would be conveyed to the area through the existing Muleta diversion canal and new main canal (28.4 km) which would be diverted from the diversion canal at about 5.9 km downstream from the Muleta diversion dam and intake.

The NIA has already prepared the topographic maps (scale : 1/4,000) of the proposed reservoir area and expansion irrigation area. The NIA also discussed about right-of-way for the reservoir area with land owners and farmers living in the area.

I.5. Integrated Development Plan

Irrigation development is one of the physical measures for the improvement of agricultural productivity through the development of lands and water. And the irrigation development has not always contributed to improve the farmers' economy and living conditions. In order to achieve the efficient and effective improvement of farmers and rural economy, the following development plans should be implemented together with the irrigation development.

- (1) Rural infrastructure development plan
- (2) Agro-industrial development plan
- (3) Institutional development plan
- (4) Environmental conservation plan

II. OBJECTIVE OF THE STUDY

The study area will include all barangays located in and around the existing Muleta River Irrigation System, the proposed irrigation extension area and the Muleta Dam and Reservoir area.

The Project intends to improve the rural economy and farmers' living standard through intensive agricultural and water resources development in and around the Muleta river basin located in Maramag and Don Carlos municipalities of Bukidnon Province, about 80 km south of Cagayan de Oro City (major town of Region X in Mindanao).

Specifically, the Project aims to increase the agricultural products with ensuring stable water supply throughout the year by providing a new reservoir dam and to upgrade rural infrastructures by improvement/construction of O&M/rural roads, post harvest facilities and rural water supply system.

Furthermore, in order to achieve the sustainable irrigated agriculture, the establishment of proper operation and maintenance system is essential for the implementation of the irrigation project. For this, institutional development will also be included in the Project as one of the major components. The institutional strengthening of the rural folks will also contribute to activate the rural economy.

The feasibility study of the Project will be conducted for the purposes of:

- a) Formulation of the agricultural and irrigation improvement plan for acceleration of rural improvement in and around the Muleta river basin area including the existing Muleta River Irrigation System;
- b) Formulation of water resources development in the Muleta river basin;
- c) Formulation of the agro-industrial development plans for improving rural economy; and
- d) Verification of the technical and economic viability for the formulated plans.

III. SCOPE OF THE STUDY

The study will be carried out in the following two (2) work stages:

Work-I : Formulation of basic development plan through data collection, field surveys and investigations, and preliminary study and analysis in the Philippines, and

Work-II : Analysis of the results of the above Work-I, and preparation of feasibility study report in home office.

During Work-I, beneficiary participatory approach will be applied to the execution of the works, as much as possible. The scope of works in the respective Works are mentioned below.

A. Work-I

- (1) Collection and review of previous studies and existing data and information
 - a) Natural conditions
 - Location, area and topography
 - Meteorology and hydrology
 - Geology and soil mechanics
 - Vegetation and forestation
 - Others
 - b) Socio-economic conditions
 - Economic indices
 - Demographic conditions
 - National and regional development plan
 - Social infrastructure
 - Others
 - c) Local Governments and institutions
 - Organization of local governments
 - Farmers' cooperatives
 - Irrigators' Associations
 - Relationship between local governments and institutions
 - Back-up system for the project implementation by the local governments
 - d) Agriculture
 - Present land use
 - Soils and land capability
 - Farming practices
 - Agricultural economy
 - Supporting services
 - Agro-industries
 - Others
 - e) Irrigation and drainage
 - Potential water resources in and around the study area
 - Present irrigation conditions and practices in and around the study area
 - Inventory reports of the existing irrigation and drainage facilities
 - Design and construction drawings/data of the existing irrigation and drainage facilities
 - Others
 - f) Rural infrastructures
 - Post harvesting facilities
 - O&M and rural roads
 - Domestic water supply system
 - Others
- (2) Execution of field surveys and investigations
 - a) Field reconnaissance survey
 - Muleta and related rivers basins
 - Proposed reservoir dam sites including its watershed
 - Existing diversion dam sites including its up/downstream reaches
 - Proposed sites and routes for irrigation and drainage facilities
 - b) Soil and land use survey

- c) Geological investigation at the proposed major structure sites
 - d) Soil mechanics survey at the proposed major structure sites
 - e) Topographic survey at the proposed major structure sites
 - f) Farming practice and farm economic surveys including market research
 - g) Construction materials and cost survey
 - h) Questionnaire/interview survey to farmers and/or members of the existing institutions
 - Farm economy
 - Present irrigation performance
 - Present Irrigators' Association and O&M activities
 - Farmers' requirements for agricultural and agro-industrial developments
 - Agricultural support services
 - Opinions and comments for the proposed development plans
 - Others
- (3) Interpretation and analyses of data and information collected
- a) Meteorology and hydrology
 - b) Soil and land use
 - c) Geology and soil mechanics
 - d) Regional socio-economy
 - e) Agriculture and agro-economy
 - f) Beneficiaries(farmers)' requirements and intentions
 - g) Environmental and watershed management
 - h) Others
- (4) Formulation of basic development plans
- a) Water resource development plan
 - b) Preliminary delineation of the project areas
 - c) Agricultural development plan including crop diversification program
 - d) Irrigation and drainage development plan
 - e) Improvement plans of rural infrastructures
 - f) Agro-industrial development plans
 - g) Institutional development plans
 - h) Social reform development plan
 - i) Basic layout of major facilities
 - j) Operation and maintenance plans

B. Work-II

- (1) Finalization of the project area
- (2) Formulation of development plan
- (3) Design of the project facilities at a feasibility level
- (4) Formulation of implementation plan and schedule
- (5) Estimation of benefits and costs
- (6) Economic evaluation of the schemes
- (7) Environmental and social impact analysis
- (8) Watershed management program
- (9) Preparation of the feasibility report

IV. TRANSFER OF TECHNOLOGY

Throughout the course of the Study, transfer of technology and training will be provided to counterpart experts by foreign experts in the following field;

- Field survey and investigations for soil & land use, geology, soil mechanics, topography, hydrology, irrigation, agriculture, agro-economy and environmental aspects
- Planning and design for irrigation, drainage, and rural development

The above transfer of technology will be carried out in the form of on-the-job training and seminar during the course of the Study. Overseas training will also be programmed.

V. SCHEDULE OF THE STUDY AND REPORTS

The period required for the study is estimated at 16 months in total. The tentative schedule of the study is shown in Attachment - 1.

The following reports will be prepared and submitted to the Government.

- (1) Inception Report : at the end of the one month after commencement of the Study.
- (2) Interim Report : at the end of 9th month after the commencement of the Study.
- (3) Draft Final Report : at the end of 13th month after the commencement of the Study.
- (4) Final Report : within one month after receiving comments of the NIA on the Draft Final Report.

VI. EXPERTS INPUTS

The engineers or experts required for the study are as follows:

- Team Leader
- Irrigation and Drainage Planning Engineer
- Dam Planning Engineer
- Agronomist/Agro-economist
- Rural Development Planning Engineer
- Sociologist
- Institutional development expert
- Hydraulic Structure Design Engineer

- Meteo-hydrologist
- Forestry Engineer
- Geologist
- Soil Mechanical Engineer
- Project Economist
- Environmental Expert

The required manpower input as engineers or experts will be about 90 man-months in total.

VII. UNDERTAKINGS OF THE GOVERNMENT OF THE PHILIPPINES

In order to facilitate the smooth and effective execution of the Study, the Government of the Philippines will undertake the following measures:

- To provide necessary data and information relevant to the study,
- To despatch counterpart personnel to the expatriate experts including topo-surveyors,
- To provide the office space with necessary facilities, inclusive of electricity and water supply,
- To provide appropriate number of vehicles with drivers,
- To install two automatic rainfall and one automatic water level gauge at appropriate sites, and to conduct the observation, and
- To prepare rating curves at the proposed water gauging stations.

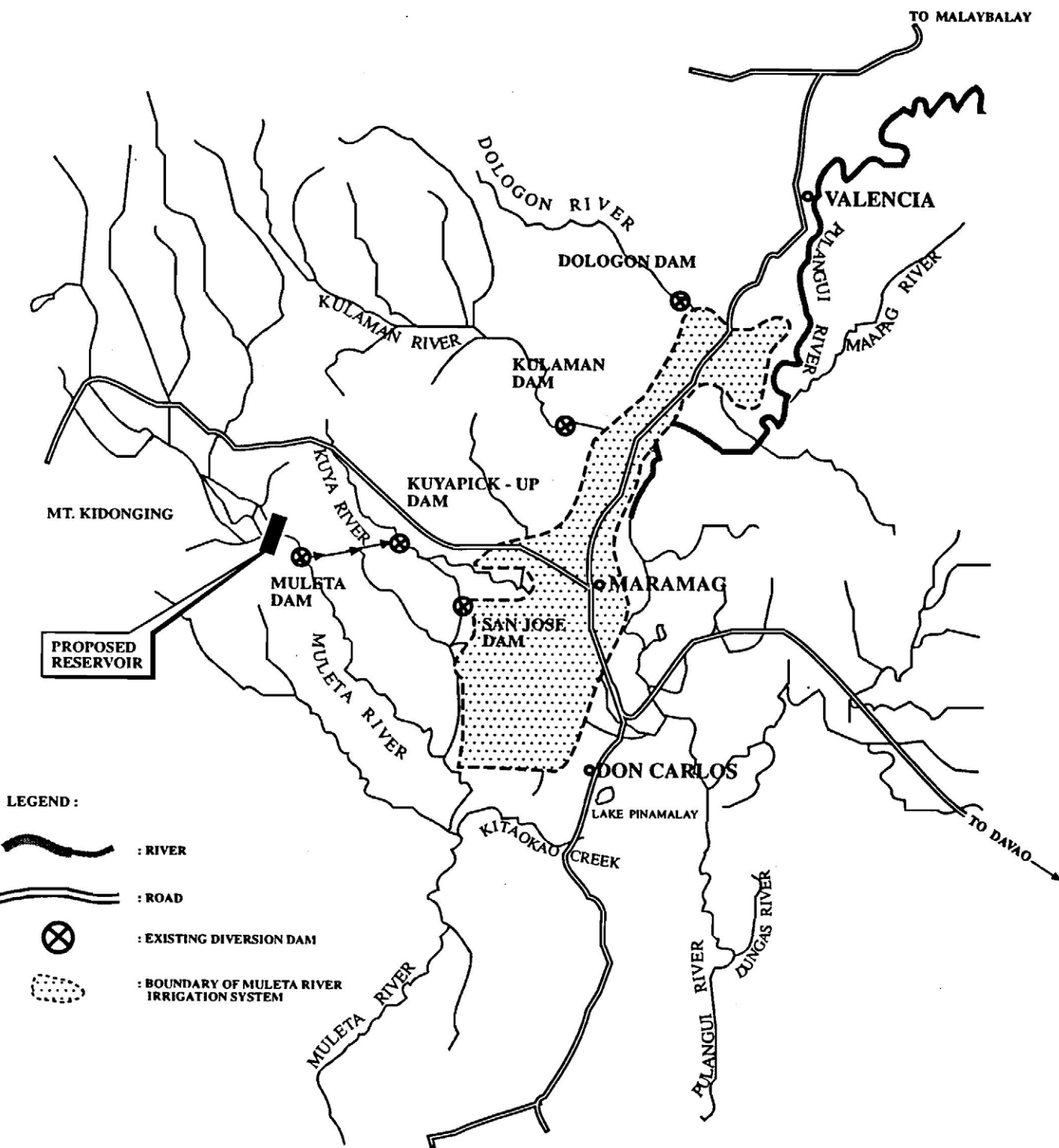
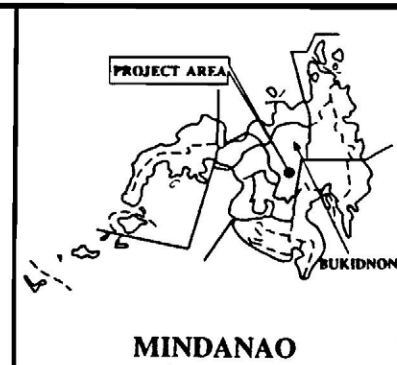
Attachment - 1

**TENTATIVE WORK SCHEDULE OF THE FEASIBILITY STUDY
FOR
THE MULETA RIVER BASIN AGRICULTURAL DEVELOPMENT PROJECT
FOR
ACCELERATION OF RURAL IMPROVEMENT**

| Description | Month in Order | | | | | | | | | | | | | | | |
|---------------------------------------|----------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 1. Work - I | | | | | | | | | | | | | | | | |
| (1) Survey & Investigations | | | | | | | | | | | | | | | | |
| (2) Basic Plan Formulation | | | | | | | | | | | | | | | | |
| 2. Work - II | | | | | | | | | | | | | | | | |
| (1) Formulation of Development Plan | | | | | | | | | | | | | | | | |
| (2) Explanation of Draft Final Report | | | | | | | | | | | | | | | | |
| 3. Reports for Work -II | | | | | | | | | | | | | | | | |
| (1) Inception Report | | | | | | | | | | | | | | | | |
| (2) Interim Report | | | | | | | | | | | | | | | | |
| (3) Draft Final Report | | | | | | | | | | | | | | | | |
| (4) Final Report | | | | | | | | | | | | | | | | |



LOCATION MAP



TERMS OF REFERENCE (DRAFT)
PROJECT PROPOSAL FOR
AGRICULTURAL RESEARCH AND EXTENSION SYSTEMS PROJECT
(ARESP)

| | |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT TITLE | : Agricultural Research and Extension Systems Project (ARESP) |
| LOCATION | : Nationwide for Basic Plan Study and Selected Schemes for Feasibility Study |
| EXECUTING AGENCY Chaired/Coordinating agency Implementing Agencies | : Department of Agriculture (DA) - Bureau of Agricultural Research (BAR) - Regional Field Units (RFUs) - Other agencies related to research, development and extension |
| PROPOSED SOURCE OF ASSISTANCE | : Government of Japan |

I. PROJECT BACKGROUND

I.1. National Strategy

The Government of the Philippines has launched medium-term (1993-1998) development plan whose main thrust is "World Competitiveness through People Empowerment". Under the plan, the country would have attained an annual growth rate in GNP of 6-8%, a per capita GNP of \$1,000 and poverty incidence reduced to 30%.

| | | |
|--------------------------------|---------|------------|
| 1) Annual Growth Rate in GNP : | 1987-92 | 4.1 % |
| | 1992-98 | 6 - 8 % |
| 2) per Capita GNP : | 1990 | US\$ 730 |
| | 1998 | US\$ 1,000 |
| 3) Poverty Incident : | 1991 | 40.7 % |
| | 1998 | 30.0 % |

The world economic competitiveness means that the country's local producers are able to sell their products or services effectively in the international market on equal terms with all competitors worldwide. People empowerment means the upliftment of people's well-being which is the ultimate goal of development. This priority goal is to alleviate poverty, which is widespread in the backward regions of the countryside.

According to the Philippine Human Development Report produced by the United Nations Development Program (UNDP) in 1994, the incidence of poverty (number of poor families as a proportion of total number of families) increased between 1971 and 1985. However, the picture improved slightly in 1991 with the poverty incidence going down from 44.2 to 40.7 percent. Instead of decreasing of the poverty incidence, with the complicating effects of population growth, the total number of poor families rose from 4.36 million in 1985 to 4.88 million in 1991 indicating that two out of every five Filipino households are poor. About 60 percent of poor families earn their income primarily in agriculture, either as farmers, landless agricultural workers, fishermen and forestry workers.

The Philippines continues to be a predominant agricultural economy. Agricultural sector still accounts for about half of total employment, about 22% of the gross domestic product, and more than one-third of export revenues. Two-third of the country's population live in the rural areas and are directly or indirectly dependent on agriculture for their livelihood.

**GNP & GDP by Industrial Origin
(1985 Constant Prices)**

| INDUSTRIAL ORIGIN | 1991 | 1992 | 1993 | 1994 | 1995 |
|------------------------------------|---------|---------|---------|---------|---------|
| (IN MILLION PESOS) | | | | | |
| 1. Agriculture, Fishery & Forestry | 162,937 | 163,571 | 167,053 | 171,472 | 172,999 |
| 2. Industrial Sector | 248,718 | 247,384 | 251,459 | 265,972 | 285,219 |
| 3. Service Sector | 304,867 | 307,986 | 315,644 | 329,006 | 345,232 |
| GDP | 716,522 | 718,941 | 734,156 | 766,450 | 803,450 |
| (Growth Rate) | -0.58% | 0.34% | 2.12% | 4.40% | 4.83% |
| % of Agriculture to Total GDP | 22.74% | 22.75% | 22.75% | 22.37% | 21.53% |
| Growth Rate in Agri GDP | 1.37% | 0.39% | 2.13% | 2.65% | 0.89% |
| 4. Net Factor Income | | | | | |
| From Abroad | 10,297 | 18,198 | 12,765 | 19,768 | 26,045 |
| GNP | 726,819 | 737,139 | 746,921 | 786,218 | 829,495 |
| (Growth Rates) | 3.36% | 1.42% | 1.01% | 5.26% | 5.50% |

Source : 1996 Philippine Statistical Yearbook
National Statistical Coordination Board

Under these economic background of agricultural sector, the Philippines government focuses on improvement of rural economy through agri-industrial development in the countryside. An agri-industrial development strategy highlights the links between the agriculture and industry sectors where the former produces commodities that are processed by the latter into high-value products. The strategy, therefore, aims to develop a highly productive agriculture sector that is composed of viable farm enterprises with strong production and marketing linkages with industry. This strategy also aims to create a strong and competitive manufacturing sector which uses local raw materials and provides employment for the majority of the population. As a result, the age-old problem of poverty would be alleviated through improvements in income and productivity. The growth in income levels is then expected to result in increases in human and physical capital.

The Philippines has imported 1.2 million ton of rice from its Asian neighbors and United States between July 1995 and June 1996 to meet the shortfall in domestic production. Furthermore, the country will import up to 650,000 ton of rice in 1997. The imported rice is priced at \$300 per tone. This means that the country spends \$360 million to \$195 million for shopping the rice, though the Philippines has the potential to achieve self-sufficiency of rice. It is essential to spend these amount for the improvement of agricultural productivity and benefiting Filipino farmers.

I.2 Production Performance, Issues and Constraints

For the past three years (1992-1995), the agriculture sector was able to sustain its previous gains as its gross value added (GVA) continued to increase. In 1994, GVA in agriculture posted a 3.02 % growth, the highest rate attained since 1990. However, during the first semester of 1995, growth in agriculture and fisheries slowed down to 1.34 % due to the adverse effects of the dryspell and unfavorable weather conditions and disease outbreaks which affected palay and livestock production.

Despite declines in the performance of palay and sugarcane, the crops subsector posted positive growth due to the higher gains achieved in coconut and other crops. Livestock and poultry production grew, though at a slower rate, by 3.01 % and 2.73 %, respectively. The fisheries subsector posted a growth of 1.70 % due to the continued expansion in aquaculture and the use of improved fishing gears for commercial fisheries.

The Grain Production Enhancement Program (GPEP) seeks to make the country self-sufficient in rice and corn, with production targets of 12 million ton, and 7 million ton by the end of the Program in 1998. The average production per ha in palay key grains areas (KGAs) reported positive accomplishment during the first two years of implementation. For GPEP I (May 1993 - April 1994), average yield levels in KGAs reached 4.26 ton/ha over the 3.50 ton/ha target. This yield level was sustained in GPEP II (May 1994 - April 1995) recording a 4.43 ton/ha production level more than the targeted yield of 4.0 ton/ha. The modest success of GPEP was totally overshadowed by the rice crisis in the second semester of 1995 caused mainly by inadequate buffer stock and poor rice supply management. The specific problems and constraints for study crops are as follows :

- (1) Rice
 - (a) Inability of farmers to procure inputs necessary for increased production ;
 - (b) Unavailability, low level of use, mismanagement, and high cost of inputs, i.e. fertilizers, pesticide, farm equipment and machinery ;
 - (c) Lack of credit and financial assistance ;
 - (d) Lack of critical support infrastructure, i.e. irrigation, transport and communication, post-harvest, storage, and processing ;
 - (e) Inadequate funding for research and extension ; and
 - (f) Ineffective government intervention in the marketing of rice.

- (2) Corn
 - (a) High post-harvest losses, and shipping and transport bottlenecks ;
 - (b) Low productivity of corn farming ; and
 - (c) Lack of production financing or credit.
- (3) Coconut
 - (a) Declining productivity of coconut trees and poor copra quality ;
 - (b) Low income in the coconut farming sectors ;
 - (c) Inadequate funding support for agro-industrial R and D ; and
 - (d) Lack of intensified market development and expansion program.
- (4) Sugar
 - (a) Limited sugarcane area ;
 - (b) Low productivity and poor sugar quality ;
 - (c) Lack of and high cost of financing assistance ; and
 - (d) Decreasing government funding for R and D.
- (5) Fruits and Vegetables
 - (a) Unavailability of superior varieties ;
 - (b) Unavailability and high cost of inputs ;
 - (c) Limited post-harvest technology at the village level ;
 - (d) Lack of financing assistance ;
 - (e) Inefficient marketing and distribution system ; and
 - (f) Ineffective research, training and extension.

I.3 DAs' Strategies and Programs

Based on the Food Security Summit on January 26, 1996, chaired by the President, the DA is tasked to implement several strategies as follows :

- (1) Implementation of a revitalized and refocused nationwide program to sustain and increase domestic grain production (Gintong Ani) mainly through productivity-enhancing measures ;
- (2) Formulation and implementation of policies to stabilize food process and reduce supply fluctuations, including importation and countertrade without adversely affecting domestic production ;
- (3) Maintenance of a buffer stock during the lean production and emergencies to be administered by NFA ; and
- (4) Production of subsidized rice and other essential foodstuffs to the poorest segment of population, employing the food stamp concept and administered by the Department of Social Welfare and Development.

The Ginton Ani becomes the national rice and corn production program aimed at ensuring food security and helping organize subsistence farmers into functional groups or cooperatives and transform them into viable producers and entrepreneurs.

The DA shall exert efforts to create a conducive environment that would encourage farmers to increase production through the adoption of appropriate technologies, thus achieving average yields of about 5 ton/ha in irrigated areas and 3 ton/ha in rainfed area. These efforts include :

- (1) Removal of all subsidies on output and input prices to ensure sustainability of the program ;
- (2) Partial compensation for removal of subsidies, elimination of all policy-induced cost to production by removing non-tariff barriers, tariffs and taxes on agricultural inputs, and facilitation of access to credit at competitive rates ; and
- (3) Provision of efficient support services (irrigation, farm-to-market roads, post-harvest facilities, etc.), encouragement of private sector participation, and strengthening of cooperation among the DA, LGUs, state universities and colleges (SUCs) and the private sector.

The program shall adopt risk-reducing mechanisms through : proper pricing policies; provision of critical and basic support services, including upgraded farm extension, making available farm inputs (e.g. seeds, fertilizers); establishment of production, credit and marketing linkages (through the involvement of LBP, Coop Banks, and guarantee and insurance institutions); promotion of strong rural based organizations; and increased research and development, training and technical assistance. To sustain the targeted growth in rice productivity, expenditure on Research and Development (R&D) shall be increased to support continuing technology generation and dissemination efforts.

Various DA agencies and LGUs shall provide interventions to make farm inputs available and accessible, and enable farmers to adopt appropriate technologies all aimed at improving farm productivity and profitability and dramatically increasing incomes of farm households.

Incentive and diversified agriculture will require irrigation, good quality seeds and other inputs, suitable farm mechanization, priority processing (e.g. drying and storage) of farm products and secondary and tertiary processing of farm products and by-products (e.g., food and feed processing). Vertical integration of these activities in crop agriculture (from intensive and diversified irrigated agriculture to suitable farm mechanization to agro-processing and development of related agri-business) offers the best opportunity for increasing farm incomes, generating employment and livelihood for the rural poor and bringing women and other underprivileged groups into the mainstream of agricultural development.

Technology monitoring and identification, testing, suitability assessment, adaptive modification and packaging are the vital linkages or processes between research and extension. These processes are, in fact, indispensable parts of an effective, integrated research and extension system. It is only by strengthening these vital linkages that research and extension services can be made sensitive to the changing needs of individual farmers and agro-industries. Therefore, for the long-term development of agricultural R&D in the country, the government focuses on :

- (1) Increase public investment in agricultural research ;
- (2) Improve the remunerative incentives for agricultural scientists, provide for adequately equipped research stations in key areas of the country, and enhance the research capacity of state universities and colleges in various regions of the country ; and
- (3) Move public sector research away from commodity sectors (i.e., banana and pineapple) in which the private sector research is active.

I.4 Activities of Bureau of Agricultural Research

The Bureau of Agricultural Research (BAR) is the research coordinating arm of the DA created by virtue of Executive Order 116 Memorandum Order Number 4, Series of 1987. It has mandate of planning, integrating, coordinating, monitoring, evaluation and sourcing funds for the various research programs of the DA from local and foreign funding agencies.

The BAR pursued its activities based on planned programs through its technical divisions namely ; Research Coordination Division (RCD), Program Development Division (PDD), and Management Information Systems Division (MISD). Providing the support services was the Administrative Support Staff (ASF). The followings are the activities undertaken by the BAR through its divisions and programs :

- (1) Research Coordination and Monitoring
 1. Monitoring of the studies for crops (Grain Production Enhancement Program-GPEP), and Key Commercial Crops Production Program (KCCDP), Livestock and Fisheries Development Programs under the Medium-Term Agricultural Development R & D program ;
 2. Preparation of inventory and consolidation of the DA researches for 15 Regional Field Units (RFUs), five staff bureaus and seven attached agencies using the Computerized Documentation System-Integrated Set of Information Systems (CDS/ISIS) software ;
 3. Evaluation of research proposals submitted to the BAR for funding under GPEP, KCCDP, regular funds, etc., and endorsement to the Department of Budget and Management (DBM) ; and
 4. Coordination and evaluation of research, development and training activities.
- (2) Research Program and Development
 1. Screening and evaluation of program /project proposals submitted by the various DA units and SUCs for the DA's regular and special funding ; and

2. Liaison works for Research and Training Council and Technical Advisory Committee.

(3) Management Information System

1. Maintenance of the DA Research Monitoring System (DARMS) computer system with the recent technologies in development and networking ;
2. Provision of information services on the DA's research, development and training activities ; and
3. Publication of quarterly, annual, and occasional journals and papers.

Under urgent requirements of provision of appropriate technologies for small farmers and fishermen, and the decentralization to the local government units, the DA's research and extension systems are facing the following constraints at present :

1. Shortage of research and development budget and skilled manpower ;
2. Duplication, and shortage of coordination on agricultural research and development activities among DA's research institutes and SUCs ;
3. Shortage of coordination and cooperation mechanism between DA's research/development/training and the local government extension activities ; and
4. Shortage of feedback system between research, training and extension activities.

II. OBJECTIVES OF THE STUDY

The proposed study is intended to provide a Basic Plan and priority projects/programs for strengthening the DA's research and extension organizations and their activities focusing on the BAR's coordination functions to provide appropriate technologies for agri-based rural development. The study is geared towards the attainment of rural poverty alleviation and activation of rural socio-economy through the establishment of rational research and extension systems, and by enlarging the development benefits for small farmers and fishermen. Particular emphasis of the study shall be on :

- 1) To establish a management information system for rational research and development activities at provincial, regional and national levels ;
- 2) To establish an effective monitoring and evaluation system for research and development activities based on the national and local needs ;

- 3) To establish an appropriate technical training and extension mechanism for research and extension organizations at provincial, regional and national levels ;
- 4) To demarcate research and development, and technical dissemination activities among the relevant organizations at provincial, regional and national levels and to formulate appropriate coordination mechanism ; and
- 5) To streamline Regional Integrated Agricultural Research Centers (RIARCs), Research Outreach Stations (ROSs), and Satellite Station or Experiment Farms under the Regional Field Units, the research stations under the bureaus and attached agencies, and ATI training centers by medium and long terms.

III. PROPOSED SCOPE OF WORK

The study will be carried out in the following two (2) phases :

Phase I : Formulation of a Basic Plan for DA's Rational Research and Extension Systems and Selection of Priority Projects/Programs

- (1) Collection of the following data and information related to agricultural research and extension covering :
 - organizations and staff composition of relevant organizations ;
 - activities and effects on research and extension programs/projects ;
 - inventory of research and extension infrastructure ;
 - research coordination, monitoring and evaluation mechanism ;
 - budgetary systems ;
 - coordination mechanism with the LGUs, SUCs and other relevant organizations ;
 - and
 - data and information on area-specific and beneficiary-oriented research and extension activities.
- (2) Assessment of present research and extension systems focusing on :
 - organizational duplication and shortage of coordination, ;
 - functional duplication and shortage of coordination ;
 - defective and insufficient infrastructure development ;
 - performance on operation and maintenance of the facilities ;
 - skills of research personnel ;
 - budget allocation (cost for manpower, actual research and extension activities) ;
 - cost effectiveness of research and extension by location and means ; and
 - feedback mechanism among research, training and extension activities.

- (3) Identification of development directions to realize appropriate research and extension systems in the DA coordinating with LGUs and other relevant organizations covering :
 - research and extension organization ;
 - monitoring and evaluation system ;
 - budgetary allocation system ;
 - infrastructure and facilities improvement ; and
 - coordination with LGUs and other relevant organizations ;

- (4) Formulation of a **Basic Plan** for Strengthening of DA's Research and Extension Systems covering :
 - Organization plan for agricultural research, development, training and extension ;
 - Agricultural research and management information system plan ;
 - Infrastructure development plan ;
 - Budget management plan for the DA's research, development, training and extension ;
 - Supporting plan for the LGUs' agricultural training and extension activities ;
 - Cooperate plan for agricultural training and extension with SCUs and NGOs ; and
 - Estimation of costs and benefits.

- (5) Selection of high priority projects/programs through :
 - Establishment and formulation of a set of criteria for selecting and prioritizing programs and projects identified in a Basic Plan ;
 - Identification of priority projects/programs ; and
 - Implementation schedule for a basic plan.

Phase II : Feasibility Studies on Priority Projects and Programs

- (1) Execution of detailed surveys and investigations for the priority projects and programs through :
 - Basic data and information collection ;
 - Survey on internal-organization and staff ;
 - Survey on management information system for reserach and extension activities ;
 - Survey on infrastructure and facilities ;
 - Survey on operation and maintenance of the facilities and equipment
 - Survey on project organization and coordination activities ; and
 - Consultation surveys for farmers and organizations, LGUs and other relevant organizations.

- (2) Formulation of development plans covering :
 - Implementation plan for research and extension at a pilot basis
 - Organizational strengthening plan ;
 - Management information system plan ;
 - Strengthening plan for coordination of research and extension activities with LGUs and other relevant organizations ; and
 - Improvement plan of infrastructure and facility.
- (3) Cost and benefit estimate for priority projects and programs
- (4) Plan formulation of project organization, operation and maintenance, and project implementation schedule
- (5) Project evaluation

IV. EXPERTISE INPUT

The following expatriate experts and engineers will be required for executing the study :

- (1) Development Planner on Research and Extension
- (2) Agronomist-A (annual crops)
- (3) Agronomist-B (perennial crops)
- (4) Livestock Specialist
- (5) Fishery Expert
- (6) Irrigation Engineer
- (7) Facility Design Engineer
- (8) Agro-Economist
- (9) Management Information System Specialist
- (10) Institutional Expert
- (11) Cost Estimator
- (12) Project Economist

V. STUDY SCHEDULE

The study shall be carried out for a duration of 19 months after its commencement and be divided into the following phases :

Phase - I : Formulation of a Basic Plan for rational research and extension systems in the DA (10 months)

Phase - II : Feasibility Studies on Priority Projects and Programs (9 months)

VI. REPORTS TO BE PREPARED

The following reports shall be prepared in the course of the Study within the period specified below :

- | | | |
|-----|-------------------------------------------------------|-----------------------------------------------------------------|
| (1) | Plan of Operation | : not less than one (1) month from commencement of the Study |
| (2) | Progress Report | : not later than four (5) months from commencement of the Study |
| (3) | Interim Report (basic plan) | : not later than 10 months from commencement of the Study |
| (5) | Draft Final Report (basic plan and F/S studies) | : not later than 17 months from commencement of the Study |
| (6) | Final Report | : not later than 19 months from commencement of the Study |

VII. RESPONSIBILITY OF THE GOVERNMENT

The DA shall, at its own expense, provide the 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, and
- (4) credentials or identification cards to the member of the Study Team.

Whenever necessary, the DA shall make arrangements with other concerned agencies, at its own expense, in order to :

- (1) secure the safety of the Study Team ;
- (2) permit the member of the Study Team to enter, leave and sojourn in the Philippines for the duration of their assignment therein ;
- (3) exempt the member of the Study Team from taxes, duties, fees and other charges of equipment, machinery and other materials to be brought into the Philippines for conduct of the Study ;
- (4) exempt the member of the Study Team from income tax and charges of any kind imposed on or in connection with any emolument or allowance paid to the member of the Study Team for his/her services in connection with the implementation of the Study ;
- (5) provide necessary facilities to the member of the Study Team for remittance as well as utilization of the funds brought into the Philippines from Japan in connection with the implementation of the Study ;
- (6) secure permission for entry into private properties or restricted areas for the conduct of the Study ;
- (7) secure permission to take all data and documents (including photographs) related to the Study out of the Philippines to Japan by the Study Team ; and
- (8) provide medical services as needed and expenses for such will be chargeable against the member of the Study Team.

Attachment - 1

**TENTATIVE WORK SCHEDULE OF
AGRICULTURAL RESEARCH AND EXTENSION SYSTEMS PROJECT (ARESP)**

| Description | Month in Order | | | | | | | | | | | | | | | | | | |
|----------------------------------------------------------|----------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1. Phase - I | | | | | | | | | | | | | | | | | | | |
| (1) Collection and review of data and information | ■ | ■ | | | | | | | | | | | | | | | | | |
| (2) Assessment of present research and extension systems | | | ■ | ■ | ■ | | | | | | | | | | | | | | |
| (3) Identification of development directions | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | |
| (4) Formulation of a Basic Plan | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | |
| (5) Selection of high priority projects/programs | | | | | | | | | | ■ | ■ | | | | | | | | |
| 2. Phase - 2 | | | | | | | | | | | | | | | | | | | |
| (1) Detailed surveys and investigations | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | | | | |
| (2) Formulation of development plans | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | |
| (3) Explanation of Draft Final Report | | | | | | | | | | | | | | | | | | ■ | |
| 3. Reports for Work -II | | | | | | | | | | | | | | | | | | | |
| (1) Inception Report | ▼ | | | | | | | | | | | | | | | | | | |
| (2) Progress Report | | | | | ▼ | | | | | | | | | | | | | | |
| (3) Interim Report | | | | | | | | | | ▼ | | | | | | | | | |
| (4) Draft Final Report | | | | | | | | | | | | | | | | | | ▼ | |
| (5) Final Report | | | | | | | | | | | | | | | | | | | ▼ |

TERMS OF REFERENCE (DRAFT)
PROJECT PROPOSAL FOR
CROP MARKETING AND INFORMATION SYSTEMS PROJECT (CMISP)

| | |
|-------------------------------|----------------------------------------------------------------------------------------------------|
| PROJECT TITLE | : Crop Marketing and Information Systems Project (CMISP) |
| LOCATION | : Pangasinan Province (Region I), Isabela Province (Region II), and Nueva Ecija (Region III) |
| EXECUTING AGENCY | : Department of Agriculture (DA) |
| Chaired/Coordinating agency | - Policy and Planning, DA |
| Implementing agencies | - National Food Authority (NFA) and - Bureau of Agricultural Statistics (BAS) |
| PROPOSED SOURCE OF ASSISTANCE | : Government of Japan |

I. PROJECT BACKGROUND

I.1. National Strategy

The Government of the Philippines has launched medium-term (1993-1998) development plan whose main thrust is "World Competitiveness through People Empowerment". Under the plan, the country would have attained an annual growth rate in GNP of 6-8%, a per capita GNP of \$1,000 and poverty incidence reduced to 30%.

| | | |
|--------------------------------|---------|------------|
| 1) Annual Growth Rate in GNP : | 1987-92 | 4.1 % |
| | 1992-98 | 6 - 8 % |
| 2) per Capita GNP : | 1990 | US\$ 730 |
| | 1998 | US\$ 1,000 |
| 3) Poverty Incident : | 1991 | 40.7 % |
| | 1998 | 30.0 % |

The world economic competitiveness means that the country's local producers are able to sell their products or services effectively in the international market on equal terms with all competitors worldwide. People empowerment means the upliftment of people's well-being which is the ultimate goal of development. This priority goal is to alleviate poverty, which is widespread in the backward regions of the countryside.

According to the Philippine Human Development Report produced by the United Nations Development Program (UNDP) in 1994, the incidence of poverty (number of poor families as a

proportion of total number of families) increased between 1971 and 1985. However, the picture improved slightly in 1991 with the poverty incidence going down from 44.2 to 40.7 percent. Instead of decreasing of the poverty incidence, with the complicating effects of population growth, the total number of poor families rose from 4.36 million in 1985 to 4.88 million in 1991 indicating that two out of every five Filipino households are poor. About 60 percent of poor families earn their income primarily in agriculture, either as farmers, landless agricultural workers, fishermen and forestry workers.

The Philippines continues to be a predominant agricultural economy. Agricultural sector still accounts for about half of total employment, about 22% of the gross domestic product, and more than one-third of export revenues. Two-third of the country's population live in the rural areas and are directly or indirectly dependent on agriculture for their livelihood.

**GNP & GDP by Industrial Origin
(1985 Constant Prices)**

| INDUSTRIAL ORIGIN | 1991 | 1992 | 1993 | 1994 | 1995 |
|------------------------------------|--------------------|---------|---------|---------|---------|
| | (IN MILLION PESOS) | | | | |
| 1. Agriculture, Fishery & Forestry | 162,937 | 163,571 | 167,053 | 171,472 | 172,999 |
| 2. Industrial Sector | 248,718 | 247,384 | 251,459 | 265,972 | 285,219 |
| 3. Service Sector | 304,867 | 307,986 | 315,644 | 329,006 | 345,232 |
| GDP | 716,522 | 718,941 | 734,156 | 766,450 | 803,450 |
| (Growth Rate) | -0.58% | 0.34% | 2.12% | 4.40% | 4.83% |
| % of Agriculture to Total GDP | 22.74% | 22.75% | 22.75% | 22.37% | 21.53% |
| Growth Rate in Agri GDP | 1.37% | 0.39% | 2.13% | 2.65% | 0.89% |
| 4. Net Factor Income | | | | | |
| From Abroad | 10,297 | 18,198 | 12,765 | 19,768 | 26,045 |
| GNP | 726,819 | 737,139 | 746,921 | 786,218 | 829,495 |
| (Growth Rates) | 3.36% | 1.42% | 1.01% | 5.26% | 5.50% |

SOURCE : 1996 Philippine Statistical Yearbook
National Statistical Coordination Board

Under these economic background of agricultural sector, the Philippines government focuses on improvement of rural economy through agri-industrial development in the countryside. An agri-industrial development strategy highlights the links between the agriculture and industry sectors where the former produces commodities that are processed by the latter into high-value products. The strategy, therefore, aims to develop a highly productive agriculture sector that is composed of viable farm enterprises with strong production and marketing linkages with industry. This strategy also aims to create a strong and competitive manufacturing sector which uses local raw materials and provides employment for the majority of the population. As a result, the age-old problem of poverty would be alleviated through improvements in income and productivity. The growth in income levels is then expected to result in increases in human and physical capital.

The Philippines has imported 1.2 million ton of rice from its Asian neighbors and United States between July 1995 and June 1996 to meet the shortfall in domestic production.

Furthermore, the country will import up to 650,000 ton of rice in 1997. The imported rice is priced at \$300 per tone. This means that the country spends \$360 million to \$195 million for shopping the rice, though the Philippines has the potential to achieve self-sufficiency of rice. It is essential to spend these amount for the improvement of agricultural productivity and benefiting Filipino farmers.

I.2 Production Performance, Issues and Constraints

For the past three years (1992-1995), the agriculture sector was able to sustain its previous gains as its gross value added (GVA) continued to increase. In 1994, GVA in agriculture posted a 3.02 % growth, the highest rate attained since 1990. However, during the first semester of 1995, growth in agriculture and fisheries slowed down to 1.34 % due to the adverse effects of the dryspell and unfavorable weather conditions and disease outbreaks which affected palay and livestock production.

Despite declines in the performance of palay and sugarcane, the crops subsector posted positive growth due to the higher gains achieved in coconut and other crops. Livestock and poultry production grew, though at a slower rate, by 3.01 % and 2.73 %, respectively. The fisheries subsector posted a growth of 1.70 % due to the continued expansion in aquaculture and the use of improved fishing gears for commercial fisheries.

The grain Production Enhancement Program (GPEP) seeks to make the country self-sufficient in rice and corn, with production targets of 12 million ton, and 7 million ton by the end of the Program in 1998. The average production per ha in palay key grains areas (KGAs) reported positive accomplishment during the first two years of implementation. For GPEP I (May 1993 - April 1994), average yield levels in KGAs reached 4.26 ton/ha over the 3.50 ton/ha target. This yield level was sustained in GPEP II (May 1994 - April 1995) recording a 4.43 ton/ha production level more than the targeted yield of 4.0 ton/ha. The modest success of GPEP was totally overshadowed by the rice crisis in the second semester of 1995 caused mainly by inadequate buffer stock and poor rice supply management. The specific problems and constraints for study crops are as follows :

- (1) Rice
 - (a) Inability of farmers to procure inputs necessary for increased production ;
 - (b) Unavailability, low level of use, mismanagement, and high cost of inputs, i.e. fertilizers, pesticide, farm equipment and machinery ;
 - (c) Lack of credit and financial assistance ;
 - (d) Lack of critical support infrastructure, i.e. irrigation, transport and communication, post-harvest, storage, and processing ;
 - (e) Inadequate funding for research and extension ; and
 - (f) Ineffective government intervention in the marketing of rice.

- (2) Corn
 - (a) High post-harvest losses, and shipping and transport bottlenecks ;
 - (b) Low productivity of corn farming ; and
 - (c) lack of production financing or credit.
- (3) Coconut
 - (a) Declining productivity of coconut trees and poor copra quality ;
 - (b) Low income in the coconut farming sectors ;
 - (c) Inadequate funding support for agro-industrial R and D ; and
 - (d) Lack of intensified market development and expansion program.
- (4) Sugar
 - (a) Limited sugarcane area ;
 - (b) Low productivity and poor sugar quality ;
 - (c) Lack of and high cost of financing assistance ; and
 - (d) Decreasing government funding for R and D.
- (5) Fruits and Vegetables
 - (a) Unavailability of superior varieties ;
 - (b) Unavailability and high cost of inputs ;
 - (c) Limited post-harvest technology at the village level ;
 - (d) Lack of financing assistance ;
 - (e) Inefficient marketing and distribution system ; and
 - (f) Ineffective research, training and extension.

I.3 DAs' Strategies and Programs

Based on the Food Security Summit on January 26, 1996, chaired by the President, the DA is tasked to implement several strategies called for under the following :

- (1) Implementation of a revitalized and refocused nationwide program to sustain and increase domestic grain production (Gintong Ani) mainly through productivity-enhancing measures ;
- (2) Formulation and implementation of policies to stabilize food process and reduce supply fluctuations, including importation and countertrade without adversely affecting domestic production ;
- (3) Maintenance of a buffer stock during the lean production and emergencies to be administered by NFA ; and
- (4) Production of subsidized rice and other essential foodstuffs to the poorest segment of population, employing the food stamp concept and administered by the Department of Social Welfare and Development.

The Gintong Ani becomes the national rice and corn production program aimed at ensuring food security and helping organize subsistence farmers into functional groups or cooperatives and transform them into viable producers and entrepreneurs.

The DA shall exert efforts to create a conducive environment that would encourage farmers to increase production through the adoption of appropriate technologies, thus achieving average yields of about 5 ton/ha in irrigated areas and 3 ton/ha in rainfed area. These efforts include :

- (1) Removal of all subsidies on output and input prices to ensure sustainability of the program ;
- (2) Partial compensation for removal of subsidies, elimination of all policy-induced cost to production by removing non-tariff barriers, tariffs and taxes on agricultural inputs, and facilitation of access to credit at competitive rates ; and
- (3) Provision of efficient support services (irrigation, farm-to-market roads, post-harvest facilities, etc.), encouragement of private sector participation, and strengthening of cooperation among the DA, LGUs, state universities and colleges (SUCs) and the private sector.

The program shall adopt risk-reducing mechanisms through : proper pricing policies; provision of critical and basic support services, including upgraded farm extension, making available farm inputs (e.g. seeds, fertilizers); establishment of production, credit and marketing linkages (through the involvement of LBP, Coop Banks, and guarantee and insurance institutions); promotion of strong rural based organizations; and increased research and development, training and technical assistance. To sustain the targeted growth in rice productivity, expenditure on Research and Development (R&D) shall be increased to support continuing technology generation and dissemination efforts.

An efficient marketing system influences the behavior of prices that farmers receive, and prices shouldered by consumers. Continuous institutional support is needed to build the capabilities of farmers' organizations to undertake marketing functions and provision of support services such as an extensive marketing information system. Strategies on marketing assistance are put on (1) implementation of palay procurement for buffer stocking purposes, and (2) provision of technical support in marketing and management assistance to cooperatives.

The National Food Authority (NFA) shall continue its palay procurement (440,000 ton in 1996) for buffer stocking purposes during the lean months (July to September). Incentives to farmers and the strengthening of institutional procurement shall be continued, including the expansion of Quedan financing by the Quedan Rural Credit and Guarantee Corporation (QuedanCor), and the extension of commodity loans. The NFA and NIA shall develop an arrangement where irrigation service fees paid in-kind (palay) are deposited with NFA. Marketing initiatives among farmers' groups and cooperatives shall be encouraged. These include procurement of palay from members and procurement of farm inputs for its members, among other marketing initiatives. The DA through its Marketing Assistance Service, the Regional Field units (RFUs), NFA and Bureau of Agricultural Statistics (BAS) shall strengthen and intensify its market information capabilities by establishing a network of Grain Market Information Centers in major gains producing areas. In addition, post-harvest development shall be promoted through the construction of multi-purpose drying pavements (MPDP), and use of instore dryer, outdoor storage and moisture meters.

I.4 Status of Market Support Services of NFA and BAS

(1) NFA's Activities

The NFA has promoted the integrated growth and development of food industry to make it capable of providing adequate and stable grains supply to meet the growing requirements of the nation. In addition, the NFA is tasked to advise a system for regularly obtaining information pertinent to the grains industry. Argument and misunderstandings on NFA's role, budget, privatization, etc. have been made since the last Medium-Term Plan. While it is obvious there are no objections against necessity on food marketing improvement and the government support services both for farmers and consumers. The government maintains the NFA as a food security agency mandated to stabilize grains supply and process. The NFA is geared towards the attainment of the following major objectives :

- (1) Establish a climate conducive to more private sector participation ;
- (2) Establish a new system of buffer stock management ;
- (3) Restructure the NFA's financial accounts and establish a more viable funding scheme for its operation ;
- (4) Institutionalize a system whereby marketing of NFA stocks will be able to regularly sustain and provide for NFA's financial requirements ;
- (5) Sustain the relevance of the services being provided by the NFA to the food sector with the end-view of transforming NFA into a service Agency ; and
- (6) Sustain implementation of site specific Project Self-Reliance (PSR) to assure project viability.

The NFA will continue its rice and corn procurement and distribution activities to help stabilize farmgate, wholesale, and retail prices. During the period 1993/94 to 1997/98, its palay procurement will be scaled down from about 6 % of total production to 3 % in 1998. In 1993 and 1994, 120,900 ton of corn was bought, while corn procurement ceased in 1995. The NFA will focus its palay procurement in Rice Key Grains Areas.

The Project Self-Reliance (PSR) will be promoted under the following support services and concepts to farmer cooperatives and federations :

- (1) Department of Agriculture
 - Provide technical assistance in production; and
 - Facilitate the acquisition of seeds and fertilizers.

(2) National Food Authority (NFA)

- Make the NFA's facilities available to farmer organizations for their use at a fee basis on prevailing market rates;
- Provide training on post-harvest technology, institutional and entrepreneurial skills;
- Provide marketing information and other support services; and
- Allow the free play of market forces by suspending the NFA's grains buying and selling operations in the area.

(3) Land Bank

- Provide the farmer organizations, subject to its lending policies and procedures, the necessary financial support needed to effect the implementation of PSR; and
- Provide training in the area of financial management.

The PSR is implemented both at the municipal level (in Munos, Nueva Ecija) and at the provincial level (in Davao Norte) at present. The NFA is preparing site specific development plans for the PSR at the following potential areas and provinces :

| | | |
|------------|---|----------------------------------------|
| Region I | : | Pangasinan, Conception/Tarlac |
| Region II | : | Isabela |
| Region III | : | Nueva Ecija, Candaba/Pampanga, Bulacan |
| Region V | : | Camarines Sur, Albay, Sorsogon |
| Region VI | : | Aklan, Antique, Negros Occidental |
| Region VII | : | Bohol |
| Region X | : | Agusan Norte, Agusan Sur |
| Region XI | : | Surigao Sur, Koronadol/South Cotabato |
| Region XII | : | North Cotabato |

(2) BAS's Activities

The Bureau of Agricultural Statistics (BAS) is the government official source of agricultural statistics. The BAS has been tasked to collect, compile and release all agricultural statistics including fishery and other related fields. These statistics are immediately used by the BAS in the preparation of a quarterly performance report in agriculture. Other uses are for agricultural policy making, formulation of plans and programs, and information dissemination to the public.

Among the staff agencies of the DA, only the BAS was not devolved when the implementation of the Local Government Code went into effect. Therefore, the BAS has retained its provincial offices but has lost the potential strength in coordinating with former DA

technicians in monitoring municipal level statistics. Existing marketing information service of the BAS covers the following types of information :

1) Price Information

Retail price collection occurs several times per week; wholesale commodity and livestock price collection occurs weekly; and farmgate and input prices are collected on a monthly basis. The provincial offices disseminate retail and wholesale prices of import local agricultural commodities immediately over the local cooperating radio station. Sixteen provinces, usually the regional seats use SSB radio links to the BAS Central Office to transmit some priority data for inclusion in a national price publication.

2) Production Information

This category of information represents the other major area of activity for the BAS with emphasis on regular palay, corn and livestock production surveys which are undertake on a quarterly basis. Production of a sizable number of other crops (about more than a hundred) are estimated semestrally following a somewhat subjective methodology. There is a public clamor for improvement of the methodology but the BAS budget has always been limited.

3) Stock and Inventory Information

The BAS data on stock and inventories cover households and some commercial stocks held by mills, processing plants and major traders, especially for corn and palay as well as estimates of on-farm livestock populations. The BAS receives and processes these information on a quarterly basis.

A common criticism of the BAS's current agricultural marketing information system, according to farmers and market intermediaries is its inability to assist them in planning their current and upcoming production and marketing activities. In response, efforts were initiated to improve the current system with financial and technical assistance from the foreign donors. Almost all the BAS provincial offices have been equipped with a personal computer and SSB radio transceiver. Improvement efforts were embodied in an Agricultural Marketing Information System (AGMARIS) concept wherein the systems design is tailor-made for a province based on findings of six to eight weeks' research called Marketing and Information Needs Assessment (MINA). The high budget preparation has allowed for the establishment of AGMARIS in 11 sites which there is heavy concentration of interregional traffic of agricultural commodities. Thus, except for Metro Manila, the ten other sites are in the Visayas and Mindanao regions. Moreover, as a launching phase, information covers wholesale and retail prices of key agricultural commodities of a province and market conditions.

Considering the low priority being given to agricultural statistics and information in the national budget, the DA has resorted to foreign donors either to be able to undertake development efforts in improving existing systems or actually implement national projects following a phased approach such as the AGMARIS.

II. NECESSITY OF THE PLAN

II.1. Price fluctuation is still a serious problem for maintenance and improvement of livelihood not only for farmer producers but also for consumers. The government has implemented several support services to realize a stable supply of food grains. The NFA has played a most critical role through direct procurement and distribution activities. At present the government have to choose a way which is less government direct interventions and more public participation in order to realize adequate and stable grains supply. The Project Self-Reliance (PSR) is an initiation to realize the above way of policy.

Two pilot projects under the PSR have been implemented in the Philippines. Through the monitoring of two PSRs, the following problems are observed in the farmer cooperatives and federations :

- 1) Insufficient working capital to procure palay ;
- 2) Shortage and insufficient post-harvest facilities for use of more member farmers ;
- 3) Shortage of outlet especially during harvesting seasons ;
- 4) Lack of communication facilities and market information for the timely and speedy handling and marketing ; and
- 5) Shortage of management and post-harvest technologies.

II.2. In addition to the above internal constraints of PSR organizations, the following external problems are pointed out :

- 1) Any farmers and groups in the PSR area could not be covered by the PSR. This means that the government could not support any farmers through the PSR ;
- 2) The PSR organization should compete with other private traders and processors in credit delivery, price and quality of product. While the PSR organization could not facilitate all of services to member farmers. This is one of the reasons for a less coverage of farmer participation in the PSR.
- 3) The marketing information service is most behind compared with other government support services. There are frequent monitoring and dissemination activities in Metro Manila, while these are not utilized for farmer producers effectively.
- 4) The PSR concept entails minimal or complete stoppage of NFA market intervention. While it is observed that the PSR cooperatives could not act as a stabilization factor.
- 5) The present PSR covers solely food grains. Multiplication of PSR organization activities to other crops will be effective to utilize post-harvest facilities in all the year round and enlarge members' incomes.

II.3. For the realization of rational crop marketing and information systems as well as adequate implementation of PSR, more integrated investigations on the present PSR trial projects, constraints of processing and marketing activities from the viewpoint of farmers, and necessary support services are urgently required. These studies will be indispensable for formulation of adequate policy measures, realization of stable supply and prices, implementation of adequate projects and programs, establishment of rational crop marketing and information systems over the long term. It appears that the country encounters some difficulties in executing such development studies due to inadequacy of the government resources and existing fragmented efforts. The government, therefore, would like to request the government of Japan to extend the technical assistance for making feasibility studies for three objective provinces and areas concerned.

III. OBJECTIVES OF THE STUDY

The proposed **study** is intended to provide model improvement projects/programs prior to the Nationwide Crop Marketing and Information Systems Development in support of the government's **Agro-Industrial Development Strategy in the Medium-Term Philippine Development Plan (MTPDP), 1993-1998**. The study is geared towards the attainment of rural poverty alleviation and activation of rural socio-economy through the establishment of rational crop marketing systems, and by enlarging the development benefits for both farmer producers and consumers. Particular emphasis of the study shall be on :

III.1 The formulation of a rational crop marketing and information systems in Pangasinan, Isabela and Nueva Ecija Provinces as model improvement plans, specifically on ;

- (a) effective utilization of NFA's existing post-harvest and marketing facilities as **rural assembling markets** and **processing centers** jointly by farmers' organizations or their federation and the NFA ;
- (b) strengthening of BAS's production and price monitoring and dissemination activities both for farmer producers and consumers ;
- (c) increase in farmer producers' bargaining powers, quality and value added of products ; and
- (d) promotion of direct marketing systems from rural assembling markets to the major terminal markets, big retailers, consumers or exportation.

III.2 Strengthening of government support services to farmers' organizations for management of rural assembling markets and processing centers , and to consumers, specifically on ;

- (a) technology transfer on post-harvest, agro-processing, institutional and entrepreneurial skills activities ;
- (b) provision of marketing information on production and prices ; and
- (c) provision of a package of incentives including credit supports for farmers' organization.

III.3 Identification of high priority projects and programs to establish rational crop marketing and information systems through the study, and formulation of the priority projects and programs at feasibility level, specifically on :

- (a) rice-based rural assembling market projects ;
- (b) annual and perennial crops' rural assembling market projects ;
- (c) strengthening plans for NFA's support service function on crop marketing system ; and
- (d) strengthening plans for BAS's production and price monitoring and dissemination activities.

IV. PROPOSED APPROACH AND METHODOLOGY

The Study will be conducted in the following two (2) Phases :

IV.1 Phase I will involve a general review and assessment of the crop marketing situation in the objective three provinces ; Pangasinan, Isabela and Nueva Ecija ; those situation in Luzon Island, and the government agro-processing, marketing and information support services for palay, corn, and other annual and perennial diversified crops. The assessment will cover the present status of the present agro-processing and marketing situation including the identification of major constraints and development potentials. These will include a review of existing policies and related studies and projects, present state-of arts on agro-processing and marketing, government information services, and producers' and consumers' marketing activities.

The review and assessment shall lead to the formulation of the Basic Plan for crop marketing improvement and the direction of government marketing and information services. The Basic Plan will contain the followings :

- (a) The proposed policy measures to address policy gaps that have been identified in the review ;
- (b) Development strategies designed to operationalize the Plan and these will include strategies to increase public sector investment in the rural area as well as farmer groups' investment ;
- (c) Area-specific development requirements in terms of handling, processing, storage, marketing, organization, and government support services ;
- (d) Estimates of the financial requirements including cost-benefit analysis ; and
- (e) Proposed programs/projects and institutional support mechanism.

IV.2 Phase II will involve the preparation of feasibility studies for the identified priority projects and programs that will be implemented in the selected priority areas in the objective provinces, if necessary in Metro Manila. The criteria for selecting and prioritizing shall be established.

V. PROPOSED SCOPE OF WORK

The scope of work for the two (2) Phases are as follows :

Phase I : Crop Marketing Survey and Formulation of a Basic Plan for Establishment of Crop Marketing and Information Systems

- (1) Collection of the following data and information related to crop marketing situation in the objective provinces and /or area concern :
 - area-specific natural environment regarding climate, topography and soils to clarify agricultural production and post-harvest condition ;
 - area-specific farming systems and productivity ;
 - commodity-specific post-harvest and marketing activities ;
 - commodity- and area-specific marketing flow and channel from producing areas to terminal markets and consumers ;
 - post-harvest and marketing costs by stage of channel ;
 - farmers' organization (cooperative) and their post-harvest and marketing activities ;
 - traders' marketing activities and marketing facilities ; and
 - government crop marketing support services such as research and development, extension and training, procurement and distribution, credit supply, etc.

- (2) Assessment of area- and commodity-specific marketing situation from :
- demand and supply aspect by style and grade of commodities ;
 - technical aspect on post-harvest, processing, storage and transportation activities ;
 - financial aspect on investment, operation and maintenance cost, marketing cost, interest, etc. ; and
 - institutional aspect on farmer producers, processors, traders, consumers, and government support agencies.
- (3) Assessment of crop marketing development constraints from the viewpoint of producers and consumers.
- (4) Identification of development directions to realize rational crop marketing and information systems covering :
- producers' organization and activities ;
 - consumers' participation ; and
 - required government support services.
- (5) Formulation of a **Basic Plan** for Establishment of Crop Marketing and Information Systems covering :
- proposed policy measures and related recommendations ;
 - development targets and strategies for crop marketing improvement and marketing information services based on the DA's crop production plan ;
 - internal and external linkages with participating agencies/offices ;
 - formulation and classification of **sub-projects / programs** under the objective provinces and/or area of concern by scale and type of investment, and for government agencies ;
 - setting-up the "**typical model plans**" for rational crop marketing and information systems covering rice and/or corn based marketing projects, and annual and perennial crops' marketing projects taking crop diversification into consideration ;
 - strengthening plans for the NFA's support service functions on crop marketing and information systems ;
 - strengthening plans for the BAS's monitoring and dissemination activities on crop production and prices
 - setting-up the organizational strengthening plan as institutional plans for the NFA and BAS
 - development programs for 10 years covering the above plans including government support services ; and
 - financial requirement for the development programs.

- (6) Selection of high priority projects/programs through :
 - establishment and formulation of a set of criteria for selecting and prioritizing programs and projects identified in a Basic Plan for establishment of Crop Marketing and Information Systems ;
 - selection of high priority projects/programs to establish rational crop marketing and information systems

Phase II : Feasibility Study on Representative Projects and Programs

- (1) Execution of field surveys and investigations at the priority project areas through :
 - Basic data and information collection ;
 - Post-harvests and marketing survey ;
 - Surveys on government's marketing support services ;
 - Organization surveys covering farmer organizations ; and
 - Public consultation surveys for potential farmer organizations and cooperatives.
- (2) Formulation of development plans covering :
 - rice and/or corn-based farm mechanization projects ;
 - annual and perennial crops' marketing projects ;
 - strengthening plans for the NFA's support service functions on crop marketing and information systems ; and
 - strengthening plans for the BAS's monitoring and dissemination activities on crop production and prices.
- (3) Design and cost estimate for project facilities and equipment.
- (4) Plan formulation of project organization, operation and maintenance, and project implementation schedule.
- (5) Project evaluation through project cost and benefit estimate

VI. EXPECTED OUTPUT

The following are expected outputs by the Crop marketing and Information Systems Project :

- (1) Assessment of are- and commodity-specific marketing situation ;
- (2) Basic Plan for establishment of Crop Marketing and Information Systems covering
 - Development targets and strategies ;
 - Internal and external organizational linkages ;

- Sub-projects/programs by scale and type of investment ;
 - Typical model plans for rational crop marketing and information systems ;
 - Strengthening plans for support service function of NFA and BAS ;
 - Organizational strengthening plan as institutional plans for NFA and BAS ;
 - Development programs for 10 years ; and
 - financial requirement of the development programs.
- (3) Feasibility studies on representative model projects / programs covering :
- Rice and/or corn based marketing projects ;
 - Annual and perennial crops' marketing projects ;
 - Strengthening plans for NFA's support service functions on crop marketing and information systems ; and
 - Strengthening plans for BAS's monitoring dissemination activities on crop production and prices.

VII. EXPERTISE INPUT

The following expatriate experts and engineers will be required for executing the study :

- (1) Regional Development Planner
- (2) Agronomist
- (3) Post-harvest Specialist
- (4) Processing Specialist
- (5) Communication and Information Specialist
- (6) Facility Design Engineer
- (7) Agro-Economist
- (8) Marketing Development Specialist
- (9) Institutional Expert
- (10) Project Economist

VIII. STUDY SCHEDULE

The study shall be carried out for a duration of 21 months after its commencement and be divided into the following phases :

- Phase - I** : Crop Marketing Survey and Formulation of a Basic Plan for Establishment of Crop Marketing and Information Systems (9 months)
- Phase - II** : Feasibility Studies on Representative Sub-Projects and Programs (9 months)

IX. REPORTS TO BE PREPARED

The following reports shall be prepared in the course of the Study within the period specified below :

- | | | |
|-----|-------------------------------------|-----------------------------------------------------------------|
| (1) | Inception Report | : not less than one (1) month from commencement of the Study |
| (2) | Progress Report | : not later than five (5) months from commencement of the Study |
| (3) | Interim Report (Basic Plan) | : not later than 9 months from commencement of the Study |
| (4) | Draft Final Report (F/S Studies) | : not later than 16 months from commencement of the Study |
| (5) | Final Report | : not later than 18 months from commencement of the Study |

X. RESPONSIBILITY OF THE GOVERNMENT

DA shall, at its own expense, provide the 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, and
- (4) credentials or identification cards to the member of the Study Team.

Whenever necessary, the DA shall make arrangements with other concerned agencies, at its own expense, in order to :

- (1) secure the safety of the Study Team ;
- (2) permit the member of the Study Team to enter, leave and sojourn in the Philippines for the duration of their assignment therein ;
- (3) exempt the member of the Study Team from taxes, duties, fees and other charges of equipment, machinery and other materials to be brought into the Philippines for conduct of the Study ;
- (4) exempt the member of the Study Team from income tax and charges of any kind imposed on or in connection with any emolument or allowance paid to the member of the Study Team for his/her services in connection with the implementation of the Study ;

- (5) provide necessary facilities to the member of the Study Team for remittance as well as utilization of the funds brought into the Philippines from Japan in connection with the implementation of the Study ;
- (6) secure permission for entry into private properties or restricted areas for the conduct of the Study ;
- (7) secure permission to take all data and documents (including photographs) related to the Study out of the Philippines to Japan by the Study Team ; and
- (8) provide medical services as needed and expenses for such will be chargeable against the member of the Study Team.

Attachment - 1

**TENTATIVE WORK SCHEDULE OF
CROP MARKETING AND INFORMATION SYSTEMS PROJECT (CMISP)**

| Description | Month in Order | | | | | | | | | | | | | | | | | | |
|-------------------------------------------------------|----------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 1. Phase - I | | | | | | | | | | | | | | | | | | | |
| (1) Collection and review of data and information | ■ | ■ | | | | | | | | | | | | | | | | | |
| (2) Assessment of marketing situation and constraints | | | ■ | ■ | | | | | | | | | | | | | | | |
| (3) Identification of development directions | | | | ■ | ■ | ■ | | | | | | | | | | | | | |
| (4) Formulation of a Basic Plan | | | | | | ■ | ■ | ■ | ■ | | | | | | | | | | |
| (5) Selection of high priority projects/programs | | | | | | | | | ■ | ■ | | | | | | | | | |
| 2. Phase - 2 | | | | | | | | | | | | | | | | | | | |
| (1) Field surveys and investigations | | | | | | | | | | ■ | ■ | ■ | ■ | | | | | | |
| (2) Formulation of development plans | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | | |
| (3) Explanation of Draft Final Report | | | | | | | | | | | | | | | | | ■ | | |
| 3. Reports for Work -II | | | | | | | | | | | | | | | | | | | |
| (1) Inception Report | ▼ | | | | | | | | | | | | | | | | | | |
| (2) Progress Report | | | | | ▼ | | | | | | | | | | | | | | |
| (3) Interim Report | | | | | | | | | ▼ | | | | | | | | | | |
| (4) Draft Final Report | | | | | | | | | | | | | | | | | ▼ | | |
| (5) Final Report | | | | | | | | | | | | | | | | | | ▼ | |

調査団長経歴

深 坂 友 一

昭和31年8月12日生

昭和57年3月

大阪府立大学農学研究科修士課程修了

昭和57年4月-昭和59年4月

営農部

昭和59年5月-昭和61年3月

企画部

昭和61年4月-平成 1年6月

営農部 技師

平成 1年7月-平成 5年3月

農業開発部 技師

平成 5年4月-

農業開発部 副参事

主な海外業務実績

| 案件名 | 対象国 | 従事期間 | 担当業務 |
|----------------------|---------|-----------------|-----------|
| 灌漑システム維持管理強化計画実施調査 | フィリピン | 昭和57年11月-58年 8月 | 農業経済 |
| 農産加工計画実施管理 | フィリピン | 昭和58年 6月-59年 5月 | 農業経済 |
| 東北道路網整備計画実施調査 | タイ | 昭和59年 7月-59年12月 | 農業経済 |
| カンガ河流域水資源開発基本計画 | フィリピン | 昭和61年 1月-61年12月 | 農業経済・事業評価 |
| グアテマラ南部地域農業開発事前調査 | エクアドル | 昭和62年 5月-62年10月 | 地域農業開発計画 |
| モンチ・モンガル農業総合開発計画実施調査 | ブータン | 昭和62年11月-63年10月 | 農業経済・事業評価 |
| 収穫後処理及び流通改善計画実施調査 | インドネシア | 昭和63年11月-平成1年7月 | 品質・流通 |
| 優良種子流通配付計画実施調査 | フィリピン | 平成 1年10月- 2年10月 | 流通・配付 |
| モザンビーク農村開発計画実施調査 | バングラデシュ | 平成 2年11月- 3年 6月 | 流通・経済 |
| 農地情報整備計画 | フィリピン | 平成 3年 7月- 4年 3月 | 農業経済・事業評価 |
| ルン島広域道路網計画 | フィリピン | 平成 4年 4月- 5年 2月 | 地域開発 |
| パラワン南部農地開発計画 | フィリピン | 平成 5年 3月 | 環境(法制度) |
| 農業金融サービス実施管理 | マレーシア | 平成 5年 5月- 5年 6月 | 融資運営管理 |
| チャジャマ右岸揚水灌漑計画実施調査 | パキスタン | 平成 5年 4月- 6年12月 | 農業経済・事業評価 |
| スリランカ灌漑III詳細F/S及び設計 | ネパール | 平成 6年 9月- 7年 5月 | 事業評価 |
| 土地銀行案件支援 (SAPI) | フィリピン | 平成 7年 2月 | 総括 |

フィリピンADCAプロファイ調査工程

1.中央ルソン農地改革活性化計画
2.ムレタ河灌漑地区農村総合開発計画

3.農業研究開発・普及体制整備強化計画
4.作物流通および市場情報整備計画

調査団

深坂友一（日本工営（株）農業開発部副参事）
濱田信一（日本工営（株）農業開発部技師）

| 日順 | 年/月/日 | 曜日 | 工 程 | | 宿泊地 | 備 考 |
|----|-------|----|--------------------------------------------------------|-------------------------------------------------|----------------------|------------|
| 1 | 5月9日 | 木 | 東京発～マニラ着 調査準備 | | マニラ | 移 動 |
| 2 | 5月10日 | 金 | 国家灌漑庁、農業省、農地改革省表敬 資料収集 | | マニラ | |
| 3 | 5月11日 | 土 | 調査準備 | | マニラ | |
| 4 | 5月12日 | 日 | マニラ～カパタアン | | カパタアン | 移 動 |
| 5 | 5月13日 | 月 | 深坂 カパタアン・ムニオス フィリピン稲研究所にて資料収集 農協調査、ムニオス・カパタアン | 濱田 食糧庁(NFA)地域3事務所、 NFA州事務所、州統計局 にて資料収集 | カパタアン | |
| 6 | 5月14日 | 火 | カパタアン～マカラン 地域農業試験場にて 資料収集、マカラン～オロンガボ | 農地改革省(DAR)スバエシハ 州事務所にて資料収集 農協調査 | 深坂：オロンガボ 浜田：カパタアン | |
| 7 | 5月15日 | 水 | オロンガボ～イハ 農地改革省(DAR)サンハレス 州事務所にて資料収集 | カパタアン～タラック DARタラック州事務所にて資料収集 現地踏査 | 深坂：イハ 浜田：タラック | |
| 8 | 5月16日 | 木 | 現地踏査 資料収集 イハ～マニラ | タラック～サンフェルナント DARサンハレス州事務所にて資料収集 現地踏査 | 深坂：マニラ 浜田：サンハレス | 移 動 |
| 9 | 5月17日 | 金 | 農業省農業開発局との協議 資料収集 | DAR地域3事務所にて資料収集 サンフェルナント～マニラ | マニラ | |
| 10 | 5月18日 | 土 | 資料整理 | | マニラ | |
| 11 | 5月19日 | 日 | レポート作成 | | マニラ | |
| 12 | 5月20日 | 月 | 国家食糧庁との協議、農地改革省との協議 資料収集 | | マニラ | |
| 13 | 5月21日 | 火 | 国家灌漑庁との協議 資料収集 | | マニラ | |
| 14 | 5月22日 | 水 | マニラ～カガヤンデ・和(空路) 地域10灌漑事務所との打ち合わせ 資料収集 | | カガヤンデ・和 | 移 動 |
| 15 | 5月23日 | 木 | カガヤンデ・和～マラマク 現地踏査 マラマク～カガヤンデ・和 | | カガヤンデ・和 | 移 動 移 動 |
| 16 | 5月24日 | 金 | 資料収集 カガヤンデ・和～マニラ(空路) | | マニラ | 移 動 |
| 17 | 5月25日 | 土 | 資料整理 | | マニラ | |
| 18 | 5月26日 | 日 | 深坂 マニラ～東京 | 濱田 レポート作成 | マニラ | 深坂：帰国 |
| 19 | 5月27日 | 月 | 大使館、JICAへ報告 | | マニラ | |
| 20 | 5月28日 | 火 | マニラ～東京 | | 帰国 | 濱田：帰国 |

主 な 面 談 者

I. 国家灌漑庁／National Irrigation Administration

本 部

| | | |
|---------------------------------|--------------------------------|---------------------------------------|
| Rodolfo C. Undan | Administrator | |
| E.B.Punzal | Department Manager | Project Development Department (PDD) |
| A.Y.Armentia | Division Manager | PFD, PDD |
| <u>ザンバレス州</u> | | |
| Juan L. Anagaran | Provincial Irrigation Manager | |
| Joel S. Monteheraios | Chief | Institutional Development Section |
| <u>第X管区事務所</u> | | |
| Orlabdo C. Hondrada | Regional Manager | Rgion X and CARAGA |
| <u>ムレタ河国营灌漑組織維持管理事務所 (MRIS)</u> | | |
| Gandebcio O. Ramos | Irrigation Superintendent | MRIS |
| Aguinardo Y. Cruz | Project in Charge | MRIS |
| Julius S. Maquiling | Provincial Irrigation Engineer | Bukidnon Provincial Irrigation Office |

II. 農地改革省／Department of Agrarian Reform

本 部

| | | |
|-----------------------|--------------------|----------------------------|
| Hector D. Soliman | Undersecretary | Planning and Policy |
| Jose M. B. Ponce | Director | Project Management Service |
| M. Cristina C. Dagdag | Program Officer II | Project Management Service |

Region III

| | | |
|---------------------|-------------------|------------------------|
| Eugenio B. Bernardo | Regional Director | |
| Edson S. Arceo | Chief | Support Service Office |

ザンバレス州

| | | |
|----------------------|------------------------------------|---------------------|
| Orlando B. Tumacay | Provincial Agrarian Reform Officer | |
| Ramon V. Estanislao | CARP Officer | Operations Division |
| Silvestre C. Fabunan | Iba Municipal Reform Officer | |

III. 農業省／Department of Agriculture (本部)

| | | |
|--------------------|----------------|--------------------------------------------------------------------------------|
| Roberto G. Villa | Division Chief | Planning and Monitoring Service (PMS) |
| Cecilla Q. Astilla | Staff | International Agricultural Development Cooperation Coordination Office (IADCO) |

IV. 農業研究局／Bureau of Agricultural Research (本部)

| | | |
|----------------------|-------------------------------|------------------------------------------------|
| Josefina M. Lantican | Supervising Agriculturist | Program Development Division |
| Salvacion M. Ritual | Agriculturist II | Program Development Division |
| Carmencita Kagaoan | Sr. Agriculturist/Head | Project Packaging Section |
| Cenon S. Atienza | Chief | Management Information Systems Division (MISD) |
| Benjamin L. Buetre | Sr. Agriculturist/Asst. Chief | MISD |
| Ricarte V. Castro | Agriculturist II | Research Coordination Division |

V. 中部ルソン地域農業試験場／Central Luzon Integrated Agricultural Research Center (RIAC)

| | | |
|----------------------|---------------|---------------------------------|
| Orlino A. Mercado | Manager | |
| Salvador C. Manalili | Asst. Manager | |
| Benjamin Baltazar | Chief | Crops and Soils System Section |
| Teresita Flores | Chief | Livestock System Section |
| Marissa David | | Planning and Monitoring Service |

VI. 日本政府関係者

| | | |
|------|-------|-------------|
| 山内勝彦 | 一等書記官 | 在フィリピン大使館 |
| 稲森幹八 | 専門家 | 農地改革省 事業管理部 |
| 下方芳美 | 専門家 | 農業省 農業研究局 |

収集資料リスト

I. 中央ルソン農地改革活性化計画

1. Zambales Provincial Development Plan, 1993
2. Summary of Emancipation Patent Accomplishments by Municipality, DAR Provincial Office Zambales, 1995
3. Development Update on Mt. Pinatubo Resettlements in Central Luzon, May 15 1996, DAR Region III
4. Social Reform Agenda, 1995 Year End Report, Social Reform Council
5. Iba Data File, DAR Provincial Office Zambales, 1996
6. List and Map of Irrigation Systems, NIA Zambales Provincial Office, 1996
7. List of Pasture Lease Zambales, Provincial DENR, 16 May 1996

II. ムレタ河灌漑組織水源強化計画

1. Map of Muleta and Roxas-Kuya River Irrigation System, MRIS O&M Office
2. Inventory of MRIS, MRIS O&M Office

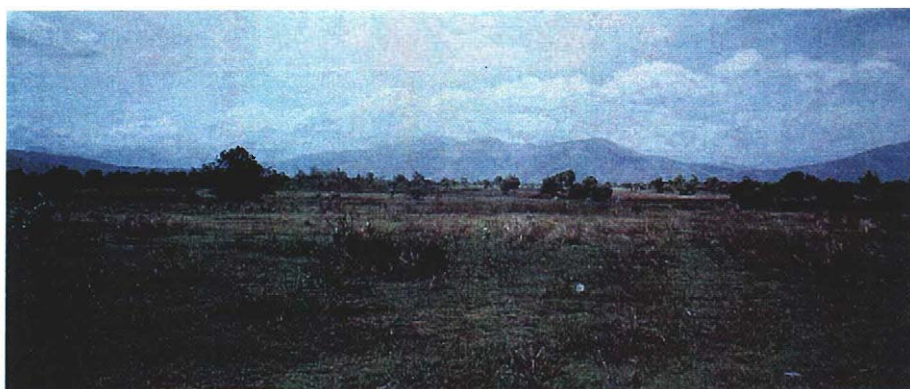
III. 農業研究開発・普及体制整備強化計画

1. Plan of Action of Secretary Salvador H. Escudero III, DA
2. Gintong Ani, Program Document, DA
3. Proposed Implementation Rules and Regulations for the Local Government Code, Issues and Concerns, October 1991, DA
4. Annual Report 1993, 1994 and 1995, BAR
5. National Agricultural Research and Extension Agenda 2000, 1993, BAR
6. On-Farm Research Manual, Overview and Directions of Agricultural Research, BAR
7. Department of Agriculture Research Monitoring System, August 1990, BAR
8. DA Information System Plan : A Framework, 1990, DA
9. Data File : Regional Integrated Agricultural research Center, Magalang Region III, 1996

IV. 作物流通および市場情報整備計画調査

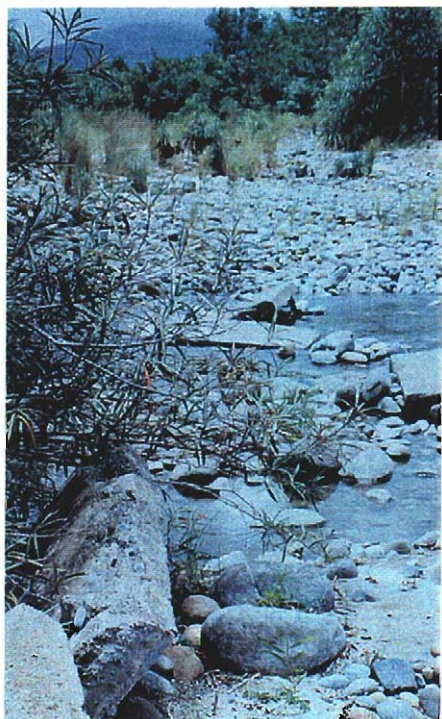
1. NFA Six-Year Plan of Action 1993-1998 (For Discussion), NFA, 1992
2. Government Corporate Objectives, Priorities and Disposition Action, 1996, NFA
3. NFA : A Brief Folio, 1996
4. NFA Palay Procurement by Province, 1985-1995
5. NFA Palay Distribution by Province, 1974-1995
6. NFA Corn Procurement by Province, 1985-1994
7. NFA Corn Distribution by Province, 1995
8. Philippine Rice Imports by Country of Origin, 1980-1993
9. NFA Fund Sources and uses, 1986-1994
10. NFA Post Harvest Facilities by Province, 1994
11. Existing Project Self-Reliance (PSR) Areas, December 1994, NFA
12. PSR Federation of Primary Agricultural Cooperative of Munoz, 1996 NFA Nueva Ecija

1. 中央ルソン農地改革活性化計画 (1/2)



CARP 開放農地
(イバ郡サント・バーバラ)
丘陵高台のため用水源は
地下水のみ。受益農家は
水源が無いため農地利用
を行っていない。

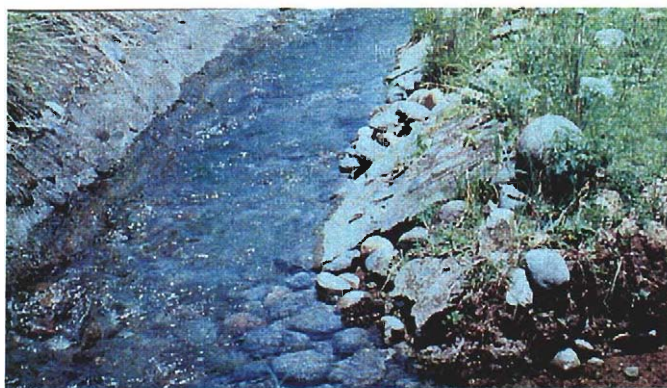
Morangla 共同灌漑地区 (計画面積 598 ha) (イバ郡)



堰は洪水で崩壊している
(Bagsit 川)



取水路



幹線水路 (約 1 km)



受益地区
雨期 275 ha
乾期 238 ha

1. 中央ルソン農地改革活性化計画 (2/2)



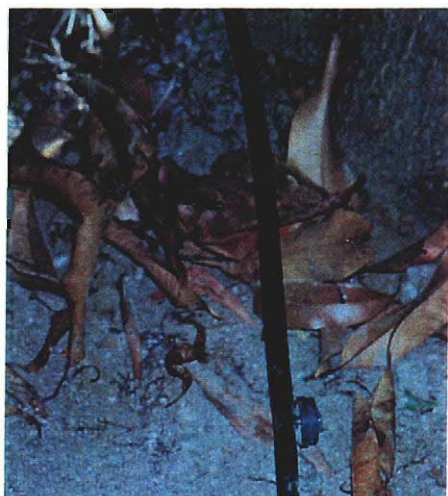
ピナツボ被災民入植予定地 (San Augstin 村, Iba 郡, 約 200 ha)



Benguet Farm, 351 ha
(Amungan 郡)
マンゴ園
CARP により農業労働者
(46名) を組織した農協
に経営を移管



マンゴ園の灌漑用溜池

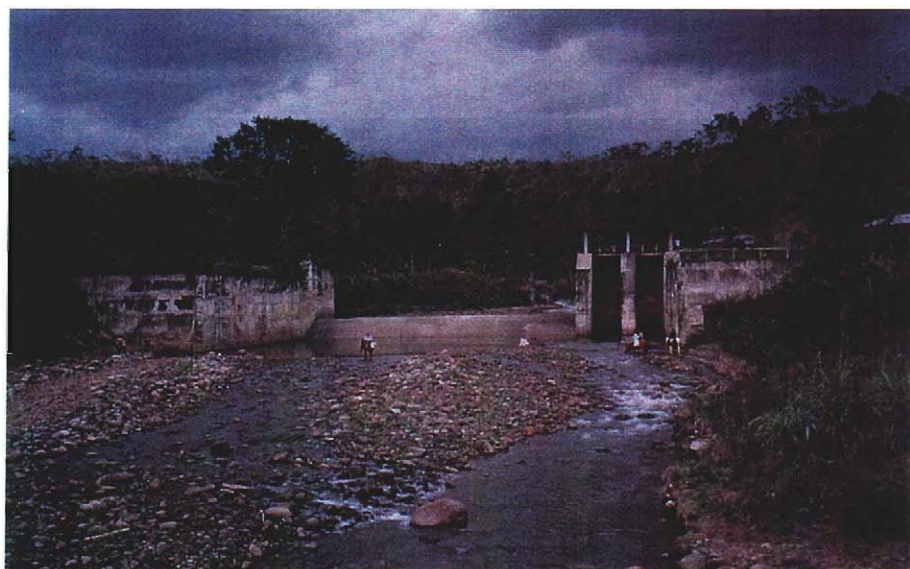


点滴灌漑を
行っている。

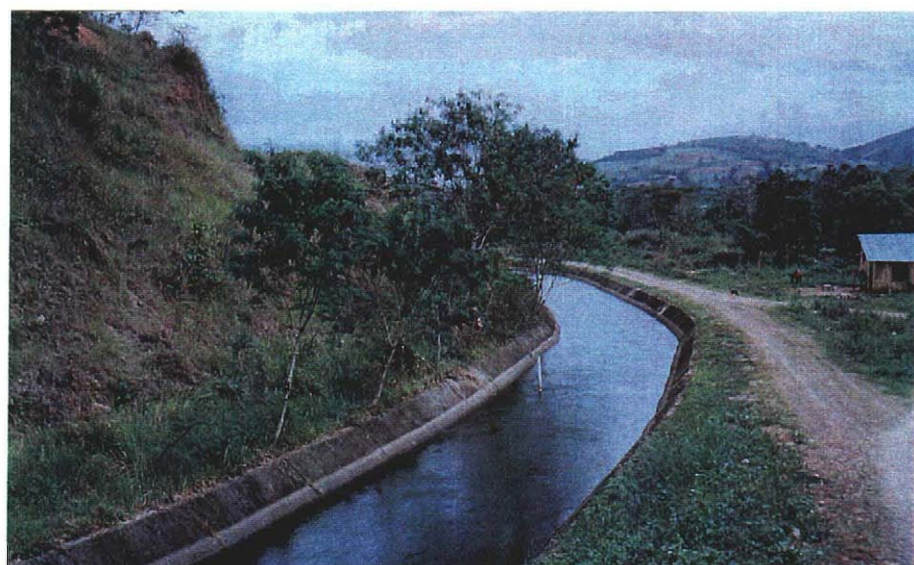


管理棟

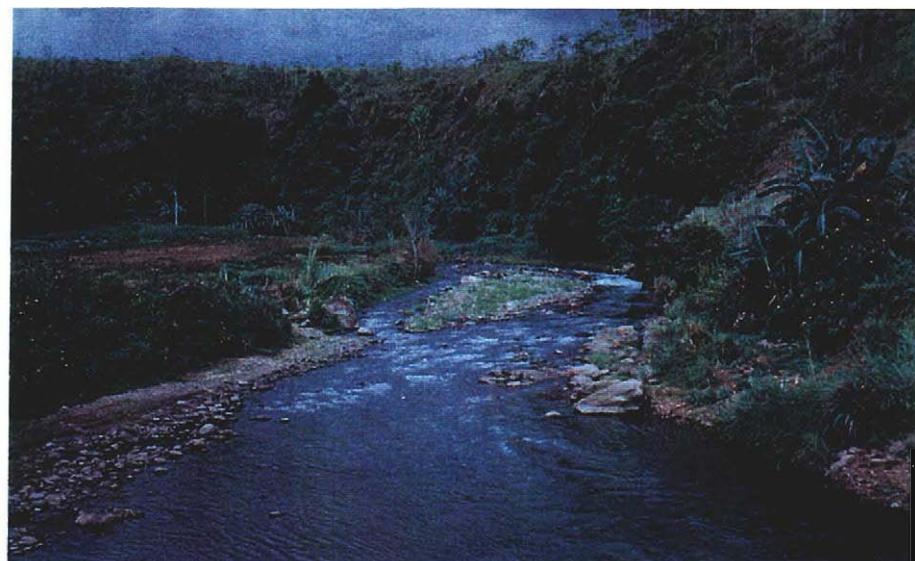
2. ムレタ河灌漑事業地区総合農村開発計画 (1/2)



Muleta 頭首工
(Muleta 河)



Muleta 送水路
Muleta 頭首工より Kuya 頭首工
に至る
(Muleta 頭首工取水口直下流部)

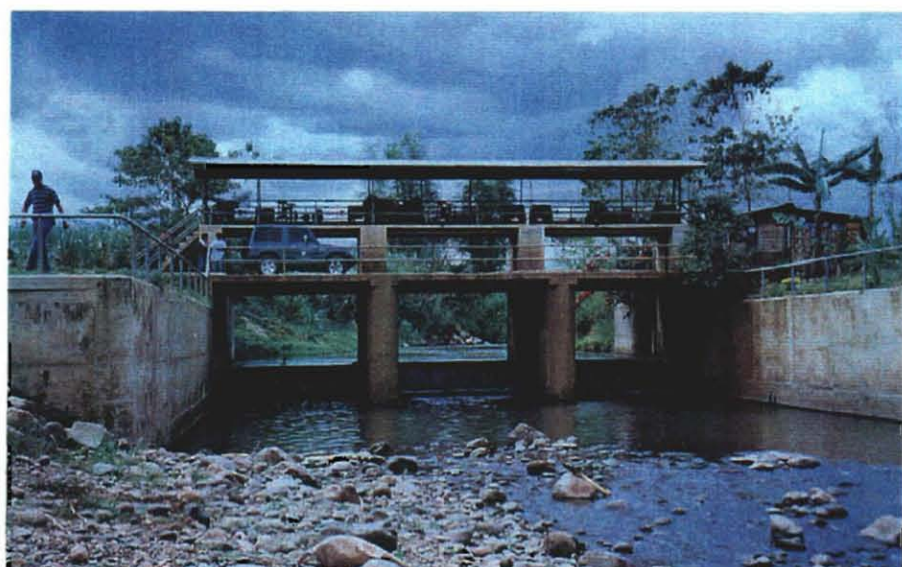


Muleta 河
(Muleta 頭首工上流部)

2. ムレタ河灌漑事業地区総合農村開発計画 (2/2)



Kuya 頭首工
(Kuya 河)

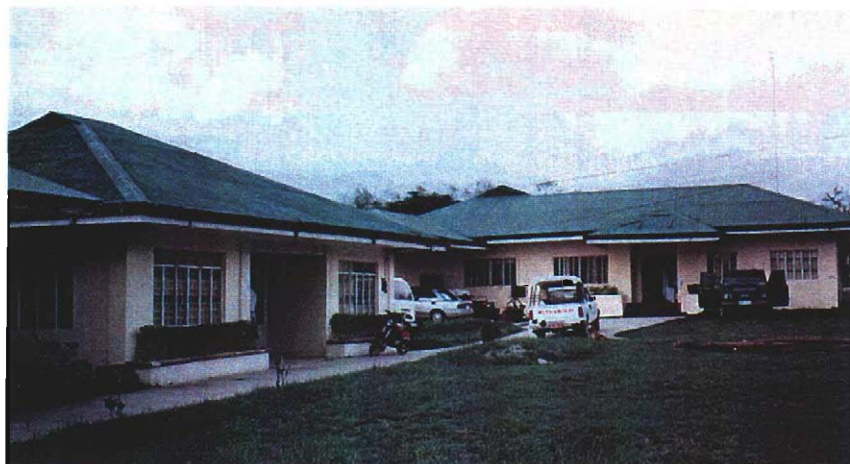


San Jose 頭首工
(Kuya 河)



Muleta 河
NIA による溜池計画地点

3. 農業研究開発・普及体制整備計画



第III管区地域農業試験場
(マガラン郡, パンパンガ州)



実験室内
(実験器具が
ほとんど整備
されていない)



風力を利用した地下水揚水施設



畜舎(豚)



配電線(容量少なく不安定)