

インドネシア共和国

ローアソロ農民参加型農業開発計画
西ランポン貧困対策中規模農業開発計画

プロジェクト・ファイナディング調査報告書

平成 12 年 2 月

社団法人 海外農業開発コンサルタンツ協会

インドネシア共和国

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序

本報告書は、社団法人海外農業開発コンサルタント協会が派遣した調査団、島崎 斉（日本工営株式会社：農業土木担当）と川口 学（アジア航測株式会社：測量）が、インドネシア共和国にて実施したプロジェクト・ファインディング調査結果にもとづいて作成されたものである。

調査は、平成 11 年 11 月 21 日（日）から同年 12 月 4 日（土）までの 14 日間実施し、資料収集および相手国政府関係機関との協議を実施するとともに、現場踏査を実施した。なお、調査実施対象案件は以下に示すとおりである。

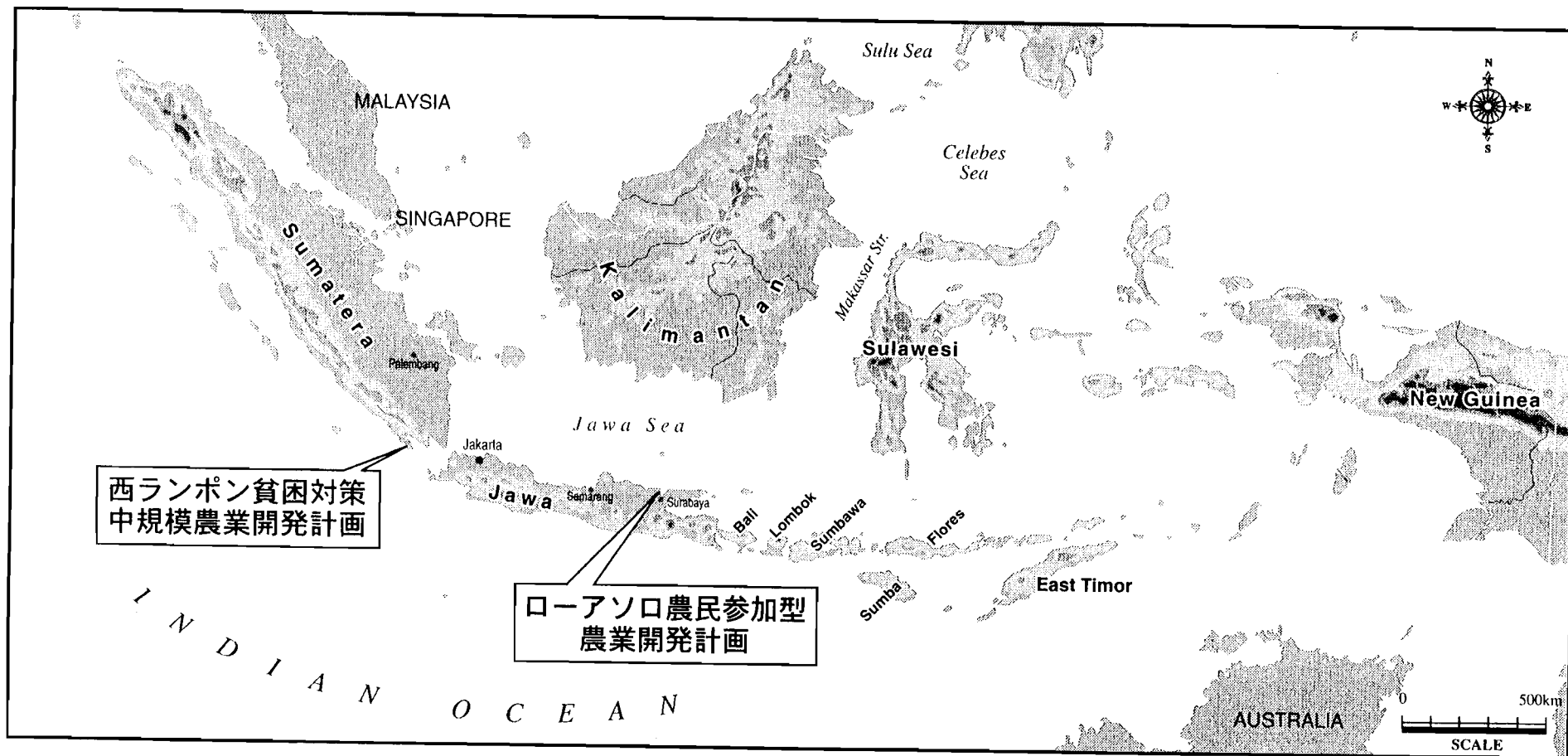
- (1) ローアソロ農民参加型農業開発計画
- (2) 西ランボン貧困対策中規模農業開発計画

これらの案件の調査結果は、本文に示すとおりである。また、調査団の調査日程および面談者リスト、現地写真、調査団員略歴は、それぞれ添付資料に示すとおりである。

調査団は調査実施に際し、相手国政府関係機関並びに日本大使館、JICA の方々に多大なる協力を得、円滑に業務を遂行することが出来た。これら関係諸機関に深甚なる感謝の意を表する次第である。

平成 12 年 2 月

プロジェクト・ファインディング調査団
島崎 斉



調査対象地域位置図

ローアソロ農民参加型農業開発計画



灌漑水田



天水田



ソロ河支川に建設された灌漑用ダム



生活用水のための井戸



既存頭首工の破損水源



ソロ河支川上の灌漑用ダム計画地点
(上流方向を見る)

西ランポン貧困対策中規模農業開発計画



ワイ・ヌガムブル灌漑計画地内の
貧困家庭の住居



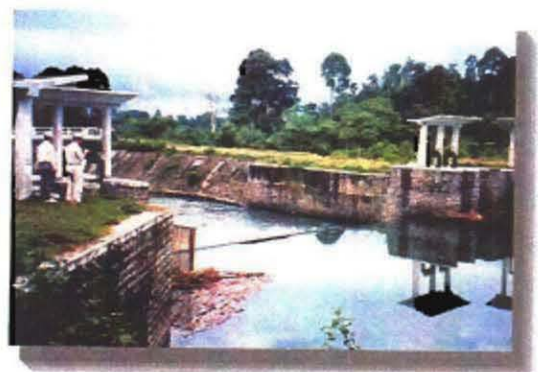
天水田



ワイ・ピントウ灌漑計画の水源地



ワイ・ヌガムブル灌漑計画地内の
移民家族の住居（バリ島から移住）



ヒハ灌漑スキームの頭首工



漏水のため
水のない
三次水路

インドネシア共和国

ローアソロ農民参加型農業開発計画 西ランボン貧困対策中規模農業開発計画

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西ランポン州貧困対策中規模農業開発計画 要請状(案)

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1 章 一般情勢

1.1 経済

インドネシア国の経済は、1969年以降第一次25ヶ年開発計画（1969-1994）の実施により、高い経済成長率を達成、保持し、その結果一人当たりのGDPは1996年には1,155米ドルに達した。続いての第二次25ヶ年開発計画（1994-2018）では、この高い経済成長の持続ほか平等開発の拡大、雇用問題の拡大など7項目の開発課題が掲げられ、実施に入ったが、1997年半ばに当国を襲った経済危機により、現在中断されている。

この経済危機は、インドネシア経済に大きな打撃を与えた。1997-98年のインフレ率は80%に達し、これによる人々の購買力の低下は、失業と貧困の急激な増加を招いた。特に農村部は、大きな打撃を受けた工業部門からの失業者が流れ込み、貧困に拍車をかけることとなった。

新政権は発足したばかりであり、経済開発の新政策はまだ発表されていない。しかし、国家開発一般指針に、以下の基本方針が述べられている。

- ① 市場経済の推進
- ② 健全で公平な競争
- ③ 公平な経済推進
- ④ 国家の経済的競争力の向上

新政府は、国民生活に多大な影響を及ぼした失業、貧困、食糧不足という課題を緊急課題として捉え、その対策を最重要項目としている。

1.2 農業開発政策

上述の第二次25ヶ年開発計画のもと、最初の5ヶ年計画（第6次5ヶ年計画：1994-1999）での農業主要政策は、下記のとおりである。

- ① 食糧自給の維持
- ② 就労機会の増加と農業労働生産性の向上
- ③ 農産物輸出の促進
- ④ 農業関連組織の整備発展
- ⑤ 貧困の克服

この政策を実現するため、インドネシア政府は1998年の終わりに農業増産自助運動計画を開始し、現在継続中である。計画では、農民金融、農業インフラ整備、流通システムの改善を含む各種の技術・資金援助に重点を置いている。

また、新政権は、主食、畜産、熱帯園芸作物などの増産計画である「Gema計画」を策定し、この農業政策を継続している。

2 章 ローアソロ農民参加型農業開発計画

2.1 位置

本計画対象地域は、マデユン河との合流点以降のソロ河下流域約 6,100 km² で約 25 万 ha の水田を含む。行政的には東部ジャワ州のボジョネゴロ県、ツバン県、ラモンガン県、グレシック県の 4 県にまたがっている。

2.2 計画の背景

ソロ河は、ジャワ島の最長河川で、インドネシア国での社会的、経済的な重要な役割を演じてきた。1974 年、日本政府の海外技術協力公団 (OTCA) の技術協力により、ソロ河全流域開発のマスタープランが実施された。このマスタープランの結果に基づき、ウオノギリ多目的ダムプロジェクト (1982 年)、ウオノギリ灌漑開発プロジェクト (1987 年)、アッパーソロ河川改修プロジェクト (1994 年)、マデユン河河川改修プロジェクト (1995 年)、ローアソロ河川改修プロジェクト (建設中) が完了もしくは実施されている。

これらのプロジェクトの実施と並行して、上記のマスタープランの中で取り上げられた数プロジェクトに対し、見直しが行われた。1986 年にカナダ国際協力事業団 (CIDA) により実施されたローアソロ河下流域開発計画も、そのうちの一つである。この開発計画の見直しの結果、取り上げられたプロジェクトは以下のとおりである。

- ① 既存灌漑スキームの改修計画
- ② 支川上での灌漑用貯留ダム計画
- ③ ジェロ湿地開発計画
- ④ 洪水防御対策
- ⑤ ジパンダム開発計画

これらのプロジェクトのうち、③ ジェロ湿地開発計画と④ 洪水防御対策は、現在国際協力銀行 (JBIC) からの円借款で実施中である。⑤ ジパンダム開発計画は、約 14,000 戸の移転が伴い社会環境の観点から実現の可能性は殆どない。残りの① 既存灌漑スキームの改修計画と② 支川上での灌漑用貯留ダム計画は、現在まで殆ど着手されていない。

1999 年 12 月に、上記プロジェクトの実施による河川形態の変更およびソロ河流域内の社会、経済状況の顕著な変化を考慮して、ソロ河水資源開発更新計画のマスタープランが開始された。このマスタープランでは、① 既存灌漑スキームの改修計画と② 支川上での灌漑用貯留ダム計画を考慮した流域内の農業開発計画の策定をも含んでいる。調査期間は約 1.5 年と見込まれている。

ソロ河下流域約 6,100 km² の内、水田は 25 万 ha を占めているが、灌漑水田は 11 万 ha にしか過ぎない。残りの 14 万 ha は天候に大きく左右される天水田である。ソロ河

下流域はインドネシアで最も天水田の多い地域として位置つけられている。天水田地域の営農は不安定で農家の収入は低い。このため、この地域の殆どの農村は政府によって貧困地域に指定されている。

2.3 計画地域の概要

(1) 人口

調査対象地域内の人口は、1998年で約4.3百万人で、約75%にあたる3.2百万人が農業に従事している。下流域全体での人口密度は、約700人/km²と推算されるが、実際は村落や灌漑地に集中しており、これらの地域の人口密度は、1,200-1,700人/km²と推定されている。

(2) 気象水文

調査対象地域内の年平均気温は、27℃で比較的一定している。年平均降雨量は、流域南西部で2,200mm、流域北東部で1,400mmである。雨期は10月から4月までで年間降雨量の約90%が集中している。地域内に位置するスラバヤ市での気象観測データを下表に示す（但、降雨量については地域内の中心に位置するボジョネゴロ市での観測値）。

	1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	平均/計
気温 (°C)													
最高	33.8	34.2	34.8	33.0	33.4	32.0	32.5	31.7	33.9	36.3	36.4	35.2	33.9
最低	22.4	22.6	22.2	23.0	22.5	20.0	19.3	18.6	19.4	18.1	20.0	22.4	20.9
湿度 (%)													
最高	93.0	93.0	95.0	95.0	97.0	95.0	93.0	88.0	88.0	84.0	86.0	95.0	92.0
最低	53.0	57.0	51.0	59.0	55.0	43.0	42.0	47.0	38.0	33.0	37.0	47.0	50.0
雨量 (mm)	230	377	194	136	50	33	14	50	0	111	268	359	1822

ソロ河の平均流量は、カラングノングコで約300m³/sで、2月に約720m³/sと最も多くなり、9月に約38m³/sと最も少ない。

(3) 土地利用

調査対象地域の土地利用は下表に示すとおりである。

分類項目	面積 (km ²)	比率 (%)
水田	2,440	40
森林	1,769	29
畑地	732	12
村落	732	12
道路/鉄道	214	3.5
湿地/溜め池	183	3
裸地	30	0.5
合計	6,100	100

(4) 地域住民の生活状況

東部ジャワ州の計画局（BAPPEDA）の資料によれば、東部ジャワ州全体で貧困に属する家庭は50%弱であるが、計画対象地域では60%強となっている。特に、灌漑施設が整備されていないボジョネゴロ県と湿地の多いツバン県は、80%以上が貧困と言われている。勿論、貧困の定義はいろいろあり一概には言えないが、天水田が多く、その生産量が天候に左右され、かつ乾期には殆ど耕作の出来ない土地が多く存在するボジョネゴロ県および雨期に洪水の影響を受け農業生産活動に支障を生じているツバン県地域に貧困家庭が多いことは十分に理解しうる状況にあることは間違い無い。

2.4 開発計画の概要

(1) 開発の目的

本計画は、計画地域内での農業農村開発をとおして地域住民の生活水準を改善することを目的とする。

(2) 開発計画の基本方針

上記計画目的を円滑にかつ効率よく達成するためおよび計画対象地域内で実施されたもしくは実施されている調査を考慮して、本開発計画は以下の基本方針を適用する。

- ① 1999年12月に開始されたソロ河水資源開発更新計画のマスタープランの結果を考慮する。
- ② 農民参加型手法を取り入れた農業開発計画とする。
- ③ 事業の持続性を確保するため、現地コンサルタントもしくはNGOによる水利組合の強化を図る。

(3) 開発計画の概要

1999年12月に開始された水資源開発更新計画マスタープランの調査結果を踏まえて、計画対象地域の農業開発計画を策定するものである。計画は、大きく分けて以下の3段階で行なうことが提案される。

① Phase-I

上述のマスタープランはあくまで水資源総合開発であり、農業はその対象分野に過ぎない。限られた期間やM/Mから判断して、計画対象地域内での予備的な農業開発地区の輪郭が描かれるものの、その精度は農業開発のマスタープランとしては十分とは言えない。したがって、この結果をレビューして、農業開発計画を目的とした追加調査を実施する。既往の調査結果と追加調査の結果をもとに、開発優先スキームを選定する。

② Phase-II

選定された開発優先スキームに対し、空撮(1/20000-1/25000 程度)により地形図(1/5000)を作成する。

③ Phase-III

選定された開発優先スキームに対し、フィジビリティ調査を実施する。調査においては、PRA と PCM の手法を用いて住民の意向を把握し、農民参加型の開発計画としてまとめる。また、インドネシア国政府の政策を考慮し、水利組合への運営・維持管理の移管計画を策定する。併せて事業の持続性を図るため、NGO の雇用を念頭に入れた水利組合の強化計画を策定する。

3 章 西ランポン貧困対策中規模農業開発計画

3.1 位置

西ランポン県は、スマトラ島南部に位置しているランポン州西部にあり、州都バンダールランポンから直線距離で約 130km 西に位置する。面積は約 475,000ha で、東高西低の地勢を呈し、低平地はインド洋に沿って広がっている。食糧作物の生産活動は、主としてこの低平地で営まれている。

3.2 計画の背景

ランポン州は、1993 年に実施された全国かんがい開発プログラム形成計画調査の中で、宅地化および工業地化により水田が失われていくジャワ島への米の輸出基地として、その地理的有利性および水資源と土地資源の優位性から開発ポテンシャルが高いと評価されている。さらに、同調査で、ランポン州の農業生産の向上は、中・小規模の灌漑開発を中心に実施すべきと提言されている。

一方、ランポン州の開発状況をみれば、州東部および南部は、大型灌漑事業が完了もしくは実施されているが、本計画対象地域が位置する西部は、交通の便の悪さもあり、開発に取り残されている地域である。農業が主要産業であるにもかかわらず、農業基盤整備の遅れのため、農業生産性は低く、農家の生活水準も低い。

現在、タンジュンガンーコタジャヤの道路が整備中であり、これが完成すると州都バンダールランポンから約 10 時間かかっていたのが約半分の 5 時間で済むようになる。この交通の便の改善および地方分権化により州内地域較差の解消が強く求められていることなど西部ランポン地域を取り巻く社会環境の変化から、ランポン州政府は本計画の実施に強い期待を抱いている。

インドネシア国の本格的な外領への移民政策も既に 40 年以上が経過した。開墾された農地が次世代への財産分与となっているが、分与された農地だけでは生活を営むことが困難なケースが増えている。このため、ランポン州内でも移転が生じている。調査対象地区である西ランポンにも、このような移転してきた家族が農業活動しているが、その生活水準は極めて低い。

3.3 計画地域の概要

(1) 人口

ランポン州の人口は、1997 年で約 6.9 百万人と推算され、このうち計画対象地域の西ランポンは約 384,000 人で総人口の約 6% しかない。したがって、人口密度も 81 人/km² とランポン州で一番低い。

(2) 気象水文

調査対象地域内の年平均気温は、26°C-28°Cで比較的一定している。最高気温は33°C、最低気温は22°Cである。平均湿度は、80%から88%の範囲内にある。年間降雨量は、ペシシルテンガーで1,145mmで、その大半が雨期である12月から4月の5ヶ月間に集中している。

計画対象の水源である河川は、地勢上急峻で、河川長が短い、小一中河川であるが、水源である東部高地は森林保護区で伐採が禁じられているため涵養、保水力があり、乾期でも比較的水量が豊富で涸れることはない。

(3) 土地利用

西ランポン県の土地利用は下表に示すとおりである。

分類項目	面積 (ha)	比率 (%)
村落	5,693	1.2
水田	9,575	2.0
畑地	3,425	0.7
農園	126,730	26.7
草地	19,547	4.1
森林	307,381	64.7
湿地/湖	2,638	0.6
合計	474,989	100.0

(4) 調査対象灌漑スキーム

ランポン州の灌漑事務所は、西ランポン県において以下の8灌漑スキームを完了もしくは計画している。

灌漑スキーム	可能流量*	開発可能面積	現況
Way Mahnai	11.8 m ³ /s	2000 ha	計画
Way Kambar	2.9 m ³ /s	1500 ha	計画
Way Biha	Not clear	4000 ha	建設完了
Way Ngambur	5.7 m ³ /s	6000 ha	計画
Way Mendati	Not clear	1500 ha	建設中止
Way Tembuli	6.9 m ³ /s	7000 ha	計画
Way Ngaras	4.3 m ³ /s	1500 ha	計画
Way Pintu	2.3 m ³ /s	2000 ha	計画
Total		25500ha	

備考: * 実測でなく算定流量

(5) 生活状況

ランポン州政府の1997年の資料によれば、西ランポン県は貧困地域に属している(図3-1参照)。調査対象地域でも同様で、雨期においても農業生産基盤施設が欠如しているため、農業生産は天候に影響され、単位収量は低く、且つ非常に不安定となっている。乾期においては、水源が確保できず殆ど耕作できないのが現状である。これが、

農業生産を営んでいる地域住民の生活水準が低く、かつ貧困と位置づけられている主たる理由である。

(6) 既存灌漑施設の現況

上表に示してあるように、Way Biha Project は 1993 年に完了している。しかしながら、計画灌漑面積の 4000ha に水を配水できていない。この理由は、三次水路からの漏水が激しいことおよび一部の水田は砂質土であるため、浸透量が大きく耕地として使用できないことである。また、施設そのものに問題がある。量水施設の欠如や数多くの分水ゲートが幹線水路に設置されているため、効率の良い水管理が出来ない状況にある。さらに、維持管理用道路もないため、生産物や肥料、農薬などの搬入が困難となっている。

Way Mendati Project は、資金の問題から取水堰の一部のみを建設しただけで、1997 年から中断している。

(7) 既存の地図

調査対象地域では、1992 年に撮影された航空写真 (1/25000) が入手可能である。一方、地勢図は、1/50000 があるが 1976 年に作成されているため、古く実際の地勢を示していない。したがって、フィジビリティ調査時には、上記航空写真をもとに 1/5000 の地勢図の作成が必要となろう。

3.4 開発計画の概要

(1) 開発の目的

本計画は、計画地域内住民の生活を改善し、ランボン州内の所得格差を是正することを目的として、地域の基幹産業である農業の開発を実施する。

(2) 開発計画の基本方針

上記の開発目的を達成し、かつその持続性を確保するため、水利組合の成立、育成を重視した農業開発計画を策定する。

(3) 開発計画の概要

本農業開発計画は、以下の 3 段階で行なうことが提案される。

① Phase-I

州政府が計画している 8 ヶ所の灌漑スキームに対して、開発優先スキームの選定を目的としたマスタープラン調査を実施する。この調査時において、特に留意

することは、これらのスキームの水源となる河川流量の実測資料が欠如していることに鑑み、流量観測施設を設置することである。




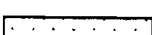
② Phase-II

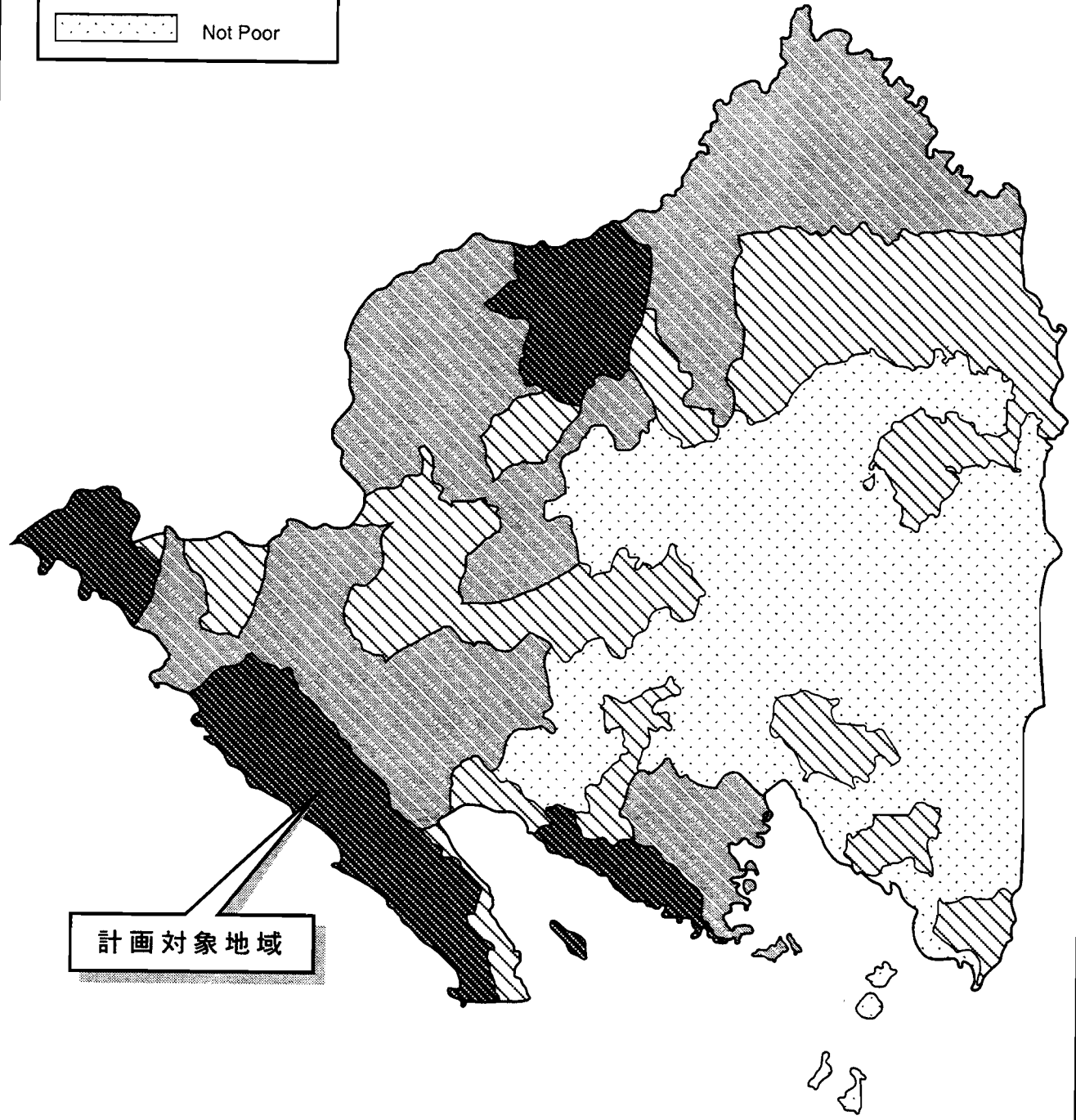
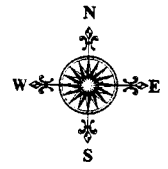
開発優先灌漑スキームに対し、既存の空撮(1/20000-1/25000 程度)により地形図(1/5000)を作成する。

③ Phase-III

選定された開発優先スキームに対し、フィジビリティ調査を実施する。調査においては、PRA の手法を用いて住民の意向を把握し、事業の持続性を図る。また、インドネシア国政府の政策を考慮し、水利組合の設立、育成計画と事業の運営・維持管理の移管計画を策定する。特に、水利組合設立計画においては、移民により異部族が同一の地区内に入る可能性があることに注意を払うことが肝要である。

LEGEND

	Very Poor
	Poor
	Sulphur Poor
	Not Poor



計画対象地域

図 3 - 1 ランポン州貧困地域識別図

ローアソロ農民参加型農業開発計画

要請状（案）

**TECHNICAL COOPERATION
BY
THE GOVERNMENT OF JAPAN**

APPLICATION

**by the Government of the Republic of Indonesia
for a Development Study on**

**LOWER SOLO FARMERS PARTICIPATORY
AGRICULTURAL DEVELOPMENT PROJECT**

to the Government of Japan

1. Project Digest

1.1 Project Title

Lower Solo Farmers Participatory Agriculture Development Project

1.2 Location

Bojonegoro, Tuban, Lamongan, and Gresik Districts in East Java Province
(Attachment - 1)

1.3 Implementing Agency

(a) Name of Agency

Directorate General of Water Resources Development

(b) Organization of Agency

Organization chart of Directorate General of Water Resources Development
(The organization might be changed in the near future.).

1.4 Desirable Implementation Schedule

(a) Development Study : Approximately 24 months from 2001

(b) Implementation : Approximately five (5) years from 2003

1.5 Prospective Funding Sources

- (a) Master Plan (grant) : Japan International Cooperation Agency (JICA)
- (b) Implementation : Japan International Cooperation Agency (JICA) and Japan Bank for International Cooperation (JBIC)

2. Project Justification

2.1 National and Regional Economics

Indonesian economy has steadily grown and has attained at US\$ 1,155 per capita in 1996, through execution of the First 25-Year National Development Plan (1969-1994) since 1969. The subsequent Second 25-Year National Development Plan (1994-2018) has launched aiming to sustain such high economic growth rate, to expand even development, and to increase job opportunity, etc. But, execution of this Plan is suspended due to the economic crisis occurred in August 1997.

The economic crisis has caused a serious economic depression of Indonesia. Inflation rate during 1997-98 has reached at 80%, and made several millions of people jobless and increase of poverty. In particular, rural area has been much influenced due to movement of jobless people, which has put spurs to raising its poverty condition.

Now, new government has just started and has not announced new national development policy. However, the following basic guidelines in national development have been issued:

- (a) acceleration of market economy
- (b) even and reasonable competition
- (c) promotion of more balanced distribution of economic opportunities
- (d) raising of national economic competitive power

New government has given the highest priority the urgent settlement to unemployment, poverty and food shortage caused by the economic crisis.

2.2 Agriculture Development Policy

The major agriculture development policies in the Sixth 5-Year National Development Plan (1994-1999) under the Second 25-Year National Development Plan are as follows:

- (a) sustain the established self-sufficiency of food to meet domestic requirements, increase diversification of products, and improve quality of production,
- (b) increase production meeting the needs of industry and expanding agricultural exports,
- (c) increase farmers' incomes and living standards and expand employment and business opportunities,
- (d) promote a more balanced distribution of economic opportunities, regional development, land settlement, and land development including rational planning of

land development to retain prime agricultural land for the future infrastructure and industry development, and

- (e) contribute to the health and better nutritional status of the population through diversification of foodstuff.

In order to realize these policies, the government prepared and has executed the self-help plan of agricultural production increase in end of 1998. In the plan, an emphasis has been placed on technical and financial assistance to farmers such as the farmers credit, construction of agricultural infra-structure and marketing system.

2.3 Outline of the Project

(1) Objective of the Project

Lower Solo Farmers Participatory Agriculture Development Project (the Project) aims at improvement of living quality of farmers in the Lower Solo river basin after confluence with the Madiun river, through the integrated agriculture development under the farmers participatory approach.

(2) Project Components

In order to fulfill the objective of the Project, the following works are needed to be implemented under the Project:

- (i) rehabilitation of existing irrigation schemes,
- (ii) construction of irrigation storage dams on tributaries,
- (iii) construction of irrigation and drainage facilities to be covered by the said irrigation storage dams,
- (iv) improvement of agricultural support services such as agricultural research, agricultural extension services and agricultural credit,
- (v) establishment of an effective water management and O&M system, including the strengthening of Water Users' Associations by employing NGO,
- (vi) introduction of a farmers participatory approach to the Project under the initiative of Ministry of Water Resources, to keep the Project sustainability,
- (vii) staff training to be undertaken for all professional and field staff who will be involved in the Project. An effective field advisory services needs to be created. Training will be encompassing all disciplines of irrigation development. The self-help envisaged for the larger portion of the area requires extensive back up from competent field personnel,
- (viii) farmers' training, demonstration and field visits in order to enable the farmers to gain the necessary expertise to manage, operate and maintain their schemes as viable enterprises. Focal points are improved farming practices including selection of profitable crops and diversified cropping system, proper and timely

application of fertilizers and chemicals, and improvement of post-harvesting and marketing system, and

(ix) construction of domestic water supply system, roads and others, if required.

(3) Prospective Beneficiaries

People living in the Lower Solo river basin. The main portion of the river basin is administratively under the Bojonegoro, Tuban, Lamongan and Gresik Districts in East Java Province. The Project covers about 6,100 km², where the total population of about 4.3 million live in 1998.

(4) Priority of Project in National Development Plan

The objectives of the Second 25 Years Development Plan (1994-2018) are as follows:

- keep the high economic growth
- expand equal development
- settle unemployment problem
- raise competent persons
- develop science and technology
- execute natural resources and environmental conservation
- develop legal, sociological and racial culture

Besides, the new government prepared the Guidelines of National Development Plan (Garis-Garis Besar Haluan Negara) as follows;

- promotion of free market
- sound and fair competition
- promotion of fair economy
- improvement of competitive power in national economy

In line with these plans, the agriculture sector has given the following development strategies under the Six Five Year Development Plan (1994-1999):

- ensure self-sufficiency in food
- increase job opportunity and improve agricultural productivity
- increase export amount of agricultural production
- strength the agricultural organizations
- overcome poverty

In particular, the new government has placed emphasis upon settlement of unemployment, poverty and food shortage as urgent matters.

The Lower Solo river basin covers about 250,000 ha of paddy field. Out of them, 110,000ha only are irrigated at present. The remaining paddy field is rain-fed and is suffered from unstable and low production due to weather condition. Subsequently, farmers in such rain-fed areas have less farm income and are categorized as poverty group. Thus, the government gives a priority to the agriculture development in the Lower Solo river basin.

3. Terms of Reference of the Proposed Study

(Refer to Attachment -2)

4. Facilities and Information for the Study Team

(1) Assignment of Counterpart Personnel of the Implementing Agency for the Study

The implementing agency of Directorate General of Water Resources Development has a capacity to assign counterpart personnel corresponding to the number of Study Team members to be organized by the Government of Japan.

(2) Available data, Information, Documents, Maps etc. related to the Study

- Meteo-hydrological data
- Topographic maps on a scale of 1:50,000 and 1:250,000
- Cadastral maps on a scale of 1:50,000
- Previous study reports
- All information available at the offices relevant to the Project

(3) Information on the Security Conditions in the Study Area

There is no security problem in the Study.

5. Global Issues

(1) Environmental Issue

Special attention shall be paid to the environmental conservation in the river basin. For this, the environmental impact assessment will be done along with the development study in order to formulate a plan with the minimum adverse effects on natural and social environment and mitigation measures.

(2) Women in Development and Anticipated Impacts on Women Caused by the Project

Women would play a major role in the economy. They are overwhelming majority of producers in agriculture, which is the mainstay of the economy. The Government is making a deliberate effort to ensure the place of women in the mainstream of development. Therefore, the Study should verify the needs of women and constraints they face. The proposed plan should be formulated with a particular attention to women.

The farming efficiency would be raised through the Project. Accordingly the women's participation in the farming activities would be reduced after completion of the Project.

(3) Poverty Reduction Components of the Project

Farmers' economy would be improved due to increase of agricultural production.

(4) Any Constraints against the Low Income People Caused by the Project

None.

6. Undertakings of the Government of Indonesia

In order to facilitate a smooth and efficient conduct of the Study, the Government of Indonesia shall take necessary measures mentioned below:

- (a) To facilitate the safety of the Study Team;
- (b) To permit the members of the Study Team to enter, leave and sojourn in the Study Area for the duration of their assignment therein, and exempt them from alien registration requirement and consular fees in accordance with existing regulation and laws;
- (c) To exempt the members of the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of the State for the execution of the Study in accordance with existing regulation and laws;
- (d) To exempt the members of the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Study Team for their services in connection with the implementation of the Study in accordance with existing regulation and laws;
- (e) To facilitate the necessary facilities to the Study Team for remittance as well as utilization of the funds from Japan in connection with the implementation of the Study;
- (f) To secure permission or entry into all the areas required for the conduct of the Study;
- (g) To secure permission for the Study Team to take all data, documents and necessary materials related to the Study to Japan;
- (h) To provide medical services as needed. Its expenses will be chargeable to the member of the Study Team.

The Government of Indonesia shall bear claims, if any arises against member (s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study Team.

The Implementing Agency shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

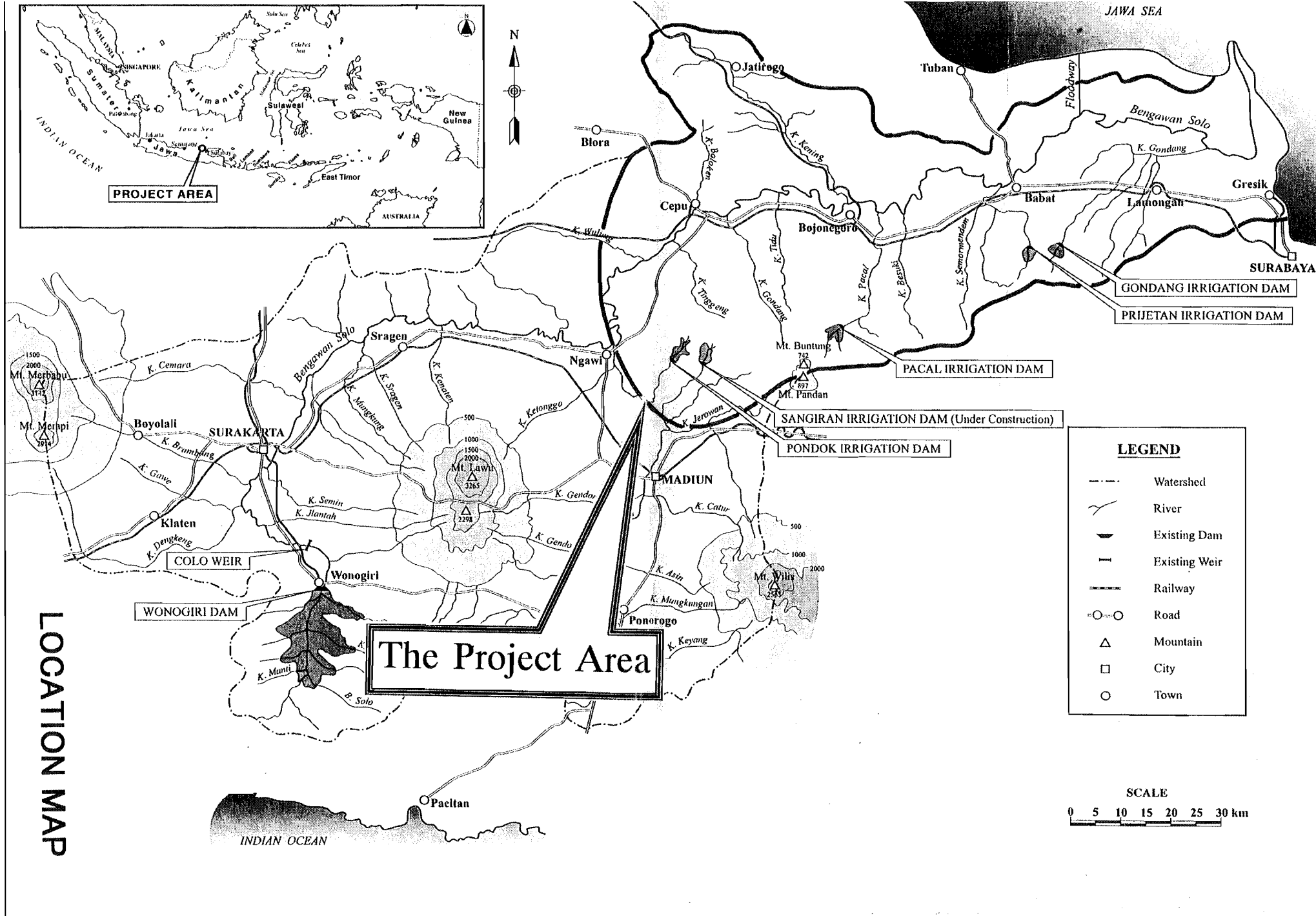
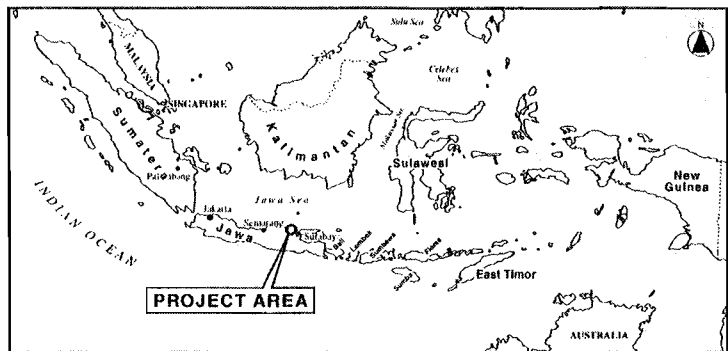
The Government of Indonesia assured that the matters referred in this form will be ensured for a smooth conduct of the Study by the Japanese Study Team.

Signed:

Titled:

On behalf of the Government of the Republic of Indonesia

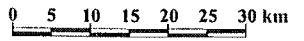
Date:



LEGEND

- Watershed
- River
- Existing Dam
- Existing Weir
- Railway
- Road
- Mountain
- City
- Town

SCALE



LOCATION MAP

The Project Area

**Terms of Reference
for
Study
on
Lower Solo Farmers Participatory Agriculture Development Project
in
The Republic of Indonesia**

1. Background and Justification of the Study

The Solo River is the longest river on the Java Island. It has long played a great role in social and economic importance in Indonesia. In 1974, a master plan was conducted for the overall development of the Solo river basin under technical assistance of OTCA, Japan. In accordance with this plan, its development has been executed by implementing the Wonogiri Multipurpose Dam Project (1982), Wonogiri Irrigation Project (1987), Upper Solo River Improvement Project (1994), the Madiun River Improvement Project (1995) and Lower Solo River Improvement Project (on-going).

Concurrently, various updating studies for the projects listed up in the said master plan have been executed so far. Out of them, development of the Lower Solo river basin was studied at feasibility level by CIDA, Canada in 1986, and the component projects studied were as follows:

- (a) Rehabilitation of existing irrigation schemes;
- (b) Irrigation storage projects on tributaries;
- (c) Jero swamp development;
- (d) Flood control measures; and
- (e) Jipan dam on the Solo river.

Out of these component projects, item (c) Jero swamp development and item (d) flood control measures are on-going using the JBIC loan, and item (e) Jipan dam on the Solo river has presently a less possibility for its implementation mainly due to social problem like need of relocation of about 70,000 people. Item (a) rehabilitation of existing irrigation schemes and item (b) irrigation storage projects on tributaries have been hardly touched so far.

In mid. December, 1999, a further Master Plan Study is planned to be commenced aiming at renewal of water resources development plan, in consideration of the significant change of social and economic conditions of within the Solo river basin and modification of river morphology mainly due to the completed/on-going construction of flood control facilities. The Study will also include the agriculture development in the Lower Solo river basin. The Study period would require about 1.5 years.

The Lower Solo river basin covers about 250,000 ha of paddy field. Out of them, 110,000ha only are irrigated at present. The remaining paddy field is rain-fed and is suffered from unstable and low production due to weather condition. Subsequently, farmers in such

rain-fed areas have less farm income and are categorized as poverty group. Thus, the government gives a priority to the agriculture development in the Lower Solo river basin.

2. Justification of Japanese Technical Cooperation

After completion of a series of development study, the Government of Indonesia intends to request the financial assistance to the Government of Japan for the implementation of the projects to be proposed in the studies. The development study by the Government of Japan will get him acquainted with the importance of the projects and makes it easier to get the financial assistance for the project implementation.

3. Objectives of the Study

The objectives of the proposed master plan and feasibility study (hereinafter referred to as "the Study") are to formulate a strategic and comprehensive agriculture development plan for the Lower Solo river basin and to carry out a feasibility study on selected priority scheme(s) for balanced and systematic development.

4. Study Area

The Study Area is defined as the Lower Solo River Basin with a total area of 6,100 km² extending in the East Java Province.

5. Scope of the Study

5.1 General

The scope of the Study will be as follows:

- (a) Master plan study in which the phased development idea of the Lower Solo Farmers Participatory Approach Agricultural Development Project will be clearly set up taking the financial and institutional capability of the Government of Indonesia and Ministry of Water Resources,
- (b) Preparation of topographic map for the priority scheme(s), and
- (c) Feasibility study for priority scheme(s), which will be selected in line with the Master Plan.

The Study will be carried out in the following three phases:

Phase-I: Master Plan Study

Field Work-I: Data collection, additional field survey and investigation, review of the results of master plan study on renewal of water resources development of Solo river basin and selection of priority scheme(s).

Home Work-I: Analysis, study and preparation of Master Plan Report (Interim Report)

Phase-II: Preparation of Topographic Map

Phase-III: Feasibility Study

Field Work-III: Topo-survey, supplementary data collection, field survey and investigations mainly for the priority scheme(s).

Home Work-III: Analysis, study and preparation of Feasibility Report (Draft Final Report and Final Report)

5.2 Detailed Scope of the Study

Phase-I: Master Plan Study

Field Work-I

(a) Data collection and review on:

- (i) results of master plan study on renewal of water resources development for Solo river basin,
- (ii) existing project studies on the Study Area,
- (iii) natural resources including topography, meteorology, hydrology, geo-hydrology and soils,
- (iii) socio-economy including population and number of households, cadastral map, social structure and social infrastructure, income, living standards, national and regional development plan, national and regional economy, organizational structure of regional government,
- (iv) agriculture including land use, cropped area, cropping pattern, crop variety, unit yield, farming practices and land holding system,
- (v) agro-economy including price of product, price of farm input, marketing system and farm economy,
- (vi) irrigation and drainage including inventory list for existing irrigation and drainage facilities, design criteria, information on O&M and water management,
- (vii) farmers' organization and agricultural supporting system including water users' association, agricultural cooperative, agricultural research, credit system, extension and other supporting services, and
- (viii) environment including ecosystem, soil erosion and sedimentation, water quality, and historical and cultural assets.

- (b) Additional field survey and basic study including:
- (i) Review on the existing project studies on the Study Area,
 - (ii) hydrological survey including review of existing hydrological and water balance study,
 - (iii) geological survey including review of existing geological study, confirmation of existing well location, survey on present well condition and check of water quality,
 - (iv) soil and land use survey including reconnaissance and auger boring to confirm the information shown in the existing soil map and field check of present land use using the existing aerial photo and topographic maps,
 - (v) irrigation and drainage survey including survey on present irrigation and drainage networks and on-farm facilities, operation and maintenance condition, activities of water users' associations, and water charge collection,
 - (vi) socio-economic survey including review of national and regional development plans, survey on social structure of village, living standard of villagers, women's participation in social activities, and NGOs' activities,
 - (vii) agricultural and agro-economic survey including interview survey to farmers for the collection of information on family size, income, monthly expenses, living condition, farming practices and farmers' desire and intention to agricultural development, and survey on present conditions and constraints of the agricultural supporting services,
 - (viii) construction material and cost survey including the survey on availability of construction materials and laborers and their unit prices,
 - (ix) environmental survey including survey on condition of water pollution, ecosystem, soil erosion, and confirmation of endangered plant and animal species and historical and cultural assets, and
 - (x) preparation of Progress Report (I), which will describe the experts' activities, the results of field survey and basic consideration for the future study for the formulation of master plan.

Home Work-I

- (a) Evaluation of development potentials, needs and clarification of present constraints for the future agricultural development.
- (b) Formulation of development strategies consisting of:

- (i) water resources plan including the assessment of water potential and water balance study between the water requirements and water supply for potential crops,
 - (ii) agricultural development plan including recommendable crops and cropping pattern, modernized farming practices, expected farm income after implementation of the Project, and improved marketing system and agricultural support system,
 - (iii) irrigation development plan including rehabilitation program of existing irrigation and drainage system, on-farm development consisting of construction of tertiary and quaternary canals, tertiary and quaternary drains and farm roads, and effective water management and O&M system,
 - (iv) environmental conservation plan including flood and sediment control, soil conservation, mitigation of water pollution,
 - (v) estimate of project implementation cost,
 - (vi) project evaluation from technical and economical viewpoints and selection of priority projects,
 - (vii) preparation of overall development program, and
 - (viii) selection of priority scheme(s) in line with overall development program.
- (c) Preparation of Master Plan Report (Interim Report) which will describe the study results and recommended development plan of the Project.

Phase-II: Preparation of Topographic Map

Field Work-II

The topographic maps will be prepared on a scale of 1/5,000 with a contour interval of 0.5 m for the priority scheme areas by means of photogrammetry and ground survey.

Phase-III: Feasibility Study

Field Work-III

- (a) Supplemental data collection, if any.
- (b) Field survey and basic study including:
 - (i) soil and land use survey using the aerial photo and topographic map,

- (ii) topographic survey along main and secondary irrigation canals and main drains and at several on-farm development areas selected for typical design,
- (iii) construction material survey for embankment materials, sand and gravel,
- (iv) execution of PRA and PCM approaches, to grasp the farmers' intention and constraints to the Project development, and to analyze constraints and clarify project object through workshop for the government staff and farmers' leaders of WUAs, respectively,
- (v) agricultural and agro-economic survey for the following items:
 - crop, crop variety, cropping pattern and livestock,
 - crop production and seed marketing system,
 - trend of demand and supply of agricultural products,
 - farming practice and mechanization,
 - incremental effect on yield by irrigation,
 - labor balance on farming practices,
 - profitability and marketability of crops and livestock,
 - agro-processing and post-harvest,
 - marketing, transportation and storing, and
 - institutional constraints to the project development,
- (vi) survey on agricultural support system for the following items:
 - agricultural support system to introduce new crops and irrigation methods including demonstration or experimental farm,
 - research station, extension and credit,
 - government policy for agricultural development,
 - present activities and financial situation of organizations and institutions for the agricultural support system, and
 - constraints to the agricultural development,
- (vii) survey on institution, legal matters and constraints of existing water users association,
- (viii) cost survey for construction materials, construction equipment and laborers, and
- (ix) preparation of Progress Report (II), which will describe the experts' activities, the results of field survey and basic consideration for the future study for the formulation of the feasibility study.

Home Work-III

- (a) Formulation of development plan consisting of:
 - (i) agricultural development plan including recommendable crops and cropping pattern, modernized farming practices, expected farm

income after implementation of the Project, and improved marketing system, agricultural support system and farmers' organizations,

- (ii) irrigation development plan including the calculation of water requirement and drainage module, preliminary design for rehabilitation of existing irrigation system and new drainage system, typical design for on-farm development works selecting several areas, and preparation of water management and O&M manual,
 - (iii) preparation of O&M transfer plan and strengthening plan of water users association mainly considering introduction of NGO,
 - (iv) preparation of project implementation program,
 - (v) estimate of project cost including investment cost and O&M cost, and
 - (vi) project evaluation from economical and financial viewpoints.
- (b) Preparation of Feasibility Report which will describe the study results and recommended development plan and justification of the Project.

5.3 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 fields:

- (a) Field survey and investigation for every line of foreign experts assigned.
- (b) Plan and design for irrigation and drainage system, on-farm development and rural infrastructure.

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. In addition to the above transfer of technology, overseas training will also be programmed preferably in Japan.

5.4 Study Schedule

The period required for the Study is estimated at 24 months in total for three phases as follows (See Figure 1):

Phase-I Work	:	8 months
Phase-II Work	:	7 months
Phase-III Work	:	11 months

The following foreign experts will be required for the Study:

- (1) Team Leader
- (2) Irrigation and Drainage Engineer
- (3) Soil and Land Use Planner

- (4) Agronomist
- (5) Agro-economist
- (6) O&M Expert
- (7) Institutional Expert
- (8) Hydrologist / Water Resources Planner
- (9) Geologist
- (10) Soil Mechanical Engineer
- (11) Topographic Engineer
- (12) Structure Design & Cost Estimate Engineer
- (13) Environmentalist
- (14) Project Evaluation Expert

The required manpower input is estimated to be 100 men-months in total.

5.5 Expected Major Outputs of the Study

The major outputs of the Study are expected to be: (i) formulation of master plan for the total study area with the priority order of agricultural development for respective schemes, and (ii) project evaluation from the technical and economical viewpoints and the implementation program for the priority scheme. These study results will be compiled in the following reports, which will be submitted to the Government of Indonesia.

- | | | |
|----------------------|---|---|
| Inception Report | : | Twenty (20) copies shall be submitted at the commencement of the Phase-I Work |
| Progress Report (I) | : | Twenty (20) copies shall be submitted at the end of the Field Work-I of the Phase-I Work |
| Interim Report | : | Twenty (20) copies shall be submitted at the end of the Phase-I Work |
| Progress Report (II) | : | Twenty (20) copies shall be submitted at the end of the Field Work-III of the Phase- III Work |
| Draft Final Report | : | Twenty (20) copies shall be submitted at the end of the Phase-III Work |
| Final Report | : | Twenty (20) copies shall be submitted within one month after getting the comments of the Directorate General of Water Resources Development on the Draft Final Report |

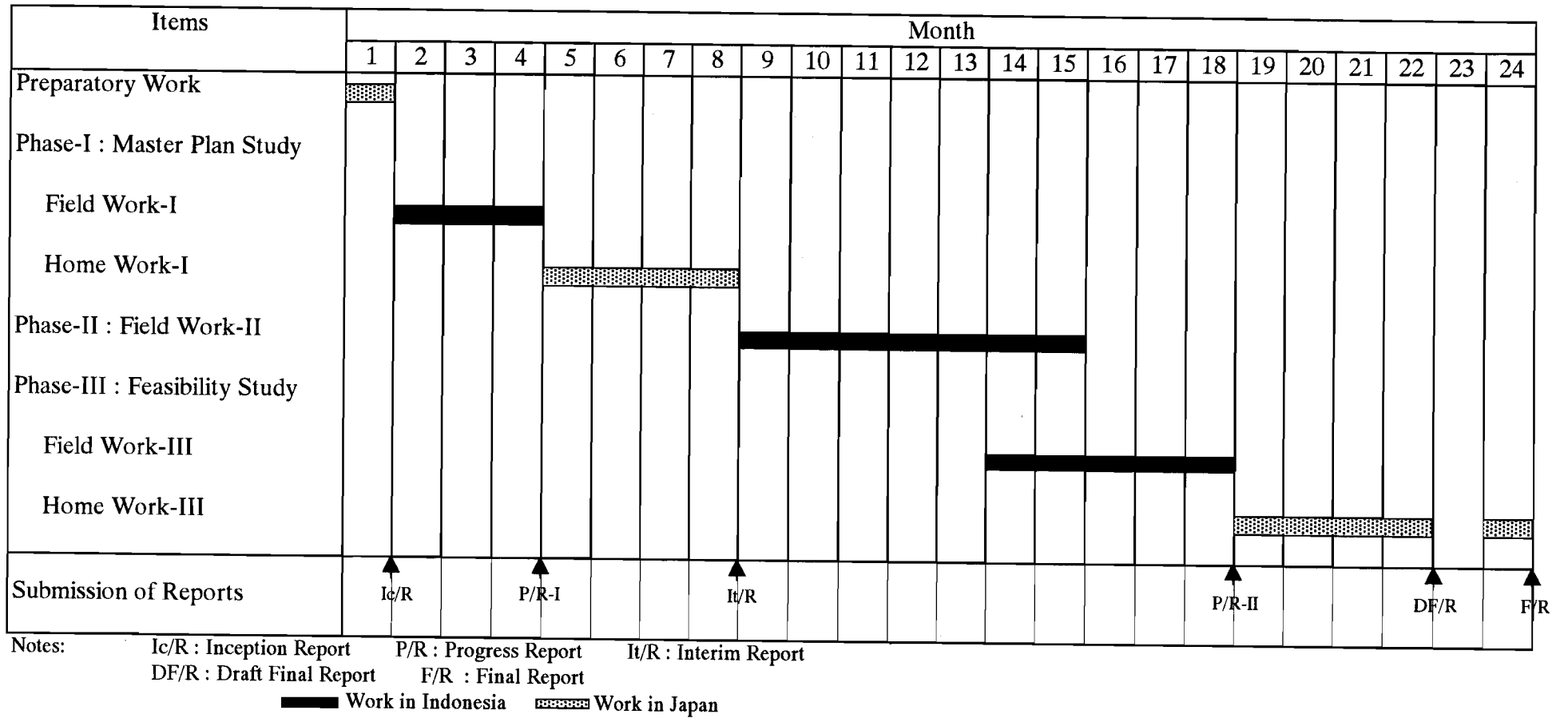


Figure 1 Tentative Work Schedule

西ランポン貧困対策中規模農業開発計画

要請状（案）

**TECHNICAL COOPERATION
BY
THE GOVERNMENT OF JAPAN**

APPLICATION

**by the Government of the Republic of Indonesia
for a Development Study on**

**MEDIUM SCALE AGRICULTURE DEVELOPMENT PROJECT
FOR POVERTY ALLEVIATION TO FARMERS IN WEST LAMPUNG**

to the Government of Japan

1. Project Digest

1.1 Project Title

Medium Scale Agriculture Development Project for Poverty Alleviation to Farmers in West Lampung

1.2 Location

West Lampung District in Lampung Province (Attachment - 1)

1.3 Implementing Agency

(a) Name of Agency

Directorate General of Water Resources Development

(b) Organization of Agency

Organization chart of Directorate General of Water Resources Development
(The organization might be changed in the near future.).

1.4 Desirable Implementation Schedule

(a) Development Study : Approximately 20 months from 2001

(b) Implementation : Approximately five (5) years from 2003

1.5 Prospective Funding Sources

- (a) Master Plan (grant) : Japan International Cooperation Agency (JICA)
- (b) Implementation : Japan International Cooperation Agency (JICA) and Japan Bank for International Cooperation (JBIC)

2. Project Justification

2.1 National and Regional Economics

Indonesian economy has steadily grown and has attained at US\$ 1,155 per capita in 1996, through execution of the First 25-Year National Development Plan (1969-1994) since 1969. The subsequent Second 25-Year National Development Plan (1994-2018) has launched aiming to sustain such high economic growth rate, to expand even development, and to increase job opportunity, etc. But, execution of this Plan is suspended due to the economic crisis occurred in August 1997.

The economic crisis has caused a serious economic depression of Indonesia. Inflation rate during 1997-98 has reached at 80%, and made several millions of people jobless and increase of poverty. In particular, rural area has been much influenced due to movement of jobless people, which has put spurs to raising its poverty condition.

Now, new government has just started and has not announced new national development policy. However, the following basic guidelines in national development have been issued:

- (a) acceleration of market economy
- (b) even and reasonable competition
- (c) promotion of more balanced distribution of economic opportunities
- (d) raising of national economic competitive power

New government has given the highest priority the urgent settlement to unemployment, poverty and food shortage caused by the economic crisis.

2.2 Agriculture Development Policy

The major agriculture development policies in the Sixth 5-Year National Development Plan (1994-1999) under the Second 25-Year National Development Plan are as follows:

- (a) sustain the established self-sufficiency of food to meet domestic requirements, increase diversification of products, and improve quality of production,
- (b) increase production meeting the needs of industry and expanding agricultural exports,
- (c) increase farmers' incomes and living standards and expand employment and business opportunities,
- (d) promote a more balanced distribution of economic opportunities, regional

development, land settlement, and land development including rational planning of land development to retain prime agricultural land for the future infrastructure and industry development, and

- (e) contribute to the health and better nutritional status of the population through diversification of foodstuff.

In order to realize these policies, the government prepared and has executed the self-help plan of agricultural production increase in end of 1998. In the plan, an emphasis has been placed on technical and financial assistance to farmers such as the farmers credit, construction of agricultural infra-structure and marketing system.

2.3 Outline of the Project

(1) Objectives of the Project

The object of the Project is to elevate the living standard of farmers in the Project area. and eventually to settle a social gap among all districts in Lampung Province, though implementation of agriculture development.

(2) Project Components

In order to attain the above objectives, the following works need to be implemented under the Project:

- (i) development of new water resources through construction of diversion weirs, and irrigation and drainage system,
- (ii) on-farm development including construction of tertiary canals, field ditches, tertiary drains, field drains and farm roads,
- (iii) improvement of agricultural support services such as agricultural research, agricultural extension services and agricultural credit, and improvement of farmers' organizations such as agricultural credit cooperatives and agricultural marketing cooperatives,
- (iv) establishment of an effective water management and O&M system, including the establishment of Water Users' Associations by employing NGO,
- (v) staff training to be undertaken for all professional and field staff who will be involved in the Project. An effective field advisory services needs to be created. Training will be encompassing all disciplines of irrigation development. The self-help envisaged for the larger portion of the area requires extensive back up from competent field personnel,
- (vi) farmers' training, demonstration and field visits in order to enable the farmers to gain the necessary expertise to manage, operate and maintain their schemes as viable enterprises. Focal points are improved farming practices including selection of profitable crops and diversified cropping system, proper and timely

application of fertilizers and chemicals, and improvement of post-harvesting and marketing system, and

(vii) construction of domestic water supply system, sewage facilities, roads and others, if required.

(3) Prospective Beneficiaries

People living in the West Lampung district. The West Lampung district covers 4,750 km², where the total population of 384,024 live in 1997.

(4) Priority of Project in National Development Plan

The objectives of the Second 25 Years Development Plan (1994-2018) are as follows:

- keep the high economic growth
- expand equal development
- settle unemployment problem
- raise competent persons
- develop science and technology
- execute natural resources and environmental conservation
- develop legal, sociological and racial culture

Besides, the new government prepared the Guidelines of National Development Plan (Garis-Garis Besar Haluan Negara) as follows;

- promotion of free market
- sound and fair competition
- promotion of fair economy
- improvement of competitive power in national economy

In line with these plans, the agriculture sector has given the following development strategies under the Six Five Year Development Plan (1994-1999):

- ensure self-sufficiency in food
- increase job opportunity and improve agricultural productivity
- increase export amount of agricultural production
- strength the agricultural organizations
- overcome poverty

In particular, the new government has placed emphasis upon settlement of unemployment, poverty and food shortage as urgent matters.

The West Lampung where the Project is located, has been long isolated from development due to lack of transportation. As a result, the West Lampung is characterized as one of poverty district in Lampung Province as shown in Figure 3-1. In order to settle such a social gap within Lampung Province, local government has started the development of

infrastructure, and a road between a road from Tanjung to Kotajaya has started for construction. After construction of this road, the Project area could be accessed only 5 hours from Bandar Lampung, Capital of Province using a car instead of 10 hours. In this connection, local government has a strong intention on the development of West Lampung district, say integrated agriculture development.

3. Terms of Reference of the Proposed Study

(Refer to Attachment -2)

4. Facilities and Information for the Study Team

(1) Assignment of Counterpart Personnel of the Implementing Agency for the Study

The implementing agency of Directorate General of Water Resources Development has a capacity to assign counterpart personnel corresponding to the number of Study Team members to be organized by the Government of Japan.

(2) Available data, Information, Documents, Maps etc. related to the Study

- Meteo-hydrological data
- Topographic maps on a scale of 1:50,000 and 1:250,000
- Cadastral maps on a scale of 1:50,000
- Previous study reports
- All information available at the offices relevant to the Project

(3) Information on the Security Conditions in the Study Area

There is no security problem in the Study Area as well as in the capital city of Battambang.

5. Global Issues

(1) Environmental Issue

Special attention shall be paid to the environmental conservation in the catchment area of respective rivers playing an important role as water resource for irrigation. For this, the environmental impact assessment will be done along with the development study in order to formulate a plan with the minimum adverse effects on natural and social environment and mitigation measures.

(2) Women in Development and Anticipated Impacts on Women Caused by the Project

Women would play a major role in the economy. They are overwhelming majority of producers in agriculture, which is the mainstay of the economy. The Government is making

a deliberate effort to ensure the place of women in the mainstream of development. Therefore, the Study should verify the needs of women and constraints they face. The proposed plan should be formulated with a particular attention to women.

The farming efficiency would be raised through the Project. Accordingly the women's participation in the farming activities would be reduced after completion of the Project.

(3) **Poverty Reduction Components of the Project**

Farmers' economy would be improved due to increase of agricultural production.

(4) **Any Constraints against the Low Income People Caused by the Project**

None.

6. Undertakings of the Government of Indonesia

In order to facilitate a smooth and efficient conduct of the Study, the Government of Indonesia shall take necessary measures mentioned below:

- (a) To facilitate the safety of the Study Team;
- (b) To permit the members of the Study Team to enter, leave and sojourn in the Study Area for the duration of their assignment therein, and exempt them from alien registration requirement and consular fees in accordance with existing regulation and laws;
- (c) To exempt the members of the Study Team from taxes, duties and any other charges on equipment, machinery and other materials brought into and out of the Study Area for the execution of the Study in accordance with existing regulation and laws;
- (d) To exempt the members of the Study Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Study Team for their services in connection with the implementation of the Study in accordance with existing regulation and laws;
- (e) To facilitate the necessary facilities to the Study Team for remittance as well as utilization of the funds introduced in the State from Japan in connection with the implementation of the Study;
- (f) To secure permission or entry into all the areas required for the conduct of the Study;
- (g) To secure permission for the Study Team to take all data, documents and necessary materials related to the Study to Japan;
- (h) To provide medical services as needed. Its expenses will be chargeable to the member of the Study Team.

The Government of Indonesia shall bear claims, if any arises against member (s) of the Japanese Study Team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Study Team.

The Implementing Agency shall act as counterpart agency to the Japanese Study Team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

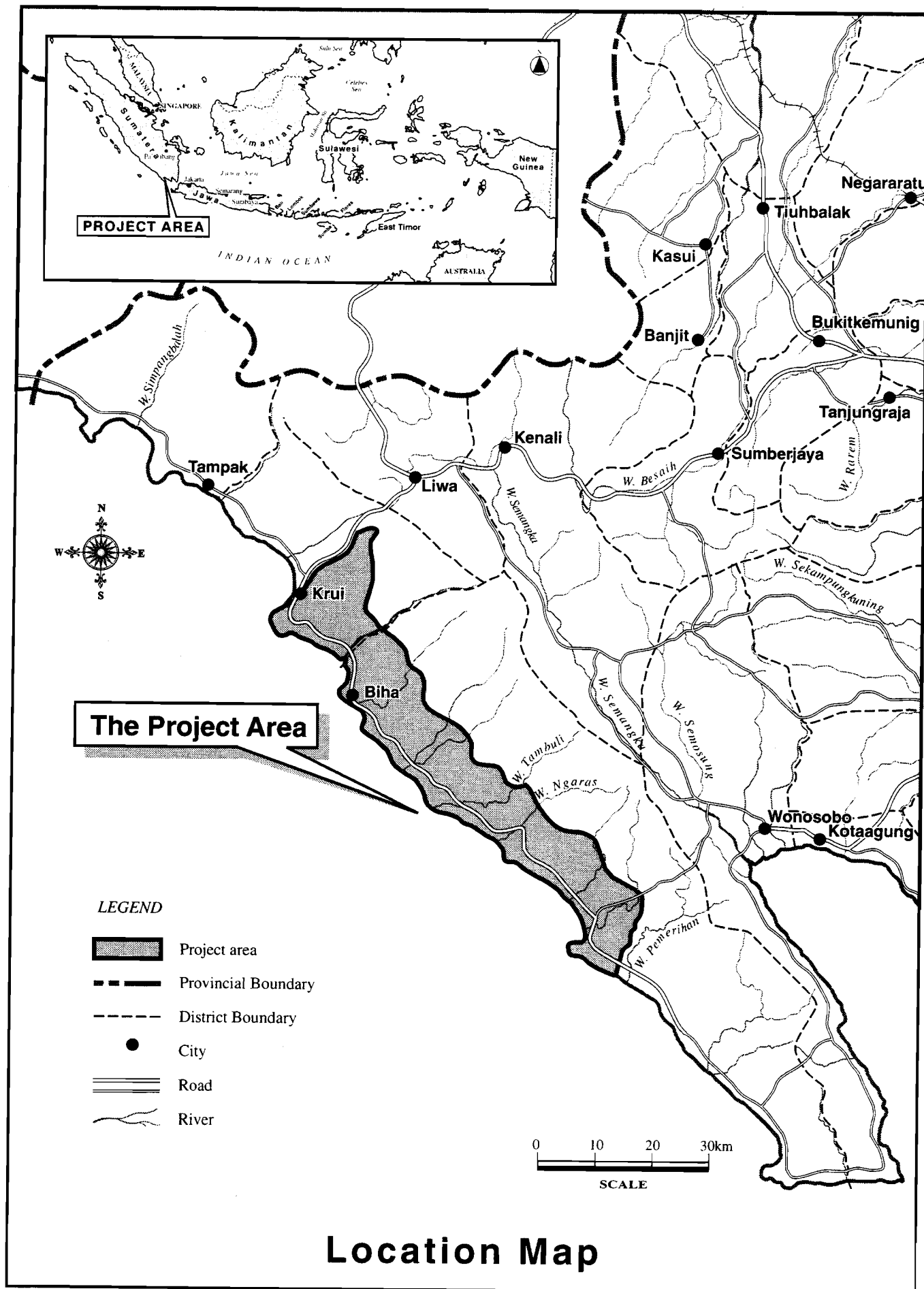
The Government of Indonesia assured that the matters referred in this form will be ensured for a smooth conduct of the Development Study by the Japanese Study Team.

Signed:

Titled:



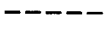

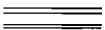

On behalf of the Government of the Republic of Indonesia

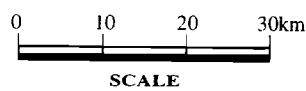
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The Project Area

LEGEND

-  Project area
-  Provincial Boundary
-  District Boundary
-  City
-  Road
-  River



Location Map

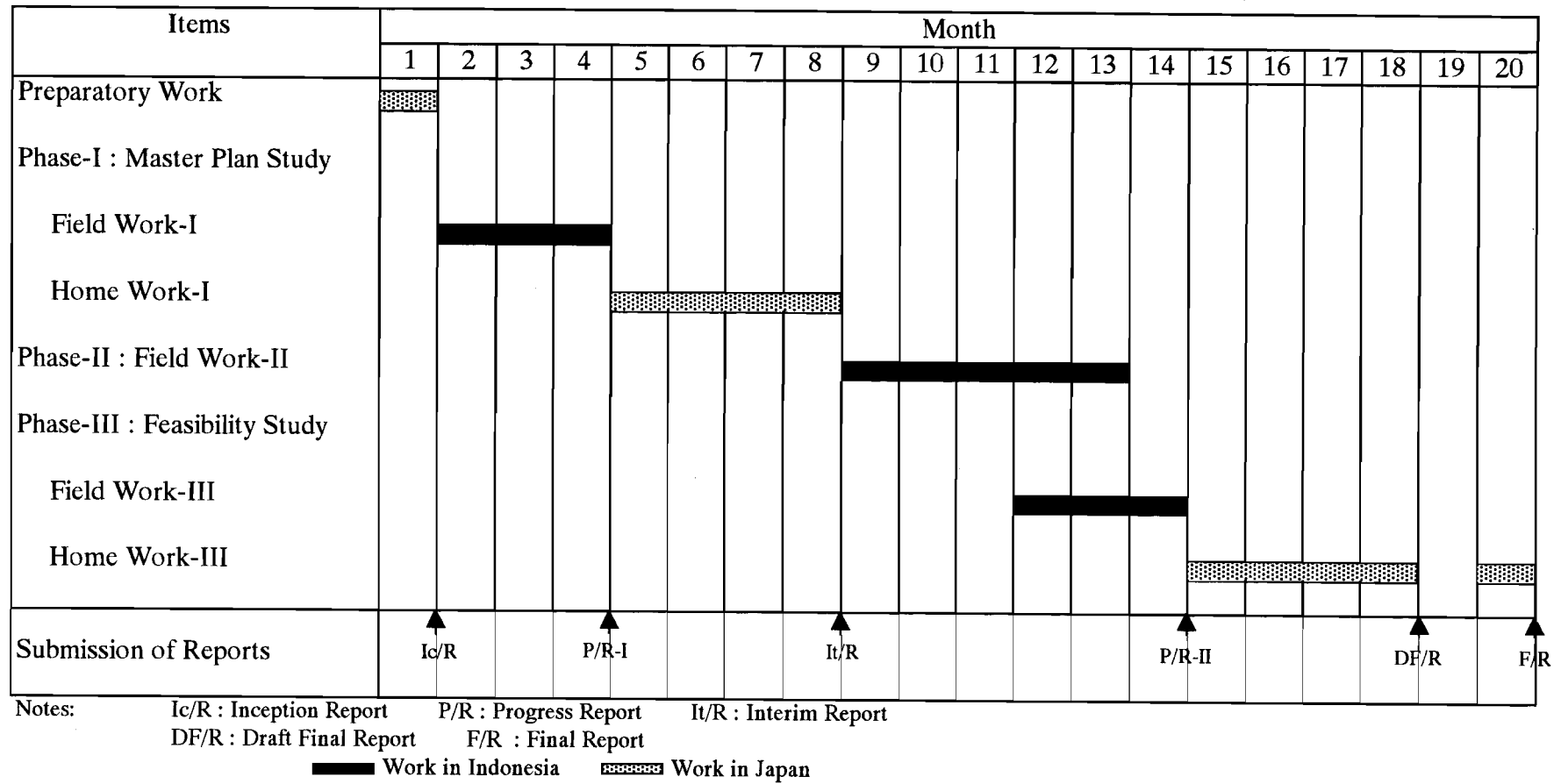


Figure 2 Tentative Work Schedule

**Terms of Reference
for
Master Plan Study
on
Medium Scale Agriculture Development for Poverty Alleviation to Farmers
in
West Lampung
in
The Republic of Indonesia**

1. Background and Justification of the Study

The West Lampung where the Project is located, has been long isolated from development due to lack of transportation. As a result, the West Lampung is characterized as one of poverty districts in Lampung Province as shown in Figure 1. In order to settle such a social gap within Lampung Province, local government has started the development of infrastructure, and a road between a road from Tanjung to Kotajaya has started for construction. After construction of this road, the Project area could be accessed only 5 hours from Bandar Lampung, Capital of Province using a car instead of 10 hours. In this connection, local government has a strong intention on the development of West Lampung district, say integrated agriculture development.

2. Justification of Japanese Technical Cooperation

After completion of a series of development study, the Government of Indonesia intends to request the financial assistance to the Government of Japan for the implementation of the projects to be proposed in the studies. The development study by the Government of Japan will get him acquainted with the importance of the projects and makes it easier to get the financial assistance for the project implementation.

3. Objectives of the Study

The objectives of the proposed master plan and feasibility study (hereinafter referred to as "the Study") are to formulate a strategic and comprehensive irrigation development plan for the West Lampung and to carry out a feasibility study on selected priority scheme for balanced and systematic development.

4. Study Area

The Study Area is defined as eight (8) irrigation schemes with a total area of 25,500 ha extending in the West Lampung district.

5. Scope of the Study

5.1 General

The scope of the Study will be as follows:

- (a) Master plan study in which the phased development idea of the Medium Scale Agriculture Development Project for Poverty Alleviation to Farmers in West Lampung, will be clearly set up taking the financial and institutional capability of the Government of Indonesia and Directorate General of Water Resources Development,
- (b) Preparation of topographic map for the priority irrigation scheme, and
- (c) Feasibility study for priority irrigation scheme, which will be selected in line with the Master Plan.

The Study will be carried out in the following three phases:

Phase-I: Master Plan Study

Field Work-I: Data collection, field survey and investigation and formulation of basic development plan.

Home Work-I: Analysis, study and preparation of Master Plan Report (Interim Report)

Phase-II: Preparation of Topographic Map

Phase-III: Feasibility Study

Field Work-III: Topo-survey, supplementary data collection, field survey and investigations mainly for the priority project areas.

Home Work-III: Analysis, study and preparation of Feasibility Report (Draft Final Report and Final Report)

5.2 Detailed Scope of the Study

Phase-I: Master Plan Study

Field Work-I

- (a) Data collection and review on:
 - (i) existing project studies on the Study Area,
 - (ii) natural resources including topography, meteorology, hydrology, geo-hydrology and soils,

- (iii) socio-economy including population and number of households, cadastral map, social structure and social infrastructure, income, living standards, national and regional development plan, national and regional economy, organizational structure of regional government,
- (iv) agriculture including land use, cropped area, cropping pattern, crop variety, unit yield, farming practices and land holding system,
- (v) agro-economy including price of product, price of farm input, marketing system and farm economy,
- (vi) irrigation and drainage including inventory list for existing irrigation and drainage facilities, design criteria, information on O&M and water management,
- (vii) farmers' organization and agricultural supporting system including water users' association, agricultural cooperative, agricultural research, credit system, extension and other supporting services, and
- (viii) environment including ecosystem, soil erosion and sedimentation, water quality, and historical and cultural assets.

(b) Field survey and basic study including:

- (i) Review on the existing project studies on the Study Area,
- (ii) hydrological survey including review of existing hydrological and water balance study,
- (iii) geological survey including review of existing geological study, confirmation of existing well location, survey on present well condition and check of water quality,
- (iv) soil and land use survey including reconnaissance and auger boring to confirm the information shown in the existing soil map and field check of present land use using the existing aerial photo and topographic maps,
- (v) irrigation and drainage survey including survey on present irrigation and drainage networks and on-farm facilities, operation and maintenance condition, activities of Water Users' Associations, and water charge collection,
- (vi) socio-economic survey including review of national and regional development plans, survey on social structure of village, living standard of villagers, women's participation in social activities, and NGOs' activities,
- (vii) agricultural and agro-economic survey including interview survey to farmers for the collection of information on family size, income, monthly expenses, living condition, farming practices and farmers' desire and intention to agricultural development, and survey on

- present conditions and constraints of the agricultural supporting services,
- (viii) construction material and cost survey including the survey on availability of construction materials and laborers and their unit prices,
 - (ix) environmental survey including survey on condition of water pollution, ecosystem, soil erosion, and confirmation of endangered plant and animal species and historical and cultural assets, and
 - (x) preparation of Progress Report (I), which will describe the experts' activities, the results of field survey and basic consideration for the future study for the formulation of master plan.

Home Work-I

- (a) Evaluation of development potentials, needs and clarification of present constraints for the future agricultural development.
- (b) Formulation of development strategies consisting of:
 - (i) water resources plan including the assessment of water potential and water balance study between the water requirements and water supply for potential crops,
 - (ii) agricultural development plan including recommendable crops and cropping pattern, modernized farming practices, expected farm income after implementation of the Project, and improved marketing system and agricultural support system,
 - (iii) irrigation development plan including rehabilitation program of existing irrigation and drainage system, on-farm development consisting of construction of tertiary and quaternary canals, tertiary and quaternary drains and farm roads, and effective water management and O&M system,
 - (iv) environmental conservation plan including flood and sediment control, soil conservation, conservation of wild life, mitigation of water pollution,
 - (v) estimate of project implementation cost,
 - (vi) project evaluation from technical and economical viewpoints and selection of priority projects,
 - (vii) preparation of overall development program, and
 - (viii) selection of priority schemes in line with overall development program.
- (c) Preparation of Master Plan Report (Interim Report) which will describe the study results and recommended development plan of the Project.

Phase-II: Preparation of Topographic Map

Field Work-II

The topographic maps will be prepared on a scale of 1/5,000 with a contour interval of 0.5 m for the priority scheme areas by means of photogrammetry and ground survey.

Phase-III: Feasibility Study

Field Work-III

- (a) Supplemental data collection, if any.
- (b) Field survey and basic study including:
 - (i) soil and land use survey using the aerial photo and topographic map,
 - (ii) topographic survey along main and secondary irrigation canals and main drains and at several on-farm development areas selected for typical design,
 - (iii) construction material survey for embankment materials, sand and gravel,
 - (iv) agricultural and agro-economic survey for the following items:
 - crop, crop variety, cropping pattern and livestock,
 - crop production and seed marketing system,
 - trend of demand and supply of agricultural products,
 - farming practice and mechanization,
 - incremental effect on yield by irrigation,
 - labor balance on farming practices,
 - profitability and marketability of crops and livestock,
 - agro-processing and post-harvest,
 - marketing, transportation and storing, and
 - institutional constraints to the project development,
 - (v) survey on agricultural support system for the following items:
 - agricultural support system to introduce new crops and irrigation methods including demonstration or experimental farm,
 - research station, extension and credit,
 - government policy for agricultural development,
 - present activities and financial situation of organizations and institutions for the agricultural support system, and
 - constraints to the agricultural development,

- (vi) cost survey for construction materials, construction equipment and laborers, and
- (vii) preparation of Progress Report (II), which will describe the experts' activities, the results of field survey and basic consideration for the future study for the formulation of the feasibility study.

Home Work-III

- (a) Formulation of development plan consisting of:
 - (i) agricultural development plan including recommendable crops and cropping pattern, modernized farming practices, expected farm income after implementation of the Project, and improved marketing system, agricultural support system and farmers' organizations,
 - (ii) irrigation development plan including the calculation of water requirement and drainage module, preliminary design for irrigation system and drainage system, typical design for on-farm development works selecting several areas, and preparation of water management and O&M manual,
 - (iii) preparation of project implementation program,
 - (iv) estimate of project cost including investment cost and O&M cost, and
 - (v) project evaluation from economical and financial viewpoints.
- (b) Preparation of Feasibility Report which will describe the study results and recommended development plan and justification of the Project.

5.3 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 fields:

- (a) Field survey and investigation for every line of foreign experts assigned.
- (b) Plan and design for irrigation and drainage system, on-farm development and rural infrastructure.

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. In addition to the above transfer of technology, overseas training will also be programmed preferably in Japan.

5.4 Study Schedule

The period required for the Study is estimated at 20 months in total for three phases as follows (See Figure 2):

- Phase-I Work : 8 months
Phase-II Work : 5 months
Phase-III Work : 9 months

The following foreign experts will be required for the Study:

- (1) Team Leader
- (2) Irrigation and Drainage Engineer
- (3) Soil and Land Use Planner
- (4) Agronomist
- (5) Agro-economist
- (6) Rural Infrastructure Development Planner
- (7) O&M Expert
- (8) Hydrologist / Water Resources Planner
- (9) Geologist
- (10) Soil Mechanical Engineer
- (11) Topographic Engineer
- (12) Structure Design & Cost Estimate Engineer
- (13) Environmentalist
- (14) Project Evaluation Expert

The required manpower input is estimated to be 90 man-months in total.

5.5 Expected Major Outputs of the Study

The major outputs of the Study are expected to be: (i) formulation of master plan for the total study area with the priority order of agricultural development for respective projects included in the study area, and (ii) project evaluation from the technical and economical viewpoints and the implementation program for the priority project. These study results will be compiled in the following reports, which will be submitted to the Government of Indonesia.

- Inception Report : Twenty (20) copies shall be submitted at the commencement of the Phase-I Work
- Progress Report (I) : Twenty (20) copies shall be submitted at the end of the Field Work-I of the Phase-I Work
- Interim Report : Twenty (20) copies shall be submitted at the end of the Phase-I Work
- Progress Report (II) : Twenty (20) copies shall be submitted at the end of the Field Work-III of the Phase- III Work
- Draft Final Report : Twenty (20) copies shall be submitted at the end of the Phase-III Work

Final Report : Twenty (20) copies shall be submitted within one month after getting the comments of Directorate General of Water Resources Development on the Draft Final Report

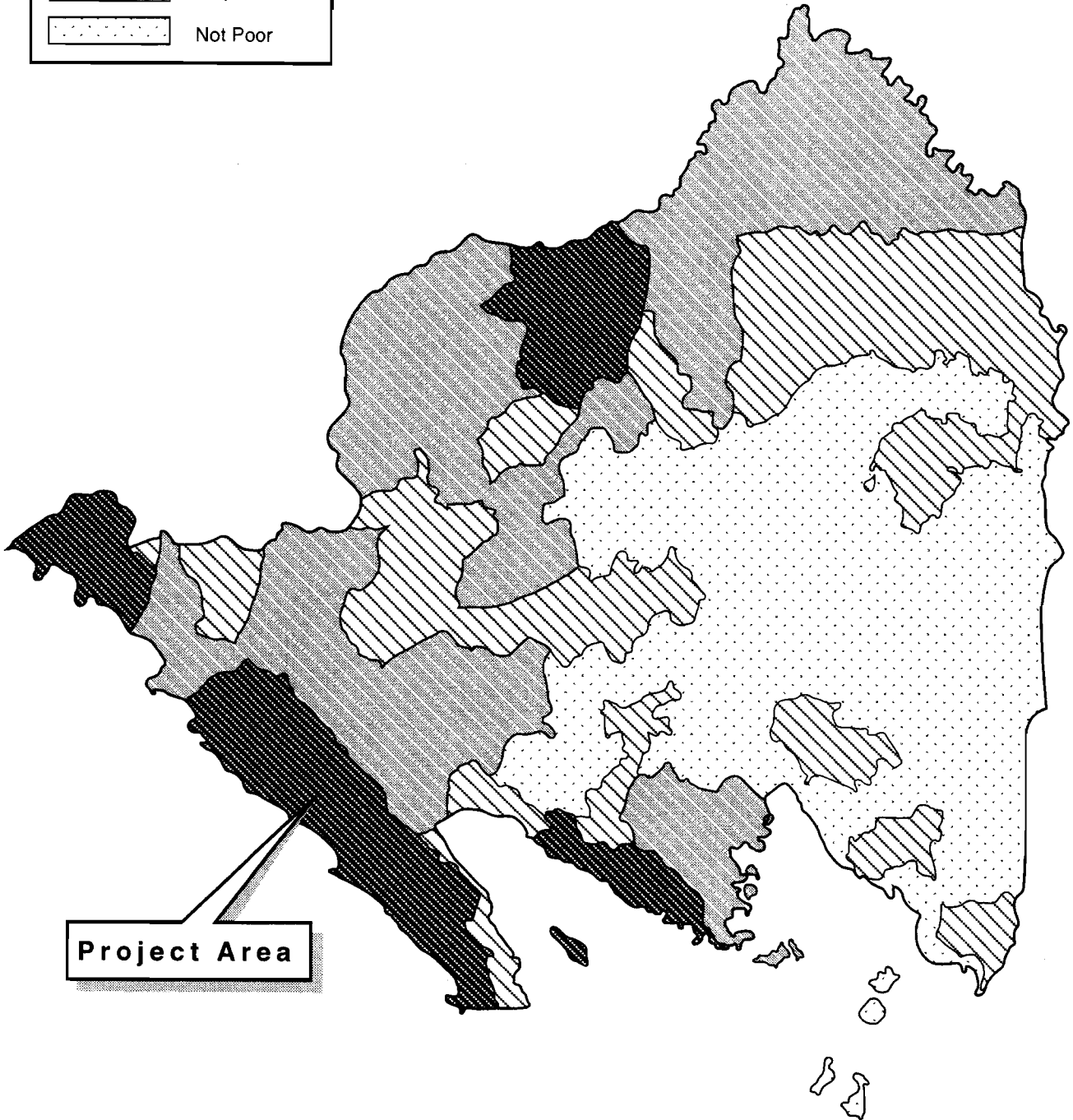
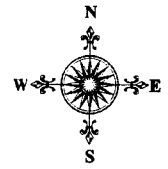
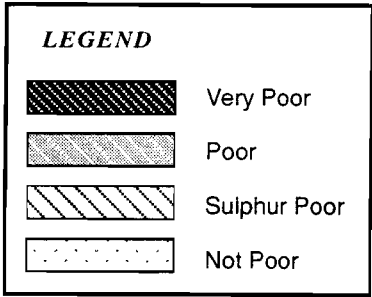


Fig-1 Poverty Degree Area

添付資料

調査団員略歴

1. 島崎 斉

日本工営株式会社 農業開発部

昭和 45 年	東京教育大学卒業
昭和 45 年	日本工営(株)入社
昭和 63 年 - 平成 6 年	日本工営(株)課長
平成 6 年 - 平成 9 年	日本工営(株)次長
平成 9 年 - 平成 10 年	日本工営(株)参事
平成 10 年 - 現在	日本工営(株)専門部長

海外業務歴： インドネシア、ネパール、ヨルダン、ガーナ、マラウイ、タンザニア、ケニア他

2. 川口 学

アジア航測株式会社 計測部

昭和 62 年	建設省建設大学校中央訓練所卒業
昭和 62 年 - 平成 2 年	青年海外協力隊 (エチオピア・測量)
平成 2 年 - 3 年	青年海外協力協会
平成 3 年 - 6 年	(株) パスコ道路技術センター
平成 6 年 - 9 年	(株)パスコインターナショナル
平成 9 年 - 現在	アジア航測 (株)

海外業務歴： インドネシア、ウガンダ、ガーナ、フィリピン、ブラジル他

インドネシア国のプロジェクト・ファインディング調査実施日程

日順	月/日	曜日	島崎農業担当		川口測量担当	
			行程	宿泊地	行程	宿泊地
1	11月21日	(日)	成田ージャカルタ	ジャカルタ		
2	11月22日	(月)	水資源省計画局、JICA、日本大使館へプロファイにつき説明	ジャカルタ		
3	11月23日	(火)	日本工営ジャカルタ事務にて打ちあわせ後スルワカルタへ移動 ソロ河開発事務所と打ち合わせ	ツバン		
4	11月24日	(水)	県灌漑事務所にて資料収集	ツバン		
5	11月25日	(木)	ソロ河下流域既存灌漑田および天水田を視察	スラバヤ		
6	11月26日	(金)	州政府および東部ジャワ灌漑事務所にて資料収集後ジャカルタへ移動			
7	11月27日	(土)	収集資料の整理	ジャカルタ	成田ージャカルタ	
8	11月28日	(日)	ジャカルターバンダールランボンへ移動	バンダールランボン	ジャカルターバンダールランボンへ移動	バンダールランボン
9	11月29日	(月)	州政府および灌漑事務所資料収集後クルイへ移動	クルイ	州政府および灌漑事務所資料収集後クルイへ移動	クルイ
10	11月30日	(火)	現地視察後バンダールランボンへ移動	バンダールランボン	現地視察後バンダールランボンへ移動	バンダールランボン
11	12月01日	(水)	バンダールランボンージャカルタ移動	ジャカルタ	バンダールランボンージャカルタ移動	ジャカルタ
12	12月02日	(木)	資料整理			
13	12月03日	(金)	水資源省およびJICA専門家へ報告後、ジャカルタ発	機中泊	水資源省およびJICA専門家へ報告後、ジャカルタ発	機中泊
14	12月04日	(土)	成田着		成田着	

面会者リスト

1. インドネシア政府

Ir. Soenarno M.Sc	Director of BINA Program, DGWRD
Ir. Kusbandoro Dip.HE	Section Chief of BINA Program, DGWRD
Ir. Graita Sutadi,M.Sc	Project Manager of PWS Bengawan Solo
Ir. Budi Harjo	Staff of PWS Bengawan Solo
Drs.Wuryanto	Assistant Administration of PWS Bengawan Solo
Ir.Ach.Soejono	Balai Pengelolaan Sumberdaya Air Wilayah Sungai B Solo Bojonegoro
Ir.H.Waidi	Balai Pengelolaan Sumberdaya Air Wilayah Sungai B Solo Bojonegoro
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2. 日本大使館

河内 幸男	一等書記官
-------	-------

3. JICA

中野 実	JICA 専門家
Hironori Ogata	JICA 専門家
吉成 安恵	Assistant Resident Representative,Indonesia Office

収集資料リスト

LOWER SOLO FARMERS PARTICIPATORY
AGRICULTURAL DEVELOPMENT PROJECT

1. JAWA TIMUR DALAM ANGKA 1997, East Java In Figures 1997
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19. Struktur Organisasi Proyek Pab. Bengawan Solo
20. Map Wilayah Sungai Bengawan Solo Hilir
21. Map Peta Rencana Identifikasi Waduk 2 Di Daerah Aliran Bengawan Solo Skala 1:250.000

22. Map Peta Wilayah Kerja Cabang Dinas P.U Pengairan Daerah Bojonegoro Skala 1:250.000
23. Map Propinsi Daerah Tingkat I Jawa Timur Rencana Pemanfaatan Ruang Tahun 2011/2012 Skala 1:250,000
24. Map · Peta Situasi 2 · Peta Situasi 3 · Peta Situasi 4 · Situasi Emsung Tambakromo

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MEDIUM SCALE AGRICULTURE DEVELOPMENT PROJECT
FOR PORVERTY AALEVATION TO FARMERS IN WEST LAMPUNG

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10. Daftar Nomor Kode Dan Nama Wilayah Adminigrasi Legenda 1:450,000

収集資料リスト

Map (Small)

Dinas Pekerjaan Umum Pengairan Daerah Propinsi Daerah Tingkat I Jawa Timur

- 1 Peta Daerah Pengairan Madura
- 2 Peta Daerah Pengairan Pekalen Sampean Bondowoso
- 3 Peta Daerah Pengairan Pekalen Sampean Banyuwangi
- 4 Peta Daerah Pengairan Pekalen Sampean Lumajang

- 5 Peta Daerah Pengairan Kediri
- 6 Peta Daerah Pengairan Brantas Malang
- 7 Peta Daerah Pengairan Brantas Mojo Kerto
- 8 Peta Daerah Pengairan Jombang
- 9 Peta Daerah Pengairan Bojonegoro
- 10 Peta Daerah Pengairan Madiun

Map (Big)

1. Peta Pengembangan Sumber Daya Air
2. Pemerintah Propinsi Daerah Tingkat I
 - 1) Peta Kepadatan Penduduk Tahun 2005
 - 2) Peta Arah Sistem Prasarana
 - 3) Peta Administrasi Dan Pemukiman Di Propinsi Lampung
 - 4) Peta Deliniasi Bencana
 - 5) Peta Arah Penataan Kawasan Lindung
 - 6) Peta Arah Penataan Kawasan Strategis
 - 7) Peta Arah Sistem Permukiman/Perkotaan
 - 8) Peta Pusat Pertumbuhan
 - 9) Peta Penyebaran Bahan Galian Golongan C
 - 10) Peta Arah Kawasan Produksi
 - 11) Peta Ariran Barang Eksport Import Arus Penumpang Dan-Barang Konsumsi
 - 12) Peta Jaringan Prasarana Yang Ada
 - 13) Peta Kawasan Budidaya Dan Non Budidaya
 - 14) Peta Tata Guna Hutan Dan Kesepakatan Tahun 1990
 - 15) Peta Penduduk Kota Pertumbuhan Kota Dan Pertumbuhan Dan Share Tenaga Kerja
 - 16) Peta Pemanfaatan Lahan Saat Ini
 - 17) Peta Arah Sistem Transportasi
 - 18) Peta Rencana Pengukuhan Dan Penatagunaan Hutan(Tata Guna Hutan Kese pakatan)Propinsi Dati I Lampung Skala 1:250,000
 - 19) Diterbitkan Olen Direktorat Janderai Inventarisasi Dan Tata Guna Hutan Tahun 1990
 - 20) Propinsi Daerah Tingkat I Lampung Sistem Dan Keseuaian Lahan Sekala 1:500,000 Sumber Data Peta Report Tahun 1988
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