

## 8. 評価結果総括

### 8-1 評価の総括

当プロジェクトは、過去 100名におよぶ隊員の畜産分野への投入が行なわれた結果形成されたプロジェクトであり、それぞれの「点」での活動を結び付け、方向性を見出し、「面」としての活動が展開されている。継続した隊員の地道な活動は実施機関の関係者（畜産局長から、現場の技術師まで）から高い評価を得られるようになった。また、農業組織、現場の状況の確実な把握はプロジェクト形成において、その効果的な実施体制及び組織整備を可能としている。協力隊員は常にカウンターパートと共に問題解決の努力を行なっているが、双方の協力は協力隊活動の原点と言ってよいであろう。

プロジェクトは農民の収入の増加を家畜人工授精による牛・水牛の改良及び飼養技術の向上を通じ行なうことを目的としている。活動範囲は大変に広範囲にわたっており、全国に13ある地域の3地域（3、7、10地域）17州にわたっている。授精業務が行なわれている市、Municipalityと呼ばれる町は当初37であったものが5年後に120を超えている。プロジェクト開始前は2,000件に満たなかった授精件数は10,000件に近づき（1993年に9,764件）5倍増となり授精師も38名から86名に増加している。

この普及の急激な拡大が可能となったのは業務実施組織の整備・体制が強化され、かつ機能していたからである。プロジェクトに配置されている人員はすべて農業省職員であるが（地方自治法施行後は州、市、町職員も含まれる）、これらの人員をまとめ上げ、目標達成の意識を向上させる為に協力隊員及びカウンターパートは多くの努力を行なっている。この地道な活動こそがプロジェクトの組織力の強化となっていることは言うまでもない。

プロジェクト開始当時は非協力的な管理者が多く、地域合同評価会において、また州レベルの評価会において多くの問題が投げかけられていたようであるが、本調査で明らかになったことは、すべての地域の事務所及び行政職員がプロジェクトのインパクトを理解するようになったことである。現在は、同様のプロジェクトの要請があいついで出てきており、それにどのようにして対応するかが問題になりつつあるようである。

#### (1) プロジェクト目標の設定

プロジェクト目標の設定はその内容の修正が加えられた結果まとまりのないものとなっているが、当初の設定に無理があった結果で、その修正は適切であったと言ってよいと思われる。

#### (2) 目標達成率

目標設定は会計年度終了前に次年度の目標値に修正が加えられ新たに設定されているが、この平均目標達成率は8割を超えており、満足のいく結果である。

### (3) 投入

日本側及び比側の投入は比側の予算措置が不足しているが、その他は計画通り行なわれている。

### (4) 効果

プロジェクトの効果は牛・水牛の改良と改良された産仔の高値売却、改良された牛・水牛からの乳生産量の増加による収入増加、人工授精師の技術の向上及びその社会的地位の向上、労働意欲と意識の向上のみでなく、受胎率の算出が可能となった事による家畜人工授精業務の信頼度が明確にされ、それを行政当局が理解しはじめたところにもある。1993年から1998年まで実施される中期開発計画での家畜人工授精業務の重要性が取り上げられ、積極的に利用する方向付けが行なわれたことは当プロジェクトの家畜人工授精が高く評価されたためと思われる。

### (5) 自立発展性

家畜人工授精業務は、プロジェクト開始以前から行われており、業務が消滅することはあり得ない。フィリピン政府の中期開発計画に家畜人工授精が重点項目として取り上げられており、比政府がこの政策を実行する場合、授精師の技術研修実施と組織整備が困難であることが予想されるが、当プロジェクト展開地域ではその実施体制は整備されている。フィリピン政府が家畜人工授精強化政策を押し進める場合、本プロジェクトの体制を参考にすると予想される。

### (6) 協力の必要性

比国は1986年にマルコス政権が崩壊し、アキノ政権では「負の遺産」の解消に力がそそがれたが、ラモス新政権が誕生した現在、治安状況、電力状況も回復し、開発への道付けが行われたところである。畜産セクターの家畜改良増殖分野においても当プロジェクトによりその基盤整備がなされたところである。家畜改良増殖は長期的展望が必要な分野であるため、地道であるが故に確実でより実りが大きい協力活動を通じた支援が必要であろう。

## 8-2. 取るべき措置

### (1) 輸入消耗品の段階的な比側への移行の実施

本件は1992年の中間評価時に調査団の指摘があったにもかかわらず、93年は改善されていない。これに対し畜産局長はプロジェクト終了が予定されている1994年7月以降の凍結精液生産及び授精業務を継続する為に、137万ペソを畜産局の一般予算に取り入れることを約束している。今後プロジェクトの延長を交渉する場合、全額ならば問題は全くないが、少なくとも段階的に移行し、その報告をプロジェクト延長の条件とする必要があり、調査団派遣時の調査項目に加えるべきであろう。

### (2) NABCの移転先の決定ならびにプロジェクト事務所としての機能の継続

NABCが設置されているアラバン種畜牧場が売却されNABCは移転する事になるが、現在移転先は決定していない。プロジェクト延長にあたり、NABCにプロジェクト事務所が置かれており、コンピュータ、その他の機材及び人員が配置されており、移転後の機能の継続はプロジェクト実施に必要不可欠であることを比側当局に伝える必要があると共にプロジェクト延長に関する条件とすべきである。

### (3) 計画の策定について

延長期間の目標設定、活動計画策定は日比両国でタスクフォースを組み、実施することが必要である。このメンバーとして、州及び家畜人工授精地域調整員、NABC所長、シニア隊員及び一般隊員、さらに技術的指導として、JICAの専門家レベルの派遣(1ヶ月程度)が必要である。また延長期間の活動として調査業務が重要となるが、調査にかかる経費負担は地方政府にとっては困難を極めることが予想され、農業省のKR-2予算の使用が望まれることから、延長の条件として比側と交渉することが必要である。

### (4) JICAフィリピン事務所の支援体制の強化

当プロジェクトは協力隊のプロジェクトであるが、予算、規模、プロジェクト実施範囲の大きさから、その業務責任は大きく、定期的な担当者会議が必要でありJICA事務所の協力隊担当(次長及び調整員)に加え、農業省担当JICAスタッフもメンバーに加わり、少なくとも半期毎の会合を行なうべきであろう。

### (5) 協力隊事務局の支援管理体制の強化

プロジェクトの円滑な運営、プロジェクトの評価、問題点の把握と対策、事務局の方針決定等のためには、事務局内でプロジェクト支援委員会を組織し、開催することが必要である。さらに巡回指導及びコンサルタントを利用した評価調査団を少なくとも1年に1回は派遣することが必要であろう。

また、技術的指導において畜産の育種・繁殖分野の国際協力専門員に定期的な報告書の評価、資料分析を依頼し必要時に指導して行く体制を整えることが必要である。これは協力隊レベルの技術には限界があることからその方向性を導く為である。

プロジェクトに派遣される隊員候補生にはプロジェクトオリエンテーションがプロジェクトのメンバーとしての意識を高める為に必要である。必要資料等の配布も非常に重要であるが、その体制は整備されておらず、早急に体制を整えるべきであろう。

### 8-3. 教訓

#### (1) チーム派遣事業のあり方

協力隊の目的である地域住民と一体となった協力隊活動は協力分野の選定、人材の発掘、現状の分析等の細密な情報の提供を可能としている。当プロジェクトの様に20年近い同分野の職種隊員の派遣があり、しかも中央組織への4代にわたるシニア隊員の派遣が行なわれた結果、隊員は畜産セクター全体の視野の広がりを持つようになった。さらに比国の畜産隊員は年2回の健康診断時に隊員が全員集合することを利用し、畜産ミーティングを開催し、そのつど議事録の作成・出席者の感想等をまとめており、年1回は篤農家や種々の農場、視察研修を行ない、その報告書をJICA事務所へ提出してきた。このような活動がすべて当プロジェクト開始の基礎となっていたことは言うまでもない。

チーム派遣プロジェクトはその発掘形成に時間が必要とされるであろうが、その実施は真に効果のある成果が期待できる、すばらしい潜在性を持つものである。

以下当プロジェクトより学んだその発掘、形成の条件をまとめる。

##### ① 業務実施中央組織へのシニア隊員の派遣

- ・このシニアは同国の同分野経験があることがのぞましい。
- ・シニア隊員は業務担当組織を確実に把握し、国家開発計画の中で業務の位置付けを明確にし、業務調査を行なう。その後、プロジェクト実施に向けた戦略を作成する。

##### ② 隊員が派遣されていない地域は避ける。可能性のある地域・分野に派遣されていない場合は派遣し（要請を上げる）状況を確認、または協力隊事業の理解を深める。

##### ③ 人材の発掘、チーム派遣プロジェクトに限らず技術協力は「人」が基本であり、意欲のある、かつ、信頼できるつながりが無い事には成功しない。協力隊の最大の効果は人材を発掘できるところにあり、優秀な、信頼できる人材を探し、業務協力をあおぐ。

##### ④ 在外事務所、協力隊事務局内の国内支援体制整備による支援

プロジェクト形成はシニア隊員とC/Pのみでは困難な事が多く、技術顧問または、専門家（協力隊OBが望ましい）による技術支援と、プロジェクト管理における在外事務所及び国内支援体制整備の機能と位置付けを明確にする。

### 8-4 提言

比国の中期農業開発計画での畜産分野は第2位に重点が置かれており、その中で牛の改良増殖は最も優先度が高い。開発計画終了時の1998年に牛の頭数を3百万頭に増殖する目標設定は現実的でないかも知れないが、この方針により比国畜産業は進められていくことは間違い無い。牛・水牛の増殖は自然交配もしくは人工授精により行なわれるが、人工授精業務はさらに強化されていく分野であり、この期間のプロジェクトの位置付けは大変重要でありタイムリーと言えよう。当プロジェクトは今後事務局、在外事務所の積極的な支援を必要としており、その体制整備に事務局の体制を

整える必要がある。

協力隊事業において、よりインパクトのある効果をねらうためには協力隊事業の国別援助実施指針、または、国別事業実施基本計画等を作成する必要がある。事業方針は要請に応じる事ではなく要請を選択することであるが、隊員の投入量の増加方針がある場合、益々援助戦略が必要とされると考えられる。この際、単なる協力隊員の派遣でなく、資金、機材等もその方向性に沿ったレベルの規模が必要となって来ることと思われる。今後協力隊事業のさらなる発展と、被援助国の地域社会の向上を望む。

## 附 屬 資 料



## 附 属 資 料

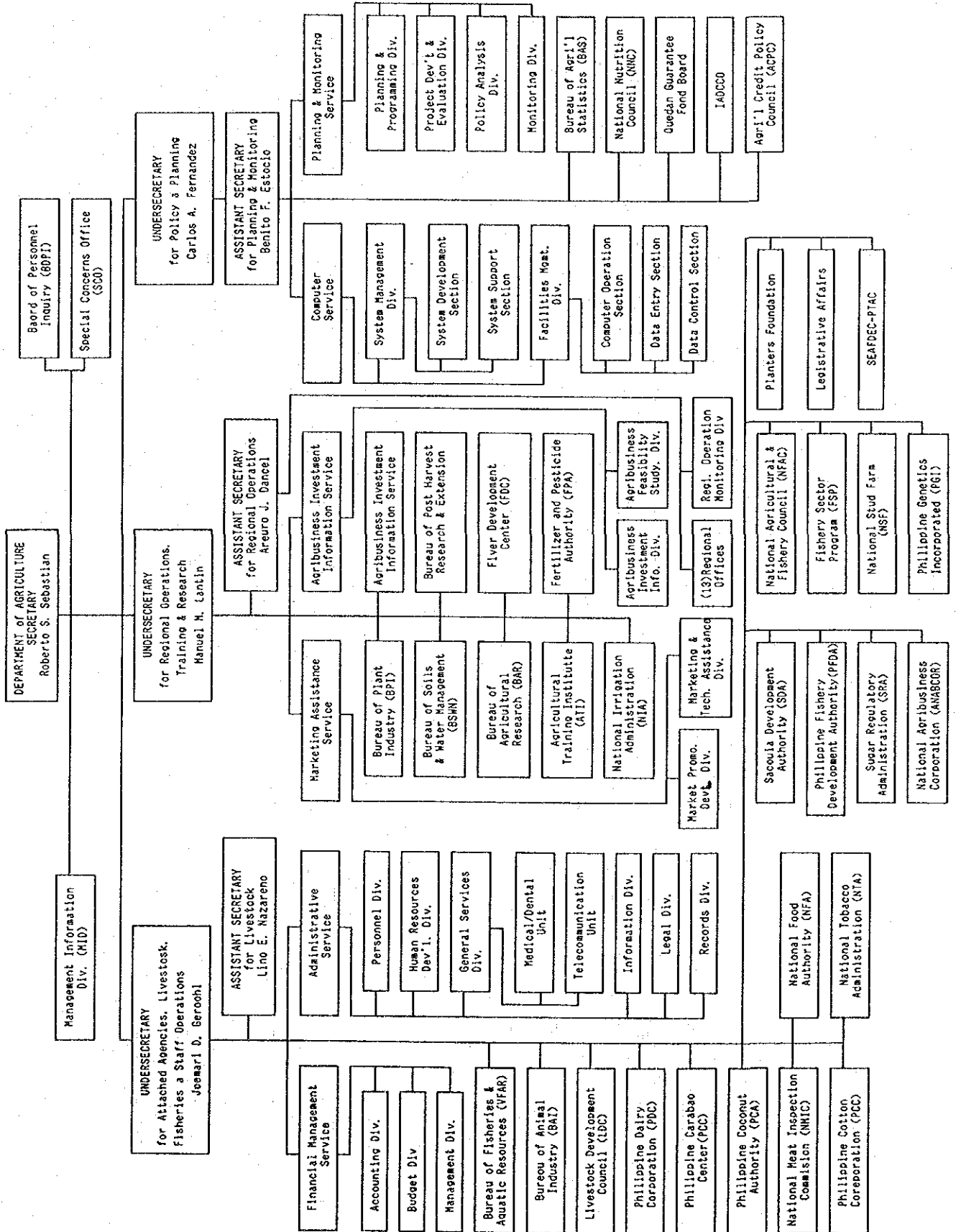
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1. 当初のログフレーム

プロジェクトの要約	指標	指標データ入手手段	外部条件
<p>I. 上位目標</p> <p>1. 地方農家の生産性と収入が増加される。</p>	<p>1-1. 人工授精の産子が自然支配のものよりも優秀かつ高価であると証明される。</p>	<p>1-1. フィールド調査 1-2. アンケート調査</p>	<p>・農家が繁殖牛を飼育し続ける。</p>
<p>II. プロジェクト目標</p> <p>1. 農家の大型家畜（牛・水牛）の飼養知識・技術が向上される。</p>	<p>1-1. 飼料作物植付が定着する。 1-2. 乾期の栄養改善が行なわれる。 1-3. 分娩間隔が3年2産となる。</p>	<p>1-1. フィールド調査/定期報告書 1-2. フィールド調査/報告書 1-3. フィールド調査/報告書</p>	<p>・牛、水牛の市場価格が現在より悪化しない。</p>
<p>III. 成果</p> <p>1. 人工授精サービスが改善される。</p>	<p>1-1. 人工授精頭数が5年間で2,141 から14,889となる。 1-2. 受胎率が5年間で70%に増加する。 1-3. 妊娠鑑定を授精師が5年間で80%の授精牛に対して行なう。 1-4. 精液の不足が1年後には解消される。 1-5. 必要消耗品の不足が無くなる。 1-6. 報告書内容が正確にまた、遅れずに提出される。 1-7. 人工授精産子の登録が行なわれる。</p>	<p>1-1. 定期報告書 1-2. 定期報告書 1-3. 定期報告書 1-4. 定期報告書 1-5. フィールド調査 1-6. 定期報告書 1-7. 報告書</p>	<p>・行政・組織改革があっても授精師の専任業務が継続される。</p>
<p>IV. 活動</p> <p>0. プロジェクト管理/組織の整備と強化を行う。</p> <p>1-1. 授精師の技術訓練を行う。 1-2. 普及教材・ポスター等を作成する。 1-3. 液体窒素の安定供給を行う。 1-4. 優秀な種雄牛の導入を行う。 1-5. 農民セミナーを開催する。 1-6. 定期会合、報告会を開催する。 1-7. 飼料作物普及を行う。</p>	<p>日本側</p> <p>1. シニア隊員 2. 隊員 3. 車両・資機材 4. C/Pの日本の日本での技術研修受入</p> <p>相手国</p> <p>1. プロジェクトマネージャー 2. 地域人工授精調整員 (C/P) 3. 州人工授精調整員 (C/P) 4. 人工授精師 (C/P) 5. 運営経費</p>	<p>投入</p> <p>60人月 528人月 4,600万円 (当初3年間、それ以降は必要分) 毎年数名 60人月 180人月 900人月 16,800人月 (5年間で38名から71名に増加)</p>	<p>・必要機材がタイムリーに調達される。 ・液体窒素の供給が安定して行われる。</p> <p>前提条件</p>

DEPARTMENT OF AGRICULTURE ORGANIZATIONAL CHART



ORGANIZATIONAL CHART (BUREAU OF ANIMAL INDUSTRY)

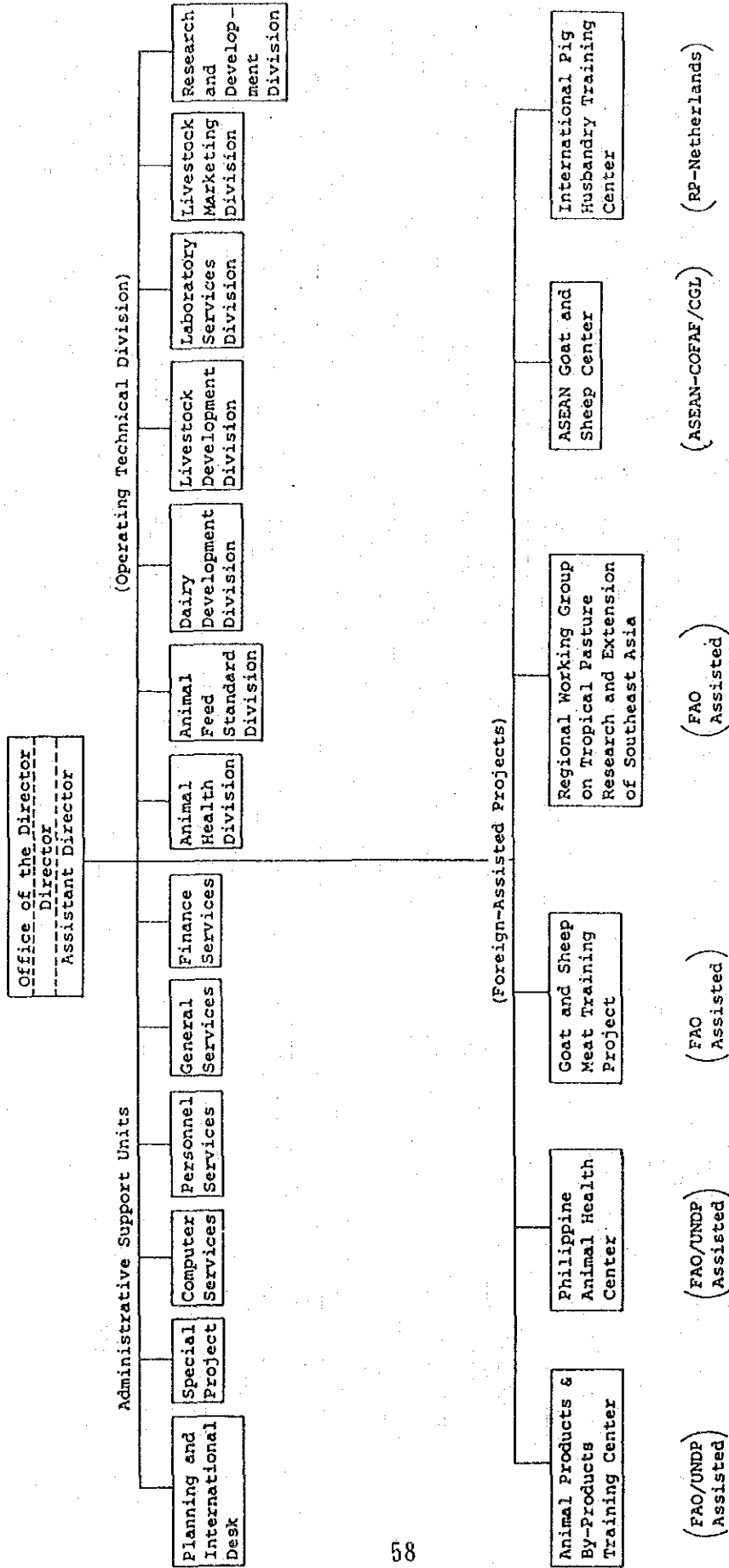


図3-10 フィリピン農業省畜産局組織図

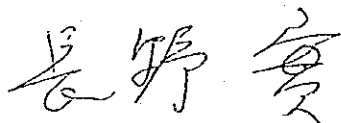
MINUTES OF THE MEETING BETWEEN THE JAPANESE EVALUATION TEAM  
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF REPUBLIC  
OF THE PHILIPPINES FOR THE JAPANESE TECHNICAL COOPERATION  
FOR  
THE STRENGTHENING OF NATIONAL ARTIFICIAL INSEMINATION PROGRAM

The Japanese Evaluation Team (hereinafter referred to as "the Japanese Team") organized by the Japan Overseas Cooperation Volunteers, Japan International Cooperation Agency (JOCV/JICA) and headed by Dr. Minoru Nagano, technical advisor of JOCV/JICA, visited Republic of the Philippines from Jan 21 to Feb 1, 1994, for the purpose of evaluating jointly with the Philippine Evaluation Team the achievement of the Project assisted by JOCV/JICA for the Project on the Strengthening of National Artificial insemination program (hereinafter referred to as "the Project") on the basis of the Agreed Minutes of the Meeting signed on July 27, 1989.

After the Joint Evaluation of the Project, the Japanese Team discussed with the authorities concerned of Republic of the Philippines over the matters for the successful implementation of the Project.

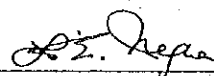
As a result of the discussions, both sides mutually agreed upon the matters referred to in the document attached hereto.

Manila, January 24, 1994



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Dr. MINORU NAGANO  
Leader  
Japanese Evaluation Team  
Japan Overseas Cooperation Volunteers  
Japan International Cooperation Agency  
Japan



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Mr. LINO E. NAZARENO  
Assistant Secretary  
Department of Agriculture  
Republic of the Philippines

THE ATTACHED DOCUMENT

1. Recognition of the Joint Evaluation Report

The Joint Committee recognize the Joint Evaluation Report submitted by both Evaluation Teams.

2. Input to the Project during the cooperation from Jan 24 to July 27, 1994

(1) Japanese side

1) Assignment of JOCV Volunteers

9 JOCV Volunteers are continuously assigned to their respective sites until the termination of their contract.

2) Acceptance of counterpart personnel for the training in Japan.

3 personnel are currently under technical training and an additional 5 personnel are recommended for 1994 slot.

3) Provision of the vehicle and/or equipment

The vehicle and equipment will be provided in accordance with the plan with in the budget.

(2) Philippine side

1) To take necessary measure in accordance with AGREED MINUTES OF THE MEETING.

2) To take appropriate action to agencies concerned for the continuation of the program affected by the excution of the Local Government law.

3. Request from the Philippine Side

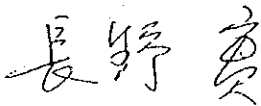
On the basis of the Joint Evaluation Report, the Philippine side strongly requested the Japanese side to take subsequent actions to further facilitate extension of the program in the field of improvement of large animal rasing technology of farmers, strengthening of surbey which proves the impact of AI, technology tranfer to AI/Laboratory technician and extension of AI services.

MUTUALLY ATTESTED AND SUBMITTED

TO ALL CONCERNED

January 24, 1994

Manila, Philippines



MINORU NAGANO

Leader

Japanese Evaluation Team  
Japan Overseas Cooperation Volunteers/  
Japan International Cooperation Agency



LINO E. NAZARENO

Assistant Secretary  
Department of Agriculture



VIRGINIA P. DAVIDE

Director  
Phil. National Volunteer Service  
Coordinating Agency

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## I. INTRODUCTION

### 1. The Evaluation Team

With about only six (6) months left until the termination of the cooperation period of the Strengthening of the National Artificial Insemination Program (hereinafter referred to as the Program) on July 27, 1994 as stated in the Agreed Minutes. The Japanese Evaluation Team organized by the Japan Overseas Cooperation Volunteer/Japan International Cooperation Agency (hereinafter referred to as JOCV/JICA) and headed by Dr. MINORU NAGANO, Technical Adviser of JOCV Program from Jan. 21 to Feb. 1, 1994 in order to conduct an overall review and evaluation of the performance of the Program.

The Team conducted interviews with JOCVs and the Philippine counterparts assigned to the Program, had a series of discussions with the Philippine Authorities concerned, made field surveys and exchanged views among themselves.

As a result, both sides agreed to submit to their respective Governments a summary of the evaluation and recommendation which is referred to in the documents attached hereto. *h*

(X)

*Signature*

## 2. Members of the Discussion Panel

### EVALUATION TEAM

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MR. SO OHORI

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MR. KHOJI SHIMOKAWA

JOCV Senior Volunteer  
Japan Overseas Cooperation  
Volunteers (JOCV)  
Department of Agriculture, Region III  
San Fernando, Pampanga

### 3. Methodology of Evaluation

In order to evaluate the past performance and achievement both quantitatively and qualitatively, the following items were used;

- a) The Agreed Minutes
- b) The Annual Workplans and Other Documents agreed on or accepted in the course of implementation of the Program.
- c) The Minutes of the DA-JICA Joint Committee Meetings, of Mid-term evaluation.

### 4. Evaluation Criteria

- a) Overall

The evaluation was made for the following two criteria:

- Degree of achievement of the program goal and objectives stipulated in Agreed Minutes

3

- To what extent the Philippine counterparts and volunteers contributed to beneficiaries

b) Details

1) Accomplishment of the Program Target

- Meeting the target (workplan)
- On schedule
- Development of product/process/procedure

2) Development of Manpower

- Number of trained manpower in Japan
- Increasing number of staff working in the program
- Number of local training conducted

3) Research Capability

- Researches conducted
- Report published
- Technical paper published or presented at conferences
- Seminars, courses organized by the program

4) Operation and Maintenance Capability

- Liquid Nitrogen supply and production
- Supply of necessary expenditures capability (before and after execution of local government law)

5) Program Management

- Structure of the program
- Reporting procedure
- Meetings

6) Utilization and Maintenance of Vehicle and Equipment

- Number of vehicle and equipment
- Rate of utilization
- Condition of vehicle and equipment
- Rate of break-down and maintenance

7) Sustainability

- Budget (maintenance and running cost)
- Technical capability
- Extension, expansion and new project

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## II. BACKGROUND AND SUMMARY OF THE PROJECT

### 1. Brief Background of the Project

Low productivity and low profitability are the main problems confronting the cattle and carabao industry. The improvement of the cattle and carabao population with better breeds and the development of the small Livestock raisers through effective extension work, have been very much required over the years.

Artificial Insemination (AI) is an economical and practical method for introduction of upgraded breed. The use of A. I. in breeding programs has been planned and implemented by the government agencies to increase quality carabao and cattle population.

Japan International Cooperation Agency/Japan Overseas Cooperation Volunteers (JICA/JOCV) has cooperated in the field of A. I. since the early 1970's. More than eighty (80) JOCV Volunteers have taken part in the promotion of the A. I. technology towards high farm profitability.

The Strengthening of the National Artificial Insemination Program has been started on July 27, 1989 for the upgrading of farmers technology in raising large animal through the promotion of proper breeding technology in cattle and carabao by joint efforts among the Department of Agriculture (DA), the Philippine National Volunteers Service Coordinating Agency (PNVSCA), and the Japan Overseas Cooperation Agency/Japan International Cooperation Agency (JOCV/JICA).

### 2. Project Site

#### NATIONAL ARTIFICIAL BREEDING CENTER (NABC)

Region III - PAMPANGA, BULACAN, NUEVA ECIJA, TARLAC,  
ZAMBALES, and BATAAN (6 Provinces)

Region VII - CEBU, BOHOL, NEGROS ORIENTAL, SIKUIJOR  
(4 Provinces)  
DUMAGUETE SEMEN PROCESSING CENTER *R*

Region X - MISAMIS OCCIDENTAL, BUKIDNON, MISAMIS  
ORIENTAL, AGUSAN DEL NORTE, AGUSAN DEL SUR,  
SURIGAO DEL NORTE, CAMIGUIN (7 Provinces)  
MALAYBALAY REGIONAL SEMEN PROCESSING CENTER

### 3. Objective and Areas of Cooperation

#### (1) Objective

To upgrade the level of technology in raising large animal (cattle and carabao) through effective artificial insemination.

#### (2) Areas of Cooperation

- a. The program will be implemented in accordance with the implementation plan.
- b. The program will provide the necessary equipment, vehicles, spare parts and others for the implementation of the program.
- c. An evaluation and assessment of the progress of the program shall be jointly undertaken in the field of AI services.

### 4. Work Plan

The technology of AI shall be the primary tool for the implementation of the national breeding program. Quality AI services are increased by full time technicians with upgraded mobility in the three (3) targeted areas. A regular accomplishment report shall be submitted to NABC through the coordination of the Regional Office for enhancing the monitoring system. Every accomplishment is evaluated in the Annual National Project Management Committee meeting.

To support this program, the semen production facilities at NABC, malaybalay Stock Farm and Dumaguete Regional Semen Processing Center shall be upgraded and improved.

Realizing the importance of an effective information dissemination to both technicians and farmer beneficiaries, the program shall embark on massive educational campaign. Key technicians of the program shall be recommended to a technical training in Japan. Barangay seminars for farmer beneficiaries shall be conducted regularly. An AI manual, a Sire Catalogue and Extension Kits are published and distributed.

A registry of AI offspring shall be implemented to collect the data in connection with bull performance evaluation. Pasture development shall be encouraged and specific researches regarding feed preservation during dry season shall be promoted.

Proper coordination among participating agencies shall be done to solicit full cooperation. By this, it is envisioned that the foundation of the program will be established through concerted efforts of all concerned parties.

### III. RESULT OF EVALUATION

#### 1. INPUTS

##### 1-1. INPUTS OF JAPANESE SIDE

###### (1) Dispatch of JOCV Volunteers

A total of twenty one (21) JOCV Volunteers has been dispatched to the program in accordance with the request. List of the dispatched JOCV Volunteers is shown in the accomplishment report.

###### (2) Provision of instruments and equipments

Thirty seven million (P 37M) worth of instruments and equipment was provided to the program since the beginning until the end of fiscal year 1993 as shown in the accomplishment report.

###### (3) Technical Training in Japan

Twenty (20) personnel related to the program have visited Japan under Prefectural Technical Training programs. Three (3) ex-trainees attended to the refresher training course in Japan. List of

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signature

participants and training course is shown in the accomplishment report.

(4) Others

JOCV/JICA missions were dispatched to the program to review and discuss on technical matters in connection with the implementation of the program. The Mid-term evaluation team was sent last Dec. 1992.

1-2. THE PHILIPPINE SIDE

(1) Provision of Land, Building and Facilities

Land, buildings and facilities essential for the implementation of the program were provided by the Department of Agriculture.

(2) Designation of AI Coordinator and Field AI Personnel

three (3) Regional AI Coordinators and twelve (12) Provincial AI Coordinators have been designated to coordinate and supervise the program. Eighty six (86) field AI personnel has been assigned to the program on full time basis.

(3) Allocation of Budget

P 29 million (Y 116 million) for running the Project during the past five (5) years. KR-II funding is expected to be disbursed until the termination of the program and even after the assistance of JOCV/JICA. Actual Budgetary Disbursement is shown in the accomplishment report.

2. OUTPUTS

2-1. Extension Work



(1) AI Services

A total of 34,980 heads of animals were artificially inseminated in the three (3) Regions. This figure represents 51% of the National Accomplishment, (68,535 heads).

(2) Pregnancy Diagnosis

The scope of pregnancy diagnosis (PD) which had not performed significantly has been increased to 80% of the total no. of animals inseminated during the period.

(3) Conception Rate (CR) and Calf Drop (CD)

The average conception rate shows 58% from 1989 to 1993. Nine thousand seven hundred eighty one (9,781) heads of actual calf drop were reported by field technicians.

2-2. Frozen Semen Production

(1) Semen Donor

Seventeen (17) beef type bulls, six (6) dairy type bulls and one (1) Murrah Buffalo were allocated to increase the semen production for the Semen Processing Centers.

(2) Semen Processing

318,792 doses of frozen semen were produced at the three (3) Semen Processing Centers for five (5) years period.

2-3. Information Dissemination

(1) Artificial Insemination (AI) Manual

The manual of the AI in large ruminant was published as the practical and simple guide to the field Technicians on the basis of scientific theory.

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(2) Extension Kits

The Philippine Sire for AI Catalogue Posters have been printed and provided to the field to improve the system of information dissemination in the implementation of the program. Six (6) AI promotion video tapes were produced through utilization of audio visual paraphernalia.

(3) Seminars

Three hundred fifty nine (359) seminars have been conducted to uplift the knowledge on breeding and livestock raising in the farmers level.

2-4. Forage Development

(1) Researches

Introduction of practical researches on improvement of existing grass land with productive grass species and specific crops were initially conducted at Lot 184 Malaybalay Stock Farm and Siquijor Breeding Center.

(2) Forage Conservation During Dry Season

Forage conservation method such as silage making has been demonstrated with the participation of the farmers cooperatives.

2-5. Transfer of Technology

Field AI personnel and laboratory technicians were motivated to improve their technical skills and to boost interest in breeding development through day to day cooperation activities and attendance of the technical seminars.

Ex-trainee in Japan and JOCV Volunteers also successfully transferred technology to counterparts.

2-6. Research Activities

(1) Embryo Transfer (ET) and In-vitro Fertilization (IVF)

Researches on ET and IVF were initiated at National Artificial Breeding Center. Several trials conducted showed great chances of success.

(2) Paper Presentations

Scientific researches which were conducted by personnel involved in the Program have been presented at the Philippine Society of Animal Science (PSAS). Likewise, activities in the field levels were presented in the annual convention of members of Japan Overseas Cooperation Volunteer-Philippine Animal Science Association (JOCV-PASA).

3. Impact of the Program

3-1. Increased Farmers Profitability

The survey comparing the price of six (6) months offsprings from AI with calf drops out of local bulls, indicated the advantage of AI in terms of selling price. About P58,686.00 worth of offsprings based on actual calf drop reported has been contributed to the Livestock Industry through the implementation of the program.

3-2. Strengthened Systematic AI on Breeding Development

Accomplishment in the three (3) Regions shows that it achieved 51% of the overall national figure. Data in pregnancy diagnosis, conception rates and calf drops were reported in line with the regular procedures in the three (3) Regions.

The improvement of monitoring system and procedures of the project has provided the strengthening of the national breeding program with reliable data.

### 3-3. Enhanced Production of Quality Frozen Semen

Semen Processing Technology was greatly improved in terms of quality through the support of modern technology equipments and which were fully utilized. The shortage of frozen semen therefore was almost solved in the field level.

### 3-4. Improved Modern Development

The program has improved the mechanism of the National Breeding Program in terms of manpower development. Technical training has resulted in substantial improvement of technical skills and knowledge of the participants as well as the provision of the several methods on livestock development.

## 4. Prospects for Sustainability

### (1). The Organizational Aspect

The program has been recognized by the government officials as a vital and indispensable strategy in breed improvement. Although the main function of the extension services has been devolved from the Department of Agriculture (DA) to the Local Government Units (LGUs), the program was able to play significant role on livestock development with proper coordination among concerned agencies.

### (2) The Financial Aspect

The local funds for the Program such as the running expenses and the cost of the necessary AI supplies is continuously allocated. This indicates the acceptance and awareness to support the program by DA and LGUs. However, the provision of equipment is still a problem and needs to be addressed.

(3) The Technical Aspect

The foundation of the AI technology in particular, has been strengthened through five (5) years cooperation period. With regards to forage development and the appropriate selection of semen donors should be further enhanced to accept the AI throughly.

#### IV. CONCLUSIONS

As a result of the joint evaluation work and discussions both panels reached the following conclusions:

1. Most activities of the program have been conducted in accordance with the objectives And work plan mentioned in the Agreed Minutes of the meeting.
2. The Program has contributed to strengthen the fundamental strategy of the development of a National Livestock Industry.
3. The survey on the farmers profitability, that was conducted so far may not be enough to thoroughly prove the offspring of AI to be more profitable. Continued monitoring on this aspect shall be undertaken.
4. A methodology for monitoring offsprings from AI was not uniformed due to the short studies about mechanism of the bull performance test.
5. Execution of the local government law attached the operation of the program and LGUs still need strong support from DA.

#### V. RECOMMENDATIONS

Recommendation to the Philippine Side

The Evaluation Team recommends to the Philippine Government side the following indispensables in the further implementation of the Program:

(1) Smooth Budgetary Disbursement

In accordance with the Minutes of Discussion, the Bureau of Animal Industry (BAI)/Department of Agriculture (DA) shall provide the necessary AI supplies as soonest.

(2) Ensure Sustainability of the Quality of AI Services

To ensure continued quality AI services in the field, close coordination between DA and LGUs shall be strengthened.

(3) Continuous Deployment of JOCV Volunteers

PNVSCA shall continue to accommodate the request for JOCV Volunteers by DA and LGUs. *f*

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RECOMMENDATIONS : TO JICA

The progress for the Artificial Insemination Program of the Department of Agriculture through the Bureau of Animal Industry strongly recommends for the extension of the technical cooperation period proportional to the implementation of the Medium-Term Livestock Development Plan (1993-1998) and the expansion of project services to other Regions of the country, to include Key Livestock Development Areas (KLDAS).

The MTLDP envisions marked increase in livestock population and an intensive Artificial Insemination Program is deemed necessary to further assure self-sufficiency in food supply from animal origin.

The extension and expansion of the project as recommended shall enable the Philippine counterpart to improve the learned technology and, consequently, transfer it for more beneficial results. Further studies are likewise necessary to gain additional knowledge in new fields such as Progeny Testing, Bull Performance Testing and possibly Embryo Transfer. These methods shall enable us to raise better quality of livestock through improved breeding efficiency, not only in beef cattle but also in dairy animals.

Parallel to the assistance extended in terms of equipment, vehicles, supplies, manpower development and technology transfer is the appropriate strengthening of the project monitoring and evaluation capability as well as the improvement of forage and pasture as sources of animal feeds.

As evidenced by the accomplishment and contribution of the program as well as its forseen vital role in the betterment of the National Livestock Industry, it is thus perceived to be an integral part of the National Medium-Term Livestock Development Plan. *f*

*(S)*

*W. P. ...*

AGREED MINUTES OF THE MEETING BETWEEN THE JAPAN INTERNATIONAL  
COOPERATION AGENCY AND THE DEPARTMENT OF AGRICULTURE ON  
STRENGTHENING OF NATIONAL ARTIFICIAL INSEMINATION PROGRAM  
MANILA, PHILIPPINES: JULY 27, 1989

1. INTRODUCTION

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), Philippines represented by Mr. Moriya Miyamoto exchanged views with the representatives from the Department of Agriculture (hereinafter referred to as "DA") on the possibilities of intensification of technical cooperation through the Japan Overseas Cooperation Volunteers (hereinafter referred to as "JOCV") program of JICA for the Strengthening of the National Artificial Insemination Program (hereinafter referred to as "The Program").

Through a series of discussion, both sides mutually agreed on the implementation arrangements of the program.

The main matters of the mutual agreement are as follows:

2. GOAL:

To increase farm profitability and income through introduction of improved technologies.

3. OBJECTIVES:

To upgrade the level of technology in raising large animal (cattle and carabao) through efficient artificial insemination (hereinafter referred to as "AI") services.

4. AREAS OF COOPERATION FOR THE SUCCESS OF THE OBJECTIVES:

- a) The program will be implemented in accordance with the implementation plan which is given in Annex I.
- b) The program will provide the necessary equipment, vehicles, spare parts and others for the implementation of the program.
- c) An evaluation and assessment on the progress of the program shall be jointly monitored through the field AI services.

5. UNDERTAKINGS OF JICA:

JICA shall take the following measures for the implementation of the program:

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- a) To dispatch JOCV Volunteers upon the official request from DA through the Philippine National Volunteer Service Coordinating Agency (hereinafter referred to as "PNVSCA").
- b) To pursue technology transfer to the Philippine counterparts in the course of the implementation of the program.
- c) To provide the necessary equipment, vehicles and spare parts for the implementation of the program within the budgetary allocation of the Government of Japan.
- d) To accept Philippine Counterparts for the technical training in Japan.

6. UNDERTAKINGS OF DA:

DA shall take the following measures for the implementation of the program:

- a) To meet running expenses necessary for the implementation of the program.
- b) To provide sufficient maintenance, fuel and oil to vehicles assigned to the field AI personnel and JOCV Volunteers.
- c) To provide travel expenses and other allowances necessary to field AI personnel and JOCV Volunteers in discharge of their duties.
- d) To designate all field AI personnel who are involved in AI services to be on full time basis.
- e) To assign full time counterparts to JOCV Volunteers.
- f) To provide orientation training to newly arrive JOCV Volunteers at the National Artificial Breeding Center and travel allowances for project site visitation.
- g) To provide the handling and transportation expenses of equipment, vehicles, and spare parts from NABC to the Regions.
- h) To bear operational and maintenance cost of equipment, vehicles, and spare parts.

7. PROJECT SITE:

Both sides selected the following project sites. Specific areas for implementation are given in Annex 2.

National Artificial Breeding Center (NABC) -- Central  
Regions 3, 7 and 10 -- Regional

8. DISTRIBUTION OF EQUIPMENT, VEHICLES AND SPARE PARTS

a) Distribution of equipment, vehicles and spare parts provided by JICA will be done through NABC.

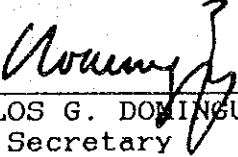
9. TERMS OF COOPERATION:

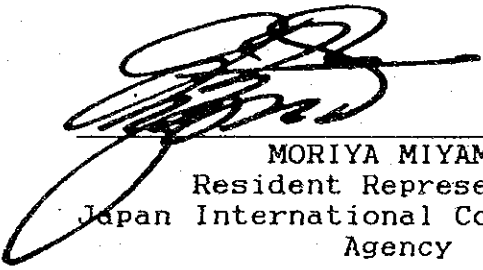
The duration of the technical cooperation for the program will be five (5) years from July 27, 1989 to July 27, 1994.

10. CONSULTATION:

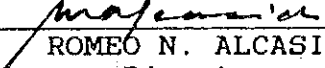
JICA and DA shall consult with each other in respect of any matter that may occur from or in connection with the program.

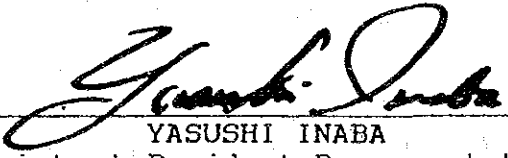
Signed by the two parties on July 27, 1989.

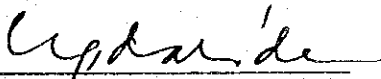
  
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CARLOS G. DOMINGUEZ  
Secretary  
Department of Agriculture

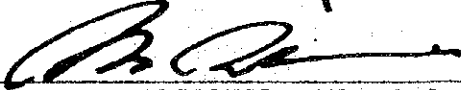
  
\_\_\_\_\_  
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Resident Representative  
Japan International Cooperation  
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W I T N E S S

  
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VIRGINIA P. DAVIDE  
Director  
Philippine National Volunteer  
Service Coordinating Agency

  
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MUNEHIRO MISHIMA  
Senior Volunteer  
Japan Overseas Cooperation  
Volunteers


MINUTES OF THE MID-TERM EVALUATION MEETING AMONG THE EVALUATION TEAM OF THE JAPAN OVERSEAS COOPERATION VOLUNTEERS/JAPAN INTERNATIONAL COOPERATION AGENCY, THE DEPARTMENT OF AGRICULTURE AND THE PHILIPPINE NATIONAL VOLUNTEER SERVICE COORDINATING AGENCY ON THE STRENGTHENING OF THE NATIONAL ARTIFICIAL INSEMINATION PROGRAM

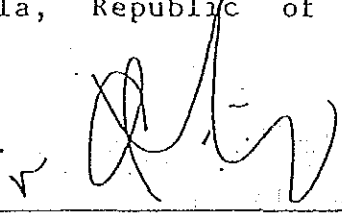
The Japanese Evaluation Team, organized by the Japan Overseas Cooperation Volunteers/Japan International Cooperation Agency (hereinafter referred to as JOCV/JICA) headed by MR. HIDEKAZU KUMANO, Director of the First Overseas Assignment Division JOCV/JICA Headquarter has been dispatched to the Republic of the Philippines from December 3 to 12 1992 to evaluate the progress and achievements of the Strengthening of the National Artificial Insemination Program (hereinafter referred to as the Program)

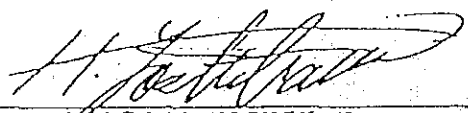
The Evaluation Team had a series of discussion with Department of Agriculture (hereinafter referred to as DA) and Philippine National Volunteer Service Coordinating Agency (hereinafter referred to as PNVSCA) concerned in respect of the on-going technical cooperation for the program.

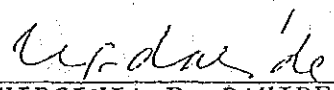
The result of discussions are hereto attached.

Done in Makati, Metro Manila, Republic of the Philippines on December 11, 1992.

  
HIDEKAZU KUMANO  
Leader, The Evaluation Team  
Japan Overseas Cooperation  
Volunteers  
Japan International Cooperation  
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PHILIPPINE NATIONAL VOLUNTEER SERVICE COORDINATING AGENCY

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JOCV/JICA PHILIPPINES

MR. HIROFUMI YOSHIKAWA

Resident Representative  
Japan Overseas Cooperation  
Volunteers

MR. HITOSHI OTOMO

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Volunteers

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Senior Volunteer  
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## I. PROGRAM BACKGROUND

The strengthening of the National Artificial Insemination Program started with the signing of the record of discussion (R/D) on the said program on July 27, 1989, between the former Secretary of the Department of Agriculture (DA) CARLOS G. DOMINGUEZ, and former Resident Representative of JICA MORIYA MIYAMOTO.

This program was realized, after a long term cooperation between the two countries. The JOCV/JICA has cooperated in the development of livestock industry in the Philippines through Artificial Insemination (AI) since the early 1970's. The deployment of Japanese Volunteers, which assisted in the substantial development of the AI technology, was accepted to be well provided the opportunity to start the program.

Regions III, VII and X were selected to be the target areas of the program and has been implemented through mutual cooperation in the development of technical skills and knowledge on AI between Philippine technicians and Japanese Volunteers. Fourteen (14) JOCV's had the opportunity to join the program with proper coordination of the PNVSICA since the beginning of the program.

The National Artificial Breeding Center (NABC) has played important role as the key agency with regard to the implementation of the program. Apart from the coordination of the program, the NABC processed and distributed the frozen semen requirements of the program. The JOCV/JICA supported the upgrading of the NABC facilities and laboratory equipment as well as the establishment of the Malaybalay Semen Processing Center and the Dumaguete Semen Processing Center which have been considered as satellites of NABC.

The program which is half-way through its five (5) years implementation period, has been generally accepted by farmers and cattle raisers as a pertinent approach to increase animal productivity. In line with the target, the cooperation is continued among program members to bring about successful results.

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## II. PROJECT SITE

### NATIONAL ARTIFICIAL BREEDING CENTER (NABC)

- Region III - PAMPANGA, BULACAN, NUEVA ECIJA,  
TARLAC, ZAMBALES, and BATAAN  
(6 provinces)
- VII - CEBU, BOHOL, NEGROS ORIENTAL, SIQUIJOR  
(4 provinces)  
DUMAGUETE SEMEN PROCESSING CENTER
- X - MISAMIS OCCIDENTAL, BUKIDNON, MISAMIS  
ORIENTAL, AGUSAN DEL NORTE, AGUSAN DEL  
SUR, SURIGAO DEL NORTE, CAMIGUIN  
(7 provinces)  
MALAYBALAY SEMEN PROCESSING CENTER

## III. OBJECTIVE AND AREAS OF COOPERATION

### 1. OBJECTIVE

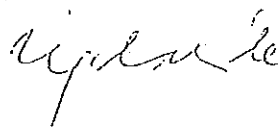
To upgrade the level of technology in raising large animal (cattle and carabao) through effective artificial insemination (hereinafter referred to as AI) services.

### 2. AREAS OF COOPERATION

a. The program will be implemented in accordance with the implementation plan.

b. The program will provide the necessary equipment, vehicles, spare parts and others for the implementation of the program.

c. An evaluation and assessment of the progress of the program shall be jointly undertaken on the field AI services.



#### IV. DISCUSSIONS

The parties have discussed and agreed on the following accomplishment:

The project achieved significant gains during the three years period it was implemented. Notable among which are the following:

##### 1. Increased farmers profitability

The survey of price on the six month old offsprings from Artificial Insemination was double the price of calves out of local bulls. The survey was conducted in different project sites.

##### 2. Strengthened Delivery of Service Network

Accomplishment in the three regions show that it achieved 60% of the overall national accomplishment. Data in pregnancy diagnosis, conception rates, calf drops were monitored while some data from other regions were not available.

##### 3. Enhanced Production of Quality Frozen Bull Semen

Semen processing technology was greatly improved in terms of quality and quantity thru the assistance and the support of modern equipment and supplies which were fully utilized.

##### 4. Improved Manpower Development

Transfer of technology was greatly improved through the assistance of JOCV Volunteers in the project sited and technical training of local counterparts in Japan.



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## V. MINUTES OF DISCUSSIONS:

The team discussed the following Programs and solutions which have been considered as subsequent components of the Program:

### A. Production of Semen

1. In line of the provision of AI supplies by the JOCV/JICA, DA shall provide thereafter the necessary AI supplies.

2. Intensified production and research activities on AI, E.T., sire testing and forage development shall be undertaken by NABC, Malaybalay Stock Farm - Regional Semen Processing Center.

### B. Field Operations

1. To insure continued AI activities the coordination between DA and the local government units (LGU's) shall be strengthened.

2. Field surveys will be enhanced to fill up the lack of data on the impact of AI.

3. The DA and the LGU's will be requested to increase the priority on AI to cover-up the lack of maintenance and operating Expenditures for the Program.

4. A realignment of the targets on field services will be made to conform to the original scope of the program for streamlined evaluation procedures.

### C. OTHERS

1. Recipients of provided vehicles shall submit vehicle used report to the office of the Project Manager.

2. The DA must provide the necessary expenditures for the used of incoming JICA donated equipment.

3. The PNVSCA will accommodate the possible request of JOCV's by the local government units (LGU's).

4. An effective assessment of the Livestock improvement program must be conducted.

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## V. MINUTES OF DISCUSSIONS:

The team discussed the following Problems and solutions which have been considered as subsequent components of the Program:

### A. Production of Semen

1. In line with the provision of AI supplies by the JOCV/JICA, the DA shall provide thereafter the necessary AI supplies.

2. Intensified production and research activities on AI, Embryo Transfer, sire testing and forage development shall be undertaken by NABC, Malaybalay Stock Farm - Regional Semen Processing Center.

### B. Field Operations

1. To insure continued AI activities the coordination between DA and the Local Government Units (LGU's) shall be strengthened.

2. The conduct of field survey by AI Technicians shall be enhanced to fill up data gap.

3. The DA shall request LGU's to provide necessary manpower financial and material support for the sustenance of AI program in their areas.

4. A realignment of the targets on field services will be made to conform with the original scope of the program for streamlined evaluation procedures.

### C. OTHERS

1. Recipients of provided vehicles shall submit vehicle used report to the office of the Project Manger.

2. The DA shall provide the necessary expenditures for the used of incoming JICA donated equipment.

3. The PNVSCA shall accomodate the requests for JOCV's by the Local Government Units (LGU's).

4. The PNVSCA shall be member of the assessment and evaluation team.

5. Recommend the review and assessment of the Livestock improvement program.

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EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1989

JAPAN PURCHASE

<u>Name of Equipment</u>	<u>Quantity</u>
1. LN Freezing Chamber	1 unit
2. Straw AV Sterilizer	2 units
3. Straw Catcher	200 pcs.
4. Straw Hanger	12 pcs.
5. Temperature Recorder	2 sets
6. AV Inner Liner	100 sets
7. AV Inner Funnel	100 pcs.
8. Cattle Scale	5 units
9. Hoof Treamer	2 sets
10. Surgical Instrument	1 set
11. Cervix Expander	1 set
12. Baloon Catheter	3 pcs.
15. Connector for No. 13	5 pcs.
14. Ovarian Injector	2 units
15. Y Junction	5 pcs.
16. Castrating Forcep	3 units
17. Obsterical Wire Saw	5 pcs.
18. LN2 PC Siphon	2 units
19. Semen Baskets	2 pcs.
20. Semen Straw	200 boxes
21. PMSG 1000 IU/ampule	30 amp.
22. FSH 20 IU	20 amp.
23. Thishydroxymethel Aminomethen (500 g.)	6 bottles
24. PBS Premix	20 bottles
25. Calf Semen Arbumindry	100 g.
26. Jar for Semen Basket	3 units
27. Straw Clip	4 pcs.
28. Straw Forceps	2 pcs.
29. Cervix Forceps	1 pc.
30. Portable Sterilizer	1 unit
31. Phase Contrast Microscope	1 set

- |     |                              |        |
|-----|------------------------------|--------|
| 32. | T. V. Monitor Set for No, 31 | 1 set  |
| 33. | Pick-up Truck 2 WD           | 1 unit |
| 34. | Pick-up Truck 4WD            | 1 unit |
| 35. | 2 Ton Truck 2 WD             | 1 unit |

Total - - - P 1,919,291.00

¥12,650,050.00

FOREIGN PURCHASE IN 1989

<u>Name of Equipment</u>	<u>QUANTITY</u>
1. CE Interval Timer	2 units
2. Bull Rings Heavy Duty	50 pcs.
3. Size 2 Sulture Needle	20 pcs.
4. Size 4 Sulture Needle	20 pcs.
5. Med Notcher	2 units
6. Yellow Blank Large Tag	25 pcs.
7. Yellow Blank Extra Large Tag	25 pcs.
8. Yellow Large Blank Cattle Tag	10 pcs.
9. Yellow Medium Blank Form Cattle Tag	10 pcs.
10. Installing Tool	1 pc.
11. Super Mark Felt Tip Pen	5 pcs.
12. PK 100 Ketcuih Tag I L-100	1 pck.
13. Leverace Plier	1 pc.
14. Curry Comb King Size	10 pcs.
15. Weighing Sling with Scale	2 units
16. Set 4 Cattle Breeding	1 pc.
17. Beef Reproduction VHS	1 pc.
18. Beef Reproduction VHS	1 pc.
19. Beef Reproduction VHS	1 pc.
20. Set of Z10464, Z10466 and Z10468 Complete Judging VHS	1 set
21. Judging Heifers-included in Z10470 set	1 pc.
22. Judging Steers-included in Z10470 set	1 pc.
23. Judging Bulls-included in Z10470 set	1 pc.
24. TV Vet. Book Stock Farmer I	2 pcs.
25. TV Vet. Book Stock Farmer 2	2 pcs.
26. Bull Lead with Snap Chain	3 pcs.
27. Merk Veterinary Mannual	2 pcs.
28. 20 cc. Automatic Drencher	4 units
29. 5" Centrigrade Thermometer	5 units
30. Cattle Trocar	5 units
31. Size 6 Suture Needle	20 pcs.

32.	Elec. Dehorner with Solder	2 units
33.	Thermometer with Clip Case	40 pcs.
34.	Duplex Applicator	1 unit
35.	Artificial Insemination Book	2 pcs.
36.	Nitrogen Freezer	20 units
37.	Cover for Freezer	30 pcs.
38.	Roller Base for Z9354 Freezer	10 units
		P454,020.00
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		¥2,992,450.00

EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1989

LOCAL PURCHASE

<u>Name of Equipment</u>	<u>Quantity</u>
1. Bull (Brahman) ANSA Farm, Bukidnon Farm	5 heads
2. Colored T.V. (25 inch.)	1 unit
3. Video Record Player	1 unit
4. Sound System	1 unit
5. Water pump.	1 unit
6. Slide Cover Glass	10 boxes
7. Slide Glass	5 boxes
8. Micro Dispenser (1-5 ml.) with tip (1000)	1 unit
9. Dispenser (1-10 ml.) Belman Fortuna Optipix	1 unit
10. Electric Stove	1 unit
11. Inoculating Loop	10 pcs.
12. Lactose (500 gm.)	8 btls.
13. Glycerol (2.5 L.)	2 btls.
14. Fructose (500 grms.)	2 btls.
15. Sodium Citrate (500 grms.)	4 btls.
16. Citric Acid (500 grms.)	4 btls.
17. 5-way Pipette Aspirator	2 pcs.
18. Lutalyse	60 btls.
19. Transformer 220-110 500 w.	2 units
20. Transformer 200-110 500 w.	2 units
21. Copy Paper 11 x 8 1/2	40 rms.
22. Copy Paper 14 x 8 1/2	20 rms.
23. Breeding Slip	500 bkts.
24. Beta Video Tape	8 pcs.
25. Haemocytometer Cover Glass	20 pcs.
26. Chloramine (500 gm.)	1 btl.
27. Filter Paper #42	10 pks.
28. Stop Watch	2 pcs.
29. Wash Bottle (250 ml.)	6 pcs.
30. Test Tube Brush (small)	10 pcs.
31. Test Tube Brush (big)	10 pcs.

P400,855.00

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¥2,641,896.00

JICA DONATION IN 1989

<u>Name of Equipment</u>	<u>Quantity</u>
1. Phase Contrast Microscope	1 set
2. Analytical Balance	1 unit
3. A V	20 sets
4. AV Inner Liner	20 pcs.
5. AV Inner Funnel	20 pcs.
6. AV, UV Sterilizer	1 unit
7. AV Water Bath	1 unit
8. AV Incubator	1 set
9. Collecting tubes.	5 boxes
10. Slide Warmer	5 units
11. Semen Examination Plate	5 pcs.
12. Haemocytometer with Pipet	5 sets
13. Prepuce Irregator	1 unit
14. Nozzle for prepuce Irregator	1 pc.
15. LN2 Refrigerator Tank Small Mouth 291	3 units
16. LN2 Refrigerator big mouth 31.8 l.	3 units
17. Distilled Apparatus deionized water & distilled 1.8 l./hr.	1 unit
18. Water Bath with timer, 36 l.	1 unit
19. Test tube Mixer	1 unit
	Total - - - P887,587.00 =====
	¥5,850,000.00
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	Grand Total - - P3,669,836.00
	¥24,129,341.00



EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1990

FOREIGN PURCHASE

<u>ITEMS</u>	<u>QUANTITY</u>
1. Animal Genetics and Breeding	1 book
2. Set 4 Cattle Breeding	1 book
3. Artificial Insemination of Beef & Dairy Cattle	1 book
4. Embryo Transfer of Beef and Dairy Cattle	1 book
5. New and Exotic Breed of Beef Cattle	1 book
6. Breeds of Beef Cattle	1 book
7. Breeds of Dairy Cattle	1 book
8. Fitting & Showing ST/1/2" VHS	1 pc.
9. Beef Series Set/1/2" VHS	1 pc.
10. ST4 Beef Production	1 book
11. Semen Collection and Processing	1 book
12. Calving Problems and Procedure	1 book
13. Artificial Insemination in cattle	1 book
14. Study of Bovine Semen	1 book
15. Study Course in Animal Reproduction	1 book
16. Artificial Insemination Complete Training course	1 book
17. Bull Ring 3 1/2 Easy Pierce	100 pcs.
18. Bull Ring	51 pcs.
19. Thaw Monitor	40 pcs.
20. Medium Bubbler	1,000 pcs.
21. Goblet Diam 35mm	1,500 pcs.
22. Goblet Diameter 65 white	500 pcs.
23. Divider for Stand Goblet	100 pcs.
24. Filling Nozzle 15 pins	3 sets
25. Long Forceps	2 sets
26. IMV Bovine Artificial Vagina	5 sets
27. New Rough Neoprene Liner	5 sets
28. Cone for Bovine Vagina	5 sets
Total - - - - -	P 262,761.00 ¥1,220,000.00

EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1990

JAPAN PURCHASE

<u>ITEMS</u>	<u>QUANTITY</u>
1. Baloon Catheters, 16Fr, FA361	12 pcs.
2.        -do-               , 18Fr, FA362	12 pcs.
3.        -do-               , 20Fr, FA363-1	12 pcs.
4. Steel Cores for Baloon Catheters FA-364-2 2.00/x635 m/m	4 pcs.
5.        -do-                               FA-365-3, 2.3ø x 740 m/m	4 pcs.
6. Connector for Baloon Catheters	10 pcs.
7. 3-way Connecting Tube	10 pcs.
8. Infusion Set	15 sets
9. Outfitter	15 pcs.
10. Catheter for Removing Mucus	2 sets
11. Cell Connector 10 pcs./case	2 cases
12. Sheath Protector, 50 pcs./case	10 cases
13. Straw Semen Tubes - Blue, 50 pcs./case	40 cases
14. Long forceps	1 pc.
15. Semen Examination Plates	5 pcs.
16. Straw Powder, 200 g., Red	20 pcs.
17.        -do-               Blue	10 pcs.
18.        -do-               Orange	10 pcs.
19.        -do-               Pink	10 pcs.
20.        -do-               Brown	10 pcs.
21.        -do-               Green	20 pcs.
22.        -do-               Purple	10 pcs.
23.        -do-               Yellow	10 pcs.
24. Rubber Inner Liners, A, FA 1512	4 pcs.
25.        -do-               , B, FA 1513	4 pcs.
26. New Inseminators for Cow for 0.5	40 pcs.
27. Sheath for Inseminators Cow 50 pcs./case	50 cases
28. Plastic Filter Holders, 12 pcs./case	1 case
29. Filter Unit, 50 pcs./case-GS-FV 1125-1	1 case
30. Filter Unit, 50 pcs./case-HA FV 1125-3	1 case
31. OVA Transplanters for Cow	3 pcs.

<u>ITEMS</u>	<u>QUANTITY</u>
32. Steel Cores for Baloon Catheters	4 pcs.
33. Straw Semen Tube - white	40 cases
34. -do- - purple	20 cases
35. -do- - green	40 cases
36. -do- - pink	40 cases
37. -do- - orange	10 cases
38. Thawing devices for Frozen Semen	2 sets
39. Artificial Vagina for Bull	50 pcs.
40. Rubber Inner Liner for Artificial Vagina	150 pcs.
41. Straw Powder - Green	10 btls.
42. Artificial Vagina for Sheep and Goat	5 pcs.
43. Inseminators for Cow 0.5 ml.	50 pcs.
44. Carbol Fuchsin 25 gm.	10 pcs.
45. Liquid Nitorgen Freezer for Straw Semen	1 set
46. Sheath	210 pcs.
47. Animal Genetics and Breeding	1 pc.
48. Set 4 Cattle Breeding	1 pc.
49. Artificial Insemination of Beef and Dairy Cattle (book)	1 pc.
50. Embryo Transfer of Beef and Dairy Cattle	1 pc.
51. Breeds of Beef Cattle	1 pc.
52. New and Exotic Breed of Beef Cattle.	1 pc.
53. Breeds of Dairy Cattle	1 pc.
54. Fitting and Showing ST/1/2 VHS (beef, swine, sheep)	1 pc.
55. Beef Series set 1/2" VHS	1 pc.
56. ST4 Beef Reproduction	1 pc.
57. Semen Collection and Processing	1 pc.
58. Calving Problems and Procedure	1 pc.
59. Artificial Insemination Cattle	1 pc.
60. Study of Bovine Semen	1 pc.
61. Study Course in Animal Reproduction	1 pc.
62. Artificial Insemination Complete Training Course	1 pc.

<u>ITEMS</u>	<u>QUANTITY</u>
63. Bull Ring 3 1/2 Easy Pierce	100 pcs.
64. Bull ring	51 pcs.
65. Thaw Monitor	40 pcs.
66. Sheath, FA 795, 50 pcs./case	10 cases
67. Sheath, FA 800, 10 pcs./case	10 cases
68. Binocular Microscopes, X-TR, FV 3002 220V/60Hz (Olympus)	1 unit
69. Raffinose, 500 g	10 pcs.
70. Tris (Hydroxymethyl) Aminomathene, 500 g,	10 pcs.
71. Eosin B, 25 g.	10 pcs.
72. Parnet A, 10 pcs./case	20 cases
73. Anthrine, 40 AU, 5 x 2	10 pcs.
74. Cow Sucker	2 units
75. PMS, 1000 IUX5A	5 pcs.
76. AV Selector, SB-V4B	1 unit
77. Conversion Lens Kit, VCL-G1	1 set
78. Filter Kit, VF-200K	1 set
79. Kubota Tractor	1 unit
80. Front Loader (kubota)	1 set
81. Digging Bucket (kubota)	2 unit
82. Hay Fork (Fubota)	1 set
83. Pallet Fork (kubota)	1 set
84. Bottom Plow (sugano)	1 set
85. Manure Spreader (Takakita)	1 set
86. Disk Plow (Takakita)	1 set
87. Spare Parts for Tractor	1 set

Total - - - - - P 2,295,815.00  
¥10,659,470.00

EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1990

LOCAL PURCHASE

<u>ITEMS</u>	<u>QUANTITY</u>
1. Centrifuge	1 unit
2. Pipette Washer	1 unit
3. Autoclave	1 unit
4. Colony Counter	1 unit
5. Magnetic Stirrer	2 units
6. Alcohol Lamp	3 pcs.
7. Inoculating Loop	70 pcs.
8. U. V. Light	2 pcs.
9. Micro Slide Box (100 cap.)	5 pcs.
10. Test Tube Rack 25 x 150 mm	15 pcs.
11. Petri Dishes 15 x 100 mm	100 pcs.
12. Voltage Regulator	4 units
13. Test Tube 25 x 150 (200 mm)	100 pcs.
14. Staining Jar Vertical	40 pcs.
15. Culture Media Tryptone Glucose Agar (500 g.)	2 kg.
16. Citric Acid	5 kg.
17. Fructose	5 kg.
18. Lactose	5 kg.
19. Glycerol 2.5 Lrs./bottle	4 btls.
20. Methylene Blue	100 gms.
21. Absolute Methylalcohol	6 btls.
22. Absolute Ethylalcohol	6 btls.
23. Laboratory Bottle 500 ml.	50 btls.
24.        -do-        250 ml.	20 btls.
25.        -do-        100 ml.	20 btls.
26. Serological Pipette 10 ml.	50 pcs.
27.        -do-        1 ml.	50 pcs.
28. Lab. Center Table	1 unit
29. Utility Table	2 pcs.
30. Hanging Cabinet	

<u>ITEMS</u>	<u>QUANTITY</u>
51. Laboratory Stool	4 pcs.
32. MVE Handler	1 unit
33. Technical Pen Set 8 pcs.	1 set
34. Technical Pen 1.4	1 pc.
35. Lettering Set	1 set
36. Triangle 30 x 60 x 12	1 pc.
37. Triangle 45 x 90 x 12	1 pc.
38. Drafting Table with stool	1 set
39. Straight Edge 42"	1 pc.
40. Rapid Drawing Board, Rotring	1 pc.
41. Drafting Lamp	1 pc.
42. Compass with Adaptor Rotring	1 pc.
43. Mechanical Pencil 0.5	1 pc.
44. Spaire Lead	5 pcs.
45. Burmester Curves	1 pc.
46. Metric Scale	1 pc.
47. Geometry Set Square Rotring	1 pc.
48. Combination Templates Rotring #840633	1 pc.
49.                -do-                #859650	1 pc.
50. Pantograph	1 pc.
51. Pencil 6B	5 pcs.
52. Pencil 3 H	5 pcs.
53. Drawing Ink (black)	5 btls.
54. Drawing Ink (red)	1 btl.
55. Drawing ink (white)	1 btl.
56. Drawing Ink (yellow)	1 btl.
57. Drawing Ink - blue	1 btl.
58. Heavy Duty Staple Wires	1 box
59. Paper Cutter 21" Blades	1 pc.
60. Fixative Spray	1 pc.
61. Cutter	1 pc.
62. Spare Blade	1 pc.
63. Poster Color 12's	1 set

<u>ITEMS</u>	<u>QUANTITY</u>
64. Water Color Dobbble 16's	1 set
65. Master Illustration Board	5 pcs.
66. Chinese Brush	5 pcs.
67. Round Brush	5 pcs.
68. Stabilo Marker Pens	8 pcs.
69. Eraser Combination	5 pcs.
70. Floppy Diskette	2 boxes
71. Beta Tape L 500	20 pcs.
72. Beta Tape Cleaner	1 pc.
73. Sony 8 mm 90 Video Tape	20 pcs.
74. Slide Film 36 ex	50 pcs.
75. Video Light 500 W/220 HVL-300	1 pc.
76. Video 8 Rechargeable Battery NP-22	2 pcs.
77. Electric Condenser Microphone ECM-Z 200	1 pc.
78. Nikon PB-6 Bellows with Slide Copier	1 unit
79. Cable Release 50 cm	1 roll
80. Karaoke TV Comp. Stand	1 pc.
81. Toner SF-811 Stl.	6 btls.
82. Drum Kit SF-770DR	1 pc.
83. Developer SF-881 Stl.	1
84. Copy Paper (PPC-A-4)	60 reams
85. Copy Paper (PPC-FA)	40 reams
86. Heater Roller	1 pc.
87. Cleaning Roller	1 pc.
88. Sledge Hammer	1 pc.
89. Tin Snip 12"	1 pc.
90. Screw Driver Set	2 sets
91. Pipe Treader	1 pc.
92. Plier #8	2 pcs.
93. Long Nose Plier # 7	2 pcs.
94. Diagonal Cutter #6	2 pcs.
95. Mechanical Plier #8	2 pcs.
96. Box Wrench 3/8-1	2 pcs.
97. Box Wrench 6-22	2 pcs.
98. Open Wrench 1/4-1	2 pc.

<u>ITEM</u>	<u>QUANTITY</u>
99. Open Wrench 6-22	2 pcs.
100. Electric Drill 1/2 HP	1 unit
101. Electric Grinder	1 unit
102. Tool Box (big)	2 boxes
103. Adjustable Wrench #18	2 pcs.
104. Adjustable Wrench #10	2 pcs.
105. Pipe Wrench #12	2 pcs.
106. Pipe Wrench #14	2 pcs.
107. Pipe Wrench #24	2 pcs.
108. Welding Machine 500 amps.	1 unit
109. Cable 40 ft.	1
110. Electrode Holder	1 unit
111. Ground Clamp	1 unit
112. Bench Vise 4"	1 unit
113. Electric Solder	2 pcs.
114. Soldering Lead	2 pcs.
115. Wood Saw #22	2 pcs.
116. Vise Crip #10	2 pcs.
117. Stanley Meter (5 meters)	2 pcs.
118. Chinsel 1/4-1	1 pc.
119. Hock Saw 22"	1 unit
120. Drill Bit 1-13 mm (25 pcs.)	1 unit
121. Drill Bit 1/16-1/2 (25 pcs.)	1 unit
122. Tester	2 units
123. Deep Well 400 ft. 7.5 Hp	1 unit
124. High Tower Water Tank	1 Unit
125. Brush Cutter 2.0 Hp.	6 units
126. Portable Sprayer	1 unit
127. Wheel Barrow	10 pcs.
128. Spade	10 pcs.
129. Shovel	10 pcs.
130. Hay Fork (3 teeth)	10 pcs.
131. Hay Fork (4 teeth)	5 pcs.
132. Pail (5 gal.)	20 pcs.
133. Protection for Artificial Breeding Con-	
134. Operational Budget	12 months



	tainer with leather	3 pcs.
134.	Roof Top for Pick-up with Sheet Fiber Glass	2 units
135.	Roof Top for Pick-up with Sheet Stainless Steel	2 units
136.	Motorcycle 100 cc	13 units
137.	Generator	1 unit
138.	Slide Projector (large)	1 unit
139.	Slide Projector (small)	1 unit
140.	Screen	1 pc.
141.	Nikon Camera 801	1 unit
142.	Nikon Camera 50 mm	1 unit
143.	Nikon 28-85 mm	1 unit
144.	Flash SB-22	1 unit
145.	Nikon Camera Bag	1 pc.
146.	Sound System	2 units
147.	Hitachi Orbit Fan	2 units
148.	Beta Record Player	1 unit
149.	VHS Record Player	1 unit
150.	Pentax PC-303S	2 units
151.	Micro Dispenser	1 unit
152.	Tip for Micro Dispenser	1000 pcs.
153.	Computer set	2 units
154.	AV Room and Clinic (Construction)	1
155.	Thermos Jar	22 units
156.	Cattle Chute	1
157.	Filling Cabinet	1 unit
158.	Storage Cabinet (big)	4 units
159.	Storage Cabinet (small)	1 unit
160.	Stainless Goblet	100 pcs.
161.	Sire Catalogue	500 pcs.
162.	A. I. Posters	1000 pcs.

Local Purchase - 1990

Total - - - - P1,540,960.55  
¥7,197,519.00

Grand Total - - - - P 4,099,536.55  
¥19,076,989.00

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EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1991

JAPAN PURCHASE

<u>Name of Equipment</u>	<u>Quantity</u>
1. Nissan Pick-Up	1 unit
2. Spare Parts	
3. IzuSu Truck	1 unit
4. Bovine Serum Albumin "Sigma"	5 pcs.
5. Pyruvic Acid Sodium Salt "Sigma"	2 pcs.
6. Caffeine C-4144 100g.	2 pcs.
7. Glycerol S500 ml.	2 pcs.
8. Ham's F-10 with Hepes 100 ml.	20 pcs.
9. M-199 with Earl's Salt L. Glutamine 100 ml.	20 pcs.
10. Phenol Red S25 g.	2 pcs.
11. Hepelin 9100 09-101-5	2 boxes
12. Paraffin Oil 500 ml.	2 pcs.
13. Hepes 100 g.	1 pc.
14. FSH 5 ml. 1x2	30 boxes
15. DNSG 1000IUX5	20 boxes
16. ESTADIOL 1 g.	5 pcs.
17. Kicilocainh 2%E 100 ml.	10 boxes
18. M E M 05900 100 g.	5 pcs.
19. Calactal 2% inj 25 g.	2 boxes
20. Bovine Albumin 500 ml.	5 pcs.
21. Raffinose S500 g.	8 pcs.
22. Tris (Hydroxymethyl)Aminomethane 500 g.	5 pcs.
23. Field Scope EDII	1 set
24. Zoom Eye Piece 20-45x	1 pc.
25. Field Scope Tripod	1 set
26. Binoculars Sx40 D CP	1 set
27. Straw Stoppered Sterilizer for Artificial Insemination of Cattle FA 352 2A 500 pcs./box	10 boxes
28. Straw Stoppered Sterilized for Artificial Insemination of Cattle FA 352-2F 500 pcs./box	5 boxes
29. -do- FA. 332- 500 pcs./box	10 boxes

	<u>Name of Equipment</u>	<u>Quantity</u>
30.	Straw Stoppered Sterilized for Artificial Insemination of Cattle FA552-2E 500 pcs./box	5 boxes
32.	-do- FA552-2B 500 pcs./box	2 boxes
33.	-do- FA555 500 pcs./box	2 boxes
34.	Multiteaching Microscope MTH-5 Nikon	1 set
35.	Microscope Color Television System	1 set
36.	Transformer KD-200	1 pc.
37.	Semen Examination Plates 220V 60HZ	2 sets
38.	Micro Warm Plate 220V 60HZ	1 set
39.	Semen Counter	5 pcs.
40.	Straw Semen Tube (0.5) 500 pcs./box (blue)	90 boxes
41.	-do- (pink)	20 boxes
42.	-do- (white)	140 boxes
43.	-do- (green)	20 boxes
44.	-do- (violet)	5 boxes
45.	Straw Semen Tube (0.25) 500 pcs./box(white)	5 boxes
46.	Straw Powder (white)	20 pcs.
47.	Straw Forcep	2 pcs.
48.	Ink for Straw Printer	4 pcs.
49.	Petri Dish 50 mm x 15	30 pcs.
50.	E.O Gas Sterilizer FL171 with Transformer BS-500 x 1	1 set
51.	Sterilizer Pack 190mm x 200mm TI-53	5 rolls
52.	Pastur pipette 146mm Corning 1K-PAS-5P 200 pcs./box	5 boxes
53.	Handy Water Distillation Unit with Transformer UD-10 x 1	2 sets
52.	Baloon Catheter 16 Fr	10 pcs.
53.	Baloon Catheter 18 Fr	20 pcs.
54.	Baloon Catheter 20 Fr	10 pcs.
55.	Connector for Baloon Catheter	20 pcs.
56.	Y-Connector	20 pcs.
57.	NJ Catheter	6 pcs.
58.	OVA Transplanter for Cow (0.25)	2 pcs.
59.	Sheath for OVA Transplanter 50 pcs./box	10 boxes

<u>Name of Equipment</u>	<u>Quantity</u>
60. Cover for Sheath with OAP 50 pcs./box	5 boxes
61. ET Scope	1 pc.
62. Micro Filter Unit 50 pcs./box FV1125-1	5 boxes
63. Micro Filter Unit 50 pcs./box FVII25-3	5 boxes
64. Pen Terminal for Temperature Recorder	4 pcs.
65. Straw Semen Tube Case Ctype	200 pcs.
66. Microscope with Spare Lamp x 6 pcs.	1 set
67. Photomicrographic Equipment for Microscope 220 V.	1 set
68. Vaginal Speculums FA601	10 pcs.
69. Vaginal Speculums FA602	2 pcs.
70. Inner liner for Artificial Vagina FA75	30 pcs.
71. Inner Liner for Artificial Vagina FA74	15 pcs.
72. Filter Cartridge GI-1600 2pcs./set	5 sets
73. Filter Cartridge TCC-W1-SOCO 2 pcs./set	4 sets
74. Uterine Irrigation FB4	1 set
75. Uterine Catheter Set for Cow FB12 4pcs./set	1 set
76. Boiling Sterilizer BiType FL11	1 set
77. Hoof Trimming Tools Kit FN680	2 sets
78. Restraining Stall and Accessories Kit	1 set
79. Sheath for Inseminator 50 pcs./bag/box	50 boxes
80. Spare Parts for Honda Generator	2 pcs.
81. Spare Parts for Toyota Hilax HUB	2 pcs.

Total - - - - - P2,552,907.00  
¥12,516,905.00

EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1991

FOREIGN PURCHASE

<u>Name of Equipment</u>	<u>Quantity</u>
1. Allflex Large Tag-Yellow (1-500)	500 pcs.
2. Allflex Maxi. Tag - Orange (1-500)	500 pcs.
3. Allflex Maxi Tag-Red (1-500)	500 pcs.
4. Allflex Maxi Tag-White (1-500)	500 pcs.
5. Allflex Maxi Tag-Blue (1-500)	500 pcs.
6. Model 510 Clipmaste 220V 60HZ	1 pc.
7. Top Blade for 510	3 pcs.
8. Bottom Blade for 510	5 pcs.
9. Bull Lead	20 pcs.
10. Small Animal Hanging Weigh Scale	20 pcs.
11. Beef Weight Tape	100 pcs.
12. Jumbo Rain Gauge	7 pcs.
13. Maximum-Minimum Thermometer	7 pcs.
14. Thermometer with Relative Humidity	7 pcs.
15. Farmers Balling Gun	5 pcs.
16. Obsterical Chains 30"	5 pcs.
17. Reproduction in Farm Animals (book)	1 pc.
18. Dairy Cattle Fertility and Sterility (books)	2 pcs.
19. TV Vet Sheep Book	1 pc.
20. Ectrin Insecticide Cattle Ear Tag Applicator	30 pcs.
21. Ectrin Insecticide Cattle Ear Tag Extra Pin	25 pcs.
22. Artificial(Video) Insemination in Cattle	1 pc.
23. Pig Ailments-Recognition and Treatment (book)	1 pc.
24. Vaco Syringe	2 pcs.
25. 50 cc Unbreakable Plastic Barrel	20 pcs.
26. Plastic Plunger	10 pcs.
27. O-Ring	14 pcs.
28. Packing and End Washer. Set	22 pcs.
29. Liquid Nitrogen Refrigerator with Canister	15 units
Model SC33/32	

<u>Name of Equipment</u>	<u>Quantity</u>
30. Liquid Nitrogen Refrigerator with Canister Model XC47/11-10	3 units
31. Neck Tube Cork	50 pcs.
32. Cryoglove D-Mas	2 pcs.
33. Cryoglove D-MAM	2 pcs.
34. Alphabetor Device C011	2 sets
35. Stamps Band for C011	10 pcs.

Total - - - - - P1,096,996.00  
 ¥5,378,572.00

EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1991

FOREIGN PURCHASE

<u>Name of Equipment</u>	<u>Quantity</u>
1. Heat Roller Kit	1 unit
2. Fuser Oil Cart	1 pc.
3. Diesel Engine	1 unit
4. Welding and Cutting Outfit	2 units
5. Welding Machine	1 unit
6. VHF/FM Radio Set (Antena, Cable, etc.)	1 unit
7. Chain Block	1 unit
8. Crocodile Jack	1 unit
9. Freezer	1 unit
10. Book Cabinet	1 pc.
11. NABC Renovation of Semen Collection Area	
12. Grass Chopper	1 unit
13. Motor for Grass Chopper	1 unit
14. LN2 Jacket (Large)	50 pcs.
15. Bull Exerciser	1 unit
16. Cattle Chute	2 units
17. Back Cover for Dina Truck	1 unit
18. Holstein Bulls	2 heads
19. Motorcycle KE 100	12 units
20. Motorcycle HDIX 100	8 units
21. Steri Gas	1 unit
22. Clean Bench	1 unit
23. Wooden Cabinet	1 unit
24. Regulated Power Supply (1.5 Kw)	1 unit
25. Pipette	50 pcs.
26. Petri Dish	50 pcs.
27. Water Filter Case	4 units
28. Filter 1	20 pcs.
29. Filter 2	20 pcs.
30. Booster	1 unit
31. Regulated Power Supply for Radio	1 unit
32. Plastic Sheath	1 unit



<u>Item</u>	<u>Qty.</u>
33. UPS	4 units
34. Manual Typewriter	3 units
35. Mandy Camera	2 units
36. Drum Kit	2 units
37. Developer	2 units
38. Heat Roller	1 unit
39. Fuser Oil Cart	1 pc.
40. Copy Paper (short)	80 rms.
41. Copy Paper (long)	20 rms.
42. Overhead Projector	1 unit
43. Sound System	1 unit
44. Beta Video Cassette Recorder	1 unit
45. Sticker for A.I. Project	
46. LN2 Tank Jacket (big)	50 pcs.
47. Pressure Cooker	1 unit
48. Wire Basket	4 pcs.
49. Hard Risk 40 MB	1 pc.
50. Re-printing of A.I. Posters	1000 pcs.
51. Renovation of RSPC	
52. Operational Budget	12 months
Total - - - - -	P 2,056,409.60 ¥10,094,216.00
Grand Total - - -	P 5,706,312.60 ¥27,989,693.00 *****

EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1992  
JAPAN PURCHASE

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<u>Item</u>	<u>Qty.</u>
1. Forage Harvester GYRO 350	1 unit
2. Raffinose	5
3. Aquarius for GS-200 (Filter;SG,GI-1600)	3
4. Aquarius for GS-200 (Filter;TCC-WI-SOCOS)	3
5. Dissecting Instrument Set Type I	1
6. Cervical Canal Expanders for Cow and Heifer Saito Type, FB-20	2
7. Long Forceps FB-73	2
8. Vaginal Speculums for Cow and Heifer FA-601	10
9. Bloodless Castrators FE@@	3
10. Sheath Tube for Inseminators FA-782	300
11. Polyethylene Gloves	250
12. Straw Semen Tube (Transparent)	40
13. Straw Semen Tube (Blue)	120
14. -do- (Green)	20
15. -do- (Pink)	40
16. -do- (Orange)	120
17. Straw Powder (Blue)	3
18. -do- (Brown)	3
19. -do- Purple	3
20. -do- (Pink)	2
21. -do- (Red)	2
22. -do- (Orange)	2
23. -do- (Green)	2
24. -do- (Yellow)	2
25. Ink for Straw	4
26. Semen Examination Plate	3
27. Nishikawa's Slide Warmers for Testing Viability of Sperm	3
28. Microwarm Plate FV-3211 with Trans.	1

Total - - - - - P 842,966.00

¥4,214,830.00

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EQUIPMENT AND SUPPLIES FOR THE  
A. I. PROJECT IN 1992  
LOCAL PURCHASE

<u>Item</u>	<u>Qty.</u>
1. Grass Chopper	3 units
2. Steel Filing Cabinet	11 units
3. Storage Cabinet	1 unit
4. Open Type Shielving	1 pc.
5. Air Conditioner	1 unit
6. Materials of Water Tank and Deep Well	1 unit
7. Air compressor	1 unit
8. Electric Grinder	1 unit
9. Electric Hadrill	1 unit
10. Table Vice	2 units
11. Fiberglass Water Tank	1 unit
12. Generator	1 unit
13. Antena	1 unit
14. Antenna Mast Tower	1 unit
15. Coaxial Cable and Connector	30 m
16. Hand held Radio with Recharger	1 unit
17. Booster	1 unit
18. Powwer Supply	1 unit
19. Rotator	1 unit
20. Battery Charger	1 unit
21. Battery Pack	1 unit
22. Computer Cabinet	1 unit
23. Bull Exerciser	1 unit
24. Fax Machine	1 unit
25. Computer Table	1 unit
26. Tractor Spare Parts	1 unit
27. Tank Jacket for Mother Tank	50 pcs.
28. Tank Cover for Field Tank	50 pcs.
29. Wheel Barrow	8 pcs.
30. Post Hole Digger	1 pc.
31. RBC Pipette	50 pcs.
32. Erlenmeyer Flask 125 ml.	30 pcs.
33. -do- 300 ml.	30 pcs.
34. -do- 1000 ml.	30 pcs.
35. Graduated Cylinder with spout	30 pcs.
36. -do-	30 pcs.
37. Silicon Stopper for Test Tube	50 pcs.
38. Aspirator	6 pcs.
39. Glycerol	6 btls.
40. Brilliant Green Bile	1 btl.
41. Nutrient Agar	1 btl.
42. Nutrient Brooth	1 btl.
43. Gram Staining Test	1 pc..
44. Colored Film	100 pcs.
45. Slide Film	50 pcs.
46. Grass Cutter	4 units
47. Centrifuge Machine	1 unit
48. Spare Blade of Grass Cutter	10 pcs.
49. Centrifuge Tube	8 pcs.
50. Electric Stove	1 unit

51.	Sprayer Napesack Type	2
52.	Wheel Barrow	3
53.	Flat Shovel	3
54.	Spade Shovel	3
55.	Rake	3
56.	Pick Mattock	2
57.	Grass Hook	3
58.	Steel Cabinet	1
59.	Typing Table	1
60.	Lab. Stool	2
61.	Spare Blade of Grass Cutter	10
62.	Cattle Chute	10
63.	Copy Paper	100 reams
64.	AI Equipment Jacket	20
65.	Thermo Jug	20
66.	Camera	4
67.	Roof of Dyna Truck	1
68.	Water Tank and Tower	1
69.	Jet Pump	1
70.	Polythelene Pipe	120 mtrs.
71.	Renovation of RSPC Bodega	1
72.	AI Manual	1000 pcs.
73.	Alternator	1
74.	Operational Budget	12 months
75.	Motorcycles	20 units

Total - - - - - P2,339,008.53  
Y9,356,034.12

Grand Total - - - - - P4,305,864.53  
Y17,223,458.12

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FOREIGN PURCHASE IN 1992

<u>Items</u>	<u>Qty.</u>
1. Liquid Nitrogen Refrigerator with Canister	23 units
2. Neck Tube Cork	50 pcs.
3. Goblet 65 mm	100 pcs.
4. New Rough Neoprene Liner	25 pcs.
5. New Smooth Liner	25 pcs.
6. Goblet, 35 mm	500 pcs.
7. Porta Milker	1 unit
8. VHS Tape "AI in Cattle Beef or Dairy"	1 pc.
9. Metal Currycomb	10 pcs.
10. A. I. Thermometer	20 pcs.
11. Thaw Monitor	20 pcs.
12. Cone for Bovine Vagina	50 pcs.

Total - - - - - P1,123,890.00

¥5,619,450.00

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FOREIGN PURCHASE IN 1993

	<u>Qty.</u>
1. Liquid Nitrogen Refrigerator (34XT)	30 units
2. Liquid Nitrogen Refrigerator (XC49)	10 units
3. Mechanical Interval Timer	2 units
4. Clipping Head	1 pc.
5. Top Blade Clipmaster	4 unit
6. Bottom	4 pcs.
7. Thaw Monitor	15 pcs.
8. Pocket Test Thermometer	14 pcs.
Total	P 830,295.00 ¥3,321,180.00

LOCAL PURCHASE IN 1993

	<u>Qty.</u>
1. Motorcycle	20 units
2. Typewriter	5
3. Paper Copier	1
4. Cattle Chute	37
5. White Board	6
6. Barbe Wire	12 rolls
7. Sound system	1
8. Generator Base	1
9. Anthena	1
10. Radio Receiver	1
11. Anthena Mast Tower	1
12. Regulated Power Supply	1
13. Booster	1
14. Transmission Line	1
15. Laboratory Cart	1
16. Dessicator	1
17. Drencher and Injector	2
18. Metal Syringe (10 cc.)	2
19. Metal Syringe (20 cc.)	2
20. Bull Exerciser	1
21. Sire Catalogue	500
22. Biology of Reproduction	1
23. Animal Reproduction Science	12
24. Color Atlas Disease & Disorders of Cattle	1
25. Feeds and Nutrition	1
26. Healthy Calves-Healthy Cattle	1
27. Vitamins in Animal Nutrition	1
28. Internal Wiring for Peletizing machine	1
29. 3 Phase Line	100 m
30. Computer Mouse	1
31. Computer Tool Kit	1
32. Operational Budget	12 months

Total - - - - - P2,263,575.00  
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EQUIPMENT AND SUPPLIES FOR THE  
AI PROJECT IN 1993  
JAPAN PURCHASE

<u>Items</u>	<u>Qty.</u>
1. Cervical Expander	8 pcs.
2. Bloodless Constrator	10
3. Line Saw	2
4. Obstetrical Wire	2
5. Straw Cather	100
6. Straw Hanger	6
7. Collecting Tube (30 cc.)	2 sets
8. Collecting Tube (10 cc.)	5 sets
9. Artificial Vagina	10
10. AV Inner Liner	30
11. AV Inner Funnel	30
12. Nose Ring	30
13. Thermos	2
14. Ultrasonic Cleanser	1
15. ET Syringe	2
16. Sheeth of ET Syringe	50
17. Embryo Straw	100

Total - - - - - P, 385,785.00

¥ 1,543,140.00

Grand Total - - - - - ¥14,038,620.00

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MEMORANDUM OF AGREEMENT

Date

KNOW ALL MEN BY THESE PRESENTS:

This AGREEMENT, made and executed this \_\_\_\_\_ day of \_\_\_\_\_ by and between:

The Department of Agriculture, a duly organized government entity of the Republic of the Philippines, with principal office at Elliptical Road, Quezon City, herein represented by the Secretary ROBERTO S. SEBASTIAN herein after referred as the first party;

-and-

The Local Government Unit with Principal Office at Tagbilaran City \_\_\_\_\_, herein represented by its Governor, DAVID B. TIROL \_\_\_\_\_, herein referred to as the second party;

WITNESSETH

WHEREAS, the Department of Agriculture (DA) believes that the Local Government Unit (LGU) is the critical integrating force that provides services at the Local level. The parties agree that local autonomy and accountability provide for quick, effective and efficient response to the problems and concerns of the people.

WHEREAS, under the local Government Code, hereinafter referred to as LGC the primary focus of the primary focus of the DA's services shifts from direct contact with the farmers and fishermen and their families to the provision of technical assistance to the IGU's in their agricultural and rural development concerns.

WHEREAS, the DA under the provision of local government code shall devolve certain functions/services to local government units namely: the provinces, cities, municipalities and barangays.

WHEREAS, under Section 3c, of DO No. 4 related to the rules and regulation on the implementation of the Department of Agriculture's Foreign Assisted Projects, FAPs which are patently agricultural and are classified as commodity-specific, sectoral-specific, area-specific and institutional strengthening are not devolved to the LGUs.

*[Handwritten signatures and initials on the left margin, including 'Sebastian', 'Tirol', and others.]*

WHEREAS, the parties agree that in the implementation of foreign assisted projects the DA and its Bureaus and Attached Agencies will still need devolved personnel such as Agricultural Technologist, Municipal Agricultural Officers, Provincial Agricultural Officers who are presently assigned to implement/coordinate/monitor these projects, hence the need for this Memorandum of Agreement, which shall not preclude the Bureaus and Attached Agencies from entering into separate Memorandum of Agreement.

NOW, THEREFORE, for and in consideration of the foregoing premises, the mutual covenants, terms and conditions hereinafter set forth; the parties hereby agree as follows:

1. The DA and its Bureaus and Attached Agencies shall;




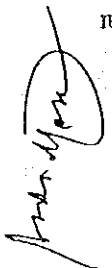
- 1.1 Continue to coordinate management of the implementation of all the on-going foreign assisted projects located within the jurisdiction of the LGU concerned thereby accentuating the process of coordination of the following projects:

TITLE : STRENGTHENING OF THE NATIONAL AI PROGRAM

- 1.2 Ensure that the foregoing projects are properly undertaken/implemented in accordance with the work program;
- 1.3 Provide the LGU's with a periodic report on program status; ←
- 1.4 Assist the LGU's in preparing project proposals which they can submit for foreign funding; ← ?
- 1.5 Facilitate the release and flow of the projects budgetary requirements; ← assist
- 1.6 Closely review the basic provision of the loan or grant agreements and see to it that it honors its commitments to the funding agencies and donors. } JICA'S personal report.
- 1.7 Have the right to change/recommend any LGU staff detailed to the project if found performing below par or his presence become inimical to the project. } was enforced?

2. The LGU shall:

- 2.1 Make available the services of the Agriculture Technologists, Municipal Agricultural Officers and the Provincial Agricultural Officers including equipment and facilities presently assigned to the on-going foreign assisted projects, being implemented by the first party in cooperation with the second party;

- 
- 
- 
- 
- 2.2 Provide benchmark data and participate in the planning, implementation, monitoring and evaluation of the project activities;
  - 2.3 To designate all field AI personnel who are involved in the AI services on full time basis;
  - 2.4 To provide sufficient maintenance, fuel and oil to vehicles assigned to field AI personnel and JOCV volunteers;
  - 2.5 To bear operational and maintenance cost of equipment, vehicles and spare parts;
  - 2.6 To meet running expenses necessary for the implementation of the program such as liquid nitrogen, shipping cost of semen tanks, traveling expenses etc;
  - 2.7 Thereafter ensure the continuity and maintenance of the project after termination of financial support from funding agency.

#### EFFECTIVITY

This agreement shall take effect upon signing hereof and shall remain in force until the project ends, unless otherwise earlier modified or amended by mutual consent of both parties.

#### TERMINATION

This agreement, upon (30) days notice may be terminated upon mutual consent of both parties.

IN WITNESS WHEREOF, the parties have affixed their signature below at \_\_\_\_\_ this day of \_\_\_\_\_, 19 \_\_\_\_\_.

DEPARTMENT OF AGRICULTURE

LOCAL GOVERNMENT UNIT

By:

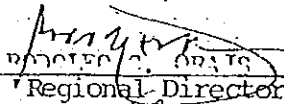
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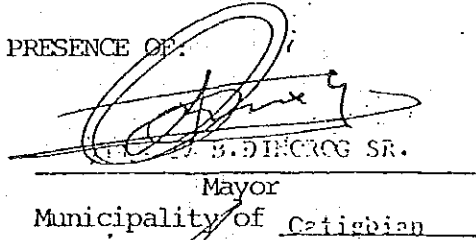
MANUEL M. LANTIN  
Officer-in-Charge

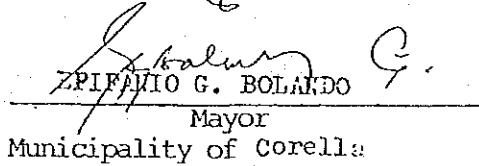
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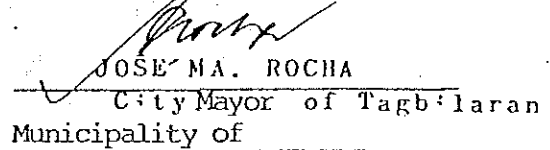
ATTY. DAVID B. TIROL, Ph. D.  
Governor

SIGNED IN THE PRESENCE OF

  
Regional Director

  
Mayor  
Municipality of Caisidian

  
MAYOR  
Municipality of Corella

  
JOSE MA. ROCHA  
City Mayor of Tagbilaran  
Municipality of \_\_\_\_\_

ACKNOWLEDGEMENT

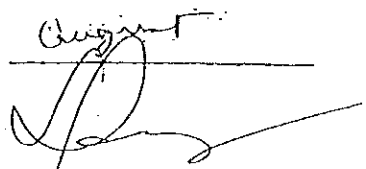
Republic of the Philippines) S.s.  
City of Quezon . . . . .)

BEFORE ME, a Notary Public for and in Quezon City, personally appeared before me ROBERTO S. SEBASTIAN in his capacity as Secretary of the Department of Agriculture, with residence Certificate No. 879004, issued at Davao City on Feb. 22 1992, known to me and to me known to be the same person who executed the foregoing instrument and acknowledged to me that the same is his voluntary free act and deed.

This instrument refers to a Memorandum of Agreement consisting of five (5) pages including this page on which this acknowledgement is written, duly assigned by the party and his instrumental witnesses on each and every page hereof.

WITNESS MY HAND AND SEAL this 18th day of August 19 93 at the place first above written.

Doc. No. 486  
Page No. 68  
Book No. XXXV  
Series of 1993

  
PACIANO T. PEREZ  
NOTARY PUBLIC  
UNTIL DECEMBER 31, 1993  
PTR NO. 1000145  
1-4-93 D.C.  
TIN-01-793-577

ACKNOWLEDGEMENT


Republic of the Philippines) S.s.  
Quezon City . . . . . )

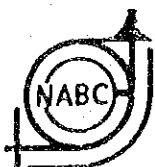
BEFORE ME, a Notary Public for and in Quezon City,  
personally appeared before me DAVID B. TIROL  
in his capacity as Governor of Tagbilaran City, with residence  
Certificate No. 9870850, issued at Tagbilaran City  
on Jan. 27, 1993, known to me and to me known to be that same  
person who executed the foregoing instrument and acknowledged to me  
that the same is his voluntary free act and deed.

This instrument refers to a Memorandum of Agreement consisting of  
five (5) pages including this page on which this acknowledgement is  
written, duly signed by the party and his instrumental witnesses on  
each and every page hereof.

WITNESS MY HAND AND SEAL this 18<sup>th</sup> day of August  
19 93 at the place first above written.

Doc. No. 487  
Page No. 68  
Book No. XXXVI  
Series of 1993

  
PACIANO F. PERCZ  
NOTARY PUBLIC  
UNTIL DECEMBER 31, 1996  
PTR NO. 1000145  
I-4-93 D.C.  
TIN-111-793-637



Republic of the Philippines  
DEPARTMENT OF AGRICULTURE  
BUREAU OF ANIMAL INDUSTRY  
**NATIONAL ARTIFICIAL BREEDING CENTER**  
Alabang, Muntinlupa  
Tel. 842-2348

9 October 1993

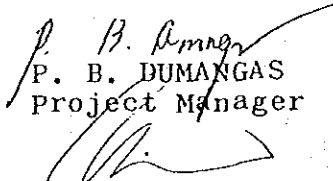
DIRECTOR ROMEO N. ALCSID  
Bureau of Animal Industry  
Visayas Ave., Diliman  
Quezon City

Sir:

We hereby request that the amount of P1,365,250.00 shall be incorporated in the yearly regular budget of the Bureau of Animal Industry in order to insure the continues production of frozen semen and implementation of A. I. program even after the termination of JICA-JOCV Assistance on July 30, 1994.

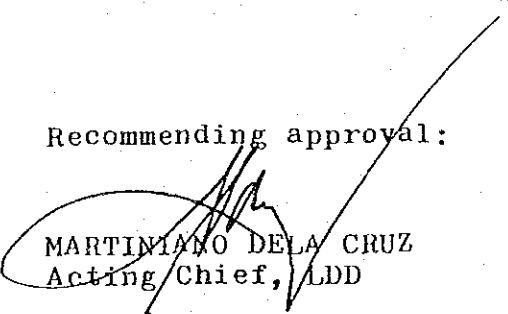
Thank you for your kind approval.

Very truly yours,

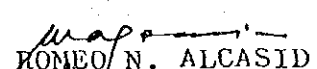
  
P. B. DUMANGAS  
Project Manager

SO OHORI  
JOCV Senior Volunteer

Recommending approval:

  
MARTINIANO DELA CRUZ  
Acting Chief, LDD

Approved:

  
ROMEO N. ALCASID  
Director

## BUDGETARY REQUIREMENT

( ESSENTIAL SUPPLIES for 100,000 doses Frozen Semen production & 30,000 A.I. services)

ITEM	F.O.B. PRICE (1991)	THRU LOCAL DISTRIBUTOR
<b>I. LABORATORY REAGENTS :</b>		
Extender	P 42,150.00	P 93,390.00
Staining	P 11,750.00	P 22,300.00
Others	P 19,760.00	P 25,360.00
<b>SUB-TOTAL</b>	<b>P 73,660.00</b>	<b>P 141,050.00</b>
<b>II. FROZEN SEMEN SUPPLIES :</b>		
Semen Straw	P 174,000.00	P 348,000.00
Straw Powder	P 27,000.00	P 54,000.00
Ink for Straw	P 18,600.00	P 37,200.00
Grass Ware	P 5,000.00	P 5,000.00
<b>SUB-TOTAL</b>	<b>P 224,600.00</b>	<b>P 444,200.00</b>
<b>III. A. I. SUPPLIES :</b>		
Straw Sheath	P 120,000.00	P 240,000.00
Plastic Glove	P 270,000.00	P 540,000.00
<b>SUB-TOTAL</b>	<b>P 390,000.00</b>	<b>P 780,000.00</b>
<b>GRAND TOTAL</b>	<b>P 688,260.00</b>	<b>P 1,365,250.00</b>

BREAKDOWN LIST

ITEM	UNIT PRICE	ANNUAL REQUIREMENTS
<b>I. LABORATORY REAGENTS :</b>		
· Extender	1. Raffinose	10,000/500g
	2. Tris	70,000/7bottles
	3. Citric Acid	1,960/500g
	4. Fructose	750/3bottles
	5. Distilled Water	800/kg
	6. Penstrep	2,400/3bottles
		40/ltr
		4,000/100bottle
		280/box
		8,400/30boxes
		<u>S-TOTAL 93,390</u>
· Staining	1. Eosin B	1,300/25g
	2. Carbon Fuchsin	2,600/2bottles
	3. Sodium Citrate	3,600/25g
	4. Methylene Blue	450/500g
		900/2bottles
		400/100g
		800/2bottles
		<u>S-TOTAL 22,300</u>
· Others	1. Alcohol	180/gal
	2. Methanol	540/3bottles
	3. Albolite Alcohol	180/ltr
	4. BTB	1,080/6bottles
	5. Glycerol	590/ltr
		3,540/6bottles
		560/box
		11,200/20boxes
		1,500/ltr
		9,000/6bottles
		<u>S-TOTAL 25,360</u>
<b>II. Frozen Semen Supplies :</b>		
· Semen Straw		870/500pcs
		348,000/200boxes
· Straw Powder		900/200g
		54,000/60bottles
· Ink for Straw		6,200/tube
		37,200/6tubes
· Glass Wares		5,000
<b>III. A. I. Supplies :</b>		
· Straw Sheath		400/50pcs
		240,000/600packs
· Plastic Glove		900/100pcs
		540,000/600packs
<b>GRAND TOTAL</b>		<b>P 1,365,250.00</b>





*United Fruit*

**THE MEDIUM-TERM AGRICULTURAL  
DEVELOPMENT PLAN 1993-1998**



*"... the toiling masses in our farms and fishing grounds . . . . These are the Filipinos whose existence we have all too often taken for granted, but whose labors bear fruit everyday, on our tables and in our pockets, in the food that we eat and in the secondary wealth that they generate in our economy. For all that, our farmers and fisherfolk have themselves had to survive on bare subsistence levels.*

*. . . They have had to contend not only with the vagaries of nature, but also with a kind of institutional neglect. It is woefully ironic, for example, that they who provide the basic wealth of our economy have found it extremely difficult to be trusted by banks for credit, to sell their goods freely and fairly, and to be heard in the halls of Government. Unquestionably, they deserve a better deal.*

*. . . As we move into the 21st century, we must make certain that agriculture — and all the people in it — are not left behind in a state of semi-feudal backwardness and incapacity. We have much to do in this area, and our work has begun."*



President Fidel V. Ramos



## *Foreword*

The Medium-Term Philippine Development Plan defines what we need to do if we are to attain prosperity and social, political, and economic stability by the turn of the century. We need to achieve world competitiveness and empower our people.

Because agriculture and fisheries produce nearly one-third of the gross national product and employ half of the labor force, these sectors are a logical and potent springboard for achieving global competitiveness and people empowerment by the year 2000. But the agriculture and fishery sector must be modernized if it is to provide the base for industrialization and propel the economy forward.

The Key Production Area or KPA development approach we are adopting is a blueprint for such modernization. It seeks to complement the macro-economic policy and institutional reform agenda for agri-industrialization laid out in the Medium-Term Philippine Development Plan.

The KPA approach encourages farmers and fisherfolk to produce specific products only in those areas of the country where the land, water resources, and climate are suitable for those products, and where ready markets are available. It is in these areas where government will concentrate its infrastructure investments, post-harvest and marketing assistance, credit support, and research and extension services.

In this way, farmers and fisherfolk would get the best returns on their investments and government would make efficient and cost-effective use of scarce resources.

The key to people empowerment in the agriculture sector is farmers' and fisherfolk's control over the resources required to make farming and fishing profitable. The most essential of these resources is land. And because land ownership is necessary to secure credit, production inputs, political patronage, and other means to make land productive, the pace of the agrarian reform program must be speeded up even as the KPA development approach is implemented.

Beyond acquiring title to land, farmers and fisherfolk must organize themselves into cooperatives. In this regard, we will provide the needed technical and institutional support to develop farmers' and fisherfolk's cooperatives, which is a vital feature of the KPA approach.

Once organized, farmers and fishers will have the capacity to negotiate directly with suppliers, processors, and end-users for lower and better prices of their inputs and various products. Moreover, they will be able to efficiently manage the available resources and factors of production they need to sustain viable enterprises. To enable them to integrate or diversify their operation, we will also help them establish the needed backward and forward linkages with concerned groups or sectors.

We have called on our partners in government for support in making our vision for the agriculture sector a reality. They have responded enthusiastically, and we look to the future with great optimism because of this.

We now ask all engaged in the business of agriculture — above all, the millions of farmers and fisherfolk who toil in the countryside — to join hands with us in this endeavor. Without their collaboration, we cannot hope to succeed.



ROBERTO S. SEBASTIAN  
Secretary

## ***Abbreviations***

<b>ACPC</b>	Agricultural Credit Policy Council
<b>ADB</b>	Asian Development Bank
<b>AT</b>	Agricultural Technologist
<b>BSWM</b>	Bureau of Soils and Water Management
<b>CRB</b>	Cooperative Rural Bank
<b>DA</b>	Department of Agriculture
<b>DAR</b>	Department of Agrarian Reform
<b>DD</b>	Diversion Dam
<b>DENR</b>	Department of Environment and Natural Resources
<b>DOST</b>	Department of Science and Technology
<b>DOTC</b>	Department of Transportation and Communication
<b>DPWH</b>	Department of Public Works and Highways
<b>DTI</b>	Department of Trade and Industry
<b>FMD</b>	Foot and Mouth Disease
<b>FMDP</b>	Fisheries Management and Development Program
<b>FSP</b>	Fisheries Sector Program
<b>GAA</b>	General Appropriations Act
<b>GFI</b>	Government Financial Institution
<b>GPEP</b>	Grains Production Enhancement Program
<b>IA</b>	Irrigators' Association
<b>KBP</b>	Kapisanan ng mga Brodkasters sa Pilipinas
<b>KCCA</b>	Key Commercial Crop Area
<b>KCCDP</b>	Key Commercial Crops Development Program
<b>KFDA</b>	Key Fisheries Development Area
<b>KG</b>	Kilogram
<b>KGA</b>	Key Grains Area
<b>KLDA</b>	Key Livestock Development Area
<b>KPA</b>	Key Production Area
<b>LBP</b>	Land Bank of the Philippines
<b>LGU</b>	Local Government Unit
<b>MA</b>	Municipal Agriculturist
<b>MARINA</b>	Maritime Industry Authority
<b>MT</b>	Metric Ton

# THE MEDIUM-TERM AGRICULTURAL DEVELOPMENT PLAN : Key Production Areas, Targets, and Programs



*United Fruit*

## The MTADP Vision, Objectives, and Strategy for Developing the Agriculture Sector

"Philippines 2000" envisions a Filipino nation by the turn of the century that will have been politically, economically, and socially stable — with an empowered citizenry enjoying a better quality of life. The following would have been achieved: a per capita gross national product (GNP) of \$1,000, an average annual growth rate of 6%-8%, and reduced poverty incidence to 30%.

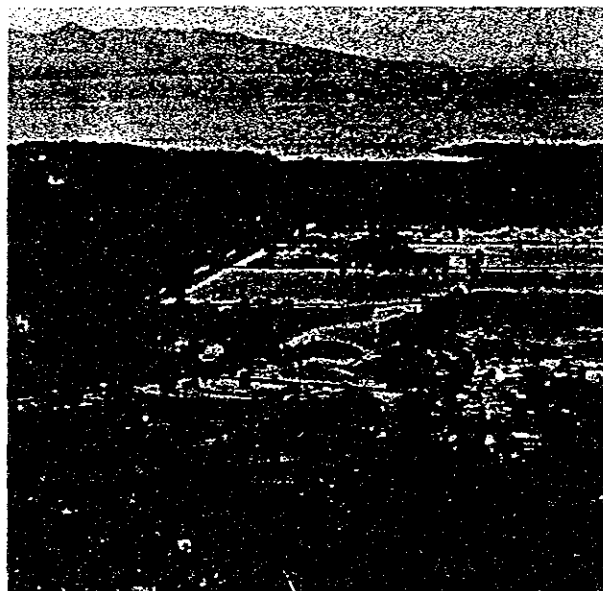
This is the same vision that inspires the Medium-Term Agricultural Development Plan (MTADP) for 1993-1998. The MTADP, guided by the Medium-Term Philippine Development Plan for 1993-1998, seeks to enable farmers and fisherfolk in increasing their incomes and realizing for themselves a better quality of life.

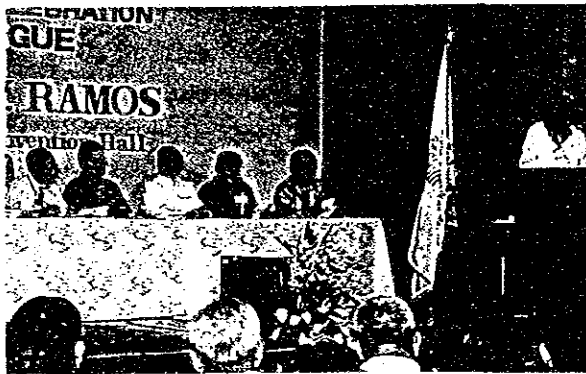
The Plan adopts the Key Production Area or KPA development approach to enable the sector in achieving its basic objective and in contributing to fulfilling the twin goals of Philippines 2000: people empowerment and global competitiveness.

## The Key Production Area Approach

The KPA approach identifies and focuses government support on certain priority areas whose agro-climatic features and market conditions are favorable for producing, processing, and marketing specific products. It is also in these areas where the need for government support is most critical.

Thus, government would find it easier to remove the bottlenecks that impede competitiveness of key commodities, ensure efficient use of scarce resources, and help obtain for farmers and fishers the best returns on their investments.





The KPA approach draws from the experience of the Newly Industrialized Countries (NICs) in Asia, particularly Taiwan and South Korea, where a modernized agriculture sector provided the base for industrialization.

**Empowering the farmers and fisherfolk.** The basic premise of the KPA approach is empowerment of farmers and fisherfolk toward increasing their incomes and realizing for themselves a better quality of life.

An effective agrarian reform program would give back to the small landless farmers and farmworkers the right to own the land they till. It would also facilitate organization of the new landowners so that they will have control of the land — which is their basic resource — and of the other aspects of the farm business: supply of farm inputs, management of credit

resources, acquisition of post-harvest facilities, marketing of produce. Thus, they would have the leverage to negotiate for better input and output prices toward making a profitable business out of agriculture.

The government, through the Department of Agriculture (DA), will support the efforts of farmers and fisherfolk in consolidating and strengthening their ranks and in sustaining their viability. It will course support through specific programs, such as Project Self-Reliance (PSR) which seeks to turn over the warehouses of the National Food Authority (NFA) to qualified farmer cooperatives and federations. Managing the warehouses themselves, these groups could directly procure palay and corn from their members, process these products, and market them to end-users.

**Toward Global Competitiveness.** An empowered citizenry among the farmers and fisherfolk who would make it possible for higher farm productivity and better cost efficiency, would lead to global competitiveness.

Thus, the KPA approach encourages farmers and fishers to produce specific crops, livestock, and fishery products only in areas that have the comparative advantage in producing such commodities. This would increase the efficiency and cost-effectiveness of agricultural and fishery enterprises, giving farmers the best returns on their investments. It would also enable the country to produce world-class products for the world market and for these products to compete on an even footing with imports in the domestic market.

Higher rural incomes from greater farm productivity increase consumer demand, expand the domestic market for industrial goods and services, and trigger employment and income multiplier effects. Rising farm productivity would allow farm and rural labor to move into industry. The GNP share of agricultural outputs would then decline as those of the manufacturing and service sectors would increase. Such a scenario would be a natural and healthy transformation in a prosperous and growing economy.

### Putting land to best use

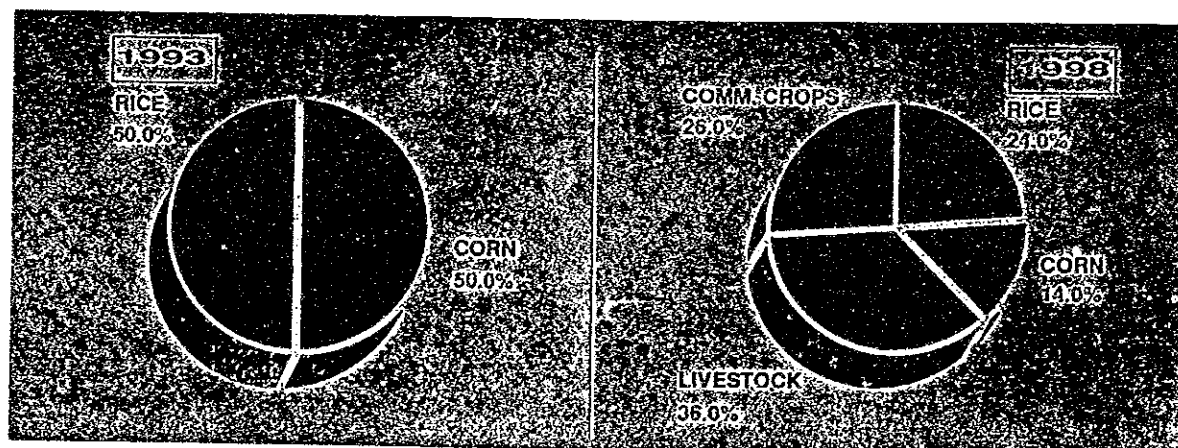
We can sustain our growing food requirements and even produce "export winners" competitively if we can put our land and water resources to best use. We can do so by managing these resources judiciously, while harnessing strategies and technologies that are most appropriate, cost-efficient, and environment friendly. Thus, we could satisfactorily meet both our immediate and long-term economic and ecological needs.

For instance, some 2.5 million hectares are currently planted to rice and another 2.5 million hectares to corn. The DA envisions that rice and corn production could eventually be concentrated in about 1.9 million hectares identified as best suited to these crops. This would free up some 3.1 million hectares for diversification to livestock and commercial crops, in addition to the livestock and commercial crop areas now profitably used for such commodities.

Of these 3.1 million hectares, about 1.8 million hectares identified as best suited to forage crops production could be used for livestock raising; 1.3 million hectares for commercial crops cultivation. The hog and poultry industries and the commercial crops sectors would provide the "export winners" that would increase our share of world agricultural markets.

The DA, in mapping out these areas, has been guided by existing laws and other relevant considerations on land conversion (Figure 1).

Figure 1. Agricultural Land Use Before and After MTADP Implementation





### Providing support beyond production

The Plan provides for the necessary support to the identified KPAs, such as PSR as abovestated, technology assistance, post-harvest and marketing facilities, and market matching. For example, under the Transport Infrastructure Component of the Grains Production Enhancement Program (GPEP) — which administers the Key Grains Areas (KGAs) for rice — the DA will identify and push for adequate transport infrastructure and handling facilities in the key areas.

Also, the DA has coordinated with the Department of Trade and Industry (DTI) on their Regional Agro-Industrial Centers (RAICs) which should serve as major markets for the commodities produced in the KPAs. Market-matching activities will also be pursued.

### Summary of Required Financial Resources

The Medium-Term Agricultural Development Plan from 1993 to 1998 will require a total of P181 billion (Table 1). This amount will come from allocations for the national government (P71.78 billion), contributions from the private sector (P15.12 billion), and government financial institutions or GFIs (P53.63 billion), and official development assistance or ODA (P40.89 billion).

The financial requirements for the MTADP may appear staggering. Their corresponding uses, however, would address only the minimal requirements which are just enough to get the sector moving. Much more is needed, as much more remains to be done.

Table 1. MTADP: Summary of required financial resources, 1993-1998, by funding source (in billion pesos)

FUNDING SOURCE	GPEP	MTLDP	KCCA	FMDP	TOTAL
Domestic Sources	45.65	18.92	4.50	3.92	73.09
Official Development Assistance Sources	17.28	22.91	7.80	12.25	60.24
Government Financial Institutions	11.78	33.11	5.91	4.82	55.62
Private Sector	0.74	5.41	7.80	11.47	25.42
<b>TOTAL</b>	<b>75.45</b>	<b>60.32</b>	<b>26.01</b>	<b>32.46</b>	<b>184.24</b>

# THE MEDIUM-TERM LIVESTOCK DEVELOPMENT PROGRAM



The Key Livestock Development Areas (KLDAs) are located in 44 provinces (Figure 3). The DA will carry out the KPA objectives in these areas under the Medium-Term Livestock Development Program (MTLDP) which complements GPEP.

The 44 KLDAs and their respective priority livestock types are:

CAR	: Ifugao	Carabao, Dairy
	Mt. Province	Cattle, Dairy
Reg. I	: Ilocos Norte	Cattle
	Ilocos Sur	Cattle
	Pangasinan	Cattle, Carabao, Hog, Dairy
Reg. II	: Cagayan	Cattle, Carabao, Hog, Dairy
	Isabela	Cattle, Carabao, Hog, Dairy
	Quirino	Cattle, Carabao
Reg. III	: Bataan	Hog
	Bulacan	Cattle, Poultry, Dairy, Carabao
	Nueva Ecija	Carabao, Goat, Dairy
	Pampanga	Cattle, Carabao
	Tarlac	Cattle, Carabao
	Zambales	Cattle

Reg. IV	: Batangas	Cattle, Carabao, Dairy
	Mindoro	
	Occidental	Cattle
	Palawan	Cattle
	Quezon	Cattle, Hog, Carabao, Dairy
Reg. V	: Albay	Cattle, Dairy
	Camarines Sur	Cattle, Poultry, Dairy
	Masbate	Cattle, Carabao
	Sorsogon	Cattle, Dairy
Reg. VI	: Aklan	Cattle, Goat
	Antique	Poultry, Cattle
	Capiz	Carabao, Cattle, Dairy
	Iloilo	Cattle, Poultry, Hog, Dairy, Carabao
	Negros Occidental	Cattle, Dairy
Reg. VII	: Bohol	Cattle, Carabao
	Cebu	Carabao, Poultry, Hog, Cattle, Dairy
	Negros Oriental	Cattle, Carabao, Dairy

Another 32% or P24 billion of the total GPEP cost will be spent on Credit Support. Some P9.3 billion of this amount is the capital infusion needed to fill in the gap between what the participating banks can provide and what is required for production loans. About P2.2 billion of the cost of the Credit component represents DA's equity contribution for post-harvest facility loans.

Marketing support should get about P9.8 billion or 13%, most of which will finance NFA's procurement activities. This amount is programmed on the assumption that the extent of NFA's involvement in the grains market will decline from 6% of total palay production in 1993 to 3% in 1998.

The Certified Seed Subsidy will account for roughly 9% or P6.9 billion of the total program cost. While this amount has been allocated for seed subsidy requirements over the five years of the program, a portion of this budget may be re-programmed for other components should government decide to stop the subsidy.

The rest of the amount needed for the program will be spent on post-harvest, production technology development and dissemination, public information support, and program management.

Table 5. Total cost of GPEP and percentage share by component, 1993-1998 (in million pesos)

COMPONENT	TOTAL	SHARE (%)
Irrigation	33,917.82	45.04
Credit	24,003.02	31.88
Capital Infusion for Production Loans	9,270.00	12.31
Capital Infusion for Post-Harvest Facility Loans	14,726.02	19.56
Credit Facilitation	7.00	0.01
Marketing Support	9,766.24	12.97
Certified Seed Component	6,926.62	9.20
Post-Harvest Technology and Facilities	474.82	0.63
Production Technology	129.40	0.17
Public Information Support	24.20	0.03
Program Management	55.60	0.07
<b>T O T A L</b>	<b>75,297.72</b>	<b>100.00</b>

Figure 3. Map of Key Livestock Development Areas, Philippines \*



\* Representational only; does not reflect actual hectareage covered by the Program.

Reg. VIII : Northern		
Leyte		Poultry, Carabao, Dairy
Eastern		
Samar		Cattle
Western		
Samar		Poultry
Reg. IX : Zamboanga		
del Norte		Cattle, Poultry
Zamboanga		
del Sur		Cattle, Hog
Reg. X : Bukidnon		Cattle, Carabao, Hog, Dairy
Misamis		
Oriental		Cattle, Carabao, Dairy
Reg. XI : Davao		
del Norte		Cattle, Carabao, Goat, Dairy
Davao		
del Sur		Cattle, Poultry, Dairy
Davao		
Oriental		Cattle
South		
Cotabato		Cattle, Hog, Carabao, Dairy
Reg. XII : Sultan		
Kudarat		Hog
North		
Cotabato		Poultry, Cattle
ARMM : Maguindanao		Poultry, Cattle

The priority clients for the program are farmers whose crop areas are not covered by GPEP and who belong to livestock cooperatives. Ranchers and cooperators also have important roles to play.

### Objectives and Targets

The program seeks to lay the foundation for a productive, efficient, economic, and sustainable livestock and poultry industry. It will have achieved the following by 1998:

- Increased population of cattle at 3.0 million;
- Stabilized population of carabaos at 2.5 million head, with measures to improve the quality of the herd for meat and milk production;
- Increased population of small ruminants (e.g., goat and sheep) at 3.4 million; and
- Increased population of hogs at 10.8 million and chicken at more than 100 million.

Corollary to these targeted increases in population will be:

- Increased overall production;
- Improvement in production coefficients;
- Rise in income levels of livestock farmers; and
- Institutionalized approaches to the industry's growth, with the private sector at the lead.

## Action Plan

The program design considered the following factors:

The commodity components of the livestock sector are in varying stages of development. The cattle industry appears to be the least developed, based on the country's almost absolute reliance on imports of milk and substantial imports of beef, and the alarming decline of the herd population. The overall direction for cattle is, therefore, to build up the population base, increase animal productivities, and lay the groundwork for sustained development.

The poultry and hog industries appear to be relatively more developed, considering that much of the local demand is met by local production. The major direction for this sector is, therefore, to sustain the gains in the industries and explore export markets.

Programs for the carabao industry have traditionally been oriented to the development of the carabao as a draft animal. With increasing reliance on mechanization and greater demand for beef and milk, the industry needs to be developed also as source of meat and milk.

The small ruminants — goat and sheep — have important roles to play in farming systems and as distinct industries by themselves. Capital operating costs for their production are not as high as those for other livestock. Further, there is a potential market demand for their products.

The program, therefore, seeks to develop the livestock sector by component industries rather than in the aggregate. On the other hand, its approach also takes into account the response of the sector, as a whole, to the needs of rice and corn farmers who are not covered by GPEP.

With the KLDAs as focal points for production and as recipients of support services, the program will have the following features:

- Private-sector led;
- Integrated production and post-production;
- Projects to be funded by loans, the terms of which will consider nature of projects and client groups;
- DA as lead in a National Breeding Program for Beef and Dairy Cattle in the various stock farms;
- Provided with support services from DA



through its regulatory functions, training and extension, organization, management, and technical assistance;

- LGUs as lead in the implementation of the various projects in their respective areas; and
- Projects to be geared to increased productivity, profitability, sustainability, and increased self-reliance of the participating cooperatives.

### Program Components

The Beef Cattle Development Program is the major thrust of the MTLDP. With 38 provinces to cover, it will directly address the alarming decline in population of the local cattle herd while attaining self-reliance in beef supply in six years.

The program will accelerate and sustain the increase of the cattle breeder base by:

- Establishing production and breeder farms



**Nucleus farms** consisting of 500 to 1,000 cow modules will be established and operated by cooperatives or private ranchers. These will serve as production farms and as sources of breeder cattle to be distributed to other cooperatives or ranches.

**Anchor farms**, which are relatively smaller nucleus farms (herd size of 20 breeder cows), will also function as production and breeding farms.

In both types of farms, the animals will be owned collectively by the cooperative and raised as communal herd.

Among the farmers, the animal modules consisting of "2-breeder, 3-feeder cattle" and "5-feeder cattle" will be promoted. The modules are designed to respond more immediately to the needs of farmers who will shift from rice/corn farming to livestock. The animals will be distributed among or through the cooperatives.

- Upgrading the local stock

The genetic potentials and productivities of local herds will be improved through intensive artificial/natural breeding programs and the promotion of improved feeding and management technologies among cooperator-farmers/cooperatives/ranches.

- Breeder/feeder cattle importation

Massive breeder cattle importation will be undertaken, primarily because of the insuf-

efficient breeder base. This is intended for foundation stock to arrest the declining trend in cattle population to three million by 1998.

The ongoing feeder cattle importation will be continued in the medium term to ensure that breeder cattle extraction rate will be minimized by supplementing local beef supply with imported feeders.

- Buy-back/save-the-herd scheme

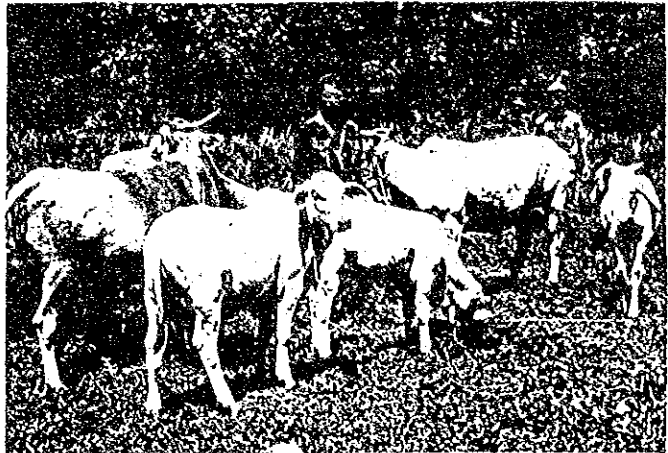
The program seeks to strengthen this ongoing project of the Bureau of Animal Industry (BAI), which involves pregnant and breedable cattle about to be slaughtered. Government buys these cattle and rears them in stock farms for production purposes.

Facilities such as feedmills, slaughterhouses, auction markets, etc. will be set up. Concerned government agencies will work together in providing for other infrastructures such as farm-to-market roads, irrigation systems, transport.

It is expected that by the end of the program, there will be sufficient numbers of locally born fatteners to meet local requirements.

Over the plan period, 358,227 beef breeders and 685,000 feeder stock will be infused; and 291 nucleus farms, 517 anchor farms, and 131,964 animal modules will be established.

The Dairy Development Program addresses the need to correct the country's current situation of heavy dependence on imported

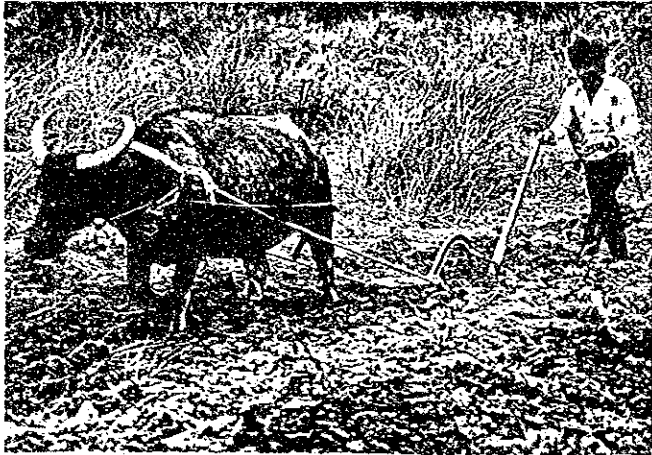


dairy products. Thus, the MTLDP encourages and supports the establishment of rural-based, cooperative-oriented dairy programs and projects. This strategy seeks to broaden the base of the local dairy sector and contribute to attaining the goals of increasing farm incomes, making efficient use of farm resources, providing rural employment opportunities, and general improvement in the quality of life in the countryside.

The program will cover 23 provincial KLDAs. At the same time, it will continue to support the six current dairy projects of the government. Such projects will involve integrated production, processing, and marketing units owned and managed by dairy cooperatives.

- The production base will consist of communally raised and managed herds. Animals will be distributed to the cooperatives, not to individuals. The production farm will likewise be managed by the cooperative to ensure consistency in the quality and quantity of milk to be produced by the project.





The dairy animals for the projects will be sourced from upgraded local stock and importation. From 1993 to 1998, some 37,500 head of dairy animals will be infused under the program and distributed among 23 provinces in 10 regions.

- Processing will be coursed through a central processing facility sized according to the projected volume to be produced, and equipped with the capability to produce a diverse range of products. Marketing of milk will be carried out by linking its production with nutrition programs and industrial processors, in addition to the traditional milk outlets.

From 1993 to 1998, imported dairy animals will be distributed among 23 provinces. For any given area, this will be done in three phases. (a) The preparatory phase is for consulting officials of the local DA and other government agencies and non-government organizations (NGOs), identifying cooperatives and project areas including markets, and conducting information and education campaigns. (b) The set-up phase

requires actual procurement of dairy animals, preparation of dairy production sites and the processing plant, and development of dairy markets. This phase will also take care of training and education. (c) Full operation phase will have instituted actual production and marketing of dairy products — providing for technical and educational, administration and management, and monitoring and evaluation services.

The Carabao Program seeks to improve the production potentials of the Philippine carabao using the riverine breed. This will result in increasing the number of breeders, conserving superior germplasm, and developing technologies aimed at increasing productivities. The program will also promote carabao upgrading and development of carabao-based enterprises in the KLDAs for carabao.

Two major programs have been designed for the MTLDP: (a) The Research Program will cover policy issues, technology generation and verification, and technology transfer. (b) The development program will intensify carabao upgrading, establish and strengthen a Philippine Carabao Elite Herd, undertake a "Save the Herd" program, and implement projects that will promote buffalo enterprises by providing technical, credit, and market development services.

The Small Ruminants Program seeks to integrate goat and sheep production into farming systems. This will require the introduction of improved breeds, design and implementation of credit schemes and training

and extension programs, and the provision of animal health and related technical services.

Ten nucleus goat farms with a population of 1,000 does each will be set up to serve as production farms and as sources of superior quality stock for distribution to the farmers. Five of these farms will be set up in 1994; the other five in 1995.

The goats produced in the nucleus farms will be distributed to anchor goat farms, each with herd size of 20 does in animal modules of one buck for every 10 does. Some 222,704 farmers will benefit from this scheme.

The program will also institutionalize intensive goat and sheep breeding to upgrade the local stock. This will be done through artificial insemination (AI) and natural breeding. The latter will be served by imported breeding bucks and locally produced but superior quality stock. Thus, productivities of animals kept by smallholder farmers are expected to increase.

Technicians and staff recruited specifically for the above purpose will undertake the training and extension component of the program.

The Poultry Program is geared to assisting the initiatives in this subsector, considering that it is already relatively well developed. With the private sector at the lead, government will promote macroeconomic policies governing poultry and animal feeds, which are supportive of such initiatives.

Grandparent (GP) breeding stock will be

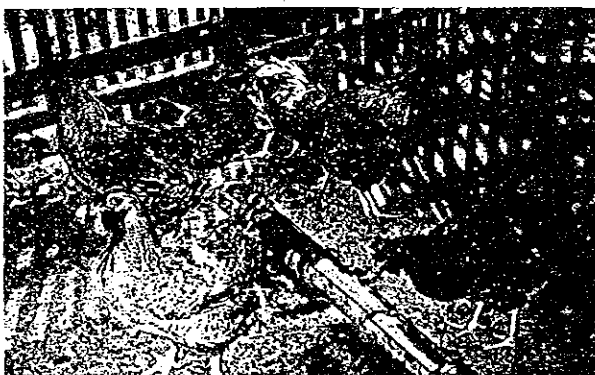
established to address the poultry sector's heavy dependence on breeding stock.

The program will move to correct the maldistribution of poultry farms that are currently concentrated in Luzon, specifically Metro Manila, and Regions III and IV. It will also undertake activities designed to conserve and improve native chicken breeds and strains.

The Swine Program will support current initiatives using DA resources that are already in place. The major thrust is to increase population to 10 million by 1998.

At the same time, the program will explore the export market potentials for hogs. This would require setting up export processing zones in areas where preconditions are met: that these areas be disease-free, with accessible basic utilities, accessible to air and sea transport, and whose production and processing facilities and technologies meet international standards.

A production center for swine GP stock will also be developed as a local complement to the production of stocks from importation and by existing commercial integrators. The



stock produced from these GP swine farms, like those from the GP poultry farms, will be distributed to small farmers who are not linked with integrators or are unable to import their requirement.

Processing zones will be managed in partnership with the hog farmers, associations, or groups from the private sector that have reached such levels of development, making the target a clear possibility.

The government will also initiate the establishment of 11 swine GP farms in pre-identified KLDAs. This will most likely assure domestic availability of stocks for smallhold swine raisers. As in the Poultry Program, this endeavor will require private sector counterparts on management, since the farms will be established on build-operate-transfer (BOT) conditions.

The Post-Production and Market Support Program is intended to achieve efficiency and attain quality for livestock products acceptable to the consuming public.

The initial thrust of the program is to improve and upgrade conditions of existing post-production facilities in KLDAs, such as auction

markets, livestock stockyards, abattoirs, poultry dressing plants, and meat and meat products processing plants.

Additional post-production facilities will be set up where the volume of production requires them in predetermined areas in the KLDAs. Inventory of all available facilities, their determined capacity, the demand in the locality, potentials for the international market — putting into consideration the situation of animal disease in the country — will be the basis for the establishment of additional post-production facilities.

Over the program period, a total of 200 meat plants are to be established: 136 abattoirs, 14 poultry dressing plants, 50 meat processing plants. Of these, 22 will meet export standards, 18 auction markets will be established, and 60 existing ones will be rehabilitated. Of the 136 abattoirs to be established, 24 will be "AA," 55, "A," and 120, "B". Of the 24 "AAs," 10 will have provisions for processing of meat and meat products.

The market support activities to be undertaken under this component will include market-matching activities, market assistance services, exploration of export market potential, and the formation of a Livestock Marketing Coordinating Group that will perform the following functions:

- Facilitate the provision of technical support services such as training and price information;
- Arrange the sale of purebreds to other



purebred breeders or to commercial producers. Purebreds could be sold through auctions sponsored by cooperatives or on a consignment basis.

- Arrange contract growing schemes;
- Provide information on the demand requirement of institutional buyers, processors, and wholesale markets. Direct assistance in grading, marketing cost, terms, quality standards, preparation for shipment and transporting/handling practice as basis for price differentiation may also be provided.
- Assist in minimizing transport costs arising from illegal taxation (checkpoints);
- Make available price information through mass media;
- Conduct marketing meetings on a regular basis;
- Include marketing as an added function of ATs; and
- Facilitate the provision of marketing facility loans for the acquisition of equipment necessary to marketing activities.

Support services will also be provided through stockfarm development, quarantine station development, feeds and forage development, and breeding services, among other interventions.

The Stockfarm Development Program will require DA to maintain its own herd of top-

quality animals for production, breeding, research, and development. It will also have to provide training facilities, sources of quality forage grasses and legumes, and undertake applied research consistent with the overall agricultural research agenda.

Eleven government stockfarms will be developed and maintained for breeder cattle (eight), carabao (one), and sheep and goat (two).

The program component for Quarantine Station and Animal Health is intended to develop a substantial number of animals that will be imported under the MTLDP.

Five Central Quarantine Stations and 145 On-Farm Quarantine Areas will be developed in five years.

For animal health, individual commodity programs have such provisions in their activities and budgets. Considering, however, the veterinary health targets of eliminating foot and mouth disease (FMD) and reducing the incidence of Hemorrhagic Septicemia, Hog Cholera, Newcastle Disease (NCD), Blackleg, and Anthrax, additional funds are programmed to support provincial and regional units. These are for pharmaceuticals, drugs, and biologics.

The Feed and Production Support Component will seek to strengthen such services to meet the demands of the program. Intensified animal feed quality control services will be provided to ensure that feeds for commercial sale conforms to the quality standards prescribed by the government and



guaranteed by the manufacturer. The program will continue with registration of feeds, feed ingredients, and veterinary drug and products, inspection and evaluation of establishments and outlets, and prescription of policies and guidelines in relation to manufacture, importation, distribution, and sale. Research and development activities for forage, pasture, and non-conventional feeds will be enhanced to aid production activities. At the same time, technical support for feasibility studies, feeding trials, feed formulation and manufacturing, and nutrition technology generation will be widely extended.

The BAI will also establish forage nurseries in strategic areas, such as the Milagros Livestock Production Center, Ubay Stockfarm, and Busuanga Livestock Breeding and Experimental Station so that farmers can avail themselves of materials at lower cost. Provincial and municipal nurseries will be expanded to provide farmers with vegetative planting material. Legumes harvested from government stations will be distributed to NGOs and cooperatives at cost.

Breeding Services capabilities of the National Artificial Breeding Center, the Regional Centers at Malaybalay, Dumaguete, and Negros Oriental will be improved to effectively provide for the needed breeding services under the program. Training on artificial insemination will be conducted for DA and LGU field technicians. They will be equipped with AI kits and motorcycles for effective delivery of services. Likewise, facilities of breeding centers will be improved.

A Credit Support System through an institutionalized Multi-Livestock Dispersal Loan Program will be advocated by the National Livestock Program Management. The loan program is now being implemented by DA-BAI.

This program has proven to be quite acceptable to farmer-cooperators and has a repayment rate of more than 90%. Its features — 10% interest rate and eight-year amortization period inclusive of a two-year grace period on the principal — appear to be most suitable for financing the various program modules.

The DA will provide seed funds to participating conduit banks. The funds will be provided at minimal rates such that even if conduit banks charged their normal intermediation fees, the loans could still be extended to farmer-cooperatives at soft rates. Also, the existing loan portfolios of the DBP, LBP, and PNB may be tapped as long as they are acceptable to farmer-borrowers.

#### Program Costs

A total of P61 billion will be needed to implement the program from 1993 to 1998. The major cost is for the Beef Breeder Cattle Development Program which requires P44 billion or 72% of the total cost (Table 6).

Most of the costs are credit and private sector costs, *i.e.*, for the procurement of stocks, development of the farms, other capital requirements, and initial operating expenses. These costs — for investments and funds to be made available for loans to cooperatives and other participating groups — will total P38.5 billion.

Direct government costs — technical assistance and services, research and development, education and training, stockfarms and quarantine station development — will require P19 billion or 31.1% of total cost.

Table 6. Total cost of MTLDP, by component, 1993-1998 (in million pesos)

COMPONENT	TOTAL	SHARE (%)
Breeder Cattle Development	43,963.60	72.16
Dairy Program	2,301.90	3.78
Carabao Program	1,144.80	1.88
Small Ruminants Program	131.60	0.22
Poultry Program	707.50	1.16
Swine Program	453.50	0.74
Post-Production Program	566.60	0.93
Support Services	11,489.90	18.86
Monitoring and Evaluation	119.10	0.20
<b>TOTAL</b>	<b>60,928.60</b>	<b>100.00</b>

年 の 飼 養 頭 数 (1980~1993)

地 域	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
全 国	1,882,860	1,939,950	1,941,650	1,937,520	1,848,950	1,786,390	1,814,460	1,746,850	1,700,010	1,681,650	1,629,230	1,676,866	1,658,766	1,913,861
REGION III	85,830	98,900	98,270	98,300	100,430	103,040	109,340	103,850	107,520	127,030	139,990	137,649	135,743	132,119
Bataan	10,540	9,150	10,080	7,860	7,580	5,960	5,260	4,760	3,590	4,120	4,070	4,823	4,751	5,630
Bulacan	8,820	13,060	13,020	13,290	13,720	12,700	16,450	18,880	21,520	24,900	31,060	33,431	32,613	27,734
Nueva Ecija	28,240	32,600	31,570	28,890	30,400	30,810	34,460	35,470	39,030	43,640	48,870	53,323	43,660	37,512
Pampanga	2,030	2,780	3,030	2,330	2,730	2,650	2,850	2,540	2,630	3,430	4,080	4,505	4,113	9,774
Tarlac	26,490	28,090	27,580	33,970	32,220	38,390	39,180	30,120	30,100	37,630	37,790	28,945	39,416	39,509
Zambales	9,760	13,220	12,990	12,760	13,810	12,550	11,640	12,080	10,650	13,310	14,120	12,622	11,190	11,960
REGION VII	232,480	251,000	246,660	243,500	221,180	205,210	221,870	230,220	229,410	205,220	206,260	220,760	217,653	241,619
Bohol	60,610	64,140	64,670	66,210	63,320	58,880	61,280	56,720	58,260	61,340	66,830	54,435	58,850	66,998
Cebu	90,190	99,880	101,190	102,520	87,480	81,590	87,160	89,610	86,940	72,210	70,750	90327	86,456	97,391
Negras Oriental	63,500	70,310	64,760	57,780	54,300	49,860	57,040	67,910	68,130	53,990	53,320	57,823	51,340	56,913
Siquijar	18,180	16,670	16,040	16,990	16,080	14,880	16,390	15,980	16,080	17,680	15,360	18,195	19,007	20,317
REGION X	235,320	205,200	204,480	189,940	176,930	159,200	164,400	133,820	134,990	148,490	166,610	193,252	210,322	242,115
Agusan del N.	4,480	5,880	6,830	6,770	6,940	5,640	5,530	5,230	5,080	4,120	2,830	6,991	3,649	7,523
Agusan del Sur	1,140	2,200	2,200	1,510	1,330	1,960	1,960	1,900	1,990	2,420	1,920	2,180	2,690	4,300
Bukidnon	113,680	84,240	82,060	75,030	71,580	64,780	72,340	43,360	43,990	57,310	61,230	68,065	81,676	101,513
Camiguin	9,010	6,690	7,050	7,960	7,350	4,710	6,100	4,460	3,850	4,160	4,920	6,267	5,873	4,560
Misamis Occ.	52,160	40,870	40,100	37,280	35,530	31,820	30,040	31,760	34,540	34,750	41,970	37,126	39,649	39,649
Misamis Or.	53,560	63,670	64,920	60,300	53,080	49,620	47,630	46,150	44,630	45,010	52,590	71,203	75,114	83,400
Surigao del N.	1,290	1,650	1,320	1,090	1,120	600	800	960	910	720	1,150	1,420	1,671	1,179

水牛の飼養頭数(1980~1993)

地域	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
全国	2,849,420	2,849,940	2,908,450	2,946,150	3,021,550	2,982,840	2,984,450	2,865,260	2,890,030	2,841,850	2,764,950	2,646,841	2,479,749	2,561,257
REGION III	281,880	287,100	296,510	291,950	283,900	265,670	268,570	256,310	260,400	256,780	247,850	230,701	228,224	194,306
Bataan	12,660	12,560	13,630	14,250	10,980	9,660	9,260	9,830	13,498	8,550	8,060	9,965	9,450	10,429
Bulacan	25,880	35,500	38,150	37,060	36,830	31,210	33,220	29,390	31,950	25,890	27,330	25,227	24,577	18,978
Nueva Ecija	89,730	93,770	96,590	91,410	90,680	88,140	89,980	88,380	89,540	89,600	94,330	89,703	95,788	72,444
Pampanga	61,350	55,440	56,870	57,510	55,710	51,520	48,600	39,400	37,650	39,980	31,570	30,224	25,487	25,015
Tarlac	66,710	64,860	66,130	66,840	65,440	63,240	64,960	65,530	65,440	68,400	64,350	51,772	51,543	29,515
Zambales	25,530	24,970	25,140	24,880	24,260	21,900	22,550	23,780	22,330	24,360	22,210	23,810	21,379	17,924
REGION VII	173,390	179,900	181,930	181,290	180,520	171,990	166,400	163,270	170,670	163,900	155,200	148,460	144,017	144,167
Bohol	90,680	90,070	89,480	90,020	89,500	80,420	82,470	76,380	78,690	78,180	72,210	63,360	62,945	62,044
Cebu	39,480	47,070	48,340	50,170	45,710	45,010	41,690	44,690	45,480	44,180	42,080	44,859	44,671	43,351
Negros Oriental	42,290	41,650	42,980	40,110	44,350	45,840	41,540	41,520	45,770	40,780	40,400	39,452	35,612	37,945
Siquijar	960	1,110	1,130	990	960	720	700	680	720	760	510	789	789	827
REGION X	180,510	173,600	177,280	190,520	196,250	178,910	162,630	169,490	153,400	176,710	192,833	146,885	24,740	27,637
Agusan del N.	31,260	33,260	34,660	37,680	41,740	36,800	45,220	38,840	33,710	30,140	26,840	32,606	24,740	27,637
Agusan del Sur	23,020	24,520	24,180	26,710	29,010	23,340	21,760	19,030	19,500	21,840	27,290	29,650	22,810	22,989
Bukidnon	53,570	49,130	50,810	54,280	58,630	54,700	53,550	53,030	60,950	50,380	65,990	73,903	60,633	56,901
Comisuin	1,750	1,850	2,090	2,200	2,240	1,520	1,970	1,440	1,440	1,440	1,410	1,552	1,849	22,745
Misamis Occ.	37,750	28,110	28,490	30,900	29,190	28,770	24,140	26,430	22,450	19,250	22,630	22,825	2,150	22,745
Misamis Or.	15,290	15,680	15,810	16,200	15,100	14,340	11,230	10,860	11,480	9,890	11,160	11,770	10,702	9,601
Surigao del N.	17,870	21,050	21,240	22,550	20,340	19,440	18,540	12,470	19,960	20,460	21,190	20,527	24,001	23,909