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## 付属資料-1 フィリピン政府関係者との協議概要

### (1) N I A テック長官の話

9月27日 長官室にて

日本のミッションにお会いできて大変光栄である。日本のこれまでの協力には感謝している。

さて、我々が要請したプロジェクトには、2つの側面がある。一つは、農業的な側面で、もう一つはかんがいに関する面である。従ってこのプロジェクトについて、検討する際には、この二つの側面をどのように結びつけるかが問題だと思う。そういう点から、このプロジェクトには最初から農業省も参加させるべきだと考えている。

私が、このように農業省と共同してこのプロジェクトを実施する必要を感じているのは、ミンダナオ島アラ・プロジェクトにおけるIIMI (International Irrigation Management Institute) とADBの共同プロジェクトをみて感じたことである。このアラ地域は、山林によつて囲まれている砂質土地地帯で、稲作に不適なためADBがIIMIを通じて畑作を進めているところである。主な水路はN I Aの施設を利用している。このプロジェクトの主な仕事は水管理及び畑作振興である。

アラ地区の他にカピテでも共同事業を行っている。このプロジェクトには農業省も参加しており、先日もこの会議に出席したところである。先日農業省の次官補のDr. Quisumbingと会った時、あなたがたミッションについて話をしたら、彼は非常に大きな関心をもっていたので調査団の方々も是非合っていただきたい。

カピテ地区は、ADBの援助で野菜生産プロジェクトを行っている。このプロジェクト・コンサルタントとしてMr. AbejuelaがADBより派遣されている。彼は農業省の出身である。

今回の畑地かんがい技術開発プロジェクトの目的は、あくまで畑地かんがいである。フィリピンの農業振興政策の中で、畑作の優先順位は非常に高いものだが、また私は、畑地かんがいの必要性が特に高いと考えている。皆さんが農業省を訪問されればフィリピン政府の畑作振興のための方針について話が聞けると思う。N I Aが考えている畑地かんがいは、現在N I Aが行っているかんがい地域を対象としている。現在N I Aが行っているかんがい方式はgravityかんがいが中心であるが、N I Aが実施したかんがい地域外の畑地かんがいについては、現在と違った新しい方式を考える必要がある。例えば、綿花についてもかんがいを必要があると思うし、この場合には現在とは異なった方式が必要と思う。

N I Aの大規模プロジェクトの方向としては、農業省が畑作振興を目指しているのだから、それに従ってプロジェクトを移行させていきたい。従って今回の畑地かんがい技術開発プロジェクトは稲作から畑作重点に移行させるというこの国の政策にそったものと考えてよいと思うが、しかしまだ研究も始まったばかりの段階であり、今後の見通しはまだはっきりしない。

N I Aの研究施設としては、ムニョスにセンターがある。この施設は世銀の協力により建設したものであり、水管理の研修を目的としたものであるが、中部ルソン大学と共同して水質と土壌の分析を行っている。今回のこのプロジェクトのための新しい研究施設としてはNIAだけのものをつくるのは困難であり、農業省などと共同して研究がすすめられる施設が必要であると考えられる。

施設の規模などについては、まだ検討中の段階である。

いずれにしても、本プロジェクトは、政府の意向にそったものでありN I Aとしては農業省の農業振興政策に即して畑地かんがいを進めて行く考えである。

## (2) N I A デル・ロザリオ次官の話

9月27日 次官室にて

日本のミッションの訪問を心から歓迎する。フィリピン政府としては、3～4年前から、畑地かんがいの重要性に留意していた。米については自給を達成したが、政府の方針として、米だけでなく他の畑作についても、自給を達成したい。このことから、畑地かんがい、畑作の振興が重要となっている。畑作振興が必要なもう一つの理由は、砂糖きびの価格低下により、他の作目への転換をせまられていることである。政府の方針として畜産の振興にも重点をおいている。このための飼料作物の増産という観点からも、畑作の振興、畑地かんがいが重要となっている。

N I Aとしては、畑作の振興のために畑地かんがいが重要であると考えている。N I Aが考える畑地かんがいの必要性としては、次のような点が上げられる。

- ポンプかんがいによる稲作は、エネルギーコスト（電気料）が高くつくため生産費の引上げの要因となっており、ポンプかんがい地域での稲作は経済的にメリットがない。
- 農業的観点からみると、ライトソイル・砂質土壌地帯では、用水量がひじょうに多くなる。こういう地域では、稲作より畑作に適していると考えられるので、畑作に切り換えたいと考えている。
- 現在N I Aが実施している畑地かんがいを含むプロジェクトの主なものは次の二件である。
  - (1) Second Laguna de Bay Project (Cavite 地域)
    - ・かんがい面積 13,000 ha (内畑作 2,500 ha)
    - ・ADB資金による。
  - (2) Palsiguan River Multi Project (Ilocos Norte 地域)
    - ・かんがい面積 10,000 ha
    - ・作目 雨季 米 乾季 部分的に畑作
    - ・OECF資金による。
- これらのプロジェクトはもうすぐ完成する予定であり、このためにも畑地かんがい技術が

必要となっている。

- 中部ルソンのターラック、タンガン、ヌエバシーバではOECEP資金で地下水開発を行ったしかし、農民は維持管理コストが高いため地下水利用による稲作は行っていない。従って、N I Aとしては畑作物の増産という政府の方針の一貫としてこの地域に稲作ではなく、畑地かんがいプロジェクトを推進して、畑作振興を図りたいと考えている。
- フィリピンにおける畑地かんがいは、極めて小規模な共同施設が一部にあるだけで、しかもそこで農民は勤にたよったかんがいを行っている。

このようなことが、今回の畑地かんがい技術開発プロジェクトとして技術協力の要請を行った背景及び原因である。

要請内容については、N I Aのコンピューター・ネットワークシステムの整備と畑地かんがいの設計計画基準の作成等がある。N I Aのコンピューターシステムは日本政府からの援助によるもので、N I A本部に本体をおき地域事務所に端末機をおいているが、この情報ネットワークの改良、拡張を図りたい。但しこれは、プロジェクト全体としては、マイナーな部分である。

このプロジェクトの主要な点は、適切な畑地かんがい方法の確立、畑地かんがいの設計計画基準の作成にあるが、N I Aとしては、畑地かんがいの技術面に特に関心をもっている。また、N I Aとしては、稲作から畑作への転換をどのように農民に説得するかについても関心がある。

現在、N I Aでは25の開発プロジェクトがあるが、畑作振興のためのプロジェクトとしては、前述のADB、OECEPのプロジェクト以外に、ミンダナオ島のアラプロジェクトを考えている。

畑作振興は、政府の食糧増産計画の一貫であり、農業省の考え方に従って、N I Aが協力するという形で実施するものである。N I Aの理事会のメンバーには公共事業大臣、農業大臣、電力公社総裁、NEDA（国家経済開発庁）長官が含まれており、この理事会の構成メンバーからもわかるように、食糧増産・エネルギーについてお互いにサポートする仕組みになっている。

前述の大規模プロジェクトの他に、農民によるかんがい開発である共同かんがいプロジェクト（30 ha以上）があるが現在はほとんど稲作のためのもので、山地部に一部畑地かんがいプロジェクトがある。

畑作物への転換についてはMAF（農業省）と共同して農民への普及・啓蒙を行っているが、一番の問題点は経済的な問題であり、農民が畑作に転換すれば安定した収入がある農業が出来るということをなかなか理解できない点である。

Laguna プロジェクトでは、MAFの協力で畑地かんがい（全体13,000 haのうち約2,500 haが畑地かんがい）を取り入れた計画となっており、近く事業が完成することもあるが、畑地かんがい技術の確立が緊急の課題となっている。適切なかんがい技術が確立され

れば農民に収入の増大をもたらすと考えている。N I Aとしては、流通分野とも連携をとっているが、これは、小規模なプロジェクトについてである。市場の確保と流通の確立にも努力をしていかななくてはならないと考えている。なお、努力したい点は、農業省の普及員との連携を図ることである。需要のある畑作物（国内用、輸出用）の増産を図りたいが、これはトウモロコシ、モンゴビーン、大豆、デント、コーン等とミンダナオ島の綿花、タバコ、こんにゃくなどである。

大豆は、現在栽培試験を行っているが、フィリピンの気候・土壌に適しているかどうかは疑問である。また小麦は気温・湿度の関係でダメであった。

以上のことから、適切な畑地かんがいを行うためにはまず設計計画基準の作成が第一であり、またそのための試験圃場の建設も必要である。そこに専門家に常駐してもらい指導してもらいたい。

現在、サイト（試験圃場及び実験室）の建設予定地としては、ターラック、アムリス（サン・ラファエル）、カビテ、ムニヨスなどがあり、いずれもサイトとして可能であると考えている。

(3) M A F（農業省）Mr. キシュムビーン次官補との会談

10月2日 AM 10:00～12:40

農業省としては、畑地かんがいプロジェクトにたいへん興味を持っており、このプロジェクトに当初から積極的に参加してまいりたい。

今日も別の会議で畑地かんがいのコンピュータによる水収支の計算や資料収集について検討していた。畑地かんがいは農業省は勿論、フィリピン国としても非常に興味を持っているところであり、特に水不足地区では、米よりも畑作物を導入した方が国の為にも非常に有益であると考えている。

農業省はこういう地域の農民に対して、米よりもどういう作物を植えたらいいかアドバイスする立場にあるが、現状では、それぞれの作物に合った必要水量の十分な資料がない。例えば、畑作物の収益性についても把握しておらず、栽培管理についての経験もない。したがってN I AがJ I C Aの協力で実施するこのプロジェクトによって基礎データを作ってくれることを期待しており、そのデータによって農民にアドバイス出来ると期待している。農業省としても、最大限の協力をおしまない。

畑地かんがいプロジェクトがスタートしようとしている段階であるので、残念ながら、畑地かんがい効果についてのデータは未だ持っていない。これからデータ収集を始めようとしているところである。各地において、稲作の後の2期作目として、どういう作物を植えたらいいかについて農民の小数の意見をまとめた資料があるので、正確なものではないが傾向はわかると思う。

また乾期にかんがい用水が供給出来ない地域に14の畑作物が稲作の後の作物として考え

られる。その作物の経済性、収益性についての調査もわずかではあるがIIMIが実施している。カビテにおいてはNIAの協力で畑作振興プロジェクトに着手しており、これからもデータが得られるのではないか。現在カビテでは玉ねぎ、トマト、ホワイトビーン、野菜等の導入について、農民の意識調査が必要と思われるが、まだやってないと思う。農民に新しい農業活動をさせる場合、どの程度の収益をあげられるのかは重要なポイントである。

NIAにおいては、社会学的調査はやっておらず、作物の導入試験にとどまっている。

NIAとしてはカビテ地区においてラグナ湖から水を上げてかんがいするのはコストが高いため畑作の導入により、コストの軽減を図りたいと考えている。畑作物に対する水の供給量等のことは全々わからないので、このプロジェクトでデータの収集を行ないたい。

この他ではボホールプロジェクトにおいて日本の協力によって、小規模ではあるが調査中であるので、ボホールのデータもこのプロジェクトの参考になるのではないか。ボホールのかんがいシステムが完成したら、農業省としても水収支の調査を行ないたい。

もう一つのプロジェクトとして参考となるのはIIMIのプロジェクトである。フィリピン政府として、かんがい地区における畑作導入は重要課題と考えているが、現在何ヶ所かで行なわれている畑地かんがいはきわめて小規模で有益なデータは得られない。このプロジェクトでつっ込んだデータが得られることを期待している。

フィリピン政府の畑作導入の目的としては、輸出の拡大と輸入代替があげられる。畑作振興の一つの刺激策として、これまでは米を中心として水の使用料をきめていたが、畑作物については、水の消費が少ないので、米と水の使用料について差をつける政策をとっている。

しかしながら、確固たる畑作振興確立のための政策は、その前提となる十分な基礎データがなければ樹立できないので、現在、まだ検討中である。

畑作物の導入は現在の稲作を主体とするかんがい地区に考えており、畑作物の需要と供給及び米とのバランスを考えながら全国的な政策をたてる必要がある。

流通機構については生産よりもむしろ重要な問題と考えている。農業省としても重要な問題として、いくつかのプロジェクトで検討を行っている。畑作振興を考えた場合、流通問題は避けて通れない事項であり、導入作物の順位潜在的な需要の動向の把握等非常にむずかしい点がある。

トゥモロコシなどのマイサン77計画については、生産面ではある程度成功したが、流通面において問題があったといえる。フィリピンは多くの島々から成っており、輸送コストが高くつくことから、地域的に自給率に増減があるが、現在は調整不十分である。農業省としても市場のはっきりしていない作物について、農民に作付させるようなアドバイスは出来ない。需要についても十分調査していく必要がある。

かんがい地域において今後、畑作振興をすすめていく計画であるが、そのためにはその地域における基礎データがないと、何を展示すべきか、わからない。したがって、畑地かんが

この試験圃場の主な目的は、基礎的な資料の収集であり、展示効果は副次的な目的と考えている。

N I Aとの協力体制については、農業省とN I Aはいろいろなプロジェクトをタイアップして実施している。カビテにおいて野菜の生産を行っているが、生産については農業省、かんがいについてはN I Aが担当している。今度のプロジェクトについては、はっきりしたことは言えないが、各地でサイトを持っているし、必要に応じて提供出来ると思う。お互い連絡をとり合って必要箇所を選定していけばよいのではないかと。しかし、新しいプロジェクトに対して、どのような協力を行えばよいか不明である。

この畑地かんがいプロジェクトで、我々がどのようなデータを望んでいるかという点、米を作っている既存のかんがい地区においては、全国72ヶ所において、土壌区分図を作り、気候に照らし合わせた適応作物のデータの作成中であり、作付体系も11種類作成している。水田の場合は土壌の水収支データがあり、うまくいっているが、アップランドに畑作物を作るために、うね間かんがいをしようとしても最適土壌水分収支がつかめないため、用水量と、蒸発散との関係基礎データがほしい。また、各土壌に合った作物は何かについても研究しておく必要がある。

かんがい方法については、一部高級野菜栽培は別であるが、コストの面からみてスプリンクラーかんがいはむずかしい。

とにかく、このプロジェクトにおいては、まったくの基礎的なデータ収集から始めてほしい。たくさんの作物について、どの時点でどの程度の頻度でかんがいしたらいいか、また、土壌の質によってかんがい方法が違ってくるのか検討する必要がある。小麦については地域によって栽培可能であるが、他の作物との効果の比較にかかっている。現在は、とうもろこしや綿花の方が採算的によい。また、小麦の場合、流通面でもととのっていない。小麦を普及しようとするならば、国として何んらかの補助金を出さなければ成り立たないであろう。

フィリピン国は72州からなっているが、どういう作物を植えたらいいか、ゾーンニングプロジェクトをやっている。気候、土壌を考慮して21のゾーンに別けて作物選定を行おうとしている。

今回のプロジェクトはその意味でも大切なものであり、フィリピン政府としても期待しているところである。

#### (4) NEDA (国家経済開発庁) Mr. サラザール局次長会談

10月3日 AM 9:30~10:30

このプロジェクトについて、今年5月の合同委員会で話をしたばかりなのに、すぐ調査団が来ていただき、NEDAを代表して、長官に代り心から札を申し上げたい。

これまでフィリピンでは低地での稲作のためのかんがいが主であったが、今後はそれ以外の畑作かんがいの推進に努めたい。調査団が帰られたらこのプロジェクトを今年度内に実施で



きるよう関係機関に働きかけていただきたい。フィリピン政府としては、重要な政策として畑地かんがいを考えている。必要な資料があれば、NEDAで提供できるものはしたい。フィリピンは7,000の島からできているため水資源が不足し、施設を作ることもむずかしい。ルソン、ミンダナオを除いて他の島々は農業用水が不足状態にある。

カビテを訪問されたのなら、ラグナのかんがい開発事業を見られたと思うが、非常にコストがかかる。畑地かんがいはかんがいコストの低減に役立つと思う。

このプロジェクトのためにNIAが無償援助を要請した場合、他のプロジェクトと比較して優先順位をつけることになるが、フィリピン政府としては農業に力を入れており、畑作振興にも力を入れているため、高い優先順位を与えられるのではないかと思う。NIAの要請があれば高い優先順位を付けたいが、1986年から4年間の無償要請案件は30プロジェクトあるので、これらを勘案して決定することになる。一般無償がだめなら、第2KR援助も考えられる。それもだめならOECFのローンとして考えたい。

(5) NIA担当者との打合

出席者(NIA) Mr. リベラ計画部長 Mr. バスクワ計画課長

Mr. フリアン管理部長 Mr. サントス管理課長

(専門家) 山田, 田村, 梅川

10月3日 11:00～

リベラ 月曜、火曜日の現地調査の結果をうかがいたい。

团长 畑かんの設計基準を作成する前提として、試験圃場でデータを集める必要がある。そういうことで皆さんの案内でテストファーム予定地を巡り、いろいろな意見を聞いてきた。各地の責任者の方々は、自分の所にテストファームを作れば協力をおしまないということであった。試験圃場は数ヶ所必要と考えているが、その条件として、

① いくつかの土壌タイプの違う場所であること。

② 計画基準作成のための基礎データを集める面と展示効果の二面があること。我々としては展示効果よりも基礎データを集めるべきだと考えている。基礎データを集めるためには、日本の栽培、かんがいそれぞれの専門家とフィリピンの実務担当者と一緒にやる必要があると考えている。そういう点を考えると、マニラから近くて、さらに現在フィリピン側のNIAあるいは農業省の存在する所がよいと考える。このあと、さらに、栽培専門家、かんがい専門家がベアとなって何と何が必要か、お互いの専門家の目で見ても、どこの場所が一番適当か、何ヶ所必要か、プロジェクトがスタートする前に長期調査をする必要がある。勿論、今回現地調査した、テストファーム候補地も見ると必要があると思う。

リベラ その通りだと思う。今回、何ヶ所かの候補地も見てもらったが、他にも何ヶ所か

- の候補地があるので、長期専門家に見てもらいたい。
- バスクワ 今回見てもらったテストファーム候補地は、各要件を十分調査したうえでのものではなかったので、カビテのように軍との貸借契約期間の問題が明らかになるなどの例もあった。長期専門家が派遣されるまでに十分つめたいと思う。
- リベラ かんがいのための用水が必要であるが、これも検討する必要がある。
- サントス テストファームは個人の土地でもよいのか。
- 団長 個人の土地を借りた場合、毎年の収入はどうなるのか。
- サントス 年間の収入と見合ったものを補償するというやり方である。
- 団長 十分な試験が出来れば公共用地でも個人用地でもかまわない。
- サントス テストファーム予定地として適当な場所があると思うが、個人の所有地でもかまわないということであれば、さらに選定の幅が拡がり、問題は解決する。借上げ料はその土地の5ヶ年間の平均収量から算定される。
- 山田 補償はどっちがするのか
- リベラ 借上げに必要な費用はプロジェクトの中で出してくれればありがたい。又、1ヶ所のテストファーム面積はどの程度必要か。
- 団長他 リジョン毎に、土壌別、作物別、気温別にポット試験を行うとすれば1 ha程度でよいが、かんがい方法別とすると1ヶ所5 ha程度は必要ではないか。
- サントス N I Aでは全国で136ヶ所のかんがいシステム地区を持っている。それぞれの特徴をふまえたところのデータを得て、その地に合った導入作物、かんがい方法を決定してゆく必要があるが、136ヶ所すべてではなく、それらの性質をそなえたテストファームでやるとよい。
- 団長 3ヶ所程度をベースとして、そこにおいては、気象特性、土壌水分特性及び対象畑作物の水分消費特性の3つの条件をはっきりつかむ必要がある。
- これらの各特性調査からはっきりした数値が得られれば、おのずと生長阻害分水点が求められ、その作物に合った、計画間断日数なり、1回の計画かんがい水量が決定される。
- リベラ 基本的に必要となる3つの土壌タイプに別けて試験を行う必要があるが、これらの他に各地区に小規模なテストファームが必要である。あくまでも当初は3ヶ所の基本的なテストファームにおいて試験を行ない、それに基づいて将来各地で適応試験を行ってゆくという方法があるのではないか。
- 今度のプロジェクトでも、今回見ていただいた候補地の他にいろいろあるので基本的なテストファーム地については長期専門家によって検討してもらいたい。プロジェクトはあくまでも当初の3ヶ所の圃場での活動でいいと思う。そこでデータに基づいてプロジェクト発足後2～3年目に12地域での小規模テストフ

ームを使って地域適応性調査を実施したい。この地域での調査はN I A負担において実施することになる。また研修については、1 2 地域での調査担当者と呼んで行うのがよい。

団 長 テストファームでの試験は2つある。

① かんがい方法(スプリンクラー、うね間、ドリップかんがい)の適性試験  
この国には、大きく分けて土壌タイプがどのくらいになるかわからないが、典型的なタイプで行なえばいいと思う。透水性の高い土壌、低い土壌の2ヶ所程度でのかんがい方法適性試験でよいと思う。

② 作日毎、土壌タイプ(少なく分類)毎に消費水量、作物生育中の土壌水分量、あるいは、生長阻害分水点(しおれ点)等の調査

以上のことから、先日拝見した4ヶ所の候補地について、気象的あるいは土壌的に同じであるなら、すべてについてテストファームを作る必要はない。

さらに毎日、データを収集する必要があることから、農業省、N I Aの事務所があるということが条件となる。

リ ベ ラ 今回の現地調査の結果に基づいて、長期専門家によるフォローアップ調査によってどういう場所がいいかわかってくると思う。

団 長 運営するという面からみると、N I A、農業省の組織がある所という条件になるから、今でもある程度しぼることが出来る。

プロジェクトが始まって、日本の専門家が器具をもって来て、テスト方法を巡回指導することになると思うが、ムニョス等各地区にN I Aあるいは農業省のカウンターパートを配置できるか。

リ ベ ラ このプロジェクトが始まって、スタッフオフィス、試験室等が必要になるが、施設も設置するに当たっては、試験室、テストファームを勘案して場所を決定する必要があると思うが、どの場所に作ったらいいか意見をききたい。

団 長 プロジェクトの指導者は、N I Aのオフィスにおいて、計画基準作成の作業を行わない必要に応じて現地を巡回することになるが、基礎的なデータはあくまでもN I Aなり農業省の人々に測定してもらおうが、ムニョスなりに人員を配置できるかということだ。

リ ベ ラ カウンターパートをつけたい。このプロジェクトを実施するに当たって研修施設、実験施設を作る必要があるが、N I Aとならんで農業省も参加する必要がある。これら施設をN I Aの敷地内に建設することについては、はっきりと決定していないがある程度の了解は出来ている。こういった施設をN I Aの中に作ることに ついて、良いということであれば、是非日本に無償協力を要請していきたい。

団 長 今回はプロジェクト方式技術協力のコンタクトミッションであり、グラント案件

に言及する立場にない。無償協力を要請するのであれば、正式なチャンネルを通じて別途要請を提出する必要があるが、その際、NIAの要請がフィリピン政府としてどのような優先順位に置かれるかが重要になると思われる。

リベラ NIAとして、今後も、畑地かんがいセンターを作る必要があることを政府に要望してゆく。各施設が別々にあることは、このプロジェクト運営上障害となると思う。しかし、無償の要請を出して、取り上げられるまでは既存施設を利用して、とりあえず始めることは可能だ。したがって、今回のプロジェクトのタイムスケジュールを変更することはない。

MINUTES OF DISCUSSIONS

BETWEEN

PROJECT IDENTIFICATION STUDY TEAM OF JICA

AND

THE NATIONAL IRRIGATION ADMINISTRATION

DIVERSIFIED CROPS IRRIGATION ENGINEERING PROJECT

## MINUTES OF DISCUSSIONS

In response to the request from the Government of the Republic of the Philippines for cooperation in the Diversified Crop Irrigation Engineering Project, the Government of Japan, through the Japan International Cooperation Agency dispatched to the Philippines the Project Identification Study Team, headed by Mr. Yusuke Suematsu for the above-mentioned project from September 26 to October 6, 1985.

The team had series of discussions with the representatives of the National Irrigation Administration and other related organizations of the Government of the Philippines to study details of the proposal and exchange opinions on the project. The Team also made field trips to various sites where establishment of such facilities as test farms, laboratory and training centre for the project was proposed by NIA.

1. (1) In the discussions NIA explained that this project had been planned in accordance with the policy of the Government of the Philippines for promotion of Crop Diversification and that primary objectives of the Project are to investigate the most appropriate methods of diversified crop irrigation for the Philippines and to establish standard for planning and designing of irrigation facilities for Crop Diversification.
- (2) NIA noted that such facilities as the head office, 3-4 test farms and field offices, a test laboratory and a training centre would be necessary for the implementation of the project and that NIA was considering to establish in near future "Diversified Crop Irrigation Engineering Centre" in Manila - the centralized facility.

for the project. However, NIA explained its intention to utilize existing facilities in the initial stage of the project in order to start the project as soon as possible and proposed to use the following sites as the initial locations for the necessary facilities.

(a) the head office - in the NIA Headquarters

(b) test farms and field offices - (i) in LBDP II Project Site

(ii) field office in the NIA Regional Headquarters in San Rafael and a test farm in the vicinity.

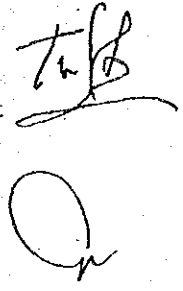
(c) test laboratory - in the NIA soil and water laboratory in Muñoz

(d) training centre - in the NIA Training Centre in San Rafael

(3) NIA further suggested that it was considering to submit a request for Japanese Grant Aid for construction of the "Diversified Crop Irrigation Engineering Centre" in the NIA Headquarters compound.

(4) NIA also requested that test irrigation facilities and other necessary equipment would be provided by JICA in the Project.

2. (1). The Study Team informed NIA that, as a result of the study, the Team could have fully understood the background and the content of the proposal and the aim of the project. The Team promised to convey the study result and the necessity of the project to the authorities concerned of the Government of Japan for further consideration.



(2) The Team agreed to locate the head office of the Project in the NIA Headquarters and requested NIA to provide an appropriate office which is suitable for office activities by Japanese experts and local counterparts if the project would be started.

(3) The Team noted that, in the selection of location of test farms, such factors as following should be taken into consideration.

1. Dominant soil types
2. existence of an office of NIA in the vicinity for management of the test farm and field office
3. Nearness to the head office
4. availability of water for irrigation

(4) The Team informed NIA that JICA is planning to dispatch a follow-up survey mission after this study in order to collect more information and data necessary for further study on formulation of the project including those factors mentioned in 2-(3) above. The Team, therefore, suggested that final locations of the test farms would be determined based on the findings of the follow-up mission.

(5) As for the suggestion by NIA concerning request for Grant Aid, the Team explained that they were not in the position to discuss the matter as they had been dispatched to study the possibility of Project Type Technical Cooperation. The Team pointed out that NIA should make another request through proper channel if NIA reached decisions to submit such Grant Aid request. However,

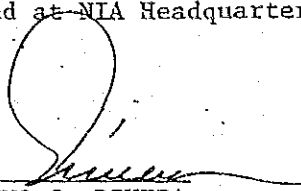




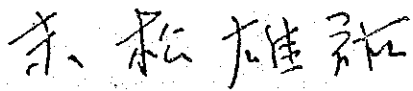
the Team noted that it would report NIA's suggestion to the authority concerned of the Government of Japan.

October 5, 1985

Signed at NIA Headquarters in Manila



AVELINO S. RIVERA  
Department Manager  
Project Development Department  
National Irrigation Administration



Mr. YUSUKE SUEMATSU  
Team Leader of the Project  
Identification Study Team  
for the Diversified Crop  
Irrigation Engineering  
Project

## Appendix

### DIVERSIFIED CROPS IRRIGATION ENGINEERING PROJECT PROPOSAL FROM NIA

#### A. ORGANIZATION AND STAFFING

##### A.1 JICA TEAM

The various experts shall be assigned long-term or short-term and on a continuous or staggered basis depending on the needs for their services.

The team shall be supported by a local staff to include clerks, typists, and drivers.

##### A.2 LOCAL COUNTERPARTS (Central Office-based)

The technical staff who shall work together with the experts shall be drafted primarily from PDD and SMD, and depending on the needs, from other units of NIA. Individual assignments shall be on full-time or part-time (concurrently with present jobs) basis, also depending on the needs for their services.

For clerical and typing needs, the counterpart staff shall avail of the services of PDD & SMD clerk/typist or if necessary permanent clerks/typists and drivers shall be assigned.

##### A.3 TRAINING CENTER

The project could make use of any of the existing NIA Training Centers: the NIA National Training Center in San Rafael; the Water Management Training Centers; Regional Training Centers

and the NIA (LBDP-II)-MAF Training Center of the LBDP II Vegetable Component. A Training officer/coordinator would be assigned to arrange for the training needs of the project. Training staff who shall act as Secretariat during trainings and to complement the existing staff of the Centers would also be assigned if necessary.

A.4 SOILS & WATER LABORATORY AND CENTRAL NURSERY

The existing staff of the NIA soils and water laboratory shall be employed in this project. Whenever necessary, additional staff shall be hired so as not to jeopardize other activities of the SWL.

A.5 TEST FARMS & NURSERY

NIA shall provide the necessary Organization to manage the Test Farms and shall include a Farm Manager, Research Assistants knowledgeable on irrigation and diversified crops production, equipment operators and laborers. The required labor for day-to-day operations shall be permanent while seasonal labor requirement shall be hired.

A.6 STUDIES ON THE EXISTING SYSTEMS

Project activities/undertakings on the other national irrigation systems shall be in coordination with the concerned NIA Staff in the Regional Irrigation Offices and Systems/Project Offices.

## B. FACILITIES AND EQUIPMENT

### B.1 OFFICE

The JICA Team and Local Counterparts shall be provided adequate office space at NIA Central Office in Quezon City. The office shall be furnished with tables & chairs, and telephone facilities.

It is requested that the following facilities for use in the office would be procured by the Project:

- a) Filing & Storage Cabinets
- b) Typewriters
- c) Copying machine
- d) Drafting equipment
- e) Portable airconditioners/electric fans
- f) Other necessary office equipment and supplies not available locally.

### B.2 TRAINING CENTER

The NIA-National Training Center in San Rafael, Bulacan is recommended to be used. The Project, however, should provide necessary training supplies and counterpart funds for the proper upkeep and maintenance of Training Center and its facilities.

If necessary, it is requested that the project would procure additional equipment to complement those that are now available.

It is also requested that the Project shall sponsor staff training and observation tours in Japan for personnel engaged in this project. Subjects shall include Diversified Crops Irrigation Planning, Design, Operation, and maintenance.

### B.3 SOILS AND WATER LABORATORY

It is recommended that the NIA Soils & Water Laboratory in Muñoz would be used for Specialized Analyses. Routine analyses (e.g. Screening & Fertility tests) could be done in the Test Farms with the use of Portable or Handy apparatus.

It is requested that other necessary equipment not available in the laboratory or to replace the old and non-operational units would be procured by the Project; including the portable equipment for use in the field (Test Farms).

### B.4 FIELD OFFICE AND TEST FARM FACILITIES

The field offices for the Experts and counterparts would be established at LBDP II in Tanza Cavite and AMRIS in San Rafael, Bulacan. The existing project & systems' office building would be refurnished and provided with tables and chairs. Along with these sites, other areas to be identified later would be considered for the establishment of Test Farms.

It is requested that the following facilities for the test farms would be constructed/provided by the Project; within the limits of funds provided for under this particular project-type technical cooperation.

#### 1. FARM HOUSE with the following features:

- a) Working room for Farm Technicians
- b) Sleeping quarters with kitchen-dining room
- c) Farm equipment/machinery shed and storage room
- d) Seedling nursery

#### 2. IRRIGATION EQUIPMENT

- a) Complete sets of irrigation equipment for DRIP or TRICKLE irrigation; SPRINKLER SYSTEM; and for FURROW irrigation.

- b) Agro-hydro-meteorological equipment (For the 12 Regions)
- c) Field Measuring devices like soil moisture meters, tensionometers, etc.

3. FARMING EQUIPMENT & IMPLEMENT

- a) Four-wheel or Hand tractors including complete attachments
- b) Fertilizer applicators
- c) Hand sprayers
- d) Other hand tools
- e) Other facilities necessary in operating the farm

4. SERVICE VEHICLES

- a) For the Team and Local Counterparts (Cars, Jeeps)
- b) For the Test Farms (Jeeps, Pick-ups)

5. COMPUTER FACILITIES FOR THE PROJECT

- a) To add one (1) megabyte to the existing one (1) MB CPU of the VAX 11/750 computer system at NIA Head Office to accommodate the computer needs of the Project.
- b) To add 6 units microcomputers for the NIA Regional Offices to facilitate data collation and analyses in the Regions.
- c) Softwares to complement those new available and developed to suit the needs of the Project.

NOTE:

Along with this Technical Assistance package, a separate request for complementary Grant-in-Aid is being considered by NIA, for the construction of a building at NIA Headquarters in Quezon City. Initially, the building is envisioned to house or accommodate the Soils and Water Laboratory; Training-Conference-Rooms; JICA-Study Group Offices; and Dormitories.

As soil samples (and water samples) are coming from all the Regions nationwide, it is more convenient to have the SWL at Quezon City. An ideal space for offices of the Study Group would be provided. The consideration of same request for the particular Project shall, however, not jeopardize earlier grants-in-aid requested for other priority projects of NIA.

DIVERSIFIED CROPS IRRIGATION ENGINEERING PROJECT

- I PROPOSED AREA: The project covers all over the country
- II EXECUTING AGENCY: NATIONAL IRRIGATION ADMINISTRATION (NIA)
- III OBJECTIVES:

GENERAL OBJECTIVES:

1. To investigate/determine the most appropriate and economical irrigation method/techniques, water requirement, and tertial development for diversified crops production.
2. To develop design criteria/standards and come up with a comprehensive recommendations in developing diversified crops irrigation project/systems.
3. To study necessity and possibility of diversified crops irrigation with the objective of utilizing more efficiently available water resources and land resources, and come up with a comprehensive diversified crops irrigation projects/systems.
4. To train planners, designers and prospective O & M staff of systems/projects planned and designed for diversified crops irrigation.

SPECIFIC OBJECTIVES:

1. To test the applicability (engineering & economics) of the various methods of irrigating the more important diversified crops under different soils and agro-climatic environment in conjunction with improved crop cultural and management practices and recommended cropping patterns.



2. To determine the optimum amount of irrigation application and water requirements under different stages of plant growth, necessary to attain maximum crop yields.
3. To prepare a detailed criteria and standards, based on results of studies and experiments, in the planning, design and O & M of irrigation facilities for diversified crops, suited to the needs of the different soils and agro-climatic zones.
4. To develop an irrigation suitability guide for various diversified crops in the different regions (existing irrigation systems) of the country.
5. To determine other requisites in the successful irrigation of various diversified crops.
6. To develop training modules (learning-by-doing) for planners, designers, and O & M engineers in diversified crops irrigation.

#### IV BACKGROUND:

With the attainment of self-sufficiency in rice, the government placed more emphasis on the production of the other important crops. Improvement of the quality and the quantity of the diversified crops, such as corn, cotton, sugarcane, vegetables, other grains and feeds, would promote the exportation and reduce the importation, bring great benefits not only to farmer but also to the country.

As the country is composed of many small islands, water resources are hard to develop at low cost because the

rivers do not have large catchment areas and it is difficult for an irrigation project to have a large benefited area correspond to the construction costs. Under such natural conditions, the importance of the cultivation of low-water-requirement crops particularly during the dry season would be higher.

On the other hand, one major thrust of the Agency is maintaining viability in the operations of the irrigation systems. The introduction of the innovative measures to increase benefits through the attainment of higher irrigation cropping intensity in the limited water resources, the introduction of diversified crops making higher profit, and the reduction of operating costs are foremost among its strategies. With adequate support from the government, a shift to these diversified crops would increase from productivity and improve the welfare of the farmers.

The project would promote crops diversification and contribute to the improvement of cropping intensities in the existing irrigation systems; as well as generate valuable information for the development and operation of diversified crops irrigation projects.

As this is NIA's first attempt of diversified crops irrigation engineering activities, NIA needs technical assistance in this field. Probable source of assistance is Japan which is advance in agricultural development.

V. SCOPE OF WORKS :

1. Collection, analysis, arrangement of the nationwide necessary data.

1.1. Collection of the existing data;

The following existing data are collected

- a) Natural conditions; climate, topography, soils, geology.
- b) Hydrology
- c) Socio\_economy, farming; planted crops, marketing, labor, farmers' intention.
- d) Recommendable institutes, documents, concerned.
- e) Inventory of existing national irrigation systems.

1.2. Field/laboratory investigation

The test farms (a few farms every region) will be selected from existing experimental stations/private farmers planted with diversified crops.

- a) Soil analysis; grading, real specific gravity, apparent specific gravity, pF-moisture ratio curve.
- b) Soil water constant; moisture holding capacity after 24 hours, depletion of moisture content for optimum growth.
- c) Consumptive use,; effective soil layer, important soil layer for growth, soil moisture extraction pattern, water balance survey.

Climate; pan evaporation, sunshine volume and hours,

humidity, temperature, wind velocity, rainfall.

- e) Terminal irrigation facilities; intake rate, water application efficiency, water distribution coefficient.

f) In order to implement the investigation of terminal irrigation facilities, water application efficiency, water distribution coefficient in each irrigation method, test farms will be constructed in the service areas of Angat-Masim River Irrigation System, Central Luzon Ground Water Irrigation Project, and Second Laguna De Bay Development Project.

Facilities of furrow irrigation; drip irrigation; and sprinkler irrigation, and necessary equipment for observation will be set on each test farm.

The test farms will be managed by NIA in cooperation with the farmers.

### 1.3. Analysis and arrangement of the data

The data and the results of the investigation will be made analysis and arrangement with upgrading the NIA computer system and micro film system.

### 1.4. Supply of experimental equipments and training for data collectors and investigators.

Laboratory tests and training for investigators are carried out at the NIA Training-Center in Cabanatuan, San Rafael and Cavite.

## 2. Development of design criteria and standard

### 2.1 Appropriate methods of irrigation

### 2.2 Design criteria : It may be necessary to show

standard/basic values which are attained from in-

vestigations on the fields or in the laboratories.

The investigations and the training for the inves-

tigators are executed at the NIA training centers,

agricultural experiment stations/or existing fields.

Soil physical experiment is executed in the Muñoz

Training Center.

### 2.3 Standards of the irrigation facilities, installation and operation.

## 3. Application to study results to several systems.

### TEAM COMPOSITION AND OFFICE :

The main office of the project will be established at the NIA Central Office, Quezon City.

The team is composed by a team leader (irrigation engineer), an irrigation engineer, an O & M engineer, a soil specialist, an agronomist who is engaged to collect the data, an agro-economist who is engaged to collect the data and to application. and a coordinator.

VII WORK SCHEDULE :

	I	II	III	IV	V
1. Preparation	_____				
2. Data Collection		_____			
3. Field Survey		_____	_____		
4. Standard/Criteria			_____	_____	
5. Application				_____	
Team Leader	_____	_____	_____	_____	_____
Irrigation Engineer	_____	_____	_____	_____	_____
O & M Engineer	_____	_____	_____	_____	_____
Soil Specialist	_____	_____	_____	_____	_____
Agronomist	_____	_____	_____	_____	_____
Agro-economist	_____	_____	_____	_____	_____
Coordinator	_____	_____	_____	_____	_____

EXISTING UPLAND CROPS EXPERIMENTAL FARMS

Center	Location	Crops
Central Luzon State University University of The Philippines	Nueva Ecija Los Baños, Laguna	Cotton, Plantation crops, Grains, Plantation crops, Corn, Sorghum, Fruit, Root crops, Sugar- cane, Tobacco
Visayas State College of Agriculture University of Southern Mindanao	Baybay, Leyte Kabacan, North Cotabato	Corn, Sorghum, Vegetables, Root crops Corn, Sorghum, Legumes, Plantation Crops, Fruits, Grains, Root crops, Sugarcane
Philippine Sugar Commission	La Granja, La Carlota City	Sugarcane
Philippine Coconut Authority	Bago, Oshiro, Davao City	Coconut
Philippine Tobacco Research and Training Center	Batac, Ilocos Norte	Tobacco
Cotton Research and Development Institute	Batac, Ilocos Norte	Cotton
Mariano Marcos State University Isabela State University	Batac, Ilocos Norte Cabagan, Echaguo	Cotton, Tobacco, Legumes, Vegetables Legumes, Tobacco, Cotton, Vegetables, Root crops
Mountain State Agricultural College	La Trinidad, Benguet	Fruits, Root crops, Vegetables
Palawan National Agricultural College	Aborlan, Palawan	Coconut, Fruits, Legumes, Root crops, Vegetables
BPI La Granja Experiment Station	La Granja, La Carlota City	Legumes, Corn, Sorghum, Vegetables
Central Mindanao University	Musuan, Bukidonan	Corn, Sorghum, Legumes, Plantation crops
BPI Davao Experiment Station	Bago, Oshiro, Davao City	Fruits, Plantation crops, Legumes, Vegetables, Corn, Sorghum
Camarines Sur Agricultural College	Pili, Camarines Sur	Root crops
Dingras Experiment Station BPI	Dingras, Ilocos Norte	Grains, Tobacco
Baguio Experiment Station BPI	Baguio City	Fruits, Medical plants, Vegetables
Ilagan Experiment Station BPI	Ilagan, Isabela	Tobacco, Corn, Sorghum, Legumes
Luzon Experiment Station Philippine Sugar Commission Economic Garden BPI	Floridablanca, Pampanga Los Baños, Laguna	Sugarcane Vegetables, Legumes
Forest Products Research and Industries Development Commission	Los Baños, Laguna	Coconut
Philippine Coconut Authority BPI Novaliches Station	Alaminos, Laguna Novaliches, Metro Manila	Coconut Fruits
Don Manuel Roxas Memorial Experiment Station BPI	Lipa City	Fruits
Mindoro Demonstration Farm BPI	San Jose, Occidental Mindoro	Tobacco, Legumes, Fruits
Bicol University College of Agriculture	Guinobatan, Albay	Fruits, Coconut
Bicol Rice and Corn Experiment Station BPI	Camarines Sur	Corn, Sorghum, Vegetables, Legumes
Guinobatan Experiment Station Philippine Coconut Authority	Guinobatan, Albay	Coconut
Guimaras Seed Farm BPI	Guimaras, Iloilo City	Fruits
Marcos Corn Experiment Station	Ubay, Bohol	Corn, Sorghum, Legumes
Mandaue Experiment Station BPI	Mandaue, Cebu City	Fruits, Vegetables
Shliman University	Dumaguete City	Coconut, Plantation crops
University of San Carlos	Cebu City	Coconut
University of Eastern Philippines	Catarman, Samar	Coconut
La Paz Seed Farm BPI	La Paz, Zamboanga City	Fruits, Vegetables
Zamboanga National Agricultural College	Zamboanga del Sur	Corn, Sorghum, Legumes
Clavaria Vegetable Farm BPI	Clavaria, Nisamis Oriental	Vegetables, Fruits
Tupi Experiment Station BPI	Tupi, South Cotabato	Corn, Sorghum, Legumes, Fruits
Twin River Research Center	Taguam, Davao del Norte	Fruits, Legumes, Vegetables, Coconut

AGENDA FOR ACTION IN AGRICULTURE: 1984-88

This document sets out the proposed program of action to be undertaken by the Government of the Philippines over the next five years to accelerate the pace of agricultural development and thus maximize agriculture's contribution to economic recovery. Attention is drawn to the set of policy and institutional reforms that need to be adopted or undertaken immediately if the sector is to fulfill its role as the key to economic recovery.

Part I describes the macro-economic context which has necessitated the formulation of the proposed program of action and adjustment. It also outlines the objectives, thrusts, and rationale of the agricultural development strategy over the short and medium terms periods. Part II discusses the specific actions and policy adjustments required to increase production and productivity, with special emphasis on market mediations design to improve producer incentives while giving due recognition to consumer interests. Part III describes the measures needed to mobilize sufficient financial resources to support the strategy for improved farm productivity and broader equity. Part IV proposes organizational reforms essential for streamlining sector management and optimizing the use of scarce resources.



## 1. THE MACRO-ECONOMIC CONTEXT AND THE ROLE OF AGRICULTURE

1.01 The Philippines is currently beset by severe balance of payment difficulties. This comes in the wake of adverse global market conditions following the second oil shock of 1979 and the subsequent recession which dampened the once buoyant markets enjoyed by traditional Philippine exports, particularly coconut products, sugar, and copper. Depressed markets adversely affected export earnings even as continued dependence on imported raw materials led to mounting import bills. The GNP growth rate of 6.7% from 1973 to 1979 eventually declined to 3.6% from 1980 to 1982. The political and economic problems that struck the country late last year aborted a much-expected recovery as GNP growth slumped to an all-time low or less than 2% in 1983. Last year's economic performance has been the worst in 23 years. Foreign debt now sums up to US\$25 billion with actual payments made on interest in 1973 at US\$1.22 billion. These represent more than one fourth of current annual exports of US\$5 billion. Continuing shortages in foreign exchange may hamper the resurgence of more encouraging growth rates in the next few years.

1.02 Currency adjustments adopted last year augur well for exports and may eventually ease up the foreign exchange burden. The June and October (1983) devaluations of the peso should help close the trade gap. Moreover, as early as 1980, the Government sought to rectify the recurrent trade imbalance through an industrialization strategy that underscores the country's comparative advantage in labor costs and raw materials availability.

1.03 Approximating the 6.3% growth rate of the national economy in the last decade (1970-1980), agriculture etched a 4.9% growth record for the same period. In 1983, gross value added in agriculture, fishery, and forestry stood at P 82.08 billion. Agricultural crops contributed the biggest share, accounting for 58.13% or P 47.71 billion of the total.

1.01 In 1977, the country reversed its previous perennial position as a rice importer and has since maintained a modest volume of rice exports. Throughout the 1970s, production of fish, pork, and poultry expanded with growth accelerating rapidly during the latter part of the decade. Banana and pineapple exports also rose over the decade. On the other hand, cocoa production fell, abaca and tobacco production leveled off and sugar production rose less than 2.5% per year. Exports of both dessicated coconut and coconut oil showed annual gains averaging about 5% and 13% respectively through the 70s.

1.04 Prospects for agricultural production indicate an annual growth rate of at least 6% over the 1984 to 1988 plan period. The grains subsector is estimated to grow 5.5% annually although corn may yet score a higher mark of 8.5% with promising yields from the Maisagana feedgrains self-sufficiency and export program. Commercial crops are projected to grow 7.1% annually while other crops may trail behind at 3.9%. With more and relatively cheaper feed supplies, the poultry industry is expected to sustain its hefty growth rate of 6.2% while livestock may move at 2% and the fish industry at 2.5%.

1.05 Throughout the last decades the agriculture sector achieved impressive breakthroughs, especially in the last decade, but maintaining the momentum entails the removal of remaining bottlenecks, especially in the areas of pricing and marketing, resource mobilization, and organizational efficiency. Solving these bottlenecks will not only benefit agriculture but industry as well. Enhanced linkages between the two sectors, which may come in the form of agribusiness ventures, will certainly help in curbing the worsening unemployment problem during this time of financial crisis. Expanded and diversified production should improve value-added in both sectors.

1.06 Confronted by a financial setback, the country's short-and medium-term objective inevitably focuses on the improvement of its balance of payments position. It is in this context that the agriculture sector can play a leading role and make up for a possible decline in other sectors and the national economy as a whole. This can be achieved by fully utilizing and, at the same time, building on the intrinsic strengths of existing investments in the export and import replacement crop subsectors.

The country's ability to achieve economic recovery hinges on the recognition of agriculture's primary role in a developing economy. The pressing needs at the moment call for improvements in agricultural policies and institutions, mobilization of adequate financial resources for agricultural development, and rational use of the country's natural resources. Under current circumstances, it is imperative to act promptly and decisively to create the appropriate incentives that will enable agriculture to propel economic recovery.

1.07 In this connection, Government should review its Investments Priorities Plan and realign all agricultural investment incentives to support the Agenda for Action in Agriculture.

1.08 In consonance with the major national development goals of sustained economic growth, equitable distribution of income, and improvement of the quality of life, the agriculture sector sets its sights on the following primary objectives for the 1984-1988 plan period:

- (i) Expand production and step up productivity to increase agriculture's contribution to the balance of payments through export expansion and import-substitution;
- (ii) Attain self-sufficiency in all basic food items including grains as well as fish and meat products, and ensure the availability of requisite food supplies at reasonable prices, with special emphasis on indigenous food products with high nutrient value for the nutritionally vulnerable and deprived population groups;
- (iii) Improve and stabilize farmer's income and welfare through higher productivity, better marketing, and a more efficient system of pricing, subsidies, and incentives;
- (iv) Enhance landless rural worker's welfare by assuring them of better access to agricultural resources and bigger share of

national income through higher returns, intensified resettlement activities and by provision of more gainful on and off-farm employment; and

- (v) Carry out a land management policy which will foster the retention of land suitable for agriculture in agricultural use, prevent diversion of such land to other uses, and enhance the security of land tenure.

All in all, therefore, the priority areas for action in agriculture for the 1984-1988 plan period are those which offer the greatest potential for contributing to national efforts toward optimum production and productivity export expansion and import replacement, poverty-reduction and better nutrition, and generally improved welfare of the Filipino family.

1.09 For agriculture to achieve its potential as the lynchpin of economic recovery, it is necessary to:

- (i) reexamine existing policies, particularly in pricing and marketing, in order to enhance the sector's productive potential;
- (ii) expand and improve the utilization of financial resources; and
- (iii) adopt institutional adjustments that would strengthen sector management.

1.10 Policy changes in Government market interventions emerge as the most pressing precondition for the sector to reach its productive potential. In the past, market mediations have been motivated by government's desire to maintain relatively affordable prices to consumers, provide relatively stable prices to farmers, and optimize subsector revenues.

Considering the country's present crisis, there is a compelling need to place primarily emphasis on increased production as the objective of intervention strategies.

1.11 In addition to market intervention the allocation of more resources for agricultural development is imperative. This means mobilizing an adequate and efficient finance base to support expanded and diversified production activities. Credit availability, and affordability are continuing concerns.

1.12 Finally, institutional adjustment is of vital importance. Fragmentation among government agencies involved in agriculture has caused not only delays and ineffectiveness in planning and implementation, but overlaps and duplication of responsibilities as well. Responsibilities for sector policies, including crucial pricing and marketing decisions, are dispersed among several ministries and agencies. Recent actions by government, however, have sought to rectify the confusing effects of fragmentation by streamlining the coordination of agricultural development programs. The adoption of the Integrated Area Management System (IAMS) under Executive Order 803 is one concrete example.

While there is still much room for additional improvements in the organizational set-up, the success of programs such as Masagana 99 as well as the commendable record of the agriculture sector throughout the 1970s proves that the system has worked with the determined leadership of the President supported by the Prime Minister.

## II. PRODUCTION AND MARKET MEDIATION

2.01 Even as Government continues to uphold the principle of private sector primacy, it will nevertheless continue to play a major role in the development process by providing the policy framework, implementing tax and incentive measures, and orchestrating the delivery of technology, credit, infrastructure, and services to support private sector endeavors

2.02 The objective is to gradually phase out market interventions which dampen production and investment incentives. This policy objective will cover both input and output prices, with special emphasis on rice, corn, feedgrains, wheat, livestock, coconut, sugar, fertilizer, and irrigation.

2.03 While some of these interventions will continue to be necessary in the short and medium term, in general, the direction should be toward greater reliance on the free interplay of market factors as the primary force for inducing increased production and better productivity and as the main determinant of prices. This approach will be pursued within the context of the overall strategies for each of the following commodities/subsectors.

### RICE

2.04 With the average 5% yearly increase in rice production since the launching of the Masagana 99 program in 1973, the Philippines succeeded in attaining self-sufficiency in rice in 1977 and exporting 620,000 metric tons of rice thereafter. It appears, however, that farmers are shifting out of rice into other more profitable crops as their margins have been eroded by increasing production costs, fueled mainly by inflation and falling farmgate prices. While yields have been increasing, hectarage dropped by 3.3% from 1980 to 1982 representing a total reduction of 195,000 hectares. In 1983, hectarage shrank further by 203,200 hectares, representing a drop of 5.9% from the 1982 level although this was largely due to the eight-month drought last crop year.

A pricing policy review in February 1982 indicated that the cash-tight rainfed farmers are shifting out of rice into other crops. While this may be desirable in the long run, we still need the output from these hectarages until we can expand irrigation and thus obtain higher yields. As it is, yields in irrigated areas have been growing at 3.5% p.a. over the past ten years while lowland rainfed yields have risen only by an average of 1.8% yearly. It is therefore imperative to continue expanding irrigation to the maximum extent allowed by budgetary resources in order to reduce unit costs and at the same time ensure a more stable and reliable production base. Five thrusts are necessary if we are to increase revenues for the rice farmer.

2.04.1 Emphasis on Rainfed Rice and Rainfed Cropping Systems. While yields in irrigated areas reached an average of 59.0 cavans (palay) per hectare in 1982, rainfed yields stood at only 38.2 cavans per hectare. With the drought in 1983, irrigated yields remained at the same level as 1982, but lowland rainfed yields dropped to 36.1 cavans per hectare. Until new irrigation systems can be built, the development of rainfed multicropping technology must be continued so that rainfed farmers can grow at least two crops of rice in one year. Significant advances have been achieved in the IBRD-assisted KABSACA project in Iloilo. Several other Mindanao projects are currently being lined up for external financing, building on the success of the Iloilo project.

At present the alternatives of rainfed rice farmers are limited to backyard vegetable farming and livestock raising. The technologies for rainfed multiple cropping systems (involving the cultivation of a second crop of corn or legumes or cotton after rice) are already available but need to be fully implemented in the field with the proper support of integrated credit programs and the extension force.

2.04.2 Commercial Rice Production in Irrigated Areas. Irrigated rice farmers have thus far reaped most of the benefits of the Masagana 99 program. However, while they have been able to attain sufficient economic stability to withstand the pressures of price fluctuations during harvest time, Government must help them acquire more dryers and threshers so that they can obtain the best market terms for their produce, especially during periods of over-supply.

Another important concern is to identify alternative uses for rice-land irrigated by diversion systems where water levels during the dry season are usually not sufficient for a second crop of rice. Since corn, sorghum, soybean, and cotton need only residual water levels, any of these could serve as a more suitable second crop in these areas.

Lastly, intercropping systems for irrigated rice should be designed to meet the specific requirements of the Philippines. The SORJAN or rice-and-corn system in Indonesia has been highly successful and could be adapted in Mindanao. Rice-fish culture has gained popularity in trial areas in Luzon and should be expanded throughout the country.

2.04.3 Price Support and Post-Harvest Program. The current situation of oversupply and low farmgate prices underscores the importance of developing and adopting a more effective system of ensuring price stability through market intervention rather than retail price ceilings. Procurement by NFA of a sufficient volume of stocks to maintain adequate buffer stocks is the key factor to price stability and sustained increases in production. In this regard, it is essential to determine the optimal level of stocks which NFA should hold for price stabilization and food security purposes.

At the same time, the NFA shall provide incentives to farmers' organizations to ensure the build-up of post-harvest facilities, specifically dryers and threshers.

Needless to say, there is a need to continue building more farm-to-market roads. The inadequacy and poor condition of feeder roads in many areas makes it virtually impossible for NFA procurement teams to reach remote places

2.04.4 Future Thrusts for Rice Exports. In consonance with the policy to foster private sector primacy in agriculture, the private sector should be allowed to take over all export trading of rice whenever exportable surpluses are available, with government-to-government transactions left to NFA. Such private sector exports, however, should be subject to NFA regulation through licensing. This would ensure quality control and enable Government to monitor regional supply movements with an eye to safeguarding supply and price stability

In irrigated areas where it would eventually be possible to grow three crops of rice in a year, reduced unit costs could make Philippine rice competitive in the world market. With the current surplus situation, we are often constrained to export excess supplies that do not easily meet world specifications. It may therefore be worthwhile to study the possibility of designating special rice export zones in the Cotabato, Iloilo and Central Luzon/Cagayan Valley areas where there are already existing roads and post-harvest facilities. Milling and processing facilities in these zones would have to be beefed up to enable the industry to meet export standards.

2.04.5 Input Cost Reduction. Substantial cost reductions would accrue to the farmer by extending technologies for the deep placement of fertilizer and the use of azolla, an organic fertilizing agent.

Studies have shown that the deep placement method reduces chemical fertilizer usage by 30% simply by burying it under the ground with an applicator instead of broadcasting it on the soil.

A nationwide program to promote the use of azolla in combination with chemical fertilizer is ongoing. It is expected that in three years, azolla will replace up to 25% of the nitrogenous chemical fertilizers used for the main season rice crop. More research must be undertaken to identify and control the diseases affecting azolla and to ascertain which azolla varieties are best suited for rice plants in different soil types and climatic conditions.

2.05 Proposed Policy Actions. The following specific actions are proposed

- (i) Develop and adopt a system of ensuring price stability at both the farmgate and retail ends through efficient market intervention. Such intervention would aim at improving producer incentives while giving due recognition to consumer interests. In this connection, a study of the National Food Authority (NFA) will be undertaken to review Government market intervention strategies and operations to determine its resource requirements.

- (ii) Export rice only to move out excess supplies and thus help stabilize domestic prices.
- (iii) Publicly announce guidelines which authorize the private sector to export rice whenever exportable surpluses arise subject to NFA regulation, with government-to-government transactions left in NFA hands;

### CORN

2.06 The Philippines has the potential for achieving self-sufficiency and for generating exportable surpluses of yellow corn within a relatively short span of time. Steps are being taken to capitalize on the potential of yellow corn as a new and major export crop, with an eye to supplying part of the huge and growing yellow corn imports of Japan, Taiwan and South Korea. Using proven packages of technology for downy-mildew tolerant yellow corn varieties and hybrids, the Maisagana Program was launched in December 1981 with the primary objective of attaining self-sufficiency by 1986 and exports of feedgrains by 1987. However, this potential has remained largely untapped because of inadequate production incentives and, until recently, the lack of viable technological packages. Now that suitable technologies have been developed, the key to expanding production clearly lies in ensuring sufficient producer incentives. The following elements are required:

2.06.1 Credit. An eight-month drought in 1982/83 set back Maisagana targets by a year and a half. The Maisagana Program is being intensified, placing more emphasis on the expansion of corn hybrid plantings to take advantage of the proven higher yield performance of hybrids developed and disseminated by five private seed companies.

Broadening the adoption of corn hybrid technology over the next two years will, however, depend on making available sufficient credit to corn farmers to meet the higher production costs of hybrids. Although the newly streamlined and expanded crop insurance program has spurred interest in corn financing due to lower credit risks, there is a need to hasten the rehabilitation of rural banks to ensure greater participation. At present, program credit has largely been contributed by the Philippine National Bank, despite incentives given to rural banks.

To supplement institutional credit, the feasibility of tapping non-institutional credit sources, such as fertilizer and seed companies, is being considered. One fertilizer company (Planters Products) has already been providing corn financing through its dealers.

2.06.2 Export Production, Processing and Financing. Four export zones comprising ten major corn provinces in Northern Luzon and Southern and Central Mindanao have been identified. Increased yellow corn hybrid production will be aggressively promoted in these zones, aiming for exports in three years. The development of these export zones to ensure export quality production at competitive prices would require the provision of adequate post-harvest and storage facilities, the improvement of port facilities for bulk handling, the construction of roads, farm mechanization, and strengthened farmer cooperatives.

At the same time, there is a need to develop a special financing program for large plantations and commercial farms willing to undertake the production of yellow corn. Large-scale production of corn through mechanized farming would considerably lower production costs, thereby improving competitiveness in the world market.

2.06.3 Greater Private Sector Participation in Corn Trading. Government has the sole responsibility for importing yellow corn and for purchasing corn from farmers at a set (target) price. However, Government often does not have the financial resources to defend the target price at the peak of harvest. Therefore, the main thrusts of the policy for yellow corn would be, first, to gradually set support prices at levels adequate to achieve exportable surpluses and, second, to liberalize imports and exports of yellow corn, thereby phasing out Government's exclusive role in such trade.

2.06.4 New Cropping Systems. There are indications that corn can be grown as a second crop in the dry season after rice on about 25% of the irrigated rice lands where soils are suited for corn production and where water supply is insufficient for rice growing during the dry season. Since corn requires only residual water, a shift to corn for the second cropping in such areas would make possible planting of three times more hectareage, thereby resulting in more efficient land and water use. Cropping systems suitable to these areas must be developed and extended to tap the production potential of irrigated corn.

2.07 Where white corn is concerned, continued research is still necessary to improve downy-mildew tolerant (open-pollinated) varieties and to develop hybrids, white corn being the crop planted by the majority of our corn farmers for subsistence. Research efforts must also be undertaken on the prevention and control of corn borers, the most prevalent pest plaguing major corn areas during the rainy season, as well as on the development of appropriate post-harvest facilities and farm machinery for small farmers. At the same time, it is essential to develop viable upland corn-based farming system (such as corn-legumes strip farming) to increase yields and improve the nutritional status of upland corn farmers.

2.08 Proposed Policy Actions. The following specific actions are proposed to enhance producer incentives and allow expanded private sector participation in corn trading:

- (i) Provide sufficient credit to enable farmers to meet the higher production costs of hybrids. In this connection, it is necessary to:
  - continue the rehabilitation of distressed rural banks
  - supplement institutional credit with credit provided through non-institutional sources.



- (ii) Commit to set domestic support prices at levels adequate to achieve exportable surpluses.
- (iii) Include in the study of NFA how such prices can be determined and maintained under normal world market conditions.
- (iv) Develop yellow corn hybrids as a major export crop, under a five-year plan with the following elements:
  - develop a pricing scheme which will recognize prevailing export prices at least partially so as to serve as an incentive to the planting of hybrid corn for export.
  - Develop designated corn export zones, from which the private sector may immediately export subject to NFA regulation.
  - At the start of the program, there may be a need to incur export promotion expenses.

Construct the necessary transportation, storage and handling facilities, and roads in the designated corn export zones.
- (v) Allow the private sector to import yellow corn.

#### LIVESTOCK AND POULTRY

2.09 The Philippines has attained self-sufficiency in poultry, eggs, and pork largely due to the unprecedented growth rates in poultry and hog production among commercial producers throughout the seventies. However, beef and dairy production have lagged behind, with about 40% of beef consumption and 98% of dairy requirements still being imported.

2.10 Feed Supply and Price Instabilities. Sustained production growth in poultry, eggs, and pork hinges on the stability of feed supply and prices. Even with large and growing imports, feed costs have been exceedingly high. This has exacted a heavy toll on poultry and hog producers, since almost 70% of their production costs goes to feeds. It is clear that the competitiveness of the domestic poultry industry will be greatly enhanced by an expanded and efficient domestic production of animal feeds, specifically corn and soybeans.

The problems of feed supply and price instabilities should eventually be solved by the government's all-out drive to achieve self-sufficiency in feedgrains through the MALSAGANA program, along with the development of viable feed ingredient substitutes such as sweet potato and cassava. Once feed costs are reduced to ensure competitiveness in the world market, exports of pork and poultry products can get underway.

2.11 Ruminant Animal Production. With the attainment of self-sufficiency in poultry and pork production, Government has shifted its attention to ruminant animals as a major thrust in livestock production.

2.11.1 Cattle. In cattle raising, breeding and fattening are key areas of concern. The Bureau of Animal Industry's cattle dispersal program distributes improved cattle breeds to backyard raisers to upgrade native stock while the Bakahang Barangay supervised credit program extends financing to backyard farmers for cattle fattening. Forage and pasture improvements and a pasture lease program are also being carried out.

2.11.2 Carabao. The high cost of mechanized farming has revived interest in the carabao as a work animal. Credit assistance is being extended for the purchase of work carabaos through the Kalabaw ng Barangay program. Alongside its work function, the carabao's potential as a source of meat and milk is also being studied and developed. Research to improve reproductive efficiency, nutrition, and feeding systems is a major area of concern.

2.11.3 Goats and Sheep. Chevon and mutton production are being stepped up to replace part of the beef supplies imported for the meat processing industry and to produce for the export market in the Middle East. The supervised credit scheme under the Kambingang Barangay Program offers a twin-pronged approach to maximize meat and milk output from goats.

To tie-up the Philippine goat and sheep program with other ASEAN countries, the Philippines has set up an ASEAN Goat and Sheep Center which focuses on the development of suitable technologies for chevon and mutton production.

2.12 Dairy Program. With the end of reducing huge dairy imports, the country has embarked on a program to accelerate dairy production and produce within 10 years at least 15% of the nation's dairy needs. Implemented jointly by the Philippine Dairy Corporation (PDC) and the Bureau of Animal Industry (BAI), the program pursues two major thrusts. The first is to upgrade native cattle for dairying purposes through artificial insemination and the dispersal of crossbred dairy farmers in designated dairy zones where steady feed supply is available for mild production.

Complimentary to these thrusts, technical services and the necessary facilities are being provided to make dairy breedings and milk production viable supplementary activities to existing farm systems. Along this line, a Smallholder Livestock Development Project is being implemented with assistance from the International Fund for Agricultural Development (IFAD) and the Asian Development Bank. The project components consist of backyard milk production, dairy cattle improvement, cattle fattening and credit extension.

2.13 Marketing. Excess supplies of poultry, eggs, and pork have been exerting downward pressure on farmgate prices for these products, with small producers most affected. Retail prices, however, have remained high, thus failing to stimulate larger consumption. The establishment of a Livestock Marketing Board is being considered as a possible mechanism for better monitoring of the market and rationalizing of the pricing and incentives system.

In cattle marketing, the establishment of auction markets will continue to be pursued. The establishment of some 75 auction markets since

1972 has resulted in the elimination of layers of middlemen in the marketing chain. This step, together with the removal of numerous unnecessary fees, has contributed significantly toward improving producers' margins and reducing consumer prices.

2.14 Government policy for the livestock and poultry industries has attempted to stabilize consumer prices by mediating in both input and output markets. Government has the exclusive right to import yellow corn and soybean meal, regulates domestic trading of these feed ingredients, and control the prices of livestock poultry products. In line with Government's policy of upholding private sector primacy, a gradual deregulation of the feed ingredient market and the elimination of price controls on livestock and poultry products would be desirable policy objectives.

2.15 Proposed Policy Actions. The specific actions proposed to liberalize the livestock and poultry markets are as follows

Inputs.

- (i) Turn over all import trade of animal feeds, including yellow corn as specified in Para. 2.08(v), to the private sector. Government will intervene only in the event that private sector imports are inadequate to meet domestic sector requirements at reasonable prices.
- (ii) Strengthen programs for domestic production of corn and soybeans.

Outputs

- (i) Remove price controls on poultry and eggs.
- (ii) Remove price controls on pork
- (iii) Adopt a <sup>gradual</sup> phased reduction of the import tariff for poultry products.

COCONUT

2.16 There are about half a million coconut farmers and close to one-third of the country's population derive incomes from one or more aspects of the industry, from production, to processing, to trading, and marketing. Coconut occupies the largest portion of the country's cropped area and coconut products continue to be the country's largest single source of export revenues. About 80% of the industry's output goes to exports, mainly of coconut oil and copra.

Although world market prices for coconut oil and copra have begun to pick-up, coconut farmers are still reeling from the effects of depressed prices brought on by the recession. In addition, long-standing problems of low productivity and under-employment continue to saddle the industry.

In 1980, a replanting program was undertaken to replace old unproductive trees with early-bearing, high-yielding hybrids. Financed largely through a levy, the replanting program has been temporarily suspended due to the lifting of the coconut levy in August 1982. In the meantime, applied research continues to test the performance of hybrids. Other measures continue to be undertaken to provide succor to the ailing industry and improve the welfare of coconut farmers. The most promising initiatives are the following:

2.16.1 Intercropping Under Coconuts. Although intercropping is not a new concept to coconut farmers, the practice is not widespread and cropping systems used are usually inefficient.

The Ministry of Agriculture has launched a pilot multi-storey cropping project to broaden the acceptance of intercropping among coconut farmers through the provision of appropriate support packages. With coconut as the main crop, farmers are encouraged to raise livestock and annuals such as coffee, banana, and papaya as mid-storey crops, with perennials, such as jackfruit, comprising the higher level crops. In line with the Philippine Food and Nutrition Plan, the primary target are the landless laborers who tend coconut trees in exchange for being allowed to cultivate the areas under the trees, with whatever they harvest going to them. The project is ongoing in three coconut regions and will be expanded soon.

2.16.2 Product Diversification. In the face of highly unstable and shrinking world markets for copra and coconut oil, efforts are being intensified to develop new coconut products (such as coco-diesel and poly-unsaturates for soap, edible oil, and margarine) in order to diversify exports and thus expand markets. One coco-chemical plant has been established and is now exporting. Another plant, a joint Philippine-German venture will soon be operating.

2.16.3 Pricing Policy to Improve Nutrition. Studies have shown that the main nutritional deficiency afflicting low-income families, particularly pre-schoolers and pregnant and lactating mothers, is in fats and oils. Much impact would accrue from re-designing pricing and distribution policies to enable nutritionally disadvantaged groups to buy more coconut oil. Because of the relatively high price of cooking oil, pricing policy alone could substantially increase the domestic market for coconut oil and thus reduce the industry's vulnerability to the vagaries of the world fats and oil markets.

2.17 Coconut Marketing and Export Trading. Over the last decade, competing products such as palm oil, corn oil and soya oil, have taken an increasingly dominant share of the world fats and oils market. This, coupled with the effects of the recession toward the end of the decade and mounting trade protectionist barriers, resulted in depressed copra and coconut oil prices for domestic producers. The desire to protect coconut producer and trader margins and to gain stronger leverage in the world market led to the concentration of trading and milling in the hands of a single aggregation of private firms. This aggregation has since become the largest buyer of copra in the country and the biggest seller of coconut oil. It accounts for some 70% of all coconut oil production. Because of the critical role of the coconut industry in the economy, it is important to ascertain how such market

concentration has affected buying prices and producer incentives, as well as the competitiveness of coconut products in the world market.

2.18 Proposed Study. It is proposed that a study be undertaken to determine the appropriate role of government in the coconut industry and the most effective means of reducing costs and enhancing benefits of all industry participants. The study will tackle issues such as:

- (i) the effects of interventions in the production, trading and pricing of coconut;
- (ii) the formulation of long-term coconut industry development strategies that rely less on controls and trade restrictions and more on technological innovations and increased productivity; and
- (iii) the nature of the relationship between the Government's regulatory agency and the processing industry and the rationale for the composition of the governing board of the regulatory agency.

#### SUGAR

2.19 Sugar is a traditional major earner of foreign exchange in the economy. The Philippines ranks tenth among the world's top sugar producers, contributing 3% of average world production or an average of 2.5 million metric tons per year. The sugar industry employs approximately 500,000 workers, around 93% of whom are farm workers. Including dependents, the sugar industry's supports around 4 million or about 8% of the Philippines' total population.

2.20 To protect producers and consumers and to control excessive price fluctuations, the Government policymaking body in the sugar industry allocates sugar production for export and domestic consumption and fixes the raw sugar buying price for the domestic and export markets. Moreover, based on the principle that a single trading entity has greater marketing power in the global arena, Government, since 1974 until very recently has been the sole buyer and sole exporter of sugar.

2.21 Proposed Study. Because of the key role that the sugar industry plays in generating foreign exchange, it is proposed that a comprehensive study of the sugar industry be carried out to determine the appropriateness of government mediation in the sector, weighing the pros and cons of the current system and its efficiency compared with alternative approaches. The study will, inter alia, review and analyze the impact of current price setting, market allocation and revenue liquidation arrangements, the costs of the Government's operations, and the factors affecting incentives to millers and growers. The study will consider issues such as:

- (i) alternative arrangements for international marketing;
- (ii) evaluation of the present domestic price policy and recommendations on its implementation;

- (iii) effect of government intervention in the trading and pricing of sugar on growers, processors and consumers;
- (iv) formulation of long term sugar industry development strategies that rely less on controls, lower prices and trading and more on technological innovations;
- (v) the nature of the relationship between the Government's policy-making and regulatory body and its marketing arm and the rationale for the composition of their Boards.

#### Other Commercial Crops

2.22 Diversification into nontraditional commercial crops such as rubber, coffee, cacao, papaya, mango, citrus, and cashew shall be a major agricultural program in the medium and long term. The main objective is to increase export earnings while at the same time reducing the country's dependence on the volatile sugar and coconut export markets. Increased production of traditional exports like abaca and tobacco and import substitution crops like cotton will also be undertaken to help reduce the balance of payments deficit.

2.25 Under the rubber development program, Government will pursue hectareage expansion while developing infrastructure in rubber growing areas to help reduce high marketing costs.

As part of the move to assist the coconut industry, intercropping of papaya, cacao and coffee under coconut trees is being implemented to boost incomes in the coconut sector and at the same time generate new export earnings. Efforts are also underway to cash in on the lucrative cashew nut export market with breeding work on varietal improvement already onstream.

Research will be stepped up to improve and expand processing of mango and citrus for the export market along with efforts to improve yields for greater competitiveness.

Government will endeavor to enhance the competitiveness of native and Virginia tobacco exports by intensifying research on production and post-harvest technologies. Government also seeks to improve the competitiveness of abaca exports mainly by introducing high yielding and disease-resistant varieties and further research on alternative uses of the fiber for handicrafts.

Cotton hectarages will continue to be expanded together with the provision of technology, credit, and marketing assistance under the cotton development program, with the end in view of eventually replacing all cotton imports.

#### Fisheries

2.23 Endowed with an extensive coastline and about 300,000 hectares devoted to fishponds at present, the Philippines has one of the largest

marine, brackishwater and freshwater resources in the world. Efforts will be increased to tap the great potential of these abundant fishery resources as a source of cheap protein for domestic consumers, while moving to completely replace canned fish imports.

Priority will likewise be given to increased production of selected fish products such as tuna and prawns for export. The success of this two-pronged strategy for domestic and export consumption will depend largely on the availability of sufficient credit and elimination of processing and marketing bottlenecks.

2.24 Emphasis on Aquaculture. The rising cost of deepsea fishing (mainly due to increased fuel costs) has underscored the importance of intensifying aquaculture to supplement the municipal fish catch and thus meet the country's growing food and export expansion requirements. This will involve the further development of fish farming to increase production of prawns, milkfish, and tilapia, among others, as well as sea farming or mariculture to expand production of nontraditional products such as seaweeds, oysters, mussels, and eels, mainly for the export market. Massive technical assistance and credit are necessary for hatchery and grown-out operations.

With the successful development of prawn aquaculture technology, the tremendous potential of prawn production for export will be further exploited with an eye to supplying a substantial share of the lucrative Japanese market. One top private corporation has led the way in extending adapted Taiwanese technology for commercial prawn hatcheries, feeds and grow-out ponds.

2.25 Selective Exploitation of Marine Resources. The declaration of the 200-mile economic zone around the country's coasts should greatly enhance the current effort to maximize the commercial deepsea catch, especially of tuna and tuna-like species aimed at the export market. The rational and selective harvesting of hard corals without disturbing the natural marine habitat is also being undertaken to increase export revenues.

Aside from traditional purse-seining, new cost-reducing methods for marine fishing are being introduced, while optimum utilization of existing fleet capacities is promoted.

2.26 Special Program for Subsistence Fisheries. The 600,000 subsistence municipal fishermen who produce 50% of the country's total fish output comprise a major poverty-group needing immediate Government support and assistance. The sector is plagued by low productivity due mainly to outdated fishing methods and the lack of credit to buy essential equipment. Government has extended technology as well as credit amounting to P 228 million through the Biyayang Dagat livelihood program. The program, however, must be strengthened and expanded in order to meet the pressing need for more boats, engines, and nets. At the same time, the establishment of cold storage facilities and processing plants in selected areas will be stepped up to rationalize supply distribution and assure municipal fishermen better prices for their highly perishable produce.

2.27 Research and Resource Assessment. In aquaculture, quite a lot of technology is already available which can increase pond production twice or even thrice the present levels, including methods for culturing fin-fishes, shellfishes, and algae. But these technologies have yet to be extended on a large-scale, and continued research is necessary to develop more efficient techniques for fry and seedling production and better management of inland water resources.

In marine fishing, resource studies have been too scarce, diverse, and limited in scope to provide a sufficient and reliable basis for planning and management purposes. The following specific areas have, therefore, been identified as priority areas for research; a comprehensive assessment of the volume, state, and distribution of the country's fishery resources; biological studies on the life history of pelagic and demersal fishes; and surveys and oceanographic studies of new and potential fishing grounds in both coastal and offshore areas.

2.28 Processing and Marketing Problems. While fish supplies are adequate in coastal areas, inland areas in general suffer from uneven distribution and widely fluctuating prices due to the lack of cold storage and processing facilities. Moreover, too many layers of middlemen in the traditional marketing chain (particularly in the case of supplies going to large urban centers) have resulted in reduced producer margins and higher consumer prices. Government has an ongoing program for the construction of more fishing ports, ice plants, and cold storage facilities to help stabilize seasonal fish supplies and even out geographical distribution. In addition, research will be undertaken to improve drying and processing methods and diversify byproduct utilization. Studies are also underway to arrive at a feasible scheme which will streamline the marketing chain supplying Manila and other large urban centers.

The establishment of integrated fish processing centers, the upgrading of existing canning plants, along with the expansion of transport facilities, will be undertaken to support substitution efforts for canned tuna, mackerel, and sardines, as well as the development of fishery products for exports.

#### Other Food Crops

2.29 Problems of very low productivity and seasonality continue to plague the production and marketing of rootcrops, beans and nuts and vegetables. Fields of beans and nuts for example, stand at less than 1 metric ton per ha. Low yields coupled with seasonality tend to push prices beyond the reach of the average Filipino family.

The following thrusts and strategies will be pursued in support of nutrition improvement efforts under the Food and Nutrition Plan:

2.29.1 Development of cheap sources of vegetable protein and nonseasonal lowland varieties of other vegetables. Research will be intensified to develop inexpensive sources of plant protein such as mungbean, peanut and soybean. In the light of possible cost advantages as a result of the peso



devaluation, studies are being undertaken on the economics of growing soybeans, possibly as a second crop after rice. Varietal improvement of nonseasonal lowland varieties of indigenous vegetables such as sigadillas, malunggay and alubati will also be undertaken.

2.29.2 Expanded mungbean and peanut production. Even as applied research continues to improve yields of mungbean and peanut varieties, programs to expand production of these high protein legumes as a second crop after rice are already underway.

2.29.3 Rootcrops as feed ingredient substitutes. Research on cassava and sweet potato will be strengthened to further develop these crops as alternative sources of animal feed.

2.29.4 Marketing and pricing of vegetables. Special attention shall be given to marketing programs, including increased storage and processing facilities. A price support mechanism for vegetables is being considered to reduce price fluctuations. The activities of the Market Assistance Center (MAC) Project in production programming and in providing up-to-date market/price information to farmers will be expanded to alleviate the problems of extreme seasonality of production and wide fluctuations in prices of vegetables.

#### Special Nutrition Intervention

2.30 While the series of commodity thrusts in the foregoing sections are designed to lead to a general improvement in nutritional intake, special and immediate measures need to be taken to correct the most serious nutritional deficiencies among groups who will still not have 100% adequacy despite these programs. These are the seriously disadvantaged and low income groups who fall outside the normal market mechanisms.

A nationwide nutrition survey in 1978 showed that the main nutritional deficiency in the Filipino diet is not so much in protein, but in calories, despite the abundance of rice in the country and the fact the Philippines is the single largest producer of coconut oil (which has a very high caloric density). The survey also showed that the lower the income, the higher the nutrient inadequacy. Within the malnourished groups identified, the most vulnerable are the pre-school children and pregnant and nursing mothers.

Among the major reasons for these calorie/energy deficiencies is the fact that, on the average, Filipinos have a low intake of fats. This is partly due to custom and partly to the relatively high prices of coconut oil.

The 1982 nutrition survey indicated that the calorie and protein intakes of households in income groups below the P 500 p.a. level have improved since 1978. However, individuals in these groups are so nutritionally deficient that, given only the production programs, they will continue to fall below 100% adequacy even by the end of the decade.

Thus, to complement production programs, it is proposed that the calorie/energy intake of specifically targetted beneficiaries be raised through a selective food discount scheme using rice and coconut oil at reduced prices. While the principal target would be preschool children and pregnant and nursing mothers, the entire household would be the target unit. The administrative mechanism will involve the participation of Home Management Technicians, Barangay Nutrition Scholars, retail outlets (including KADIWA outlets), rural banks, as well as the delivery systems for rice and coconut oil from source to point of purchase.

Because the scheme constitutes an approach not previously tried in the Philippines, pilot testing is now being undertaken prior to full-scale implementation. Piloting has commenced in 18 barangays and 7 towns in the depressed provinces of Abra, Antique, and South Cotabato.

### Research

2.31 At present, a major concern in agricultural research is to strengthen the translation of research results into viable location-specific technologies. Some 12 Regional Integrated Agricultural Research Stations (RIARS) are already in place - one in each of the country's 12 regions - under the World Bank-assisted Agricultural Support Services Project (ASSP). These regional centers have the main function of verifying new technologies turned out by national research institutions and ascertaining their suitability to local conditions.

The need for more financial support for research is also a principal concern. While government funding of agricultural research has increased greatly over the past decade, the present level (0.1% of GNP) still falls far short of the amount required to expand research in real terms. Private sector funding is minimal and difficult to quantify.

Appendix I lists the research priority areas adopted by the Philippine Council for Agriculture and Resources Research and Development (PCARRD) for the period 1984-88 to support the agriculture sector's action agenda.

### Fertilizer

2.32 As in food policy, the Government's approach to fertilizer policy is to achieve a balance between the conflicting objectives of ensuring low fertilizer prices to farmers and providing adequate incentives to domestic fertilizer producers. Some 70% of the country's fertilizer requirements are imported, with the rest produced locally. The Fertilizer and Pesticide Authority (FPA), formed in 1977, regulates the fertilizer industry by allocating imports of fertilizer and adjusting duties and taxes on raw materials required by local companies for fertilizer production.

2.33 Industry Problems. A number of problems confront the industry. One of these is the apparent stagnation of fertilizer use in the last five years and its adverse effects on productivity. Another problem is Government's arrears to fertilizer companies representing unpaid reimbursements under

earlier subsidy programs. There also exists a potential conflict of interest between FPA and Philphos, one of the production companies, since both organizations have common management at the top.

2.34 ADB Study. A comprehensive study to be undertaken in the context of a proposed ADB loan will review the problem of stagnating fertilizer use as well as the following related issues:

- (i) alternative sources of supply, particularly how this relates to future relationships with other countries and the local fertilizer industry;
- (ii) the role Government expects the private sector to play in developing the fertilizer industry;
- (iii) the merits of free competition vis-a-vis controlled competition;
- (iv) the concept of price deregulation at all levels; and
- (v) increasing the efficiency of nitrogen fertilizer recovery.

2.36 Other Measures. Government shall adopt specific measures and a timetable to retire Government's arrears to fertilizer firms. The Government also intends to appoint separate chief executives for FPA and Philphos.

#### Irrigation

2.36 There is no doubt that the expansion of irrigated hectareage since 1972 was a crucial factor in the attainment of self-sufficiency in rice in the short span of three years after the Masagana 99 program began.

The most significant impact of irrigation can be seen in the increase in incomes of irrigated rice farmers during 1972-76. Despite the decline of farmer's margins in 1977 to 1981, farm incomes were still higher in real terms than incomes before the spread of new technology made possible by expanded irrigation. At the same time, the Government was able to maintain low and stable prices for the consumer. The benefits to the economy have been substantial as rice constitutes 19% of food expenditures which in turn constitute half of the consumer basket.

2.37 Continued Expansion of Irrigation. The risk of crop failures due to floods, pest infestations, and droughts; the desired reduction in unit costs; and the desirability of providing farmers the opportunity to plant alternative crops - all these factors combine to underscore the wisdom of increasing irrigated area. Generation of new irrigated areas would provide a more reliable base for increased agricultural production and price stability while providing a means for balanced growth among regions.

Government will therefore continue to expand irrigation to the maximum extent allowed by national budget resources.

However, in view of budgetary constraints and increasing capital costs, it has been necessary to implement large major projects sequentially

while stepping up the development of smaller scale communal irrigation and water impounding projects which cost less and can be completed quickly. At the same time, rehabilitation and improvement of existing irrigation systems will be intensified.

2.38 NIA Program Targets. The National Irrigation Administration (NIA) program already recognizes the need to redirect some investment outlays and perhaps moderate the rapid pace of expansion in large irrigation systems. The NIA program for the current plan period targets a total increase in the irrigated area of 245,345 hectares by 1987, over and above the current service area (as of end-1982) of about 1.32 million ha. Rehabilitation of 106,062 ha of existing systems is also expected to be completed by 1987.

2.39 Irrigation Subsidy. While irrigation fees are collected by NIA to help defray the cost of maintaining and operating irrigation systems, Government, in effect, has had to subsidize irrigation services to farmers due to the low fee collection rate. However, as more farmer associations take over the operation and maintenance of their irrigation systems, Government should be relieved of some subsidy costs. Other measures being considered to reduce NIA's operating costs include:

- (i) conversion of marginal national irrigation systems with incomes less than operating and maintenance costs into communal systems which will be operated by farmers' associations;
- (ii) turning over large national irrigation systems on a modular basis - by sections or laterals - to farmers' associations;
- (iii) improvement of water delivery and services to farmers and exploring the possibility of pricing water on the basis of volume used rather than on a per hectare basis. These two measures should improve efficiency of water utilization and thus result in larger fee collection.

2.58 To minimize subsidies, Government has asked the NIA to assume responsibility for servicing its debt obligation. However, NIA internal cash generation falls significantly short of its needs in this regard. A study is therefore needed to assess NIA's financial requirements during the next decade both for operation and maintenance of the national system as well as for debt service. The study will evaluate whether NIA can realistically be expected to generate the needed resources through irrigation fees. In the event that this is not deemed feasible, the study should examine other possible ways of ensuring adequate resources for these purposes, including the accelerated transfer of responsibility for operations and maintenance to irrigators' associations even in the case of national systems, and for strengthening the rules and procedures for improving fee collections.

It is also proposed that the Cabinet approve NIA's proposal for charging variable irrigation water fees for different crops to encourage diversification in irrigated areas and to reduce the overall demand for water.

## LAND MANAGEMENT

2.41 The Philippines has a total land area of 30 million hectares. The aim is to keep about 12 million hectares reserved as permanent forest, with the rest considered alienable and disposable.

The national density of 300 persons per square kilometer as of 1980 is already among the highest in the world. Government sees the urgent need to carry out a land management policy which will foster maximum and rational land use, prevent the diversion of agricultural land to other uses, and provide the basis for better land tenure arrangements.

The Government's land management program has, therefore, adopted the following strategies and actions as the principal focus of attention in the next five years.

2.41.1 Strengthening the Capability for Land Classification - Some 5.5 million hectares or 18.5% of the country's total land area still remain unclassified. This slow pace has greatly hampered land disposition and has stood in the way of efforts to maximize and rationalize land use. Priority attention will, therefore, be given to beefing up the land classification teams and facilities of the Bureau of Forest Development so that classification of the remaining unclassified hectareage can be speeded up and completed within ten years. Photogrammetry will be employed to the maximum extent possible to hasten land classification surveys.

2.41.2 Completion of Cadastral Surveys - Delays in the completion of cadastral surveys and land titling have resulted in the lack of land security for farmers and prolonged land disputes. With adequate financial support, the Bureau of Lands aim to complete the cadastral survey of the remaining unsurveyed 19.5 million hectares (covering 784 cities and municipalities) by 1991, so that titling of these areas can proceed quickly. To augment its in-house capability, the Bureau is tapping private firms in the conduct of cadastral surveys. Multipurpose land surveys including land use inventory, tax mapping, and barangay updating, are being undertaken. The extensive use of aerial photography to supplement ground surveys is under study.

2.41.3 Preventing the Conversion of Agricultural Land to Industrial and Urban Uses - Growing population pressure on prime agricultural land and the resulting cultivation of less productive marginal areas has become a national concern. Land use control through zonification and other urban development regulations have been instituted to stop the use of agricultural land for non-agricultural purposes. Presidential Decree 815 prohibits the conversion of agricultural rice land to urban uses and P.D. 1517 proclaimed urban land reform.

2.41.4 Measures to Facilitate Agrarian Reform and Stabilize Land Tenure - The objective is to enable more tenants in rice and corn lands to acquire ownership of the land they till and to arrive at equitable and secured tenural arrangements in crop lands other than rice and corn. This will be accomplished through the accelerated issuance of emancipation patents in land transfer areas, stepped-up land patenting in resettlement areas, the

stabilization of the leasehold system, the promotion of the stewardship concept, and the integration of development projects in resettled areas.

2.41.5 Expansion of the Resettlement Program and Rehabilitation of Existing Settlement Projects - To accommodate the increasing number of landless workers and shifting cultivators (kaingineros) and to prevent further encroachment on unclassified land not suitable for settlement purposes, portions of the public domain, where feasible, will be proclaimed for resettlement under the agrarian reform program. Such resettlement will be supported by a package of services emphasizing proper land use and soil conservation. At the same time, rehabilitation of existing settlements will be undertaken through an integrated approach whereby all development components shall be carried out in direct support of land distribution and titling. Three settlement projects using this approach are now in the pipeline for World Bank assistance.

### III. IMPROVING THE LEVEL OF FINANCIAL SUPPORT FOR AGRICULTURAL DEVELOPMENT

3.01 Financial Support Objectives. The main objectives of the proposed program are to channel an adequate level of resources for sector development in accordance with well-defined investment priorities and to encourage a more efficient utilization of scarce credit resources. In particular, Government seeks to pursue the following:

- (i) the establishment of mechanisms to identify and plan critical agricultural development programs;
- (ii) the establishment of a sectoral programming and budgeting mechanism to direct public resource to the most efficient use; and
- (iii) the improvement of the policy and institutional framework for channeling working capital and investment credit to farmers.

3.02 Sectoral Development Plan. The agricultural sector shall play a crucial role in the country's drive toward economic recovery. This being the case, increased amounts of the country's already limited financial resources should be devoted to increasing agricultural production and productivity. In the light of these severe financial constraints, there is a need to formulate a well-defined plan for resource allocation and utilization based on national needs and priorities.

3.03 Agricultural Credit Trends. Over the last decade, the Philippine government's agricultural credit strategy has aimed at providing an adequate flow of institutional credit to the agricultural sector. Various programs of supervised credit, policies to encourage banks to operate in the countryside and attract them to lend to agriculture, and measures to minimize risks have succeeded in expanding countryside banking facilities.

The share of agriculture in total loans granted dropped from 20% in the 1960s to 8% in the late 1970s. Moreover, supervised farm credit constitutes a minor portion (3%) of total agricultural production loans, the great

bulk of which is availed of by the large agribusiness concerns, mainly for marketing purposes and not for production. Alongside this major issue are the concerns over the proliferation of single commodity-oriented agricultural credit programs, the credit specialization of lending conduits, and the scattered nationwide implementation of agricultural credit programs.

3.04 Credit Subsidy Issues. In an effort to alleviate the problem of decreasing supply of institutional credit to small farmers, all forms of control on interest rates have been lifted, except for loans rediscounted with the Central Bank and loans under the KKK livelihood program. Deregulation of interest rates removes a substantial portion of interest rate subsidies and leads to increased bank margins.

However, there is still a need for government to continue subsidizing interest rates for carefully identified target groups in agriculture, especially at a time when the sector must assume the lead role in the drive toward economic recovery.

The present spread between interest rates and rediscounting rates has been designed precisely to cover the high costs of lending to thousands of small farmers scattered throughout the countryside as well as to compensate for the high risks and the attendant lower repayment rates associated with agriculture. Any increase in Central Bank rediscounting rates to rural banks will result in higher interest rates to the farmer-borrower. Unlike industrial and trader-borrowers, the farmer is already burdened with other loan expenses due to the high risk of his occupation (such as crop insurance, premiums, service charges, Samahang Nasyon fees and other transactions costs).

3.05 Availability of Term Credit. Because of financial intermediation, the interest rate reforms initiated in 1980 are expected to contribute to the growth of rural financing markets. The deregulation of deposit and loan rates and the institution of a floating rate system for term loans provide a better climate for savings mobilization and could contribute to the lengthening of the term structure of agricultural credit.

3.06 Rehabilitation of the Rural Banking System. To continue and broaden institutional participation in agricultural financing, government has adopted measures to facilitate recovery of farmers' loans, to correct the arrearages problem, to rehabilitate rural banks and to expand credit flows to areas not served at present. The crop insurance program shall continue to reach out to rice and corn farmers and its expansion to include other crops is currently being studied. In pursuit of its commitment to guarantee supervised credit losses under Masagana and to restore the good credit standing of affected banks, the government shall continue to provide a revolving trust fund for the payment of guarantee claims by PNB and rural banks.

To ensure the long-term stability of the rural credit system, a capital build-up and arrears conversion scheme will be fully implemented. All rural banks with supervised credit arrearages are qualified to participate in the scheme. Under the capital build-up program, the scheme will provide for an equal yearly increase in the paid-up capital stock of rural banks over a period not exceeding ten (10) years. The arrears conversion scheme provides

that for every additional private paid-up capital stock put up by the bank, an equivalent amount rediscounting arrearages shall be converted into preferred shares to be issued in the name of DBP. Past due rediscounting arrears for supervised credit which are not restructured or covered by the conversion scheme shall be covered by an acceptable plan of payment over not more than 10 years.

Measures have also been instituted to ensure the continuous flow of credit to areas which are inadequately served by existing rural banks to broaden the channel of credit in the countryside. Existing rural banks within the region or province are encouraged to put up branches or extension offices. Rural banks were also granted authority to use government counterpart capital for loans other than those under the supervised credit programs.

3.07 Integrated Rural Financing. The Central Bank's integrated rural financing program is a significant departure from the traditional practice of extending a separate production loan for each commodity. The integrated financing scheme offers the farmer a single credit line to support his entire annual farm plan, which may include all his production requirements for several crops, infrastructure needs and marketing exigencies. This scheme supports the newly adopted farm systems approach of agricultural development and at the same time, provides the means for streamlining the current proliferation of credit programs for various commodities.

3.08 The following policy actions are required to mobilize a greater level of resources for agricultural development:

- (i) Credit Program. The formulation of a comprehensive action program on agricultural credit will be undertaken, based on a thorough review of existing credit studies and a program of such additional studies as may be required to fill information gaps. This credit program will address the need to strengthen the mechanisms to mobilize and channel an adequate level of financial resources to the sector.
- (ii) Lending Rates. It is proposed that government gradually reduce subsidies in government-sponsored programs through revisions in the lending rate while taking into account the need for maintaining a slight differential between the rediscount rate for agriculture and that for other sectors.
- (iii) Sectoral Development Plan. Government will strengthen the sectoral planning system and will prepare annually prioritized agriculture sector development plans and a corresponding consolidated budget consistent with the objectives of the plan.

#### IV. INITIAL INSTITUTIONAL CHANGES

4.01 Objectives. The set of institutional changes proposed for the short run is intended to improve planning, programming and budgeting, as well as policy formulation for the agricultural sector. Over the long term, the



ultimate objective is to streamline all institutions involved in agricultural production by eliminating duplication of functions and strengthening the lead agency which has been mandated to coordinate all agricultural programs. The program will focus on the management and organization of the food and agriculture sector, the Government's role in food marketing, and the strengthening of farmers' organizations.

4.02 Organization and Management. Excessive fragmentation of institutions within the agricultural sector and the lack of an effective mechanism for determining directions and for defining priorities inhibit the formulation of optimal agricultural policies and investment programs and complicate the implementation of sectoral development programs. A study is therefore needed which will be geared towards minimizing this fragmentation of institutions, providing for an acceptable mechanism, and facilitating the implementation of sectoral development programs.

4.03 Despite these problems, the Ministry of Agriculture has functioned as a common point providing policy direction. The National Food and Agriculture Council, chaired by the Minister of Agriculture, has recently been strengthened as the coordinating agency for all agricultural development programs at the national level by virtue of two Executive Orders issued by the President. NFAC's coordinating role has been explicitly recognized and reiterated by the Prime Minister.

4.04 Coordination at the Provincial and Municipal Levels. Patterned largely after the management framework of Masagana 99, the Integrated Area Management System (IAMS) established by Executive Order 803 pulls together various agencies and sectors at the local levels to make possible the harmonious delivery of goods and services to a given area. At the regional level, a regional agricultural land classification committee will be responsible for the identification of specific areas for agricultural purposes. Operating as a subcommittee of the Regional Development Council, this committee is chaired by the NEDA Regional Director with the regional directors of various ministries, including the Ministry of Agriculture, as members. The Governor is given the responsibility and authority for coordination and supervision, with the support of a provincial agricultural council composed of agencies involved in the delivery of services and inputs in the provinces. This enlistment of the provincial governor as the focal point of the management set-up should provide the necessary political support for development programs in the province. An action man to oversee day-to-day operations called the Provincial Agricultural Executive Officer (PAEO) assists the Governor and the Council. In a majority of cases, the PAEO is also the Ministry of Agriculture's top man in the province, the Provincial Agricultural Officer.

5 The execution of the integrated area management system at the local level pre-supposes the formulation of an area-specific agricultural development plan which incorporates all critical elements required to develop a specific area.

The development of integrated provincial agricultural development plans, however, has been hampered by inadequate land classification, an outdated data base, the multiplicity of farmer and community organizations

sponsored by various government agencies, limited credit facilities under the integrated rural financing scheme, the lack of management skills and the inadequacy of farmer participation in integrated agricultural planning. All these constraints are tackled in the agriculture sector's agenda for the next five years. In addition, the development of a single monitoring system which would effectively link the operation and management of the agricultural sector to its planning group would further streamline the integrated area management system.

To sustain agricultural development, structural rationalization has to take place at both the national and local levels. This has been initiated with the promulgation of E.O. 803 which provides the framework for rationalization, but such rationalization has yet to take place.

4.05 Proposed Actions. The specific actions proposed are:

- (i) Initially, a plan will be developed to improve the coordination of the functions of the present Ministry of Agriculture and the National Food Authority by placing both under a new Ministry of Agriculture and Food. This new Ministry should also be represented in the governing boards of the coconut and sugar regulatory agencies together with the Ministry of Trade and Industry.
- (ii) At the same time, the plan should also delineate the respective roles of NEDA and NFAC in the agriculture and food sector, particularly with respect to planning, programming, policy formulation, coordination and monitoring. To the extent feasible, the possible conflict of interests among agencies which have regulatory, developmental, and participatory functions will be resolved in an efficient and economical manner. For example, the present conflict of interest in the fertilizer industry, where the same individual heads both the FPA and Philphos, could be resolved by simply appointing a new head either for FPA or Philphos.
- (iii) Subsequently, the Government will undertake a long term program of institutional building for the new ministry.

4.06 National Food Authority. The NFA, in addition to its basic role of safeguarding the interests of the producer and the consumer in the matter of price support operations and distribution of vital cereal foods in the country, is entrusted with a multiplicity of other functions. Moreover, a large portion of the scarce resources available to the Government has been committed to these activities.

4.07 Proposed Study. The commissioning of a study is, therefore, necessary to review the present role, organization and functions of NFA, with a view to finding out:

- (i) the impact of present policies and programs on the various sectors of the food industry;
- (ii) how pricing and marketing policies and programs can be attuned and

implemented to suit present conditions and to best serve the interest of producers, consumers and traders, while taking cognizance of scarce government resources; and

- (iii) how NFA's organizational and financial structure can best respond to the needs of the industry, how the financial needs of the NFA would be affected by a streamlining of its present activities by focusing on its functions of price stabilization and maintenance of buffer stocks, and how best the functioning of the resultant needs of the Authority could be arranged to remove the burden on government finances.

4.08 Farmers' Organizations. By the end of 1982, the Government's Cooperative Development Program had organized some 18,600 village associations or "Samahang Nayong" with a total membership numbering 888,480 individuals and aggregate savings of P64 million. There are 45 Area Marketing Cooperatives and 25 Cooperative Rural Banks nationwide. Samahang Nayongs, initially considered pre-cooperatives, were transformed into full-fledged primary cooperatives in 1982 and allowed to engage in business enterprises. At the same time, steps were taken to streamline Area Marketing Cooperatives and strengthen the viability of Cooperative Rural Banks.

4.09 Need to Integrate Diverse Organizations. One problem which must be addressed immediately is the proliferation of various types of farmer organizations set up at the village level for diverse purposes. Apart from the Samahang Nayon and farmers' associations organized by the Ministry of Agriculture, there are agrarian reform beneficiaries organized by the Ministry of Agrarian Reform, irrigation associations organized by the National Irrigation Administration, and associations set up by the Farm Systems Development Corporation. In addition, there are groups formed by several private organizations. This situation has led to fragmentation and confusion, with farmers frequently holding membership and having to pay dues in several organizations at the same time. It is necessary to unify all cooperative undertakings under a single umbrella organization at the village level. This is essential if farmers' organizations are to function effectively as the conduits for delivery inputs and services to the farm in line with the new adopted area-specific farm systems approach of the Integrated Area Management System.

Agricultural Research Priorities for 1984-88

1. Rice-based cropping systems, especially in lowland rainfed areas;
2. Development of white corn hybrid and high-yielding open-pollinated varieties;
3. Development of improved varieties of crops such as sorghum and cassava to serve as alternative sources of livestock feed;
4. Varietal improvement and development of crops which are cheap sources of vegetable protein such as mungbean, peanuts and coconuts;
5. Development of non-seasonal lowland varieties of vegetables, which are indigenous and have high nutritional value;
6. Development of wheat varieties that are heat tolerant and adaptable to local conditions;
7. Control of the leaf-mottling virus affecting citrus, dwarfing techniques for citrus and mango for high-density planting, as well as fruit processing and storage for fruit exports;
8. Breeding and propagation techniques of ornamental plants and cut flowers for export;
9. Coconut tissue culture, coconut hybrid and cultural testing, wet coconut processing to hasten the production of coco-oil and other coco products and by-products such a coco chemical and coco-diesel, intensified coconut-based cropping systems;
10. Development of agro-forestry systems utilizing perennial industrial crops, fruit trees (cashew, rambutan, et al) and tree legumes such as ipil-ipil;
11. Improvement of soil management techniques, including the use of nitrogen-fixing agents such as azolla and blue-green algae;
12. Pest management research including biological control of pests;
13. Varietal improvement and disease control for cotton and tobacco;
14. Genetic improvement of dairy cattle and a carabao breeding program;
15. Marine fish resource assessment;
16. Aquaculture research, especially on products with export potentials such as prawns and finfish (lapu-lapu or groupers), macro-brachium, and seaweeds, as well as research on rice-fish cropping systems;

17. Fish product processing techniques such as drying and fermentation, and mussels and seaweed processing for exports;
18. Basic sociological studies on the impact of technologies and attitudinal responses of farmer-recipients as well as the role of rural institutions in rural development;
19. Establishment of a reliable agricultural data base on the municipal level.

付属資料ー5 収集資料リスト

- 1.(1) プロジェクト・プロポーザル
- (2) Appendix I. "Diversified Crops Irrigation Engineering Project"
- (3) Appendix II. "Agenda for Action in Agriculture 1984-88"  
農業省5ヶ年計画
- (4) Appendix III. (1) TarlacにおけるOECF地下水開発プロジェクト概況  
(2) AMRIS(San Rafael)事業の概要  
(3) LAGUNA DE BAY(II) 開発計画概要
- (5) Appendix IV. "Irrigation Management for Crop Diversification  
(Philippines)"  
IIMI(International Irrigation Management Institute)
- (6) Appendix V. 農業関連統計データ
2. NIAの予算書 1982-1984年
3. Tarlac Ground Water Pilot Area
4. 2nd Laguna De Bay Irrigation Project — 野菜コンポーネント関連資料
5. 『Tarlac Irrigation Systems Improvement Project(TISIP)  
完成報告書 — 世銀プロジェクトの報告書
6. 『中部ルソン地下水灌漑計画の成功と失敗』  
Success and Failure of CLGIP Operation & Maintenance Program  
— OECFによる円借款プロジェクトの結果報告書



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