

ネパール王国  
園芸開発計画フェーズ  
終了時評価報告書

平成9年7月  
(1997年7月)

国際協力事業団  
農業開発協力部

## 序 文

ネパール園芸開発計画フェーズ は、平成 4 年 11 月 12 日に署名された討議議事録 (R/D) に基づき、ネパール山間地の農業経営の基盤強化、安定化を目的に、果樹栽培技術の開発、栽培果樹作目の多様化、園芸技術者の訓練、確立した技術の先導的農家への普及などを行うプロジェクトとして、平成 9 年 11 月 11 日まで 5 年間の予定で協力が行われてきました。

プロジェクト協力期間の終了を 4 か月後に控え、国際協力事業団は平成 9 年 7 月 6 日から 7 月 19 日までの 14 日間、農林水産省果樹試験場企画連絡室室長 梶浦一郎氏を団長とする終了時評価調査団を現地に派遣しました。同調査団は、ネパール側評価委員と合同評価チームを形成し、これまでの活動実績などについて総合的な評価を行うとともに、今後取るべき措置について提言を行いました。

これらの評価結果は、合同評価チームによる討議を経て、合同評価報告書に取りまとめられ、署名のうえ、プロジェクト合同委員会に提出されました。

本報告書は、調査及び討議の結果を取りまとめたものであり、今後広く関係者に活用され、日本・ネパール両国の親善及び国際協力の推進に寄与することを願うものです。

最後に本調査の実施にあたり、ご協力頂いたネパール政府関係機関及び我が国関係各位に対し御礼申し上げるとともに、当事業団の業務に対して今後とも一層のご支援をお願いする次第です。

平成 9 年 7 月

**国際協力事業団**  
**理 事 亀 若 誠**



# 目 次

序文

プロジェクト位置図

第1章 終了時評価調査団の派遣 .....	1
1 - 1 調査団派遣の経緯と目的 .....	1
1 - 2 調査団の構成 .....	2
1 - 3 調査日程 .....	2
1 - 4 主要面談者 .....	2
1 - 5 評価の方法 .....	3
第2章 要約 .....	5
第3章 調査・評価結果 .....	8
3 - 1 プロジェクトの投入実績 .....	8
3 - 2 計画の妥当性 .....	8
3 - 3 プロジェクトの達成度 .....	9
3 - 4 プロジェクトの効果 .....	15
3 - 5 プロジェクトの自立発展性 .....	17
第4章 結論と提言 .....	19
4 - 1 評価結果の総括 .....	19
4 - 2 提言 .....	19
4 - 3 プロジェクトの将来展望 .....	20
第5章 現行協力期間終了後の対応 .....	21
5 - 1 フォローアップ協力 .....	21
5 - 2 ネパール側への申入れ .....	22
資料	
1 ミニッツ .....	25
2 合同評価報告書 .....	29
3 着手報告書 .....	108

# 第1章 終了時評価調査団の派遣

## 1 - 1 調査団派遣の経緯と目的

ネパールでは絶対的貧困の撲滅を国家開発の最重要課題とし、平野部に比べて穀物生産が困難かつ貧困度の高い山岳丘陵地帯では、食糧不足の解消、生活全般の向上を開発目標として、土地に適した果樹、野菜など換金作物栽培の導入を中心に、開発を行おうとしている。

この国家開発戦略に基づくネパール側の要請により、国際協力事業団（JICA）は1985年10月、山岳丘陵地帯における果樹生産を開発・振興する目的で「ネパール園芸開発計画フェーズ」を開始した。同時に日本政府は、無償資金協力事業によりキルティプール園芸センターの敷地内に「園芸研究・研修センター」を建設し、必要な機材を供与した。フェーズプロジェクトは、同センター及びサブサイトにおいて、果樹栽培技術の開発とネパール人園芸技術者の訓練を行い、1990年に当初設定された目標をほぼ達成して終了した。

フェーズ協力終了後の1991年、ネパール政府は「国家園芸開発マスタープラン」を策定した。同プランは山岳丘陵地帯における果樹生産の振興、果樹市場の整備などを柱としている。ネパール政府はこのマスタープランに沿って、さらなる果樹栽培技術の開発、栽培果樹作目の多様化、園芸技術者の訓練、確立した技術の主要農家への普及などを行うプロジェクトを計画し、我が国に技術協力を求めてきた。

これを受けてJICAは「ネパール園芸開発計画フェーズ」の技術協力を1992年11月12日から5年間の予定で開始した。

本プロジェクトの主要活動は、カンキツ（ジュネール、スンタラ）、ブドウ、クリの栽培技術のさらなる開発、ニホンナシ、ニホンカキの栽培技術の導入、園芸用器具の適切な製造技術の移転、長期研修、短期研修による園芸技術者、モデル農民の訓練、開発した技術のデモファーム、巡回指導による普及、などである。

このたび、フェーズ協力終了を4か月後に控えて、以下の調査・評価を行う目的で評価調査団が派遣された。

- (1) 当初の討議議事録（Record of Discussions: R/D）で設定され、中間評価で見直されたプロジェクト目標の達成度を調査する。
- (2) プロジェクト終了後の本プロジェクトの持続性を調査する。
- (3) 具体的な効果が発現しているなら、どのような効果がどのような対象に対して生み出されたのか、調査する。
- (4) 当初予定のとおり、日本の協力を終了することが妥当かどうか、検討する。

## 1 - 2 調査団の構成

(担当)	(氏名)	(所属)
総括	梶浦 一郎	農林水産省果樹試験場企画連絡室室長
果樹栽培技術	今田 準	農林水産省果樹試験場カキブドウ支場病害研究室室長
研修・普及	溝淵 誠郎	元高知県農林水産部副部長
計画評価・調整	向井 一郎	国際協力事業団農業開発協力部畜産園芸課課長代理

## 1 - 3 調査日程

調査期間：1997年7月6日～7月19日

日順	月日(曜)	移動及び業務
1	7月6日(日)	羽田 関西空港 関西空港 カトマンズ
2	7日(月)	JICA ネパール事務所打合せ、在ネパール日本大使館表敬 外務省、農業省表敬
3	8日(火)	第1回合同評価委員会 園芸局長表敬
4	9日(水)	プロジェクト専門家との協議
5	10日(木)	合同評価1(プロジェクト発表)
6	11日(金)	合同評価2(キルティプール園芸研究・研修センター、圃場見学) 合同評価3(個別インタビュー)
7	12日(土)	資料整理
8	13日(日)	日本側メンバーによるデモファーム視察
9	14日(月)	合同評価4(デモファーム、農家視察)
10	15日(火)	評価報告書作成
11	16日(水)	農業局への報告 第2回合同評価委員会
12	17日(木)	農業省次官報告 合同委員会(報告書発表) 合同委員会ミニッツ署名・交換 在ネパール日本大使館及びJICAネパール事務所報告
13	18日(金)	カトマンズ バンコク バンコク
14	19日(土)	成田着

## 1 - 4 主要面談者

Mr. S. N. Upadhaya	農業省次官
Mr. T. B. Shrestha	農業省農業局局长
Mr. S. S. Shrestha	農業省農業局副局長
Mr. T. B. Thapa	農業省農業局副局長
Mr. R. D. Shahi	キルティプール園芸センター所長
Mr. B. P. Upadhyay	農業省農業局植物保護課課長(評価委員)

Mr. G. P. Shrestha	農業省農業局果樹開発課（評価委員）
Mr. P. L. Shrestha	農業省農業局中央農業研修センター訓練員（評価委員）
Mr. R. Adhikari	農業省農業局計画課（評価委員）

## 1 - 5 評価の方法

### (1) 合同評価

本評価は、日本側・ネパール側双方の「合同評価委員会」を構成し、合同評価形式で実施した。合同評価委員会は、日本側、ネパール側同数の委員を選定し、ネパール側の代表者を委員長として構成した。評価の成果品である評価報告書は英文で作成し、評価の結果をプロジェクト合同委員会へ提出した。

合同評価委員会の構成は以下のとおりである。

#### 1) 日本側委員

団長	梶浦 一郎	農林水産省果樹試験場企画連絡室室長
果樹栽培	今田 準	農林水産省果樹試験場カキブドウ支場病害研究室室長
研修・普及	溝淵 誠郎	元高知県農林水産部副部長
計画評価	向井 一郎	国際協力事業団農業開発協力部畜産園芸課課長代理

#### 2) ネパール側委員

団長	B. P. Upadhaya	農業省農業局植物保護課課長
果樹栽培	G. P. Shrestha	農業省農業局果樹開発課
研修・普及	P. L. Shrestha	農業省農業局中央農業研修センター訓練員
計画評価	R. Adhikari	農業省農業局計画課

### (2) 評価項目

以下の評価項目について評価を実施し、評価5項目（目標達成度、実施の効率性、効果、計画の妥当性、自立発展の見通し）に沿って評価結果を取りまとめた。

#### 1) 目標達成度：当初目標が達成されたか否か、達成されなければその理由

- 上位計画との整合性
- 案件目標の達成状況
- 成果目標の達成状況
- 投入目標の達成状況
- 目標達成あるいは未達成の理由

#### 2) 案件効果の発現状況

プロジェクト実施による効果の内容（技術的、制度的、経済的、社会文化的、環境的効果

など)

効果の広がり及び受益者の範囲(プロジェクト、セクター、地域、国家の各レベル)

3) プロジェクト自立発展の見通し

組織的自立発展の見通し

財務的自立発展の見通し

物的・技術的自立発展の見通し

その他運営管理上の制約要因

4) 取るべき措置

協力期間延長の要否

延長時の協力内容と方法

5) 教訓・提言など

(3) 評価の手順

評価調査の手順は以下のとおり。

1) 第1回合同評価委員会の開催

合同評価委員会の顔合わせ、評価作業の分担、手順の協議。

2) 合同評価

資料調査: プロジェクトから資料を提出させ、その資料を調査して面談調査の質問事項を決定した。資料はネパール側カウンターパートに説明させた。

面談調査: 資料調査に基づいて決めた質問事項ごとに面談し質問した。

実地調査(野外調査): プロジェクトの現場(圃場、農家、実験室、ワークショップ)などを視察・調査した。

3) 評価報告書作成

合同評価の結果を双方の委員が協議しながら報告書に取りまとめた。

4) 第2回合同評価委員会の開催

合同評価報告書について最終確認し「合同委員会」での発表を準備した。

5) プロジェクト合同委員会出席

プロジェクトの最高決定機関である合同委員会で評価結果を発表し、勧告を行った。



## 第2章 要約

本ネパール園芸開発計画フェーズ 終了時評価調査団は、ネパール側の評価チームと合同で終了時評価調査を行い、結果を合同評価報告書に取りまとめて、プロジェクト合同委員会に報告した。合同評価報告書では、プロジェクトが所期の目的をほぼ達成したものの、ニホンナシやニホンカキ栽培などの新規導入技術を移転するため、なお2年間のフォローアップ協力が必要であることを勧告した。

### (1) 評価概要

プロジェクトの目的は、そのほとんどが達成された。本プロジェクトは、詳細実施計画 (Detailed Implementation Plan: DIP) に基づいて、山岳丘陵地帯の果樹開発に適した技術を 既存の農業省の普及制度の活用、 デモファーム、サブデモファームの設立、 重点分野における長期研修、短期研修の実施 の手法を通じて移転し、日本の果樹栽培管理技術がネパールにも適応可能であることを成功裏に示した。今後ネパール国内の必要な地域に対して、開発された果樹栽培技術を普及するために、効果的かつ実績のあるこれら3方法を継続し、補強し、活用することが強く求められる。

本プロジェクトの主要な活動は恒久的組織に引き継がれる必要があるが、そのために、キルティプール園芸センターの能力、受容力が著しく増大していることを確認した。同センターの活動範囲は、現在のネパール中央部地域に限らず、山岳丘陵地の園芸に係る同国の中心センターとするよう、新たな機能を付与すべきである。

しかしながら、特にニホンナシやニホンカキの栽培技術及び園芸器具製造管理など早急に取り組むべき課題が残されていることも確認された。これらの技術に関して、ネパールの果樹専門家は十分な技術力を持っていない。一方で、本プロジェクトにより導入され、高接ぎされた品種は結実を始めたばかりであり、これら品種の収穫、選果、収穫後処理技術を、今後2年以内に集中的に導入することが重要である。これら新規導入技術の移転に関しては、今後2年間のフォローアップ協力などにより解決を図る必要がある。

### (2) フォローアップ協力の課題

- 1) ニホンナシに係る栽培技術 (特に樹形管理・摘果技術) の移転
- 2) ニホンナシに係る果実収穫・処理技術の移転
- 3) 上記技術に関するセンターでの長期・短期研修を通じての訓練
- 4) 上記技術のデモファームでの普及
- 5) 上記技術の農家巡回指導による普及

6) プロジェクトで製造した農機具の品質管理

(3) フォローアップ協力への日本側投入

- 1) 協力期間は2年間
- 2) 果樹栽培「研修・普及」分野の長期専門家の派遣
- 3) ニホンナシ収穫技術に係る短期専門家2名程度の派遣(園場管理業務1名及び収穫指導開発1名)
- 4) ニホンナシ樹形管理技術に係る短期専門家1名程度
- 5) 農機具品質管理に係る短期専門家1名程度
- 6) 機材供与は、スペアパーツなど最小限にとどめる
- 7) ローカルコスト負担として啓蒙普及活動費の支給に配慮する

(4) 今後のネパール側の課題

- 1) プロジェクト臨時組織のキルティプール園芸センターへの移管
- 2) 鍛冶技術者養成研修を除くプロジェクト活動(特にデモファーム維持、長期・短期研修、農家巡回指導)の継承、維持、強化
- 3) プロジェクト運営予算のネパール側による確保
- 4) キルティプールセンター活動対象の全国の山岳丘陵地帯への拡大
- 5) 農業機材維持管理に係るアシスタントカウンターパートの常勤化
- 6) 自主的な今後の果樹開発計画の策定

(5) 総括

園芸開発計画への協力は果樹栽培技術の導入、デモファーム農家へのそれら技術の定着をもって終了とする。高品質果樹の生産技術の定着後は、市場開発、農民の組織化の促進などの課題が考えられるが、これらについては今後ネパール側の自主的な開発課題の選定、開発計画の策定を促すとともに、園芸開発とはまったく別個の協力案件としての可能性を検討するよう提言する。

(6) 所感

1) ネパール側政府機関の対応

農業局では本案件を、今後の山岳丘陵地帯における果樹生産の増大の礎として高く評価している。また、農業局長自らが調査団の農家視察に1日同行するなど、日本側への協力継続の期待は大きいと思われる。ただし、ネパール側では本案件終了後の果樹開発について具体

的な計画を持っておらず、今後ネパール側による具体的な果樹開発課題の選定、計画策定が強く望まれる。

## 2) 果樹栽培農家の対応

調査団の視察したデモファームでは、農家の果樹栽培に係る新品種、新技術導入の意欲が非常に高く、またプロジェクトの指導により圃場が管理されている。また、本強力により導入した果樹が一部結実しはじめており、今後のフォローアップ強力によって、デモファームレベルでは果樹栽培技術が定着し、今後地域への果樹栽培技術の広がりの核となることが期待される。

## 3) 今後の日本側の対応

フォローアップ協力終了後の果樹分野での課題は、農民の組織化などであり、果樹分野の専門家による技術移転にはなじみにくい。そこで今後は、果樹栽培技術普及分野で青年海外協力隊など、プロジェクト方式技術協力以外のスキームによる、農民に近いレベルでの協力の検討も必要かと考える。

## 第3章 調査・評価結果

### 3 - 1 プロジェクトの投入実績

日本側・ネパール側双方による投入実績を、資料2の合同評価報告書 ANNEX II に示す。

#### (1) 日本側投入実績

日本側からは、討議議事録(R/D)に基づき、専任チームリーダー、調整員を含む6分野の長期専門家が派遣された。チームリーダー、カンキツ、農業機械分野の専門家は、プロジェクト期間5年間を通じて同一人物が派遣され、プロジェクト指導の一貫性を高めた。また、落葉果樹分野の専門家は、最初の専門家が派遣後すぐに健康上の理由で帰国し、約1年間の長期専門家不在期間があったが、この間に、4名の落葉果樹分野短期専門家が派遣され、技術移転活動に支障を生じなかった。一方、普及分野については、プロジェクト期間内に、健康上の理由で任期を全うできなかった専門家が2名続いた。

評価調査の時点で16名の研修員を受け入れ、約9500万円の機材が供与された。

プロジェクトによる研修活動の2本柱である長期研修と短期研修のうち、長期研修に関しては、日本側の経費負担で行われ、32名が研修を修了した。

#### (2) ネパール側投入実績

ネパール側では他のプロジェクト同様、本プロジェクトは、プロジェクト実施のための臨時の組織により実施された。カウンターパートの配置に関して、特にプロジェクトの前半1年の間にプロジェクトマネージャーが4名交代したのをはじめカウンターパートの継続勤務、定着に問題があったが、プロジェクト後半には、カウンターパートも既存の組織であるキルティプール園芸センターとの兼務者で占められ、激しい人事異動も抑えられ、プロジェクトが大きな成果をあげる要因となった。

ネパール側は、決して容易ではない財政事情のなか、本プロジェクトに対し、最大限可能な予算配分を行った。特に、第KR 2 援助見返り資金の活用を図り、1995/1996年の予算は1992/1993年の2倍以上に伸びている。

### 3 - 2 計画の妥当性

#### (1) プロジェクトのデザイン

ネパール政府の要請に応じて派遣されたJICAの3つの調査団、すなわち事前調査団、長期調査員、実施協議調査団とネパール政府の間の協議により、プロジェクトのデザインが決定された。その結果、1992年11月12日に、討議議事録(R/D)がJICAとネパール政府農業省、

大蔵省との間で署名された。

プロジェクトのデザインに関する基本的合意事項は R/D に、プロジェクト活動項目は暫定実施計画 ( Tentative Schedule of Implementation: TSI ) に、活動項目の詳細は詳細実施計画 ( DIP ) にそれぞれ記載されている。

プロジェクトの活動開始後、JICA はプロジェクト・サイクル・マネジメント ( PCM ) と呼ばれる、プロジェクト管理、評価のための新しい方法を導入した。1985 年 10 月に派遣された中間評価調査団との協議の結果、ネパール政府は、当初の「プロジェクトの目的」を、「上位目標」と「プロジェクト目標」に分離することに合意した。

「上位目標」は「ネパールの丘陵地域の果樹生産の開発」であり、「プロジェクト目標」は「丘陵地域における果樹生産振興に係る普及を含めた技術の向上」である。

## (2) 上記計画との整合性

本プロジェクトは、1991 年にアジア開発銀行 ( ADB ) の協力でネパール政府の作成した「国家園芸開発マスタープラン」に沿って策定された。本マスタープランでは、山間傾斜地の果樹栽培の振興、多様化及び市場の開発を主要開発課題としている。

現在では、1995 年から 2015 年までの農業開発を描いた「農業将来計画」 ( Agricultural Perspective Plan: APP ) が農業分野の最重要開発計画である。本計画では、山間傾斜地の果樹栽培をはじめとする換金作物の栽培を振興するとしており、本プロジェクトの計画は、現在でも国家レベルの農業開発計画と整合性を持っている。

また、現在準備中の第 9 次 5 か年計画も「農業将来計画」に沿って作成されており、この点でも計画の妥当性はあったと評価できる。

## 3 - 3 プロジェクトの達成度

### (1) 概況

プロジェクトの目的は、そのほとんどがよく達成された。本プロジェクトは詳細実施計画に基づき、日本の果樹栽培管理技術がネパールにも適応可能であることを成功裏に示し、山岳丘陵地帯の果樹開発に適した技術を、既存の農業省の普及制度の活用、デモファーム、サブデモファームの設立、重点分野における長期研修、短期研修の実施——という主要な手法を通じて移転したと評価できる。

一方、ニホンナシやニホンカキの栽培技術及び園芸器具製造品質管理など、早急に取り組むべき課題が残されていることも確認された。

## (2) 各分野別達成度

### 1) 果樹栽培

#### ナシ

##### (a) 優良品種の選抜

約100系統の在来種についての調査の結果、在来種間の遺伝的変異は小さく、実用的には単一系統と判定され、これらのなかから9系統が優良系統として選抜された。日本からの導入品種のなかでは、幸水、豊水が在来種との交配親和性に問題がなく、果実品種も良好で、ネパール人の嗜好にもあい、新興や晩三吉に比べて収穫期が早いことミバエの被害を受けにくい、などの観点から、ネパールにとって適正な導入品種として選抜された。今後、収穫果実のグレーディング(果実の大小や品等による選別)やパッキングなどの市場出荷技術の開発が必要である。以上のとおり本課題の到達目標は達成された。

##### (b) 苗木の増殖技術

台木の効率的な育成法として挿し木繁殖が優れていることが明らかにされ、ファルピンナシと野生種(Mayal)が優良台木の候補として選抜された。これらの在来種は60～65%とほぼ満足できる挿し木活着率を示し、また、日本からの導入品種との接ぎ木親和性も優れていることが確認された。現在、ファルピンナシを含めた在来4種に対する台木適応性の確認試験が継続中であり、協力期間終了後も継続調査が必要である。しかしながら、この調査方法については既に技術移転が完了しており、また、本試験は長期間を要することから、今後、ネパール側による継続調査が必要である。

##### (c) 樹体管理技術

定植した苗木の幼木期～結実開始期までの経過から、また、台風の襲来がないこと、資材の節約などの観点からも、整技法として開心形立木仕立てが適切と判断された。今後、成木期に至るまでの樹形及び結実管理技術の移転が重要な課題として残る。

ニホンナシ品種の高接ぎ更新樹の樹形管理も開心形とする方法が適切と判断されたが、1997年が初成りであるため、今後、着果管理も含めた樹形管理技術の移転も残された課題である。

また、成熟前の果実の早取りが行われる傾向にあることから、収穫適期の判定も今後の課題であり、この技術の農家への移転も必要である。

##### (d) 土壌及び樹体栄養

デモフォーム及びキルディプール園芸センターの土壌を対象にpH、各種塩基、物理性について調査し、それぞれの土壌の基礎データを得た。また、有機物による肥培管理のための施肥基準を栽培暦に設定した。以上のとおり本課題の到達目標は達成されたも

のとみなされた。

(e) 病害虫防除と鳥害対策

病害虫の発生調査により、主要病害虫の種類、発生状況がほぼ判明し、これらの防除に関しては、現地で調達できる薬剤の散布の新聞紙、ネットを利用した果実の袋掛けによってほぼ解決されている。防除暦の作成や一般農家への袋掛けの必要性の徹底が課題として残っている。鳥害に関しては、防鳥網以外に有効な対策はないと考えられ、現地での防鳥網調達の可能性の調査や、これ以外の方法の検討が課題として残っている。以上の残された課題については協力期間終了までにはすべて完了する予定である。

ブドウ

(a) 優良品種の選抜

日本から導入した10品種のうち、果実品質、栽培特性、消費嗜好などの調査から、ヒムロッド、スチューベン、巨峰、マスカット、ベリーAが試験レベルで栽培可能であることが明らかになった。しかしながら、農家レベルではとりわけ巨峰で果実品種にバラツキがみられることから、協力期間終了後も研修の継続による栽培技術の移転が必要と思われる。

(b) 苗木の増殖技術

導入した5種類の台木品種のうち、SO<sub>4</sub>と5BBが適正台木として選ばれた。苗木の大量生産のための接ぎ技術として、4種類の接ぎ木法が検討された結果、緑枝接ぎ法が最も適していることが明らかになった。苗木畑において黒とう病の多発生がみられることから、挿し木のための挿し穂や接ぎ木のための接ぎ穂は必ず無病樹由来のものを使うことを徹底する必要がある。

(c) 病害虫防除及び鳥害対策

病害虫の発生調査により、主要病害虫の種類、発生状況がほぼ判明し、これに基づいた防除暦が作成された。農薬に頼らない耕種的防除法として、剪定による伝染源の除去、袋掛けによる防除、早期休眠打破により黒とう病の主感染時期を避けるための石灰窒素処理が検討され、いずれも一定の効果を認めている。鳥害についてはナシと同様である。以上のとおり本課題の目標はほぼ達成されたとみなされた。

カキ

(a) 優良品種の選抜

すべてが渋柿である在来種のなかから10月に成熟する2種類の晩生種(Teku、Dhauraと命名)が優良品種として選抜された。フェーズで日本から導入された渋柿のうち、平核無と堂上蜂屋が有望であることが明らかになった。フェーズで導入された5種の甘柿のうち、富有と次郎がデモファームで1996年から結実を開始し、他品種

は1997年が初成りの状態にあり、プロジェクト終了後も2～3年はこれらの品種の適応性検定を継続する必要がある。

(b) 苗木の増殖技術

台木としては在来種の実生苗、接ぎ木法は居接ぎ、接ぎ木時期は発芽初期が適切と判断された。苗木定植後の植え傷みによる発育遅延が問題として残っているが、対策を講じるため素焼鉢や麻袋を用いた台木の育成試験が開始されており、今後、ネパール側によるさらなる工夫を凝らした克服が期待される。

(c) 樹体管理技術

在来種に数種の雄花着生樹があり、これらが受粉樹として利用できること、また、訪花昆虫による授粉により着果が確保されることが明らかになった。

以上のとおり授粉樹導入による着果調整という本課題の目的は達成された。

(d) 土壌及び樹体栄養

デモファーム及びキルティプールセンターの土壌を対象にpH、各種塩基、物理性について調査し、それぞれの土壌の基礎データを得た。冬期における堆肥の多量施用と土壌乾燥防止のための灌水の必要性が確認された。自給肥料をベースとした施肥法の確立という本課題の目標は一応達成されたものとみなされた。

(e) 病虫害防除及び鳥害対策

病虫害の発生調査により、主要病虫害の種類、発生状況が判明した。また、収穫期の鳥害も重要となることが予想される。防除暦が作成され、本課題の所期の目的は達成されたものとみなされた。

(f) 収穫・貯蔵

導入品種の収穫適期が把握されるとともに、農家が実施可能な渋柿の簡易脱渋法(地元産蒸留酒、48時間処理)が確立された。

クリ

(a) 苗木の増殖技術

台木としては日本品種の実生苗、接ぎ木法としては春期の居接ぎが適していた。

(b) 貯蔵

種子の貯蔵法としては、常温貯蔵は困難であり、水に浸漬した砂中での低温貯蔵が有効であることが明らかになった。

クリはフェーズ からの継続樹種であり、上述の2課題の成果の達成度が不十分であったが、フェーズ でほぼ解決された。しかしながら、栽培適地などについては長期的な検討が必要と思われる。



## カンキツ（ジュナール）

### (a) 優良品種の選抜

フェーズで行われた250個体のなかから、1次及び2次の系統選抜の結果、Rai、Koiralaの2系統が有望品種として選抜された。

### (b) 苗木の増殖技術

カラタチ、トロイヤシトレンジ、ラフレモンが台木として適していることが確認された。苗木増殖用に毎年120～150kgのカラタチ種子が生産され、園芸研究・研修センターを通じて民間の苗木業者に配布されている。

### (c) 樹体管理技術

間引き剪定と誘引による適正樹形の確立、適正な葉果比（60～70葉/果）による適正着果の設定が行われた。

### (d) 病虫害防除

グリーンング病とウイルス病（カンキツトリステザウイルス）が最も重要であり、詳細な発生生態の調査から、これらの散布防止対策が立てられている。今後はネパール側による地道な対策の実行が強く望まれる。

### (e) 収穫・貯蔵

3年間にわたる継続調査により、収穫適期が把握された。また、市場調査の結果、収穫果実を5段階（LL、L、M、S、SS）に分ける選果基準が作成された。新聞紙や生松葉を利用した室温貯蔵により3月まで貯蔵できることから、本方法が山岳部に適した簡易貯蔵法であることが明らかにされている。

## カンキツ（スンタラ）

### (a) 優良品種の選抜

1993～1996年に570個体のなかから60個体が1次選抜され、現在、2次選抜が行われている。また、これまでの未調査地域については、協力期間内に日本人専門家による調査が予定されている。

### (b) 苗木の増殖技術

カラタチとSeti Jyampir（ネパール産ラフレモン）が台木として適していることが確認された。

### (c) 樹体管理技術

幼木時の支柱誘引、間引き剪定、成木時の誘引による適正樹形の確立、適正な葉果比（100～110葉/果）による適正着果の設定が行われた。

### (d) 病虫害防除

ジュナールと同じ。

(e) 収穫・貯蔵

ジュナルと同じ。

以上、カンキツにおける課題の到達目標は、フェーズ からの地道な努力の積み重ねによりウイルス病、グリーニング病対策を除いてすべて達成された。ウイルス病、グリーニング病対策については、生物学的診断法、血清学的診断法(エライザ法)、ウイルスフリー苗の作出方法などの技術移転は既に完了しており、残された課題とはしないと結論した。

2) 研修普及分野

研修分野では、長期研修と短期研修の2種類の研修が実施され、普及分野では、展示農場(デモファーム、サブデモファーム)の設置、巡回指導などを行った。

普及・研修分野の最も大きな成果は、プロジェクトが新しく導入した2つの普及・研修手法、すなわち展示農場(デモファーム、サブデモファーム)の設置とこれを利用した果樹技術の開発、実証、展示、普及及び長期・短期研修の実施が、農業省の既存の普及制度に加わり、三位一体システムとしてネパールに定着し、今後の果樹技術の開発、普及が円滑に行われる体制が整った点である。

研修

長期研修は、普及員(JT/JTA)を対象として1年間、園芸研究・研修センターで研修を行うもので、4期32名が研修を修了した。この長期研修では、果樹の改良栽培技術、展示農場運営、普及技術、高品位果樹生産、果樹保護対策、果樹の収穫後処理技術などについて研修を実施した。

短期研修は、先導的農民、展示農場主、苗木農家、普及員などを対象として、特定の課題について3日間から1週間の研修を園芸研究・研修センターで実施した。評価調査団派遣時点では、2183名の研修が修了し、農家への果樹栽培技術の普及、定着に大きな貢献があった。

普及

普及は、展示農場(デモファーム、サブデモファーム)の設置、巡回指導のほか、セミナー実施や、マニュアル発行を行った。

展示農場については、9か所のデモファームと3か所のサブデモファームを設置し、新しい果樹栽培技術を展示し、また近辺の農民を訓練する場として活用された。また、プロジェクトで導入された果樹を普及するために、苗木生産農家が、プロジェクトの支援により設定された。

セミナーは、1995年2月に3日間実施され、ネパール全土から64名の果樹技術者が参加し、プロジェクトの概要、プロジェクトにより導入された新技術の紹介を行った。このセミナーは新技術の紹介には非常に有用な手段であり、今後ともセミナーを実施していく

ことが推奨される。

#### 今後の課題

本分野の今後の課題としては、以下が考えられる。

プロジェクトによるナシ、ブドウが1996年あたりから販売されており、現地のものに比較してきわめて高価である。年々生産が増大すると思われるが、この価格を維持できるかが今後の課題のひとつと思われる。今後の課題のなかでは栽培技術の高位平準化が大きな課題になる。そのためには小規模ながら目的研究集団がデモファームを中心に形成されるべきであり、農業者にも目的研究集団ができればよいと思う。これができれば品質の統一ができる。また、売り手市場を維持するための組織化が重要である。デモファームを中心として小規模なこれら3者の研究集団を組織化することを、ネパール側に提案した。

限られた生産手段、悪い輸送事情、限られた農地規模なので、小規模ながら現在の高水準の個性的産地を維持することが課題と思われる。

普及では、技術力もまだ十分ではないが、今後はこれに加えて農家の経営管理を指導できる普及員が重要になるとと思われる。園芸研究・研修センターを中心に、普及員の部門別研修を行っていくべきだと伝えてきた。

### 3) 農業機械分野

農業機械整備については、技術移転も順調に進行し、ネパール側スタッフのみで、供与した機材・車両類の維持管理が行えるようになっている。

過去に供与した機材も非常に良好な状況で維持管理されている。

農器具製作では、鍛冶技術者を対象に、農器具の作成技術が移転された。この分野では、貨車のスプリング廃材など、現地で容易にしかも安価に入手できる材料を利用して、農器具を作成する技術が移転された。プロジェクトで技術移転を受けた鍛冶技術者が作成する農器具には個人記号が刻印され、今後農家などから器具改良の要望があった場合に、作製者が対応できるような体制がとられている。本プロジェクトで作製した農器具は、市中の農器具販売店でも販売されており、輸入品と遜色のない品質でかつ輸入品よりは安価で販売できるため、多くの注文が寄せられている。

今後は、農器具製作分野において、品質管理の確立が必要とされている。

#### 3 - 4 プロジェクトの効果

プロジェクトの効果についてプラスの効果は以下のとおり測定されたが、マイナス効果については、顕著なものを発見することはできなかった。

(1) 技術面での効果

- 1) プロジェクトにより導入された新しい果樹栽培技術が、農家に普及され、農民によって、従来からある果樹栽培へも適用され、従来作物の栽培技術も向上した(セクターレベル)。
- 2) 従来、メイズ単作型の農業が主流であった農民に、果樹栽培の間作物として、チリ、大豆、トマト、菜の花などが導入され、農民の農作物が多様化された(セクターレベル)。

(2) 制度面での効果

- 1) プロジェクトによる巡回指導、研修の実施により農業省の農業普及員、果樹技術者が、農家を巡回指導する回数が顕著に増加した(プロジェクトレベル)。
- 2) プロジェクトによりカンキツのグリーンング病とその媒介昆虫が明確になったことにより、植物防疫が強化された(セクター、マクロレベル)。
- 3) グリーンング病の解明により、グリーンング病予防のため、カンキツ栽培制限区域が設けられた(セクター、マクロレベル)。

(3) 経済面での効果

- 1) プロジェクトにより果樹を導入した展示農場では、果樹栽培により単位面積当たりの収入がプロジェクト開始前に比べて顕著に増加した(プロジェクトレベル)。
- 2) プロジェクトにより導入した果樹を栽培した農家で、導入した果実が結実しはじめ、農家の収入は顕著に増大した(セクターレベル)。
- 3) 果樹のみならず、間作物の多様化により農民の農業基盤が強化され、また、これらによって農家収入が向上した(セクターレベル)。
- 4) 多くの果樹販売店では、プロジェクトで導入した果実を販売することに大きな興味を示している(セクターレベル)。

(4) 社会文化面での効果

- 1) 展示農場での訓練、指導活動を通じて、農家間のコミュニケーションが促進された(リージョナルレベル)。
- 2) シンズリ地区のジュナール農家では、農民組織による販売活動が始まっている(セクターレベル)。
- 3) 園芸研究・研修センター、展示農場周辺の農民で、プロジェクトの紹介した果実を知った者のなかに、果樹栽培をより大規模に行いたいと興味を持つ者がいる(リージョナルレベル)。

#### (5) 環境面での効果

- 1) グリーニング病の汚染地域が確定され、それによってグリーニング病の発生が抑えられるようになった(セクター、マクロレベル)。
- 2) 病害虫防除のためにいくつかの農薬がプロジェクトを通じて導入された。農薬使用に関しては十分な指導を行ったので、環境への影響は最小限に抑えられると考えられる(プロジェクト、リージョナルレベル)。
- 3) 農薬と並行して、環境負荷の少ない虫害防除技術(フェロモントラップなど)が導入された(プロジェクト、リージョナルレベル)。

#### (6) その他の効果

プロジェクトが導入した果樹栽培には、従来農業により多くの労働力が必要とされ、雇用機会の創出に貢献した。これは、貧困撲滅にも貢献する効果である(セクターレベル)。

### 3 - 5 プロジェクトの自立発展性

#### (1) 自立発展性

プロジェクトの持続性について組織的自立発展の見込み、財政的自立発展の見込み、技術的自立発展の見込みの3点から検討した。

ネパールではプロジェクトを既存の恒久的組織で行う例が少なく、本プロジェクトも一時的組織で実施された。しかし、幸い本プロジェクトはキルティプール園芸センター敷地内に設置され、カウンターパートも同センターと兼務しており、プロジェクトを通じてセンター自体の能力が著しく増大した。今後プロジェクトの活動を同センターに移して、吸収する形にするよう検討されている。現在キルティプール園芸センターは中央部地方農政局傘下の組織であるが、今後園芸開発に関して、ネパール全部、特に中山間地の国の中心センターとする方向で検討されている。

育成された人材はキルティプール園芸センター兼務であり、園芸センターに残っていく。

機械保守管理、園芸器具作製など機材関連のパーマネントカウンターパートを置かず、アシスタントカウンターパートを置いていたが、徐々に恒久的な部署を作って、キルティプール園芸センターに吸収する計画ができている。

運営経費としては、現在デモファーム活動の一部、巡回指導の実施旅費、長期研修の実施に関しては日本側の現地業務費で対応しているが、ネパール側もKR2見返り資金を活用しながら、かなりの金額を投入している。プロジェクト終了後は日本側のローカルコストの負担がなくなるが、60～80%に縮小はしても、現在ネパール側が負担している予算の範囲で活動が継続可能と考えられる。ネパール側も最低限現在の予算レベルを維持したいと表明している。

## (2) 自立発展の予想される阻害要因

以下の点が配慮されなければ、今後の自立発展が阻害されると予想される。このため、ネパール政府、特に農業局が、今後注意深くこれらの点を考慮するよう要望した。

- 1) 現在、キルティプール園芸センターは、その活動対象が、中部地区に限られているが、本プロジェクトの成果を全国の山間地帯へ普及するためには、同センターの機能を今後、全国山間傾斜地を対象としたものに、機能拡張していかなくてはならない。
- 2) 現在、常勤カウンターパートの配置されていない農業機械分野のアシスタントカウンターパートは、本プロジェクトを通じて、機材維持管理の技術を移転されている。プロジェクト終了後、プロジェクトの臨時組織がキルティプール園芸センターに移管される際に、新規に機材維持管理分野の常勤ポストを創設し、これらアシスタントカウンターパートを継続的に確保していくことが重要である。
- 3) 本プロジェクトを通じて開発された成果を発展させるため、農業省の他の部局、特に園芸開発課、農業研究会議 ( Nepal Agricultural Research Council: NARC ) が本センターと密接に連携協力し、本プロジェクトの成果の持続発展、普及に協力していくことが重要である。

## 第4章 結論と提言

### 4 - 1 評価結果の総括

プロジェクトの目的は、そのほとんどが達成された。本プロジェクトは詳細実施計画に基づき、日本の果樹栽培管理技術がネパールにも適応可能であることを成功裏に示し、山岳丘陵地帯の果樹開発に適した技術を以下の主要な手法を通じて移転した。

- ・既存の農業省の普及制度の活用
- ・デモファーム及びサブデモファームの設立
- ・重点分野における長期研修、短期研修の実施

今後ネパール国内の必要な地域に対して、開発された果樹栽培技術を普及するために、効果的かつ実績のある上記の3方法を継続し、補強し、活用することが強く求められる。

また、キルティプール園芸センターの能力、受容力が本プロジェクトの主要な活動を徐々に引継ぐために著しく増大していることも確認された。

しかしながら、特にニホンナシやニホンカキの栽培技術及び園芸器具製造品質管理など、早急に取り組むべき課題が残っていることも確認された。これらの技術に関し、ネパールの果樹専門家は十分な技術力を持っていない。一方、本プロジェクトによって導入され、高接ぎされた品種は結実を始めたばかりであり、これらの品種について収穫、選果、収穫後処理技術を、今後2年以内に集中的に導入することが重要である。

### 4 - 2 提言

合同評価委員会は評価結果に基づき、ネパール政府に対し、プロジェクトの今後の持続発展を図るため、以下の措置を取ることを勧告した。

- (1) プロジェクト終了後、その活動を、恒久的な組織を設立して引き継ぐ必要がある。キルティプール園芸センターは、ネパールの山岳丘陵地に対する本プロジェクトの活動を引き継ぐのに十分な能力を持っていると思われる。

しかしながら、現在、キルティプール園芸センターの活動対象は中央部地方に限定されている。ネパール政府は、同センターの活動対象がネパール全土に及ぶように新たなシステムを作る必要がある。同センターは、山岳丘陵地の園芸に係る国の中心センターとなるべきである。

- (2) 本プロジェクトの成果と持続的効果を認識するためには、キルティプール園芸センターと農業省の他の技術部門やネパール農業研究会議との相互理解が非常に重要である。このための適切な仕組みづくりが要望される。

(3) 同様に、主要な分野においてプロジェクトを通じて育成された有能な人材を今後、恒久的に雇用すべく、ポストの用意と任用が必要がある。

(4) 現在、デモファーム活動の維持、巡回指導の実施、長期研修の実施などプロジェクト運営費の一部がJICA側により負担されている。本プロジェクト協力期間終了後、ネパール政府はそれらの経費を負担する必要がある。このような状況にかんがみ、ネパール政府は、双方の協力によりプロジェクトで達成された成果を維持するために、最低限現在のレベルの経費負担を継続しなくてはならない。

(5) ネパール政府は、本プロジェクトによって整備された施設及びカウンターパートをそのまま保持する必要がある。これらのカウンターパートには、現在臨時雇用の身分となっているアシスタントカウンターパートも含まれるべきである。

#### 4 - 3 プロジェクトの将来展望

農業将来計画（Agriculture Perspective Plan: APP）の概要に沿った長期の園芸開発を展望すれば、今後の開発の重点はより一層山岳丘陵地に集中する必要がある。本プロジェクトの現時点での成功は、今後類似の対象地に成果を拡大することによって、非常に実のあるものになる。

この観点から、ネパール政府は今後APPの目標に合致したプロジェクトの概念を形成し、日本・ネパール間の二国協力の可能性を模索すべきである。本プロジェクトの成果を持続するため、ネパール政府は、本プロジェクトにより導入された手法、デモファーム、サブデモファーム、園芸センターにおける長期・短期研修を農業省の既存の普及制度と組み合わせ、農場経営・市場・農民組織化・技術普及などを包括したより具体的かつ総合的な園芸開発計画を策定することが望ましい。

また、本プロジェクトを通じて増大した、キルティプール園芸センターの能力、受容力が、本プロジェクトの主要な活動を引き継ぎ継続するために、維持されることが望ましい。



## 第5章 現行協力期間終了後の対応

### 5 - 1 フォローアップ協力

調査団の調査結果として、現在デモファームレベルでようやく定着しつつある落葉果樹について今後2年間程度、更に普及制度の活性化を図り、農家の栽培管理指導を継続するとともに、特にニホンナシについて樹形剪定、収穫指導、収穫目標づくりを中心としたフォローアップ協力をを行うことを勧告する。

その具体的協力内容については以下のとおりである。

#### (1) 長期専門家

評価調査団では「普及・研修分野を中心に1名程度の長期専門家を派遣する」との結論であった。

しかし、プロジェクト、JICAネパール事務所とJICA農業開発協力部が更に協議を重ねた結果、プロジェクトの運営管理の見地から、プロジェクト活動の規模が縮小されるとはいえ、技術指導のほか、プロジェクト終了後の体制づくり、各種の現地活動経費の処理、短期専門家の受入体制づくりなど、従来プロジェクト管理部門としてリーダー、調整員が行っていた活動を長期専門家が担う必要があり、これらの業務を考慮すると、長期専門家が技術指導に専念する時間が制限されるため、複数名体制での派遣としたい。

検討の結果、以上の点に配慮して、果樹栽培分野1名、普及・研修分野1名の計2名の長期専門家を派遣したい。

#### (2) 短期専門家

短期専門家派遣期間中には、カウンターパート、関係農業技術員、デモファーム農民、鍛冶技術者などの短期集中的な訓練を行うことにする。

##### 1) 落葉果樹収穫：3か月×2名程度

圃場技術者1名と、研修者1名の組合せとする。

圃場技術者は収穫及び収穫後処理技術を、研究者は収穫適期判定のための指標づくりを行う。

##### 2) 落葉果樹剪定技術：2か月×1名程度

##### 3) 農機具作製管理：2か月×1名程度

プロジェクトにおいて鍛冶技術者の養成は終了したが、カウンターパートが配置されなかったため(鍛冶技術者はカーストの最下層で、政府の役人で鍛冶技術をカバーする人材はまったくいない)、フォローアップ協力期間においてプロジェクトの長期研修を修了した9名の鍛冶

技術者に対してブラッシュアップ研修を行う。

(3) 供与機材

若干のスペアパーツ類を除いて機材供与予算は最小限に抑えるものとする。

(4) 現地業務費

今後長期研修・短期研修に係る費用負担は原則的にネパール側に引き渡すが、専門家による農家巡回指導など専門家の活動に直接関与する経費、また短期専門家派遣時の短期研修経費でネパール側が支弁の困難なものなど、専門家の本質的技術移転に必要な経費については、更に啓蒙普及活動費などによる負担を行う必要があると思われる。

5 - 2 ネパール側への申入れ

また、フォローアップ協力の開始にあたって、以下の点をネパール側に申し入れることを勧告する。

(1) プロジェクトカウンターパート、アシスタントカウンターパートの継続配置

(2) フォローアップ協力で協力対象とならない活動分野は、キルティプール園芸センターがその活動を担うこと。

(3) デモファーム維持管理、長期・短期研修、巡回指導に係るネパール側スタッフの費用をはじめとするプロジェクト活動の維持に必要なかつ適切な予算を確保すること。

(4) そのほか、プロジェクトの活動の維持発展、成果の普及に関する以下の事項について早急に検討し、実現すること。

1) プロジェクト臨時組織のキルティプール園芸センターへの移管。

2) そのうえで、キルティプール園芸センターに中央地区のみならずネパール全土の丘陵地を対象とした活動が展開できるような機能を付与する。

3) 特に機材維持管理に係るアシスタントカウンターパートの常勤化

(5) 今後の果樹開発計画(市場開発、農民組織化など現在認識されている課題を中心として)について早急に具体的計画を立案し、必要な対策を講じる努力を行うこと。

## 資 料

- 1 ミニッツ
- 2 合同評価報告書
- 3 着手報告書



Minutes of Discussions  
on  
The Joint Final Evaluation  
for  
The Horticulture Development Project Phase II  
in  
The Kingdom of Nepal

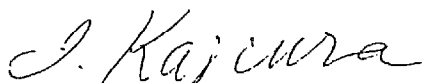
Japan International Cooperation Agency (hereinafter referred to as "JICA") organized the Final Evaluation Team (hereinafter referred to as "the Team") headed by Dr. Ichiro KAJIURA, Director, Department of Research Planning and Coordination, National Institute of Fruit Tree Science, Ministry of Agriculture, Forestry and Fisheries, and assigned to Nepal from the 6th to the 19th July, 1997.

A Joint Evaluation Committee was organized for the purpose to conduct final evaluation of the Horticulture Development Project Phase II (herein referred to as "the project"), which consists of 8 members, 4 members from the JICA and 4 members from His Majesty's Government of Nepal (hereinafter referred to as "HMG/N").

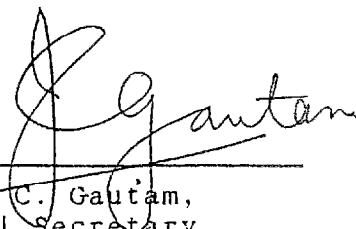
The Joint Evaluation Committee conducted evaluation in the form of interviews, field visits and analysis of these results, and concluded into a Final Evaluation Report (hereinafter referred to as "the Report"). The Report was presented and discussed in the Joint Coordination Committee of the Project.

The major items agreed in the Joint Coordination Committee meeting are found in the attached sheet, and will be recommended to the respective Governments.

Kathmandu, 17th July, 1997



Dr. Ichiro KAJIURA,  
Leader,  
The Final Evaluation Team,  
JICA



Mr. J. C. Gautam,  
Special Secretary,  
Ministry of Agriculture,  
His Majesty's Government  
of Nepal

## ATTACHMENT

### 1 . Joint Evaluation Report Presentation

(1) The Joint Evaluation Committee, jointly organized by JICA and HMG/N, has presented the Joint Evaluation Report as per attached as ANNEX1.

(2) The Joint Coordinating Committee has agreed and accepted the Report presented by the Joint Evaluation Committee and taken note the recommendations made for sustaining and developing the Project achievements.

### 2 . Post-Project Activities

(1) His Majesty's Government of Nepal has made a strong request to the Japanese side to provide a Follow-up Cooperation for a period of 2years.

Justifications and details of the request are as per attached in ANNEX 2.

(2) The Team has clarified that confirming on the implementation of Follow-up Cooperation is out of their terms of references, however, been agreed to convey the HMG/N's request to the Government of Japan.



ANNEX 2 REQUEST FOR FOLLOW-UP COOPERATION  
MADE BY THE HMG/N

1. Background of the Request

Although the Evaluation Team reported to the Joint Committee that the achievement of the Project is quite satisfying and successful, the Team also identifies several remaining issues to be tackled with urgency, especially those issues which are related to the newly introduced technologies like cultivation of Japanese pear and persimmon and quality control of horticultural tools manufacturing. Nepalese fruit experts are not adequately familiar with these technologies. On the other hand, the introduced varieties of fruits in the Project and top-grafting trees have just started fruiting, and it is important to acquire techniques on harvesting, fruit grading and post-harvest fruits handling intensively within next two years.

2. Fields of activities necessary for further cooperation

Nepalese side strongly requests to the Japanese side to cover the following fields of activities within next two years after the present cooperation period is terminated.

(1) Improvement of techniques for fruit production

- 1) Suitable management techniques for bearing Japanese pears/trees, including pruning/training, shoot management and fruit thinning.
- 2) Harvesting and handling techniques of Japanese pear fruits at farmer's level.
- 3) Monitoring and quality assurance for manufacturing horticulture-tools.

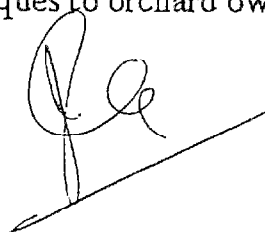
(2) Training

- 1) Long-term training for JT/JTAs on harvesting, fruit grading and post-harvest fruits handling techniques of Japanese pears.
- 2) Short-term training for leader farmers, demo-farm owners and JET/JTAs on harvesting, fruit grading and post-harvest fruits handling techniques of Japanese pears.

(3) Extension

- 1) Demonstration farms and Sub-demonstration farms management guidance on harvesting, fruit grading and post-harvest fruit handling techniques of Japanese pears.
- 2) Circuit guidance on the harvesting, fruit grading and post-harvest fruit handling techniques to orchard owners who are cultivating Japanese pears.

(K)



### 3. Necessary contribution

Following contribution to conduct the above activities appropriately is required.

#### (1) Japanese side

- 1) Experts: adequate number of experts to conduct technology transfer.
- 2) Training in Japan: adequate number of Nepalese fruit experts and extension workers to be trained in Japan.
- 3) Equipment provision: the minimum requirement of the Project like spare parts of existing equipment.
- 4) Project activities supporting funds: the decreased level of financial support within the scope of local cost provision mainly for circuit guidance of Japanese expert/s.

#### (2) Nepalese side

- 1) Assignment of C/P and AC/P and other necessary staffs: retention of C/P and AC/P trained through the Project.
- 2) Sustaining the Project activities: the fields of activities not to be covered under the follow-up cooperation will be taken over by Horticulture Centre, Kirtipur.
- 3) Allocation of budget: adequate budget to conduct appropriate Project activities will be provided, including expenses for demo-farm maintenance, long/short-term training, and circuit guidance of Nepalese experts.

(K) 



FINAL EVALUATION REPORT  
ON  
THE HORTICULTURE DEVELOPMENT PROJECT  
PHASE II  
IN  
THE KINGDOM OF NEPAL

17 JULY, 1997  
KATHMANDU  
NEPAL

JAPAN - NEPAL  
JOINT EVALUATION COMMITTEE  
JOINTLY ORGANIZED BY  
JICA AND HMG/N

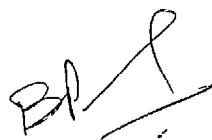
This Joint Evaluation Report has been prepared by the following members with the cooperation of the Horticulture Development Project Phase II, Department of Agriculture, Ministry of Agriculture and Ministry of Finance of HMG/N, Japanese Embassy in Nepal and JICA Nepal Office.

Here, the members of the Joint Evaluation Committee, jointly organized by JICA and the HMG/N, agree to put their signature as confirmation of the Report contents.



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Dr. Ichiro KAJIURA,  
Team Leader, Japanese Team



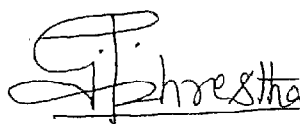
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Mr. B.P. Upadhyay,  
Team Leader, Nepalese Team



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Dr. Jun IMADA,  
Member of the Japanese Team



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Mr. G. P. Shrestha,  
Member of the Nepalese Team



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Mr. Seiro MIZOBUCHI,  
Member of the Japanese Team



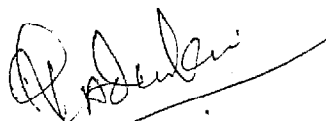
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Mr. P. L. Shrestha,  
Member of the Nepalese Team



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Mr. Ichiro MUKAI,  
Member of the Japanese Team



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Mr. R. Adhikari,  
Member of the Nepalese Team

## CONTENTS

1. OUTLINE OF THE PROJECT EVALUATION
  - 1.1 Outline of the Project
    - 1.1.1 Background of the Project
    - 1.1.2 Design of the Project
  - 1.2 Purposes of the Evaluation
    - 1.2.1 Aims of the Evaluation
    - 1.2.2 Items of the Evaluation
  - 1.3 Composition of the Joint Evaluation Committee
  - 1.4 Schedule of the Evaluation
  
2. METHODS OF THE EVALUATION
  
3. RESULTS OF THE EVALUATION
  - 3.1 Degree of Achievement
    - 3.1.1 Consistency with plans at higher levels
    - 3.1.2 Degree of achievement of Project purpose
    - 3.1.3 Degree of achievement of activities target
      - 3.1.3.1 Improvement of Techniques for Fruit Production
      - 3.1.3.2 Training
      - 3.1.3.3 Extension
    - 3.1.4 Degree of achievement of input target
  - 3.2 Project Impact
  - 3.3 Prospects for Sustainability
    - 3.3.1 Prospects for organizational sustainability
    - 3.3.2 Prospects for financial sustainability
    - 3.3.3 Prospects for material and technical sustainability
    - 3.3.4 Factors inhibiting sustainable management and operation
  
4. CONCLUSION
  - 4.1 Conclusion of the Evaluation Results
    - 4.1.2 Recommendations for post-Project activities

## LIST OF ANNEX

1. Project Design ( R/D, TSI, DIP )
2. Inputs to the Project ( Japanese, Nepalese )
3. Activities and Achievements of the Project

## 1. **OUTLINE OF THE PROJECT EVALUATION**

### 1.1 **Outline of the Project**

#### 1.1.1 **Background of the Project**

Poverty alleviation has been the most important and prioritized strategy of National Development Plan of HMG/N. For the purpose, HMG/N has introduced different approaches appropriate for each region. Terai (plain) region is suitable for cereals production, but the hilly region, where the farmers are comparatively poorer than Terai region, is not economically stable. To overcome this situation, HMG/N has planned to diversify the farming systems by introducing high value commodities like fruits and vegetables which will ultimately increase the farmers' income and improve nutritional status of the people in the hilly region.

In this context, Japan International Cooperation Agency (JICA) and the Ministry of Agriculture, HMG/N had launched the Horticulture Development Project in Nepal (Phase I Project) to develop and promote fruit cultivation for hilly regions in October, 1985.

At the same time, the Government of Japan constructed the "Horticulture Research and Training Center" (the Center) inside the compound of the Horticulture Research Station at Kirtipur and provided necessary equipment under its Grant Aid Programme.

The Phase I Project was implemented in the Center and sub-sites to fulfill its purposes through development of technologies on fruit cultivation and training of horticultural experts in Nepal. This phase of the Project terminated in October 1990 achieving almost all the targets set.

After the completion of the Phase I Project, HMG/N prepared "National Horticulture Development Master Plan" ( National Master Plan ) in 1991. The National Master plan identifies the importance of further promotion and diversification of fruit cultivation in hilly areas as well as the establishment of marketing systems.

In line with this National Master Plan, HMG/N formulated a project to further develop the fruit cultivation technologies, introduce and diversify cultivating fruits, train horticultural expert, and extend the proven technologies to the key farmers.

Following this, on the 12th Nov., 1992, HMG/N started the Horticulture Development Project Phase II ( the Project ) for the duration of five years under the technical cooperation by JICA, with the following activities :-

- Further develop the cultivation technologies on Junar, Suntala, Grape and Chestnut;
- Introduce the cultivation technologies on Japanese Pear and Japanese Persimmon;

- Transfer the appropriate manufacturing technologies related to horticultural tools;
- Train horticultural experts and model farmers through long/short term training; and
- Extend the developed technologies through model farms and circuit guidances.

### 1.1.2 Design of the Project

The Project design was formulated following the request from HMG/N through the negotiations by 3 teams of JICA namely, the Preliminary Study Team, the Supplemental Study Team and the Implementation Study Team, with HMG/N. As a result, the Record of Discussions (R/D) was signed between JICA and Ministry of Agriculture (MOA) and Ministry of Finance on behalf of HMG/N on the 12th November, 1992.

The basic agreement on the Project design is described in the R/D, the fields of activities are shown in Tentative Schedule of Implementation (TSI) and the break-down of the activities is found in Detailed Implementation Programme (DIP). These documents are presented in ANNEX 1.

In the course of implementation, JICA introduced a new methodology to manage, monitor and evaluate project implementation named PCM ( Project Cycle Management ). With the Japanese Mid-term Evaluation Team which visited Nepal in October, 1995, HMG/N had agreed to modify the "Objective of the Project" to separate into "Overall goal" and "Project purpose".

The "Overall goal" was set as "To develop fruits production particularly in the hilly areas in Nepal." and the "Project purpose" as " To improve technical background of horticulture, including extension service, in order to promote activities for development of the fruit production particularly in hilly areas in Nepal."

## 1.2 Purposes of the Evaluation

### 1.2.1 Aims of the Evaluation

The evaluation activities were performed with the aims of :-

- 1) Verifying the degree of achievement of the Project target set in R/D and modified in the occasion of mid-term evaluation;
- 2) Assessing whether the Project has chance of fully attaining sustainability after the termination of the cooperation period;
- 3) Assessing what sort of effects are being produced, to what extent they are produced and how far reaching they are, if they are already evident; and
- 4) Determining whether it is proper to terminate the Japanese cooperation as originally designed.

### 1.2.2 **Items of the Evaluation**

The following items were evaluated.

- (1) Degree of Achievement
  - 1) Consistency with plans at higher levels
  - 2) Degree of achievement of Project purpose
  - 3) Degree of achievement of activity target
  - 4) Degree of achievement of input target
- (2) Project Impact ( Project level, Sector level ,Regional level and Macro level )
  - 1) Technical Impact
  - 2) Institutional Impact
  - 3) Economic Impact
  - 4) Socio-cultural Impact
  - 5) Environmental Impact
  - 6) Other Impact
- (3) Prospects for Sustainability
  - 1) Prospects for organizational sustainability
  - 2) Prospects for financial sustainability
  - 3) Prospects for material and technical sustainability
  - 4) Factors inhibiting sustainable management and operation
- (4) Recommendations for Post-Project activities

### 1.3 **Composition of the Joint Evaluation Committee**

The evaluation was jointly conducted by both the Japanese and Nepalese members.

- (1) Japanese members
  - 1) Team Leader  
Dr. Ichiro KAJIURA, Team Leader of the Japanese Final Evaluation Team  
Director, Department of Research Planning and Coordination,  
National Institute of Fruit Tree Science,  
Ministry of Agriculture, Forestry and Fisheries ( MAFF )
  - 2) Fruit Tree Culture  
Dr. Jun IMADA, Member of the Japanese Final Evaluation Team  
Chief, Laboratory of Plant Pathology, Persimmon and Grape Research Center,  
National Institute of Fruit Tree Science, MAFF
  - 3) Training and Extension  
Mr. Seiro MIZOBUCHI, Member of the Japanese Final Evaluation Team

Former Sub-Director, Department of Agriculture, Forestry and Fisheries,

Kochi Prefectural Government

- 4) Programme Evaluation cum Project Coordination  
 Mr. Ichiro MUKAI, Member of the Japanese Final Evaluation Team  
 Deputy Director, Livestock and Horticulture Division,  
 Agricultural Development Cooperation Department, JICA

(2) Nepalese members

- 1) Team Leader  
 Mr. B.P. Upadhyay,  
 Chief, Plant Protection Division, Department of Agriculture ( DOA ),  
 MOA
- 2) Fruit Tree Culture  
 Mr. G. P. Shrestha,  
 Pomologist, Fruit Development Division, DOA, MOA
- 3) Training and Extension  
 Mr. P. L. Shrestha,  
 Agri-Extension and Training Officer, Central Agricultural Training  
 Centre, DOA, MOA
- 4) Programme Evaluation cum Project Coordination  
 Mr. R. Adhikari,  
 Section Officer, Planning Division, MOA

1.4 **Schedule of the Evaluation**

Date	Time	Schedule
Jul. 09 (Wed.)	11:00	First Joint Evaluation Committee Meeting
10 (Thr.)	11:00	Evaluation I (Presentation by the Project)
11 (Fri.)	11:00 12:30	Evaluation II (Tour on Kirtipur Center and Field) Evaluation III (Individual Interview)
12 (Sat.)		Day off
13 (Sun.)	9:00	Field Trip for Japanese Members Pharping demo-farm, Horticulture shop, and Fruit markets
14 (Mon.)	10:00	Evaluation IV (Field Observation) Grape demo-farm and orchards in Lalitpur, Japanese pear and Persimmon demo. farm in Kavre, and Citriculture demo-farm in Panchkhal
15 (Tue.)	11:00	Report Making

16 (Wed.)	10:30	Reporting to the DOA
	14:00	Second Joint Evaluation Committee Meeting
	16:00	Reporting to JICA Nepal Office
17 (Thr.)	10:30	Reporting to the Secretary of MOA
	14:00	Joint Coordinating Committee (Presentation of the Evaluation report)
	15:00	Signing on the Minutes of the Joint Coordinating Committee

## 2. **METHODS OF THE EVALUATION**

The Joint Evaluation Committee spent approximately two weeks of time carrying out the following activities :-

- Brief review of Project activities undertaken so far through technical presentations by the Nepalese Counterpart staff (C/P);
- Brief interviews in individual sessions with both the JICA Experts and the Nepalese C/P, and Project Manager;
- Consultation meetings with high ranking officials of MOA and DOA, and also with selected ADOs of the Project Districts;
- Field tours of demo and sub-demo farms, and discussions with farm-owners and the Project trained extension officers;
- Observation of Kirtipur Horticulture Centre, including orchard, nursery, laboratory facilities and workshops for agro-tools and machinery;
- Analysis of observations and findings under the key headings identified during the inception meeting of the Joint Evaluation Committee.

## 3. **RESULTS OF THE EVALUATION**

### 3.1 **Degree of Achievement**

#### 3.1.1 **Consistency with Plans at Higher Levels**

The Project was originally designed in the line of "National Horticulture Development Master Plan (1991)", which identifies the importance of further promotion and diversification of fruit cultivation in hilly areas as well as the establishment of marketing systems.

At present, the Project is consistent with the priorities set by the Agricultural Perspective Plan (1995 - 2015) which emphasizes the promotion of fruit crops as high value commodities specially in the hills. Conforming to this Plan, the upcoming Ninth Five Year Plan (1997 - 2002) has also identified the priority fruits development in the country. The priorities have been identified on the basis of regional potentials and comparative advantages of the commodities. The ultimate impact of development of fruit sector will be on poverty alleviation,



environmental protection and agro-business development.

### **3.1.2 Degree of Achievement of Project Purpose**

The Project purpose was set as "To improve technical background of horticulture, including extension service, in order to promote activities for development of the fruit production particularly in hilly areas in Nepal."

It was found through the activities conducted under the Project, specially those related to technology development of fruit culture, training and extension and agro-machinery, that the Project purpose has been fulfilled in major extent. Achievements can be measured in terms of the areas in which technologies were generated, the number of Demo and Sub Demo-Farms operated, the number of persons trained, the frequency of circuit guidance provided at farm level and the types of horticultural tools developed. Impacts were also realized in terms of the newly emerging commercial orchards in the vicinity of the Demo/Sub Demo-Farms.

However, several critical items are still remaining to be solved in order to fully comply with the Project purpose. Mainly because, the introduced varieties in the Project and top-worked trees have just started fruiting and technical transfer of tree form management, control of fruits and proper harvesting technologies are remaining.

The items that need continuous attention in each field of project activity are presented below in subsection 3.1.3.

### **3.1.3 Degree of Achievement of Activity Target**

#### **3.1.3.1 Improvement of Techniques for Fruit Production**

##### **A. Deciduous Fruits**

###### **(1) Pear**

###### **(a) Selection of Suitable Variety**

As the results of evaluation of one hundred lines of Pharping local pear, its genetical variation is narrow and it seems to be same line. Nine lines of Pharping local pear are selected as a suitable variety.

Among the introduced varieties from Japan, Kosui and Hosui were selected as the adaptable varieties to Nepal as high quality of fruit. Nepalese preference and evasion the damage of fruit fly (relatively early type) have also shown their comparative advantage.

Cross compatibility between local pear and Japanese pear is satisfactorily high.

The above mentioned goal of this item has been achieved.

###### **(b) Propagation Technique**

Four lines of Pharping pear and Nepali wild pear (Mayal) were

selected as a promising suitable root stock and the take-up percentage of those cuttings was satisfactorily high (60 - 65 %).

Grafting affinity between scion of Japanese pear and cutting of local pear indicated good result.

The comparison among 4 selected lines of local root stock are being tested and should be continued over a long period of time.

**(c) Tree Management Technique**

The open center system of tree form is appropriate both in newly planted Japanese pear tree and top worked pear tree in Nepal. As introduced varieties in Phase II and top-worked trees have just started fruit set, technical transfer of tree form management and control of fruit set are the remaining activities. As harvesting is sometimes done before maturity, standardization of harvesting time and also the transfer of these techniques to farmers are remaining activities.

**(d) Soil and Plant Nutrition Management**

According to diagnosis of soil condition (i.e. pH and base) at Demo-Farm and Kirtipur Center, basic soil data have been prepared and requirement of chemical fertilizer and organic material is known.

The instructions have been written in the field management calendar.

The goal of this item has been achieved.

**(e) Plant Protection from Insect-Pest, Diseases and Birds**

According to the observation of diseases and insect pests, major diseases and insect pests and their occurrences have been mostly proved. A calendar was published showing the diagrams and pictures of control measure.

For control of diseases and pests, chemical spray and utilization of paper bag and net bag for covering fruits are found to be effective. Utilization of bird net is most effective.

Use of paper bag to farmers, study of reasonable local procurable bird net for farmers and trial of finding alternate materials for protection from bird injury should be emphasized and completed by Nov. 1997.

**(2) Grape**

**(a) Selection of Suitable Variety**

As the results of evaluation of 10 introduced grape varieties from Japan, based on fruit quality, characteristics of cultivation and consumer's taste, Himrod, Steuben, Kyoho and Muscat Bailey 'A' were proved to culture at level of experimental station. But at the level of farmers fruit quality of Kyoho varied, so training to farmers should be

continued.

Himrod is popular to Nepalese because of seedless variety. It seems the possibility of using GA for making Japanese varieties seedless.

(b) **Propagation Technique**

Among the five introduced root stock varieties, SO4 and Teleki 5BB were selected as a suitable root stock.

Green wood grafting is best technique for mass production. Healthy mother stocks for nursery sapling production should be well maintained.

(c) **Plant Protection from Pests, Diseases and Birds**

According to the observation of diseases and pests, major diseases and pests and their occurrences have been mostly proved and the calendar has been published.

Regarding agro-technical control measure, removal of inoculum by pruning, covering fruit by paper bag and breaking dormancy by calcium cyanamide for avoiding the damage of Anthracnose were effective.

Utilization of bird net is most effective.

The goal of this item has been achieved.

(3) **Persimmon**

(a) **Selection of Suitable Variety**

Based on the results of evaluation of Nepali local persimmon, all of which are found to be astringent type, and two late varieties (Teku and Dhaura) were selected as suitable varieties.

Among the astringent type varieties introduced in Phase I, Hiratanenashi and Hachiya were selected as promising suitable varieties.

Among the non-astringent type, 5 varieties introduced in Phase II, Fuyu and Maekawa-Jiro in Demo-Farm beard fruit last year, but others have just started fruiting. So, the yield and fruit quality of these varieties should be checked for several years after Nov. 1997.

(b) **Propagation Technique**

The seedlings from local variety are suitable rootstock and veneer grafting at sprouting stage is better.

Transplanting injury from nursery bed to orchard is found to be the main cause of higher mortality in the field condition. Some experiments are being continued to solve this problem. Based on the results of those experiments, additional ideas should be generated.

(c) **Tree Management Technique**

There are several local varieties setting male flower which can be used as pollinizer in persimmon cultivation. There is no problem in fruit

set due to pollination.

The goal of this item by introducing pollinizer has been achieved.

(d) **Soil and Plant Nutrition Management**

According to diagnosis of soil condition (i.e. pH and base) at Demo-Farm and Kirtipur Center, basic soil data have been prepared and necessity of increasing of winter fertilizer application is felt.

(e) **Plant Protection from Pests, Diseases and Birds**

According to the observation of diseases and insect pests, major diseases and pests and their occurrences have been mostly proved. The important pests are noted are thrips, beetles and borers. A spray calendar has been published.

(f) **Harvesting and Storing**

The time of harvesting of introduced varieties and the practical technique of removing astringency by local alcohol treatment have been established.

(4) **Chestnut**

(a) **Propagation Technique**

The seedling of Japanese varieties have served as better rootstock for its own scion. Veneer grafting in spring season seems better and suitable.

(b) **Storing**

Storing seeds in moist sand in cold store is better than in normal temperature.

Grafting study should be continued to get higher success. Survey should be conducted to find out the suitable areas for the expansion of chestnut cultivation.

B. **Citrus**

(1) **Junar**

(a) **Selection of Suitable Variety**

Among 250 lines, two lines (Rai and Koirala) were found to be promisingly suitable under 1st and 2nd selections.

(b) **Propagation Technique**

Trifoliolate, Troyer citrange and Rough lemon were confirmed as a suitable rootstocks. 120 - 150 kg of Trifoliolate seeds are being produced every year and distributed to private citrus nurserymen for mass production.

(c) **Tree Management Technique**

Suitable tree form was established by training and pruning. Controlling of fruit setting was established by maintaining fruit to leaf

ratio in 60 - 70.

(d) **Plant Protection**

Greening and citrus tristeza are most important diseases. Control measures of these diseases have been established. Established control measure should be implemented effectively in the farmer's field.

(e) **Harvesting and Storing**

According to the three years' experiments, harvest time was determined and based on the market survey and fruit quality, five grades have been established.

The fruit covered with newspaper or pine leaves with careful handling at room temperature was found to be better storage method. This method should be disseminated to the farmers.

(2) **Suntala**

(a) **Selection of Suitable Variety**

Among 570 lines, 60 lines were selected as first selection and are now under second selection. In future survey will be conducted in those areas which are not covered by this project.

(b) **Propagation Technique**

Trifoliate and Seti Jyamir have been found better rootstock.

(c) **Tree Management Technique**

Suitable tree form was established by training (bracing the limbs) and pruning.

Controlling of fruit setting was established by maintaining fruit to leaf ratio in 100 - 110.

(d) **Plant Protection**

Greening and citrus tristeza are most important diseases. Control measures of these diseases have been established. Established control measure should be implemented effectively in the farmer's field.

(e) **Harvesting and Storing**

According to the three years' experiments, harvest time was determined and based on the market survey and fruit quality, five grades have been established.

The fruit covered with newspaper or pine leaves with careful handling at room temperature was found to be better storage method. This method should be disseminated to the farmers.

A lot of efforts have been made since Phase I in different aspects of citrus field, and goals of respective fields have been fulfilled.

### C. **Improvement of Equipment and Tools**

#### (1) **Development and Improvement of Horticultural Equipment**

In Nepal, specialized horticultural equipment, such as secateurs, are not widely used, because of insufficient knowledge on practical management of fruit trees and lack of manufacturing facilities within Nepal. To overcome this problem, blacksmiths have been trained to produce locally made tools at relatively lower-cost, resembling Japanese made simple ones introduced by the Project.

Nine blacksmiths have been trained, and now they can make equipments by themselves, sell them through some horticultural equipment and agro-centres in Kathmandu or directly by themselves. Quality check of their products was made at Centre.

The following number of tools has been produced by the trainees at the Centre. The required number of essential tools such as secateurs, saws, scissors and knives were also presented to long term trainees by the Project.

477 secateurs,

388 saws,

103 harvesting scissors,

276 grafting knives, and

66 harvesting bags.

Several types of wetstones were selected and collecting sites of each were determined.

Development of horticultural equipment and training of blacksmiths have been completely achieved. However a quality control in terms of monitoring & quality assurance system for produced equipment is necessary to be set, and also the maintenance practice on these equipment should be provided for end users such as orchardists.

#### (2) **Maintenance of Agro-Machinery**

At the beginning of the Project, some of the agro-machinery were left in bad maintenance conditions.

During the Project, maintenance and management techniques have been transferred to a C/P and 4 to 5 Assistant C/P (AC/P). It is critically necessary to create appropriate number of permanent positions for AC/P to sustain the technology transferred through the Project.

Processing and improving of some parts of machinery have also been achieved.

#### (3) **Horticultural Machinery at Demo-farms**

Major horticultural machinery used in the Demo-farms is simple-structured sprayer. Operation and maintenance training have been provided to the Demo-farm owners, C/P and related Extension officers.

A manual for operation and maintenance has been prepared in Japanese and will be translated and published in Nepalese before the termination of present Project period.

### 3.1.3.2 **Training**

The Project envisaged two types of training :-

- Long-term (1 year) training for JT/JTAs; and
- Short-term (3 to 7 days ) training for leader farmers, Demo-farm owners and JT/JTAs.

#### (1) **Long-term Training**

During the Project, 4 batches of 1 year training have been conducted, and 32 JT/JTAs were trained and developed as the experts in fruits development.

These trained field staff are expected to transfer technologies related to fruits cultivation to farmers as they got theoretical as well as practical training in the Centre.

The training covers the following aspects :-

- 1) Improved fruit cultivation techniques;
- 2) Demo-farm management;
- 3) Propagation techniques;
- 4) Quality fruit production;
- 5) Plant protection measures; and
- 6) Post-harvest fruits handling.

However, the introduced varieties in the Project and top-grafting trees have just started fruiting, practical training has not been conducted in adult tree form management, quality fruit production and post-harvest fruits handling. Practical training of these aspect is need to be additionally conducted within these 2 years intensively.

#### (2) **Short-term Training**

Altogether 2,183 leader farmers, Demo-farm owners and JT/JTAs have been benefited from this type of training under the Project. These trainings are mainly focused on fruit cultivation techniques and planned to be useful for farmers in cultivation and production of quality fruits. Demo-farm and nursery owners are trained for their management.

The introduced varieties in the Project and top-grafting trees have just started fruiting, and it is important to provide training on harvesting, fruit grading and post-harvest fruits handling techniques intensively within a year or two.

It is also recommended to promote communication among the orchardists and organizing group of them by technical information exchange through the

#### **3.1.4 Degree of Achievement of Input Target**

The inputs from both the Japanese and Nepalese sides are shown in ANNEX 2.

As per the R/D, the project operated smoothly through a joint team of Japanese Experts and Nepalese C/P. In some areas, especially the agro-machinery C/P, no appropriate Nepalese C/P could be assigned. However, the needed C/P service in the administrative and managerial aspects was extended to the Japanese Expert by the Project manager himself. The manufacturing technologies related to agro-machinery has been successfully transferred to the nine trainee-blacksmiths under the Project.



occasion of this training.

### 3.1.3.3 **Extension**

The Project have conducted following extension activities as mentioned below.

#### (1) **Demonstration Farms (demo-farms) and Sub-demonstration Farms**

The Project have established 9 demo-farms and 3 sub-demo-farms as its outreach programme. Demo-farms are served to demonstrate the new fruit cultivation technologies with those fruits introduced by the Project. They are also serving as the training centres for farmers.

Demo-farm methodology was newly introduced to Nepal by the Project, and it is really served as the effective extension tools to diffuse the fruits cultivation techniques for large areas.

It is recommended to form a group of farmers to introduce new techniques and improve techniques by themselves with demo-farms and the information exchange among demo-farms is also expected.

#### (2) **Private Fruit Nurseries and Commercial Orchards**

The Project has assisted in establishing a number of private fruit nurseries and commercial orchards.

#### (3) **Seminars**

The Project organized 3 days seminar on fruit development in Nepal in February, 1995. The seminar was participated by 64 fruit experts from all over Nepal.

Conducting seminar was found to be one of the effective methods to introduce new techniques, and is recommended to have more frequently.

#### (4) **Publication**

For the flow of information to the fruit experts and farmers, the Project published and distributed news letters, pamphlets, booklets, posters etc. regularly.

It is also recognized as one of the effective methods to disseminate information, and recommended to continue and expand the activity.

#### (5) **Circuit Guidance**

Circuit guidance has been regularly conducted with participation of Nepalese experts as well as JICA Experts.

The Japanese side is prepared to offer its own newly developed technology, latest information and publications through the National Institute of Fruit Tree Science by active contact from Nepalese side.

### 3.2 Project Impact

	Technical	Institutional	Economic	Socio-cultural	Environmental	Others
Levels	<p>New technologies introduced by the Project are being applied at Farmers' level to improve cultivation techniques of conventional fruit crops. (Sector)</p> <p>Crops such as Soybean, Chilli, Tomato or Mustard have been introduced by the Farmers as inter crops instead of Maize to generate additional income. This has created crop diversification at Farmers' level. (Sector)</p>	<p>The frequency of circuit guidance by agricultural/horticultural experts of DOA has significantly increased at Extension offices' and Farmers' level. (Project)</p> <p>The issues of Greening disease and its vector have been clarified through the Project and plant quarantine was strengthened and regulation for regional was set for limitation of citriculture for the disease prevention. (Sector and Macro)</p>	<p>At some Demo. Farms, fruits introduced by the Project have significantly generated the income per unit area compared with the income before the Project. (Project)</p> <p>In some farms introduced fruits by the Project have started fruiting, which has significantly generated their income. (Sector)</p> <p>Most fruits shops have shown strong interest to deal with the Project fruits (Sector)</p>	<p>Inter-farmer's communication has been promoted through training and consulting activities at Demo. Farms. (Regional)</p> <p>Marketing activities conducted by Junal producers association, Shinduri</p> <p>People around the Centre and Demo. Farms are exposed to the Project introduced fruits and have developed interest in their large scale production. (Regional)</p>	<p>The area infected by Greening disease have been identified and outbreak of the disease can be prevented. (Sector and Macro)</p> <p>Some pesticides have been introduced to prevent plant pests at Center's fields, Demo. Farms. And also some efforts have been made to introduce the Integrated Pest Management tools, particularly the pheromone traps and cultural control. (Project and Regional)</p>	<p>The labour force requirement for the cultivation of fruits introduced by the Project is more than for the conventional crops. (Sector)</p> <p>Thereby, increasing the employment opportunities which can positively contribute to poverty alleviation.</p>

### **3.3 Prospects for Sustainability**

#### **3.3.1 Prospects for Organizational Sustainability**

Presently, the Project management functions have been organized as a separate entity in the form of Project office. After the Project completion, there is a need to take over the ongoing activities by creating a stable institutional mechanism.

With the present project support, the capacity and capability of Horticultural Centre at Kirtipur have increased tremendously to sustain the key activities introduced during the Project. Optimum physical facilities have been created and the local technical staff have been trained to take over the tasks. Thus the centre has the good prospect to impart organizational sustainability of taking over the ongoing Project activities in the hilly regions of Nepal. For this HMG/N should transfer the required existing facilities to this centre.

However, the activities of the centre is limited to cover the central region instead the overall goal of the Project is targeting entire Nepal. HMG/N. should create a system to expand the Center's outreach activities to all over Nepal.

#### **3.3.2 Prospects for Financial Sustainability**

This evaluation study finds that HMG/N has been contributing a significant level of funding support to implement key project activities such as technology development, operation of demo/sub-demo farms, short and long term training, general and specific extension services and laboratory operation as mentioned in the DIP.

At present, JICA also bears a part of recurrent cost of the Project such as maintenance of demo-farm activities, conducting circuit guidance and long-term training. After the termination of the Project cooperation, HMG/N has to bear such expenses borne by JICA.

HMG/N has to take the JICA contribution into consideration, its funding support should be continued at least at present level for

financial sustainability of the basic Project activities to sustain the achievement of the joint efforts of the Project.

The HMG/N also needs to allocate budget to create appropriate number of permanent positions for AC/P on agro-machinery, for Center's facilities and laboratory equipment maintenance to sustain the technology transferred through the Project and to keep Project facilities and equipment in good condition.

### **3.3.3 Prospects for Material and Technical Sustainability**

It is obvious that the sustainable positive impact of the Project will be visualized in terms of the extension of project activities after the Japanese cooperation is phased out. Retaining the materials and technical expertise built with the Japanese support is very critical to create such a sustainable impact.

HMG/N needs to assure the retention of such physical facilities and the counterpart staff built under the Project to continue the activities. Especially, it is critically necessary to secure appropriate staff for maintaining agro-machinery, maintain Center's facilities and laboratory equipment to keep Project facilities and equipment in good condition.

### **3.3.4 Factors Inhibiting Sustainable Management and Operation**

The following factors which can potentially inhibit sustainable management and operation of the project activities should receive due attention of HMG/N, particularly of MOA/DOA :-

- The scope of Kirtipur Horticulture Centre should be upgraded to make it a national centre of excellence in horticulture for the mid-hill regions of Nepal.
- The retention of currently trained counterpart staff including temporarily employed AC/P should be assured.

- The permanent positions for the recruitment of the presently Project trained skilled manpower in key areas should be created and fulfilled.
- To recognize the value and sustainable impact of the Project activities, a mutual understanding of this centre with the concerning technical divisions of DOA and Nepal Agricultural Research Council (NARC) will be very essential. An appropriate mechanism needs to be established.

#### 4. **CONCLUSION**

##### 4.1 **Conclusion of the Evaluation Results**

The Evaluation study finds that the Project purposes have mostly been achieved. As stated in the DIP, the Project has been successful in demonstrating adaptability of Japanese fruit cultivation and management in Nepal and transferring appropriate technologies for the development of fruits in hilly areas through the following key measures :-

- utilizing the existing extension systems of MOA;
- establishing demo/sub-demo farms; and
- conducting long and short term training in critical areas.

It is strongly recommended that the continuity of these three effective and successful methods should be maintained, reinforced and applied in future for diffusing the developed fruit cultivation technology to the necessary areas of Nepal.

It is also found that the capacity and capability of Horticultural Center, Kirtipur has increased tremendously to gradually take over the key activities of the Project.

However, it is identified that there are several remaining issues to be tackled with urgency, especially those issues which are related to the newly introduced technologies like cultivation of Japanese pear and persimmon, and quality control of horticultural tools manufacturing. Nepalese fruit experts are not adequately familiar with these technologies. On the other hand, the introduced varieties of fruits in

the Project and top-worked trees have just started fruiting, and it is important to introduce techniques on harvesting, fruit grading and post-harvest fruit handling intensively within next two years.

#### 4.2 **Recommendations for Post-Project Activities**

The Joint Evaluation Committee recommends HMG/N to take following necessary measures based on the findings of the evaluation results.

##### A. **Technical aspects**

1. Observation of trees and fruits for rootstock of selected local pear should be continued over a long period of time.
2. As the introduced Japanese varieties have just started fruiting, it is important to provide training on harvesting, fruit grading and post-harvest fruit handling techniques intensively within a year or two.
3. Among the non-astringent types of persimmon, Fuyu and Maekawa-Jiro in Demo-Farms beared fruits last year, but others have just started fruiting. So, the yield and fruit quality of these varieties should be checked for several years after the termination of Japanese cooperation.
4. Established control measures for Greening and tristeza, should be implemented effectively in the citrus farmer's field.
5. For Pest and Disease control in Demo farms and nurseries, the present spraying schedule needs to be continued.
6. A quality control system for produced equipment and tools is necessary to be set up, and also the maintenance practice on these equipment should be provided for end users such as orchard owners.
7. To sustain the maintenance and management techniques of agro-machineries, it is critical to create appropriate number of permanent positions for C /P.

8. The introduced varieties have just started fruiting. It is therefore essential to continue long-term and short term training on harvesting, fruit grading and post-harvest fruits handling techniques intensively for a year or two.
9. It is also recommended to promote communication among the orchard owners and organize groups of them by technical information exchange.
10. It is recommended that activities such as seminars and publications should continue.
11. Number of Demo-Farms so far established are not sufficient for the project district. Each district should have at least four Demo-farms.
12. Though HMG/N has already initiated the agricultural extension activities through farmer groups, the group approach should be further reinforced for the successful implementation of fruit development programmes. For this, demo-form owners should be included in the groups.
13. The existing demo/sub - demo farms should be effectively used as the training sites for the service - centre level farmer's training.

The Japanese side is prepared to offer its own newly developed technology, latest information and publications through the National Institute of Fruit Tree Science if the Nepalese side needs so.

**B. Sustainability Aspects**

1. After the Project completion, there is a need to take over the ongoing activities by creating a stable institutional mechanism. The Horticultural Centre at Kirtipur has the good prospect to take over the ongoing Project activities for the mid hill regions of Nepal.

However, the activities of the Centre is presently limited to the central region. HMG/N should create a system to expand the

Centre's outreach activities to all over Nepal. Kirtipur Horticulture Centre should be upgraded to make it a national centre of excellence in horticulture for the mid-hill region of Nepal.

2. To recognize the value and sustainable impact of the Project activities, a mutual understanding of this Centre with the concerning technical divisions of DOA and Nepal Agricultural Research Council (NARC) will be very essential. An appropriate mechanizing needs to be established.
3. Similarly, the permanent positions for the recruitment of the presently Project trained skilled manpower in key areas should be created and fulfilled.
4. At present, JICA bears a part of recurrent cost of the Project such as maintenance of demo-farm activities, conducting circuit guidance and long-term training. After the termination of the Project cooperation, the HMG/N has to bear such expenses. Considering this, HMG/N's funding support should be continued at least at present level to sustain the achievements of the joint efforts of the Project.
5. The HMG/N needs to assure the retention of physical facilities and the counterpart staff built under the Project to continue the activities. The retention of currently trained counterpart staff including temporarily employed AC/P should be assured.

#### C. **Future Perspectives**

Considering the long-term perspective of horticulture development as outlined in the APP, the future development efforts need to be more focused in hilly areas of the country. The present success of the Project can be very fruitfully utilized to extend the approaches to other similar areas.



In this view, a thought from the HMG/N Nepal side should be given to conceptualize a Project to meet the APP targets, and indentify potential areas of bilateral cooperation between Nepal and Japan.

For the purpose to sustain the outcome of the Project, the HMG/N has to formulate more concrete and comprehensive horticultural development programme including farm management, marketing, farmers grouping, technology dissemination, etc, by reinforcing and applying the methods introduced by the project namely, demo/ sub demo-farms and long and short term trainings in the horticulture centre besides the existing extension systems of MOA.

It is also recommended that the capacity and capability of Horticultural Centre, Kirtipur developed through the implementation of the Project should be sustained to take over and continue the key activities of the Project.

ANNEX I PROJECT DESIGN

RECORD OF DISCUSSIONS  
TENTATIVE SCHEDULE OF IMPLEMENTATION  
DETAILED IMPLEMENTATION PROGRAMME

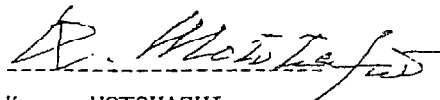
THE RECORD OF DISCUSSIONS  
BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM  
&  
THE AUTHORITIES CONCERNED OF HIS MAJESTY'S GOVERNMENT OF NEPAL  
ON THE JAPANESE TECHNICAL COOPERATION FOR  
THE HORTICULTURE DEVELOPMENT PROJECT - PHASE II  
IN THE KINGDOM OF NEPAL

The Japanese Implementation Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA"), and headed by Mr. Kaoru MOTOHASHI, Special Technical Advisor, JICA visited the Kingdom of Nepal from November 3 to November 15, 1992 in order to work out the details of the technical cooperation programme concerning the Horticulture Development Project Phase II in the Kingdom of Nepal.

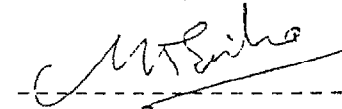
During its stay in the Kingdom of Nepal, the Team exchanged views and had a series of discussions with the Nepalese authorities concerned in respect of the desirable measures to be taken by both Governments for the successful implementation of the above mentioned Project.

As a result of discussions, the Team and the Nepalese authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached herewith.

Kathmandu, November 12, 1992

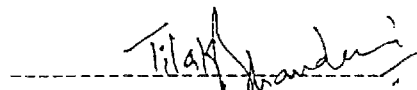


Kaoru MOTOHASHI  
Leader  
Japanese Implementation Survey Team  
Japan International Cooperation  
Agency (JICA)



Bindeshwori Prasad SINHA  
Secretary  
Ministry of Agriculture  
His Majesty's Government of Nepal

WITNESS:



Tilak Man Singh Bhandari  
Representative  
Ministry of Finance,  
His Majesty's Government of Nepal

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS:

1. The Government of Japan and His Majesty's Government of Nepal will cooperate with each other in implementing the Horticulture Development Project Phase II in the Kingdom of Nepal (hereinafter referred to as "the Project") for the purpose of developing fruit production particularly in the hilly areas through technological development, training and extension, thus, contributing to the promotion of horticulture development in Nepal.
2. The Project will be implemented in accordance with the Project Master Plan as is given in I of Annex.

II. DISPATCH OF JAPANESE EXPERTS:

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide, at its own expense, services of the Japanese experts as listed in II of Annex, through the normal procedures under the Colombo Plan Technical Cooperation Scheme.
2. The Japanese experts referred to in 1 above and their families will be granted in Nepal the privileges, exemptions and benefits no less favourable than those accorded to experts of third countries working in Nepal under the Colombo Plan Technical Cooperation Scheme.

III. PROVISION OF MACHINERY AND EQUIPMENT:

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide, at its own expense, such machinery, Equipment and other materials (hereinafter referred to as "the equipment") necessary for the implementation of the Project as listed in III of Annex, through the normal procedures under the Colombo Plan Technical Cooperation Scheme.

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2. The Equipment will become the property of His Majesty's Government of Nepal upon being delivered C.I.F. to the Nepalese authorities concerned at the airports and/or borders of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese experts referred to in II of Annex.

#### IV. TRAINING OF NEPALESE PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive, at its own expense, the Nepalese personnel connected with the Project for technical training in Japan through the normal procedure under the Colombo Plan Technical Cooperation Scheme.
2. His Majesty's Government of Nepal will take necessary measures to ensure that the knowledge and experience acquired by the Nepalese personnel from technical training in Japan will be utilized effectively for the implementation of the Project.

#### V. SERVICES OF NEPALESE COUNTERPART AND ADMINISTRATIVE PERSONNEL:

1. In accordance with the laws and regulations in force in Nepal, His Majesty's Government of Nepal will take necessary measures to secure, at its own expense, the necessary services of Nepalese counterpart and administrative personnel as listed in IV of Annex.

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2. His Majesty's Government of Nepal will allocate the necessary number of suitable qualified personnel corresponding to each Japanese expert to be dispatched by the Government of Japan as specified in II of Annex and researchers for the laboratories and at the designated districts for the effective and successful transfer of technology under the Project.

VI. MEASURES TO BE TAKEN BY HIS MAJESTY'S GOVERNMENT OF NEPAL:

1. In accordance with the laws and regulations in force in Nepal, His Majesty's Government of Nepal will take necessary measures to provide at its own expenses:
  - (1) Services of the Nepalese counterpart personnel and administrative personnel as listed in IV of Annex;
  - (2) Land, building and facilities as listed in V of Annex;
  - (3) Supply or replacement of machinery, equipment, instrument, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided through JICA under III above;
  - (4) Transportation facilities and travel allowances for the official travel of the Japanese experts within Nepal;
  - (5) Suitable furnished accommodations for the Japanese experts and their families.
2. In accordance with the laws and regulations in force in Nepal, His Majesty's Government of Nepal will take necessary measures to meet:
  - (1) Expenses necessary for the transportation of the Equipment within Nepal as well as for the installation, operation and maintenance thereof;
  - (2) Customs duties, internal taxes and other charges, imposed on the Machineries and Equipment in Nepal;
  - (3) All running expenses necessary for the implementation of the Project;
  - (4) Proper maintenance of vehicles, machineries and equipments procured for the Project.

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VII. ADMINISTRATION OF THE PROJECT:

1. The Secretary, Ministry of Agriculture, will bear overall responsibility for the policy issues related with Project activities.
2. The Director General, Department of Agriculture Development (DOAD), as the Project Director, will be overall responsible for the implementation of the Project with the help of Director (Horticulture) and the Chief of Fruit Development Division.
3. The Head of the Horticulture Development Research and Training Centre, Kirtipur (hereinafter referred to as "the Centre"), as the Project Manager, will be responsible for the routine activities and managerial matters of the Project.
4. The Japanese Team Leader will provide necessary recommendations and advice on technical and administrative matters concerning the implementation of the Project both to the Project Director and the Project Manager and also to the Director (Horticulture) and the Chief of Fruit Development Division.
5. The Japanese experts will give necessary technical recommendations and advice to the Nepalese counterpart personnels on matters pertaining to the implementation of the Project in their respective fields.
6. For the effective and successful implementation of the Project, a joint committee will be established with the functions and composition as referred to in VI of Annex.

VIII. CLAIMS AGAINST THE JAPANESE EXPERTS:

His Majesty's Government of Nepal undertakes to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in Nepal except for those arising from the willful misconduct or gross negligence of the Japanese experts.

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IX. MUTUAL CONSULTATION:

There will be mutual consultations between the two Governments on major issues arising from, or in connection with this Attached Document.

X. TERM OF COOPERATION:

The duration of the technical cooperation for the Project under this Attached Document will be five (5) years from the date of signature.

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## ANNEX

### 1. MASTER PLAN:

#### 1. Objective of the Project:

The primary objective of the Project is to develop fruit production particularly in hilly areas through technological development, training and extension, thus, contributing to the promotion of horticulture development in Nepal.

#### 2. ACTIVITIES OF THE PROJECT:

The Project will be implemented at the Centre, Demonstration Farms and technical guidance sites in the designated areas (districts). The designated area will be 3 districts (Kathmandu, Bhaktapur and Lalitpur) in Kathmandu valley and 3 adjoining districts (Kavre-Palanchok, Sindhuli and Ramechhap).

The Project activities will be as follows:

- (1) Improvement of techniques for fruit production:
- (2) Training
- (3) Extension

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II. JAPANESE EXPERTS:

1. Long-term experts
  - (1) Team Leader
  - (2) Co-ordinator
  - (3) Experts in the fields of;
    - 1) Citriculture
    - 2) Pomiculture
    - 3) Extension
    - 4) Agricultural Machinery
    - 5) Training

An expert enrolled for a single field which is one of them listed above may concurrently work for plural fields, occasionally.

2. Short-term experts may be dispatched if necessity arises, for the smooth implementation of the Project.

III. LIST OF THE EQUIPMENT:

1. Equipment, machinery, instrument, tools, and other materials necessary for the technical cooperation.
2. Pesticides and chemicals.
3. Vehicles
4. Audio-visual aids and training materials.

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#### IV. LIST OF NEPALESE COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Project Manager: the Head of the Centre
2. Full-time counterpart personnel in the field of;
  - (1) Citriculture - 1
  - (2) Pomiculture - 1
  - (3) Training - 1
  - (4) Extension - 1
  - (5) Agricultural Machinery - 1
  - (6) Laboratory research - 3
3. Full-time assistant counterpart personnel in the fields as listed in 2 above.
4. Full-time Administrative personnel
5. Other necessary supporting staff.

#### V. LIST OF FACILITIES

1. Land for fruit trees in the Centre, Demonstration Farms and Technical Guidance Plots.
2. Buildings and Facilities of the Centre
  - (1) Laboratories, office and lecture hall
  - (2) Workshop
  - (3) Farmhouse
  - (4) Irrigation facilities
  - (5) Greenhouse complex
  - (6) Other necessary facilities
3. Buildings and Facilities of Demonstration Farms and Technical Guidance Plots:
  - (1) Store houses for Demonstration Farms
  - (2) Other necessary facilities

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## VI. THE JOINT COMMITTEE

### 1. Functions:

The joint committee will meet at least once a year and when necessity arises, and work:

- (1) To formulate the Annual Work Plan of the Project prepared in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;
- (2) To review the overall progress of the technical cooperation programme as well as the achievements of the above-mentioned Annual Work Plan;
- (3) To review and exchange views on major issues arising from or in connection with the technical cooperation programme.

### 2. Composition

#### (1) Nepalese side:

- 1) Chairman: Secretary, Ministry of Agriculture
- 2) Members:
  - a. Joint Secretaries-Planning, Evaluation, Agricultural Statistics / Economic Analysis and Women Farmers Development Divisions, Ministry of Agriculture
  - b. Director General, Department of Agricultural Development (Project Director)
  - c. Director (Horticulture), DOAD
  - d. Executive Director, Nepal Agriculture Research Council (NARC)
  - e. The Chief of Fruit Development Division
  - f. Representative of Ministry of Finance
  - g. Representative of the National Planning Commission
  - h. Representative of the Ministry of General Administration
  - i. The Head of the Horticulture Development Research and Training Centre (Project Manager) - will also work as Member Secretary
  - j. Counterparts
  - k. Other personnel appointed by the Chairman

#### (2) Japanese side:

- 1) Team Leader
- 2) Coordinator
- 3) Other experts
- 4) Other personnel concerned to be dispatched by JICA, if necessary.
- 5) Resident Representative of JICA, Nepal

Note: Official(s) of the Embassy of Japan may attend the Joint Committee Meeting as observer(s).

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TENTATIVE SCHEDULE OF IMPLEMENTATION

I. Annual Programme

Item	Year	1st	2nd	3rd	4th	5th	Site of cooperation	
1. Improvement of techniques for fruit production:							The centre and Demo. farms	
(1) Subjects on improvement								
1) Selection of suitable varieties and mother tree management including native varieties.								
2) Propagation techniques of fruit trees.								
3) Suitable cultivation techniques including pruning/training, shoot management, pollination, fruit thinning, irrigation, development of canopy, etc. of the fruit trees.								
4) Soil and plant nutrition management.								
5) Control of pests, diseases and utilization of protection net against birds								
6) Harvesting and storage improvement techniques of the fruits at the farmer's level.								
7) Improvement of equipment and tools.								
(2) Trials of techniques								
2. Training								The centre and Demo. farms
(1) Long term (JTs/JTAs one year)								
(2) Short term (Leader farmers etc)								
3. Extension							The designated area, etc	
(1) Extension activities in demonstration farms								
(2) Circuit technical guidance								
(3) Seminar								
(4) Publication								

Note. .... ; Preparation period

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II. Technical Cooperation Programme

Item	Year	1st	2nd	3rd	4th	5th	Remarks	
1. Japanese side								
(1) Long-term experts								
1) Team Leader								
2) Coordinator								
3) Citriculture							(An expert enrolled for a single field which is one of them listed here may concurrently work for plural fields occasionally.)	
4) Pomiculture								
5) Extension								
6) Agricultural machinery								
7) Training								
(2) Short-term experts								(Short-term experts may be dispatched when necessity arises.)
(3) Counterparts training in Japan								(Not more than three persons per year.)
(4) Provision of machinery and equipment								
(5) Dispatch of survey missions							(Mission may be dispatched when necessity arises.)	
2. Nepalese side								
(1) Supply of Nepalese counterparts								
1) Project Manager							(The Nepalese side will assign necessary number of qualified counterparts to Japanese experts and laboratory.)	
2) Counterparts of Japanese experts								
3) Assitant counterparts								
4) Administration personnel								
(2) Running cost of the Project								
(3) Land, buildings and facilities								

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# DETAILED IMPLEMENTATION PLAN

ANNEX II

OF

# HORTICULTURE DEVELOPMENT PROJECT

PHASE II

KIRTIPUR

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## CONTENTS:-

- I. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION
  1. PEAR CULTIVATION
  2. GRAPE CULTIVATION
  3. PERSIMMON CULTIVATION
  4. CHESTNUT CULTIVATION
  5. CITRUS CULTIVATION
  6. AGRO- MACHINERY
- II. TRAINING
- III. EXTENSION

(12)

I. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(PEAR CULTIVATION)

Item	Subject of Technical Guidance	Description of Activity	Goal	Remark
1. Selection of suitable variety.	(1) Selection of suitable varieties of Nepali local pear. (2) Test of adaptability on introduced cultivars from Japan.	* Field survey of local pear. * Marketing survey. * Observation of ecological characteristics. * Test of characteristic of variety.	* Selection of high quality line among Nepali local pear. * Selection of suitable variety introduced from Japan.	* Understand the whole present circumstances of Pear by marketing survey.
2. Propagation technique.	(1) Raising of root stock.	* Selection of suitable local root stock line. * Establishment of grafting technique.	* Securing of suitable root stock and production of high quality sapling.	* Technical guidance will be given to Trainees and nursery farmers.
3. Tree management technique.	(1) Establishment of suitable tree form. (2) Establishment of reasonable technique of pruning. (3) Control of fruit set.	* Improvement on natural training form. * Management after top-grafting.	* Improvement and establishment of reasonable tree form. * Renewal of variety by top-grafting. * Confirmation of effectiveness for tree growth, early thinning and suitable fruit set.	
4. Soil and plant nutrition management	(1) Improvement of soil management technique.	* Diagnosis of soil condition * Utilization of local organic substance.	* Tree management by local organic substance utilization.	* Establishment of recommended rate of fertilizer and organic manure.
5. Plant protection from pests, diseases and birds.	(1) Development of suitable control measure. (2) Counter measure of bird injury.	* Observation of diseases and insect pest. * Utilization of paperbags for their control. * Study of simple plant protection method from bird injury.	* Implementation of suitable control at suitable period. * Development of simple plant protection method from bird injury.	* Observation of effectiveness.

I. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Grape Cultivation)

Item	Subject of Technical Guidance	Activity	Goal	Remark
1. Selection of suitable variety.	(1) Test of characteristics on introduced variety from Japan.	* Check of susceptibility to diseases and pests. * Testing of fruits quality.	* Re-evaluation of variety which made good performance in I-Phase and confirm suitable variety for Nepal.	* After tree became old will have another problem. * Improved Mansoon training method will be used.
2. Propagation technique.	(1) Raising of root stock.	* Selection of root stock variety. * Improvement of grafting technique.	* Confirm necessity of root stock * Grasp the grafting technique.	* Propagation by cutting is not good because of Phylloxera.
3. Plant protection from pests, diseases and birds.	(1) Development of suitable control measure. (2) Development of agrotechnical control measure. (3) Counter measur of bird injury.	* Make Plan of control. * Cleaning of field during dormant period. * Disease control by pruning. * Study of simple plant protectionmethod from bird injury.	* Control Anthracnose by breaking of dormancy and other techniques. * Intentional control. * Development of simple protection method from bird injury.	





1. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Persimmon Cultivation)

Item	Subject of Technical Guidance	Activity	Goal	Remark
1. Selection of suitable variety.	(1) Selection of suitable variety of Nepali local persimmon. (2) Test of adaptability on introduced variety from Japan.	* Field survey of local persimmon. * Marketing survey. * Observation of ecological characteristics. * Quality and yield survey.	* Confirm good variety from the point of view of fruit quality and disease resistance.	* Renovate variety by top-grafting.
2. Propagation technique.	(1) Raising of root stock.	* Selection of suitable root stock line. * Establishment of grafting technique.	* Do grafting on time and raising good sapling.	
3. Tree management technique.	(1) Control of fruit set.	* Introducing pollinizer.	* Make good fruiting by introducing of compatible pollinizer.	
4. Soil and plant nutrition management.	(1) Improvement of soil management technique.	* Diagnosis of soil condition * Utilization of local organic substance.	* Establishment of fertilizing method based on self-supporting fertilizer.	
5. Plant protection from pests, diseases and birds.	(1) Development of suitable control measure. (2) Counter measure of bird injury.	* Observation of diseases and insect pests. * Study of simple plant protection method from bird injury.	* Implementation of suitable control at suitable period. * Development of simple plant protection method from bird injury.	
6. Harvesting and storing.	(1) Determination of harvesting time. (2) Trial for simple removal (loss) of astringency.	* Judgement of time for harvest. * Establishment of simple method of removal of astringency.	* Confirm exact time of harvesting. * Establishment of simple method of removal of astringency for farmers.	* Using alcohol to remove astringency

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I. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Chestnut Cultivation)

I t e m	Subject of Technical Guidance	Activity	G o a l	Remark
1. Propagation technique.	(1) Raising of root stock.	* Selection of root stock variety. * Improvement of grafting technique.	* Confirm necessity of root stock * Grasp the grafting technique.	
2. Storing	(1) Storing method improvement..	* Improvement of simple storing method.	* Establishment of simple storing method.	

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(14)

CITRUS CULTIVATION (JUNAR)

Improvement of Technology	Items on technical improvement	Activities	Goal	Remarks
1. Selection of suitable variety	(1) Selection of suitable line of Junar	Continuation of survey on selected Junar at same condition	Extension on selected Junar	Already 1st selection has been done in 1st phase
2. Propagation technique	(1) Selection of suitable root stock (2) Propagation of selected line of Junar (3) Management of Root-stock varieties	Continuation of study of phase-I Production of plants in small scale Management of possible root-stock and seed production	Selection of suitable root-stock variety Healthy sapling production Raising of trifoliolate line of root-stocks and seed production	Beginning of fruiting in phase-II
3. Tree management technique.	(1) Establishment of suitable tree form (2) Controlling of fruit set (3) Soil management and nutrition	Pruning and training Study on suitable leaves per fruit Soil survey of Demo, farm Organic fertilizer, mulching and inter-crops	Improvement of tree form technique Establishing norms for suitable leaves per fruit Improving soil Organic fertilization	Using simple technique Survey for main citrus production area

4. Plant protection	<p>(1) Survey of pests, diseases and natural enemy.</p> <p>(2) Study of viruses and greening disease</p> <p>(3) Establishment of plant protection technique</p>	<p>Survey of main pest, disease and natural enemy. (citrus psylla, scales, foot-rot)</p> <p>Study on greening disease, CTV, Tatter leaf, Exocortis, etc. and study on CTV resistance</p> <p>Protection period, utilization of local chemical &amp; equipments</p>	<p>Grasp the characteristic of main pests, diseases and natural enemy.</p> <p>Grasp of situation of the main virus in Nepal</p> <p>To make suitable plant protection technique</p>	<p>CTV and greening tests have been done in Ramechhap,</p> <p>Keep natural environment balanced</p>
5. Harvesting and storing	<p>(1) Determination of harvest time</p> <p>(2) Improvement of fruit grading</p> <p>(3) Simple storing method at farmer's level</p>	<p>Fruit size measurement, colouring, fruit analysis and method of harvest</p> <p>Survey for fruit quality and market price</p> <p>Monthly survey of fruit price and study on natural storing and cold storage</p>	<p>Grasp of harvest on time and method of harvesting</p> <p>make norms of fruit grading</p> <p>Development of profitable local storing in hill area</p>	<p>If possible marketing will be included</p> <p>Study will be in 1994-96</p>

CITRUS CULTIVATION (Mainly SUNTALA)

Improvement of Technology	Items on technical improvement	Activities	Goal	Remarks
1. Selection of suitable variety	(1) Selection of suitable line of Suntala	Selection of suitable Suntala line at main citrus area in Nepal	1st selection of suntala and management of selected variety	1st selection in 1993 and 1994 for two times
2. Propagation technique	(1) Selection of suitable root stock (2) Propagation of selected line of Suntala	Continuation of study of phase-I Production plants in small scale	Selection of suitable Root-stock variety Healthy sapling production	Beginning of fruiting in phase-II
3. Tree management technique.	(1) Establishment of suitable tree form (2) Controlling of fruit set (3) Soil management and nutrition	Pruning and training Study on suitable leaves number per fruit Soil survey of Demo. farm Organic fertilizer, mulching and inter-crops	Improvement of tree form technique Establishing norms for suitable leaves number per fruit Improving soil Organic fertilization	Using simple technique Study will be in 1994 and 1995 Survey for main citrus production area

4. Plant protection	(1) Survey of pests, diseases and natural enemy.	Survey of main pests, diseases and natural enemy. (citrus psylla, scales, foot-rot)	Grasp the characteristic of main pests, diseases and natural enemy.	
	(2) Study of main viruses and greening disease	Study on greening disease, CTV, Tatter leaf, Exocortis and CTV resistance	Grasp of situation of the main virus in Nepal	CTV and greening tests has been done in Ramechap, and Sindhuli
	(3) Establishment of plant protection technique	Protection period, utilization of local chemical & equipments	To make suitable plant protection technique	Keep natural environment balanced
5. Harvesting and storing	(1) Determination of harvest time	Fruit size measurement, colouring, fruit analysis and method of harvest	Grasp of harvest on time and method of harvesting	If possible marketing will be included
	(2) Improvement of fruit grading	Survey for fruit quality and market price	make norms of fruit grading	
	(3) Simple storing method at farmer's level	Monthly survey of fruit price and study on natural storing and cold storage	Development of profitable local storing in hill area	Study will be in 1994 -1996

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I. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Agro-Machinery)

Item	Subject of Technical Guidance	Activity	Goal	Remark
1. Development and improvement of Horticulture equipment.	(1) Trial to develop the suitable equipment for Nepal.	<ul style="list-style-type: none"> <li>* Survey of agricultural implement on fruit grower and market.</li> <li>* Study of material to make Horticultural tool in Nepal</li> <li>* Improvement and extension of equipment.</li> </ul>	<ul style="list-style-type: none"> <li>* Trial to develop grafting knife, pruning saw, pruning scissor, ladder, anti-birdnet and harvesting bag.</li> <li>* Co-operate with farmer to solve any problem on their field and improve their equipments.</li> </ul>	<ul style="list-style-type: none"> <li>* Trial to improve the technique of blading and tempering.</li> <li>* Whetstone.</li> </ul>

☆ TRIALS OF TECHNIQUES : \* According to progress of activity of "Improvement of technique for fruit production", necessary trials will be done in the vicinity of Demo-farms by Nepali counterpart personnel and Japanese experts.

II. TRAINING

Item	Subject	Activity	Goal	Remark
1. Long term training.	(1) Improvement of training.  (2) Improvement of curriculum and implementation of training.  (3) Development and improvement of training materials  (4) Evaluation of training.	- Improvement on selection method of trainees. - Making regulations of trainings.  - Improvement of training curriculum. - Basic cultivation techniques - Operation and management of agro-machinery. - Extension method.  - Development and improvement of materials for lecture. - Development and improvement of materials for practical training.  - Execution of evaluation.	- Improvement on reasonable implementation and system for training.  - Develop Junior technicians and Junior technician assistants ability through practical work and lecture.	*Basic techniques of fruit cultivation. - Propagation techniques. - Tree management techniques. - Soil management & harvesting and storing.  * Japanese experts will help in lecture and practical work.  * Long term training will be given only to JTs and JTAs.
2. Short term training.	Short term training will be implemented by Nepali counter parts/side.			

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### III. EXTENSION

Item	Subject	Activity	Goal	Remark
1. Demonstration farm management	(1) Site selection, development and management of demo-farm.	- Advice to the set up nine demonstration farm; 2 established. 7 new (with the cooperation of ADOs) - Development of extension method. - Technical extension in the vicinity of Demo-farms.	- Establishment of reasonable system of technical transfer to farmers (nursery) through this project.	- Distribution of promising fruits in each district.  - Grape cultivation extend around Kathmandu only.  - Recommend and practical work at suitable period.
2. Circuit guidance.	(1) Improvement on planning and method of circuit guidance.	- Implementation of circuit guidance reasonably.		
3. Seminar	(1) Planning of seminar.	- Implementation of seminar and exchange ideas, opinions		
4. Publication	(1) Development of publication method.	- Extension of improved techniques.		

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## ANNEX II INPUTS TO THE PROJECT

1. Input from Japanese Government
  - (1) Long Term Expert
  - (2) Short Term Experts
  - (3) Provision of Machinery and Equipments
  - (4) Counterpart Training in Japan
2. List of Counterpart
3. List of Agriculture Development Officer
4. List of Horticulture Development Officer
5. JT/JTAs Long term Training
6. HMG Annual Budget Situation
7. Organizational Structure
8. Joint Committee Meetings
9. Joint Meetings
10. Newspaper's reports

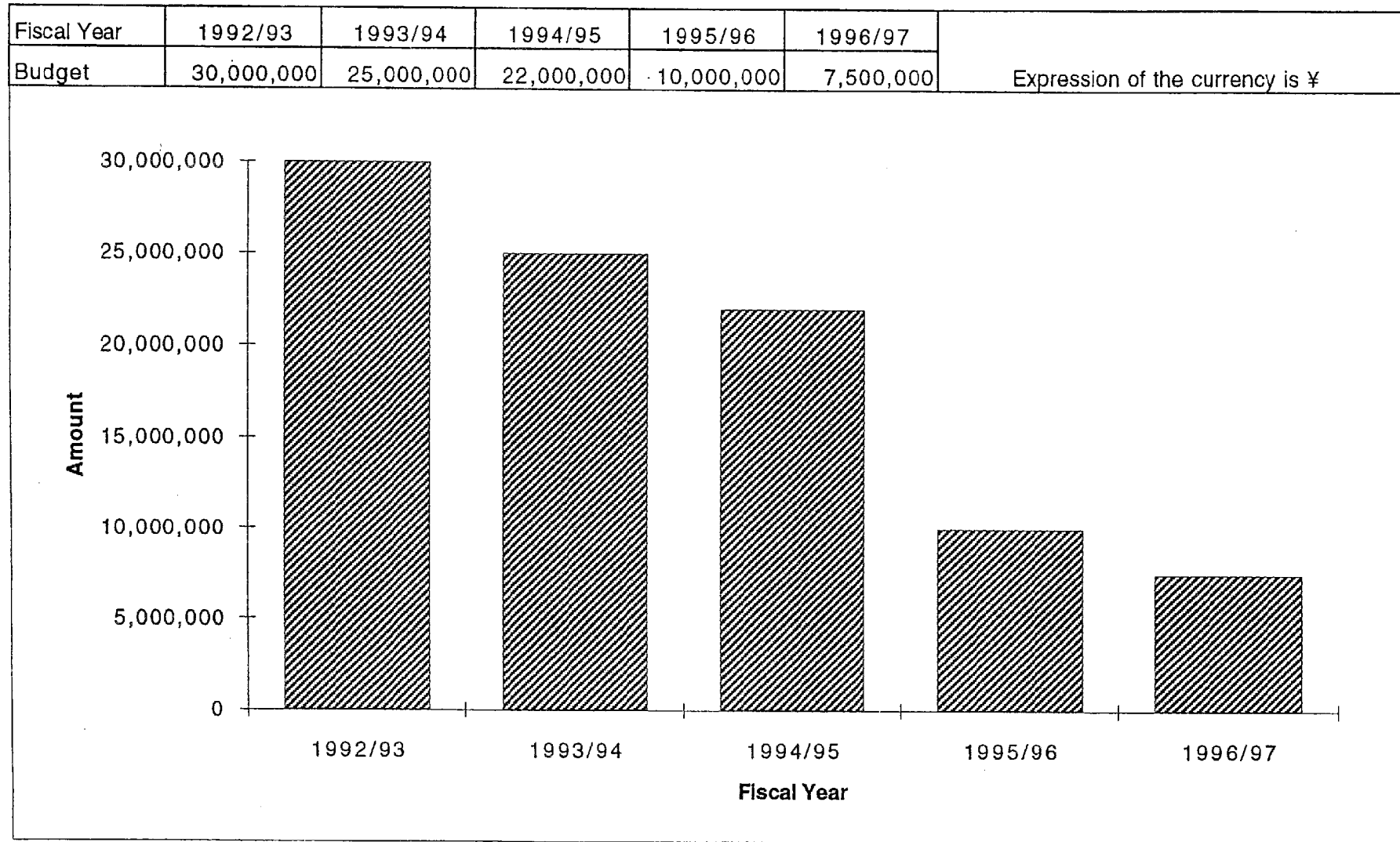
Long Term Expert

	Name	93-94	94-95	95-96	96-97	
Team Leader	Dr. T. Sakuma	—————				(93.3.23-97.11.13)
Coordinator	Mr. A. Nishikori	—————			(93.1.26-96.1.25)	
	Mr. T. Omachi			—————	(96.1.11-97.11.13)	
Expert (Citrus)	Mr. Y. Tomiyasu	—————				(93.1.26-97.11.13)
Expert (Agro-machinery)	Mr. T. Tokudome	—————				(93.6.8-97.11.13)
Expert (Extension)	Mr. K. Oikawa	—— (93.4.6-93.9.25)				
	Mr. H. Ito		————— (94.4.24-95.7.7)			
	Mr. S. Yamanaka			—————	(96.3.19-97.11.13)	
Expert (Pomiculture)	Mr. S. Nakamura	— (93.4.16-93.5.23)				
	Mr. T. Miyoshi		—————			(94.4.24-97.11.13)

Short Term Experts

Name	Speciality	93-94	94-95	95-96	96-97		
Mr. O.Komori	Pomiculture	—	(93.8.4-93.10.3)				
Dr. K.Komamura	Soil	—	(93.11.3-93.12.22)				
Mr. K.Suzuki	Pomiculture	—	(93.11.24-94.1.26)				
Mr.K.Yoshinaga	Pomiculture	—	(94.2.15-94.4.14)				
Mr. T. Miyoshi	Pomiculture	—	(94.2.24-94.3.3)				
Mr. K.Kotobuki	Pomiculture		—	(94.9.10-94.10.13)			
Dr.M. Osakabe	Entomology		—	(95.2.21-95.4.13)			
Mr.T. Sugiura	Entomology			—	(95.5.7-95.12.27)		
Mr. K. Nagai	Soil			—	(95.5.11-95.11.9)		
Mr. Matsumoto	Citrus			—	(95.10.31-95.12.25)		
Mr.T. Sugiura	Entomology			—	(96.3.1-96.9.30)		
Mr.Y. Otsu	Pathology			—	(96.4.26-96.7.10)		
Mr. K. Hiraoka	Soil				—	(96.7.14-96.8.27)	
Mr.Y. Yasunobu	Extension				—	(96.9.1-96.12.25)	
Mr. J. Minami	Pomiculture				—	(97.4.13-97.7.10)	

## Budget for Machinery and Equipments



**Counterpart Training in Japan**

Name	93-94	94-95	95-96	96-97			
Mr. G.P. Shrestha	—	(93.7.19-93.11.17)					
Mr. L.N.Deoju	—	(93.10.11-94.3.30)					
Mr. B.R.Kaini	—	(93.10.26-93.11.24)					
Mr. S. Shrestha	—	(93.9.27-93.12.7)					
Mr. T. B. Subedi	—	(93.9.27-93.12.21)					
Mr. M.B.Thapa	—	(93.9.27-93.12.7)					
Mr. D.B.Thapa	—	(94.3.21-94.5.24)					
Mr. U. K.C.		—	—	(95.9.4-95.12.17)			
Mr. Dhalak B.Thapa		—	—	(95.10.24-95.12.24)			
Mr. Y.D.Pant		—		(95.2.19-95.3.3)			
Ms. S. Adhikari		—	—	(95.3.26-95.6.30)			
Mr. B.P.Giri				— (96.8.13-96.11.24)			
Mr. R. A. Yadav				— (96.9.24-96.12.22)			
Mr. N.D. Mishra				—	(96.10.8-96.12.22)		
Mr. R.D.Shahi				—	(96.10.14-96.11.10)		
Mr. T.B.Shrestha				—	(97.4.14-97.4.30)		

List of Counterpart

	Name	93-94	94-95	95-96	96-97		
Project Manager	Mr. B.R. Kaini	_____	_____	(92,11-95,02)			
	Mr. S.K.Verma		---	(95,02-95,03)			
	Mr. B.R.Sainju		---	(95,03-95,04)			
	Mr. R.D.Shahi			_____	_____	(95,04-97,03)	
Citrus	Mr. S.K.Verma C/P	_____	_____		(93,02-95,10)		
	Mr. D.Maharjan C/P				---	(97,04-97,05)	
Deciduous	Mr. G.P.Shrestha C/P	_____	_____	(93,02-94,12)			
	Mr. C.R.Gurung C/P		_____		(94,12-95,08)		
	Mr. C.B.Gurung C/P			_____	_____	(95,11-97,03)	
Extension	Mr. S.Shrestha C/P	_____	_____		(93,02-95,11)		
	Mr. L.N.Deoju C/P			_____	(95,11-96,06)		
	Mr. E.P.Shimkhada C/P				_____	(96,06-97,03)	
Lab	Mr. R.P.Shah C/P	_____	_____	(93,04-94,07)			
	Ms. V.Pandey C/P		_____	_____	_____	(94,12-97,03)	
Entomology	Ms. S. Adhikari C/P			_____	(95,05-96,07)		
	Mr. K.B.Shrestha C/P			_____	_____	(96,06-97,03)	
Plant Pathology	Mr. S.P.Gautam C/P	_____	(93,02-94,05)				
	Mr. F. M.Pandey C/P				---	(97,04-97,05)	
Soil	Mr. T.B.Subedi C/P	_____	_____	_____	(93,02-95,09)		
	Ms. R.Manandhar C/P		_____	_____	(94,03-95,08)		
	Mr. J.Khadka C/P			_____	_____	(95,11-97,03)	

List of Agriculture Development Officer

	Name	93-94	94-95	95-96	96-97		
Kathmandu	Dr.B.M.Malla	_____	(92.12-94,04)				
	Mr. Bishnu Hari Sharma		_____	(94,04-95,05)			
	Mr. Gopal Prasad Kafle				_____	(95,05-95,09)	
	Mr. K.C.Sharma				_____	(95,09--->)	
Bhaktapur	Mr. K.P.Pradhan				_____	(93,01-96,02)	
	Mr. G.B. Malla				_____	(96,03--->)	
Lalitpur	Mr. M.B. Thapa	_____	(92.04-94,01)				
	Dr.B.Sharma				_____	(94,07--->)	
Kavre	Mr.L.N.Deoju )	_____			_____	(92,07-95,08)	
	Mr.R.K.Jha			_____		(95.09-95,12)	
	Mr.Y.R.Pant				_____	(96,10--->)	
Ramechhap	Mr. K.B.Nepali	_____	(91-93,07)				
	Mr. L.P. Upadhyaya		_____		_____	(93.07-95,08)	
	Mr.T.R.Mulicha				_____	(95,08--->)	
Sindhuli	Dr.S.K.Shah				_____	(90,06--->)	
	Mr.C.B.Tamang		(Horticulture station)		_____	(96,01--->)	



List of Horticulture Development Officer

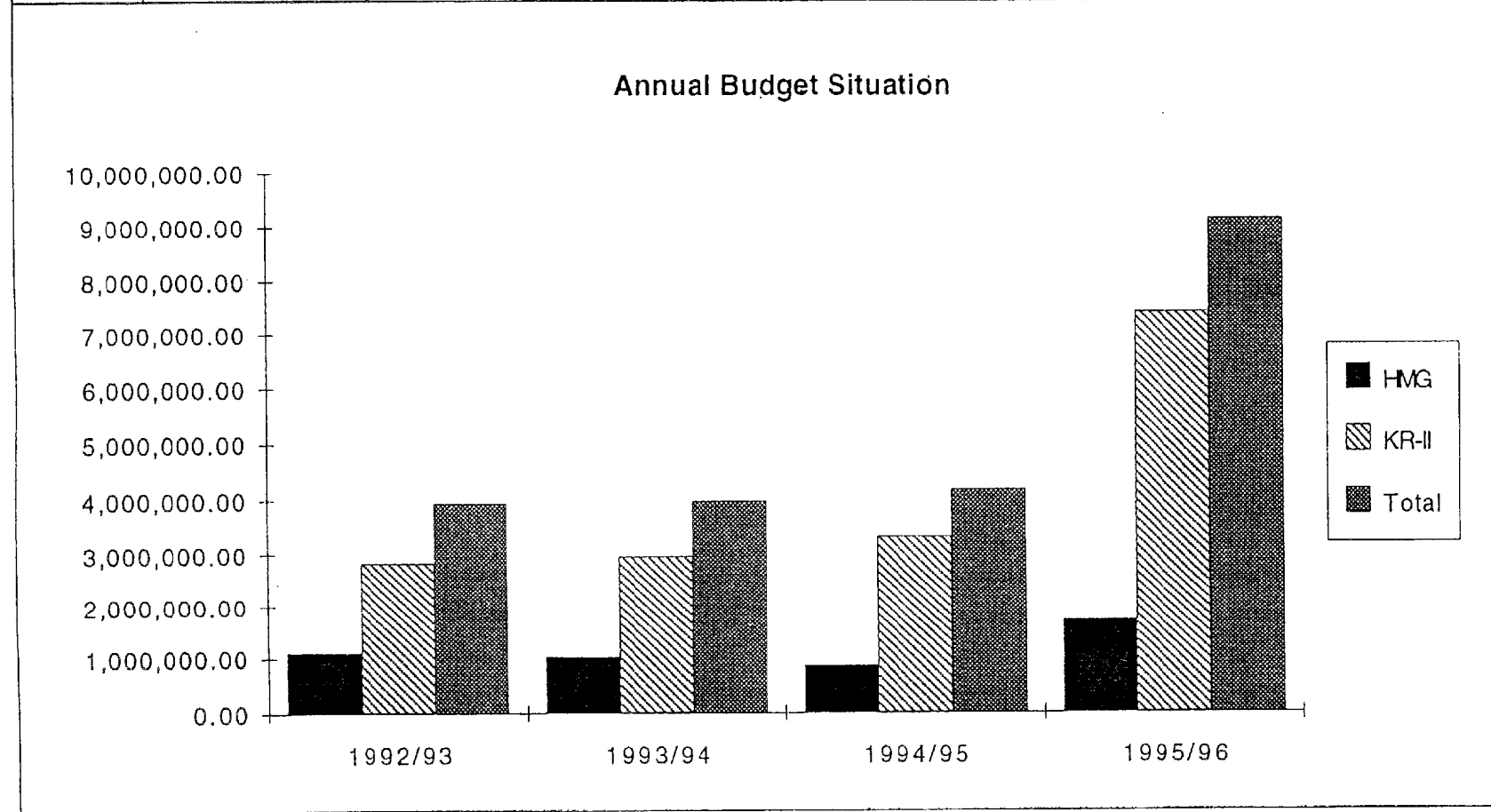
	Name	93-94	94-95	95-96	96-97		
Kathmandu	Mr. G.K.Shrestha				(90-95.08)		
	Mr. D. K. Subedi				(95,08-96,03)		
	Mr. Devendra Saraf					(96,03--->)	
Bhaktapur	Mr. Dharma Maharjan					(92,11-96,07)	
Lalitpur	Mr. Basudev Karmacharya					(92.01-96.07)	
Kavre	Mr. L.N. Acharya					(95,12-96,08)	
	Mr. U.N. Bhandari					(95.08--->)	
Ramechhap	Mr. C.B. Tamang					(94,08-96,12)	
Sindhuli	Mr. R.L. Mandal					(93,07--->)	

**Horticulture Development Project ( Phase II), Kirtipur, Kathmandu**  
**JT / JTAs Longterm Training**  
**1993 to 1997**

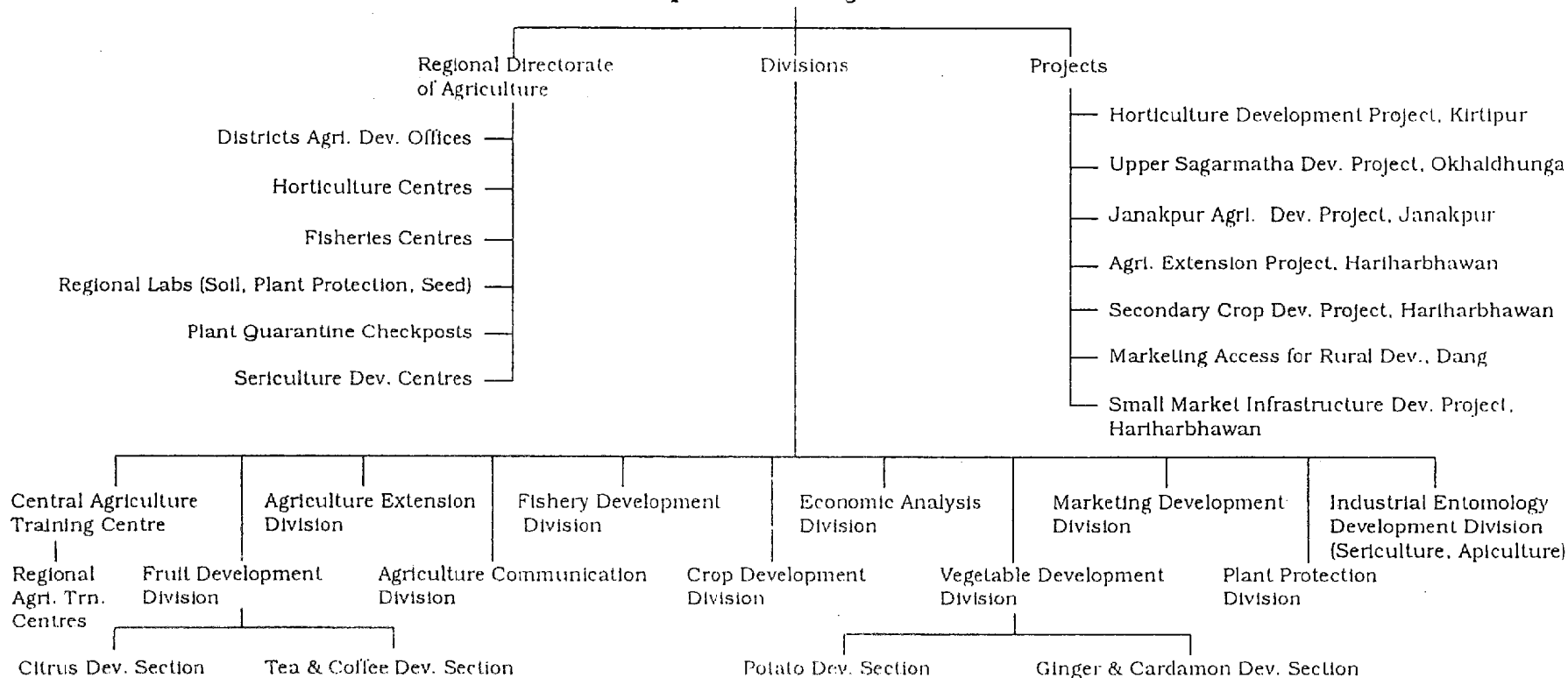
Group	Name of the Trainees	Name of the office	Post	Present office	Training in JPN
<u>1st</u> May 93 to June 94	1. M. Joshi	Kathmandu ADO	JT	Kavre ADO	-
	2. U. K.C.	Bhaktapur ADO	JTA	Bhaktapur ADO	1995 (3 months)
	3. G.B. Rana	Lalitpur ADO	JTA	Lalitpur ADO	-
	4. R. K.C.	Kavre ADO	JTA	Kavre ADO	-
	5. Namdev Mishra	Kavre ADO	JT	Kavre ADO	1996 (2 months)
	6. Ramavatar Yadav	Ramechhap ADO	JT	Ramechhap ADO	1996 (3 months)
	7. Ram hari Upadhya	Shindhuli ADO	JT	Sindhuli ADO	-
	8. Dhalak Bahadur Thapa	Shindhuli ADO	JT	Sindhuli ADO	1996 (3 months)
<u>2nd</u> July 94 to June 95	1. M.R. Pant	Kathmandu ADO	JTA	HDP	1997 (3 months)
	2. Arjun Silwal	Bhaktapur ADO	JTA	Kirtipur, KTM	-
	3. Achut Mainali	Lalitpur ADO	JTA	Resignation	-
	4. Bishnu Adhikari	Kavre ADO	JTA	Lalitpur ADO	1997 (3 months)
	5. Hari Bahadur Karki	Ramechhap ADO	JTA	Kavre ADO	-
	6. Ramnarayan Mondal	Sindhuli ADO	JTA	Ramechhap ADO	-
	7. Brama Dev Thakur	Sindhuli ADO	JTA	Sindhuli ADO	-
	8. Lok Nath Chapagai	Solkhumbu Horticulture Farm Tanahu ADO	JTA	Sindhuli Horticulture Farm Tanhu ADO	-
<u>3rd</u> July 95 to June 96	1. Chinkaji Adhikari	Kathmandu ADO	JTA	Kathmandu ADO	-
	2. Dhurba lal Munakarmi	Bhaktapur ADO	JTA	Expire	-
	3. Nav Raj Thapa	Lalitpur ADO	JTA	Lalitpur ADO	-
	4. Shayam Kaji Shrestha	Kavre ADO	JT	Kavre ADO	-
	5. Bishnu Dev Shah	Ramechhap ADO	JTA	Ramechhap ADO	-
	6. Rudra kant Jha	Sindhuli ADO	JTA	Sindhuli ADO	-
	7. Bhim Bahadur Thakali	Mustang ADO	JTA	Mustang ADO	-
	8. Anjani Kumar Neupane	Sankhuwasabha ADO	JTA	Sunsari ADO	-
<u>4th</u> July 96 to June 97	1. Devi Prasad Sharma	Kathmandu ADO	JTA	Kathmandu ADO	-
	2. Gagan Singh K.C	Bhaktapur ADO	JT	Bhaktapur ADO	-
	3. Binoj Khadka	Lalitpur ADO	JTA	Lalitpur ADO	-
	4. Chandra Prasad Humagai	Kavre ADO	JTA	Kavre ADO	-
	5. Yoj Bahadur Sunuwar	Ramechhap ADO	JTA	Ramechhap ADO	-
	6. Bhagya Narayan Jha	Sindhuli ADO	JTA	Sindhuli ADO	-
	7. Bodh Raj Dhakal	Syanja ADO	JTA	Syanja ADO	-
	8. Purna Chandra Acharya	Jumla ADO	JTA	Jumla ADO	-

## Annual Budget Situation

Fiscal Year	According to Annual Budget			Expression of the currency is NRs.
	HMG	KR-II	Total	
1992/93	1,107,000.00	2,840,000.00	3,947,000.00	
1993/94	1,019,006.00	2,960,994.00	3,980,000.00	
1994/95	865,000.00	3,323,000.00	4,188,000.00	
1995/96	1,734,000.00	7,411,000.00	9,145,000.00	



## Department of Agriculture



Note : All Division under DOA play the role of technical leaders for providing technical support and guidance to farm, centres and extension offices in their respective technical areas.

### Joint Committee Meetings

Date	Purpose	Place	Remarks
May,17,93	* to review the project activities and approve the annual programme and budget for the fiscal year 93/94	Kirtipur	
March,21,94	* to review of overall progress of the phase II * formulation of the annual work plan for 94/95 * any other issues in connection with the technical cooperation programme	Kirtipur	
April, 16, 96	* review of overall progress of the project phase II * formulation of next fiscal year's programme & budget 96/97	Kirtipur	

## Joint Meetings

Date	Purpose	Place	Remarks
April 21, 93	* selection of long term trainees * schedule of work plan and meeting	Kirtipur	
June 18, 93	* necessary preparation & management for long term training * plan of new demo farm establishment	"	
July 12, 93	* how to manage training * dormitory arrangement	"	
August 9, 93	* prepare curriculum for trainees * wages for field worker * fruit sapling production	"	
June 13, 94	* theft problem * closing ceremony	"	
July 1, 94	* selection of JT/JTAs for next year long term training * review of this year programme and progress * handover of motorcycles and other goods	"	with ADO
Sept. 5, 94	* situation of field management in each division * establishment of new demofarm * arrival of JICA Mission	"	
Sept. 15, 94	* preparation of Annual Report 93/94		
Sept. 26, 94	* purpose of mission visit * necessity of long term training * fruit theft problem * visiting demofarms		
Jan. 16, 95	* plan of re-plantation on deciduous fruit orchard * establishment of sub demo farm & nurseries * seminar on fruit development in Nepal.		
Jan. 27, 95	* review of this year programme * discussion on next fiscal year programme of the respective districts.		with ADO

Date	Purpose	Place	Remarks
Feb. 1, 95	<ul style="list-style-type: none"> <li>* budget and programme for next fiscal year 95/96</li> <li>* training on grape</li> <li>* discussion on production of sapling</li> <li>* increase labour wages</li> </ul>		
March 23, 95	<ul style="list-style-type: none"> <li>* field trip</li> <li>* issue of Newsletter</li> </ul>		
June 13, 95	<ul style="list-style-type: none"> <li>* proposed programme &amp; budget for fiscal year 95/96</li> <li>* conduction of Joint Committee Meeting</li> <li>* closing ceremony</li> </ul>		
Nov. 8, 95	<ul style="list-style-type: none"> <li>* transfer of sapling imported from Japan</li> <li>* activities at Pharping area for top working</li> <li>* management of the farm of centre and demofarm</li> <li>* scion of pear &amp; persimmon</li> </ul>		
Nov. 18, 95	<ul style="list-style-type: none"> <li>* pruning &amp; training of top worked pear trees</li> </ul>	Pharping demofarm	On the spot
Nov. 19, 95	<ul style="list-style-type: none"> <li>* pruning &amp; training of grape vine</li> </ul>	Lalitpur, Bhaktapur & Kavre demofarm	On the spot
Jan. 8-10, 96	<ul style="list-style-type: none"> <li>* practical training, handling and maintenance of horticultural tools</li> <li>* pruning &amp; training of citrus, grape and pears &amp; top working on pear</li> <li>* plan propagation techniques</li> </ul>	Kirtipur	Demofarm owner
Feb 8, 96	<ul style="list-style-type: none"> <li>* deployment of ex long term trainees in demofarm</li> <li>* programme for next fiscal year 96/97</li> <li>* long and short term training programme</li> <li>* distribution of scion to private nursery</li> <li>* training of blacksmith</li> </ul>		with ADO
March 5, 96	<ul style="list-style-type: none"> <li>* follow-up meeting of 8th Feb. 96</li> <li>* continuation of the management of demofarm after completion of the project</li> <li>* distribution of sprayer</li> </ul>	Kathmandu, Bhaktapur and Kavre	with ADO
Sept. 10-12, 96	<ul style="list-style-type: none"> <li>* use of manure, fertilizer</li> <li>* training, pruning, thinning, bagging</li> <li>* insect pest. disease control</li> <li>* harvesting etc.</li> </ul>		Demofarm owner

Date	Purpose	Place	Remarks
Dec.16-18, 96	fully practical training in the field of handling and maintenance of horticultural tools pruning and training of citrus, grape, pear, persimmon and chestnut top working on pear and plant propagation techniques.	Kirtipur	demofarm owner
Dec.19-22,96	pruning and training of grapevine topworking on pear trees	Kavre & Pharping	on the spot training to demofarm owner
March 19,97	handover of the orchard management from Japanese Expert to HMG technicians proposed programme for the next fiscal year 97/98	Kirtipur	



## Newspaper's reports

Feb 22, 1994	Auspicious beginning of Establishment of Demo farm
April 01, 1994	Fruit crops in Agroforestry
July 02, 1994	One year Fruit Training.
July, 05, 1994	Training on Horticulture
Aug 05, 1994	Pasang sherpa gets French award for Horticulture
Aug 24, 1994	Fruit market, Labs to be opened
Aug 25, 1994	Popularizing Horticulture
Sep 25, 1994	JICA Marks 20th Anniversary
Sep 28, 1994	Syangja Horticulture gains firm footing
Nov 10, 1994	Agreement on bridge construction
Nov 10, 1994	HMG appoint ,transfers secys
Jan 20, 1995	Continued Assistance
Feb 23, 1995	Fruits of Development
Feb 26, 1995	Fruits for Future
Mar 02, 1995	Secretaries transferred
Mar 12, 1995	Japan aid to Siddheswor VDC
May 24, 1995	Kavre suitable for orange farming
July 30, 1995	Fruit Farming spreads its roots
Aug 13, 1996	No Matching returns : Lawoti
Sep 15, 1996	Pear of Pharping - Not free from Problems
Sep 18, 1996	Pear better than Pharping pear
Feb 25, 1997	Distribution of fruit sapling
Mar 26, 1997	Japanese pear in Lalitpur

1.-(1) IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Pear Cultivation)

Date : 31st May, '97

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Selection of suitable variety.	(1) Selection of a suitable varieties of Nepali local pear. (2) Test of adaptability on introduced cultivated varieties from Japan.	* Field survey of local pear. * Marketing survey. * Observation of ecological characteristics. * Test of characteristic of variety.	* Evaluation of hundred lines of local pear. ---Pharpping local pear seem to be same line. * Evaluation of fruit quality of local pear with red skin color. ---Size, Brix and fruit shape are almost as same as Japanese pear but hardness is more that is 3 to 4 times of Japanese pear and has less juice. * Adaptability of introduced cultivated varieties was tested. ---Kosui, Housi and Shinko can be cultivated easily. ---The taste is preferred by Nepalese. So, those have adaptability. * Test of pollination computibility between local and Japanese pear. ---A ratio of compatibility is about 70% Ratio of natural pollination is about 45%.	* Selection of high quality line among Nepalese local pear. * Selection of suitable variety introduced from Japan.	* Evaluation of adaptability of introduced cultivators in Phase II.	* Will be completed by Nov.,97.
2. Propagation technique.	(1) Raising of root stock.	* Selection of suitable root stock line. * Establishment of grafting technique.	* Study of suitable rootstock. ---Affinity between local and Japanese are good. * Study of cutting propagation of local pear. ---A ratio of taking root is about 60%-65%. * Test of adaptability of local wild root stock. ---Sapling productions is easy by veneor grafting of seedling or cutting root-stock.	* Securing of suitable root stock and production of high quality sapling.	* Study of possibility of clone (local rootstock) production by cutting.  * Study and comparison between 4 selected lines of local rootstock.	* Will be completed by Nov.97.  * Should be continued after Nov.,97

ANNEX III  
ACTIVITIES AND ACHIEVEMENTS  
OF THE PROJECT

3. Tree management technique.	(1) Establishment of suitable tree form. (2) Establishment of reasonable technique of pruning. (3) Control of fruit set.	* Improvement of natural training form. * Management after top grafting.	* Study of natural training form. --- Open center training is suitable in Nepal. * Management after top-grafting. ---Open center training is suitable for top grafted Japanese Pear. ---A high-ratio of top-grafting successful union is conformed. ---Fruit set control method of one fruit per a cluster is suitable method in Nepal.	* Improvement and establishment of reasonable tree form. * Renewal of variety by top-grafting.	* Technical transfer of tree form management of introduced varieties in Phase II. * Technical transfer of tree form management of top-grafting tree.	* Should be continued after Nov.97  * Should be continued after Nov.,97
4. Soil and plant nutrition management	(1) Improvement of soil management technique.	* Diagnosis of soil condition . * Utilization of local organic substance.	* Recommended rate of fertilizer or organic material was studied. ---Requirement of chemical fertilizer is known, and the instruction have been wrote on the field management calendar. * Soil of Demo-farm and center has been diagnosed (i.e, PH and base). ---Basic soil data have been prepared.	* Tree management by local organic substance utilization.		
5. Plant protection from insect pests, diseases and birds.	(1) Development of suitable control measure. (2) Counter measure of bird injury.	* Observation of diseases and insect pest.  * Utilization of paper bags for their control.  * Study of simple plant protection method from bird injury.	* Observation of diseases and insect pest. ---Major diseases and insect pests and situation of those occurrences were mostly studied. * Study of fruit bagging. ---Method of making paper bag by newspaper was established. * Study of control of bird injury. ---Bird net utilization is most effective. * Best season of spray for scale insects is last ten days of march when hatching them.	* Implementation of suitable control at suitable period. * Development of simple plant protection method from bird injury.	* Give emphasis on use of paper bag to the farmers. * Establishment of spray calendar. * Study of reasonable local procurable bird net for farmers. * Trial of finding alternate materials for protection from bird injury.	* All the items will be completed by Nov.,97

1.-(2) IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Grape Cultivation)

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Selection of suitable variety.	(1) Test of characteristics on introduced variety from Japan.	* Check of susceptibility to diseases and pests. * Testing of fruits quality.	* Study on the susceptibility of varieties to diseases and insect pests selected in phase I. ---It has been found that these varieties were practically resistant. * Study of suitable training method. ---Suitable training method is developed.	* Re-evaluation of variety which made good performance in Phase I and confirm suitable variety for Nepal.	* All subjects of item (1) are completed.	
2. Propagation technique.	(1) Raising of root stock.	* Selection of root stock variety.  * Improvement of grafting technique.	* Test of introduced rootstock. ---Suitable rootstock are selected. * Test of tongue grafting on Phyloxera resistant rootstock have been continuing. ---Tongue grafting is best method for mass production but technique and materials providing are difficult in Nepal. --- Comforted, soft (green) wood grafting is suitable in Nepal.	* Confirm necessity of root stock. * Grasp the grafting technique.	* Study of soft (green) wood grafting method using with local materials.	* Will be completed by Nov.,97
3. Plant protection from pests, diseases and birds.	(1) Development of suitable control measure. (2) Development of agro-technical control measure. (3) Counter measure of bird injury.	* Make plan of control. * Cleaning of field during dormant period. * Diseases control by pruning.	* Observation of diseases and insect pests occurrence. ---Major diseases and insect-pests and situation of those occurrences are mostly studied. * Test of effectiveness of breaking of dormancy by nitro-lime. ---Effective on Himrod and Steuben. * Control of bird injury. ---Bird net utilization is most effective. ---Agro-technical control by pruning was guided. * Study of control measure and cause of leaf dying, which occurs from middle of growing period. ---Will be test effectiveness of agrochemical	* Development of spray calendar * Control Anthracnose by breaking of dormancy and other techniques.  * Development of simple protection method from bird injury.	* Establishment of spray calendar.	* Completed  * Should be continued after Nov.,97  * Will be completed by Nov.,97.

1.-(3) IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Persimmon Cultivation)

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Selection of suitable variety.	(1) Selection of suitable variety of Nepali local persimmon. (2) Test of adaptability on introduced variety from Japan.	* Field survey of local persimmon. * Marketing survey. * Observation of ecological characteristics. * Quality and yield survey.	* Observation on local persimmon. ---Harvest time is August to November. All local varieties are astringent type. --- Selected two late flowering variety and gave the name "TEKU" & "DHURA". * Observation on introduced cultivators in phase I. ---Hiralanensi, Douzyouhachiya are promising astringent varieties.	* Confirm good variety from the point of view of fruit quality and diseases resistance.	* Observation on introduced variety by Ph.II.	* Should be continue after Nov.,97
2. Propagation technique.	(1) Raising of root stock.	* Selection of suitable root stock line. * Establishment of grafting technique.	* Raising of rootstock have been done. ---Root-stock raised from scion's variety is suitable. * Study on grafting timing and method. ---Suitable grafting time is sprouting time. Field grafting method is suitable.	* Do grafting on time and raising good sapling.	* Study on root damage and post planting management.	* Should be continue after Nov.,97
3. Tree management technique.	(1) Control of fruit set.	* Introducing pollinizer.	* New orchard was established (companion planting with pollinizer). * Observation on fruit set. ---Suitable fruit set by entomophily is confirmed. * Study on male flower set of local variety. ---Possible for fruits set by existing local male flower is confirmed.	* Make good fruiting by introducing of compatible pollinizer.	* Study on effectiveness of pollinizer.	* completed
4. Soil and plant nutrition management	(1) Improvement of soil management technique.	* Diagnosis of soil condition. * Utilization of local organic substance.	* Diagnosis of soil condition. ---PH and base of soil in Demo-farm and center have been diagnosed and those basic data have been prepared. * Study of organic substance utilization have been done. ---Necessity of increasing of winter fertilizer application is found * Study of fertilizer application for growth promotion in dry season. ---Watering in dry season is necessary for keep out of land drying	* Establishment of fertilizing method based on self-supporting fertilizer.		* completed  * The choice of right land is important

<p>5. Plant protection from pests, diseases and birds.</p>	<p>(1) Development of suitable control measure.</p> <p>(2) Counter measure of bird injury.</p>	<p>* Observation of diseases and insect pests.</p> <p>* Study of simple plant protection method from bird injury.</p>	<p>* Observation of diseases and insect pests occurrence.          ---Major diseases and insect pests and situation of those occurrences are mostly studied.          * Observation about bird injury.          ---No bird injury before harvest, so bird control is not necessary.</p>	<p>* Implementation of suitable control at suitable period.</p> <p>* Development of simple plant protection method from bird injury.</p>	<p>* Establishment of spray calendar.</p>	<p>* completed</p>
<p>6. Harvesting and storing.</p>	<p>(1) Determination of harvesting time.</p> <p>(2) Trial for simple removal (loss) of astringency.</p>	<p>* Judgment of time for harvest.</p> <p>* Establishment of simple method of removal of astringency.</p>	<p>* Study on harvest timing of introduced variety.          ---Suitable harvest time is found.          * Simple astringency removal test have been done.          ---alcohol (local liquor) method is established.</p>	<p>* Confirm exact time of harvesting.</p> <p>* Establishment of simple method of removal of astringency for farmers.</p>		

1.-(4) IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Chestnut Cultivation)

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Propagation technique.	(1) Raising of root stock.	* Selection of root stock variety.	* Seedling and rising of Japanese and Chinese varieties rootstock have been done. ---Good result from seedling is found . * But grafting in late summer, spring grafting and transplanting in February to March. ---Low successful union.	* Confirm necessity of root stock.  * Grasp the grafting technique.		
2. Storing	(1) Storing method improvement.	* Improvement of simple storing method.	* Study of seed storing method. ---Storing under room temperature is difficult. ---Winter sowing get low germination percentage.	* Establishment of simple storing method.	* Continue of study of seed storing method. * Study of Autumn sowing.	* Both items will be completed by Nov.,97

2.-(1) IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Junar)

Improvement of Technology	Items of technical improvement	Activity	Progress	Goal	Remaining Activity	Remark
1. Selection of suitable variety.	(1) Selection of suitable line of Junar.	* Continuation of survey on selected Junar at same condition.	* Rising of selected 3 lines in field and net house. ---Second fruit quality analysis have been doing since 1994 and the 2 selected varieties of "Rai" & "Koirala" are hopeful. * Fruit quality analysis. ---Fruit quality analysis have been done.	* Extension on selected Junar.		
2. Propagation technique.	(1) Selection of suitable root stock.  (2) Propagation of selected line of Junar.  (3) Management of root-stock varieties.	* Continuation of root-stock trial.  * Management of possible rootstock and seed production.	* Test of rootstock. ---Suitable variety are confirmed such as three trifoliolate line of USDA trifoliolate, trifoliolate, troyer citrange, and rough lemon also. * Propagation of USDA trifoliolate. ---USDA trifoliolate are top-grafted on 100 trifoliolate. * Seed production for rootstock. --Continually producing seeds witch are mainly normal trifoliolate & USDA trifoliolate about 100~150Kg par year. * Seed storing method. ---Seed storing method have been established and transferred it. * Healthy sapling production. ---Single bud side-grafting method is suitable and transferred the technique to AC/P, JT/JTA, and fifteen Nursery farmers.	* Selection of suitable root-stock variety. * Healthy sapling production. * Raising of trifoliolate line of root-stock and seed production.		



3. Tree management technique.	(1) Establishment of suitable tree form. (2) Controlling of fruit set. (3) Soil management and nutrition.	* Pruning and training  * Study on suitable leaves per a fruit.  * Soil survey of Demo-farm Organic fertilizer, mulching and inter crops.	* Improvement of tree form. ---Technique is developed by training, pruning and fruit thinning. * Study on suitable leaf number per a fruit. ---Three years continually tested, about 60-70 leaves per a fruit are suitable. * Soil survey of Demo-farm . ---PH and base of soil have been diagnosed. So basic data have been prepared. * Study of mulching, Sod culture and inter crops ---Possibility of mulching & Sod culture are found. ---Standardization of suitable inter crop has been developed.	* Improvement of tree from technique.  * Establishing norms for suitable leaves per fruit.  * Improving soil Organic fertilization.		
4. Plant protection.	(1) Survey of pests, diseases and natural enemy. (2) Study of viruses and greening diseases. (3) Establishment of plant protection technique.	* Survey of main pests, diseases and natural enemy. (citrus psylla, scales, foot-rot) * Study on greening diseases, CTV, Tatter leaf, Exocortis, etc. and study on CTV resistance. * Protection period, utilization of local chemical & equipment.	* Observation of major diseases and insect pests. ---Occurrence situations of major diseases and insect pests are mostly studied. * Test of major virus and CTV resistance. ---Wide renege of CTV infected area were confirmed existing in citrus cultivation area . ---Junar lines have no resistance for CTV , is Confirmed. ---Non infection of tatter leaf-V, Xyloporosis, Exocortis are confirmed in project target aria. * Comparison of effectiveness between machine oil and plant oil to control scale insects. ---Plant oil is not useful because of chemical damage.	* Grasp the characteristic of main pests, diseases and understanding natural enemy. * Grasp of situation of the main virus, recognized infected Area, studydy of CTV resistance and establishment of prevention method. * To make suitable plant protection technique.	* Establish prevention plan for spreading CTV infection.	* Main pests and diseases plant protection method will establish before Nov.,97  * Should be continue a CTV countermeasure after Nov., 97.
5. Harvesting and storing.	(1) Determination of harvest time. (2) Improvement of fruit grading. (3) Simple storing method at farmer's level.	* Fruit size measurement, coloring, fruit analysis and method of harvest.  * Survey for fruit quality and market price.  * Monthly survey of fruit price and study on natural storing and cold storage.	* Test of fruit enlargement, coloring and fruit quality. ---Three years continually tested and founded the step of fruit enlargement by seasonally, measurement of fruit quality by coloring grade. * Study of fruit grading. ---Norms of fruit grading is almost fixed. * Development of natural and cold storing method with utilization of local materials. ---If utilize newspaper or pine leaves with careful handling, in-house temperate storing is storable until March. ---Natural simple storing method have economical advantage also.	* Grasp of harvest on time and method of harvesting.  * Make norms of fruit grading.  * Development of profitable local storing method in hill area.		* Will be completed by Nov.,97

1. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Mainly Suntala)

Improvement of Technology	Items of technical improvement	Activity	Progress	Goal	Remaining Activity	Remark
1. Selection of suitable variety.	(1) Selection of suitable line of Suntala.	* Selection of suitable Suntala line at main citrus area in Nepal.	* Selection of suitable Suntala lines. --- First selections have been done by continuous three years observations and selected 60 lines are cultivating. * Selection of suitable pummelo lines. ---20 lines selected from 230 lines at first survey has been tested as second selection. ---Markkot and Yoshida Ponkan are hopeful.	* Selection of better quality of Suntala line and management of selected variety.	* Both of second selection.	* All the items should be continue by C/P & ACP.
2. Propagation technique.	(1) Selection of suitable root stock.  (2) Propagation of selected line of Suntala.	* Continuation of rootstock trial.  * Production of plants in small scale.	* Test of root-stock. ---Rootstock lines of USAD trifoliolate & Setijamir lines are hopeful.	* Selection of suitable root-stock variety.  * Healthy sapling production.		
3. Tree management technique.	(1) Establishment of suitable tree form. (2) Controlling of fruit set. (3) Soil management and nutrition.	* Pruning and training.  * Study on suitable leaves number per fruit.  * Soil survey of Domo-farm Organic fertilizer, mulching and inter crops.	* Improvement of tree form. ---Standing tree form is possible by the techniques of pole training of young tree, thinning-out pruning. * Alternate bearing control. ---Alternate bearing is under control by the techniques of, proper thinning, using summer shoot and cutting back pruning at old bearing shoot to renew bearing shoot. * Study on suitable leaf number per fruit. ---About 100 leaves per a fruit are suitable resulting from continues three years observations.	* Improvement of tree form technique.  * Establishing norms for suitable leaves number per fruit.  * Improving soil Organic fertilization.		

4. Plant protection.	(1) Survey of pests, diseases and natural enemy. (2) Study of main viruses and greening diseases. (3) Establishment of plant protection technique.	* Survey of main pests, diseases and natural enemy. (citrus psylla, scales, foot-rot) * Study on greening diseases, CTV, Tatter leaf, Exocortis and CTV resistance. * Protection period, utilization of local chemical & equipments.	* Observation of greening vector. ---Greening vector situation had grasp by indicator plant test and visual check.	* Grasp the characteristic of main pests, diseases and understanding natural enemy. * Grasp of greening vector situation and recognize infected areas. * To make suitable plant protection technique.	* Inform to the public the characteristic of diseases and establish prevention plan for spreading greening infection.	* Should be continue a greening countermeasure as step by step after Nov., 97.
5. Harvesting and storing.	(1) Determination of harvest time. (2) Improvement of fruit grading. (3) Simple storing method at farmer's level.	* Fruit size measurement coloring, fruit analysis and method of harvest. * Survey for fruit quality and market price. * Monthly survey of fruit price and study on natural storing and cold storage.	* Market survey. ---Price survey at fruit production areas and consumption area had been don. * Development on natural storing and cold storage method with local materials. ---If utilize newspaper or pine leaves with careful handling, in-house temperate storing is storable until February. * Others description are same of Junar.	* Grasp of harvest on time and method of harvesting.  * Make norms of fruit grading.  * Development of profitable local storing in hill area.		

1. IMPROVEMENT OF TECHNIQUES FOR FRUIT PRODUCTION  
(Agro-Machinery)

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Development and improvement of Horticultural equipment.	(1) Trial to develop the suitable equipment and tools.	<p>* Survey of agriculture implement on fruit grower and market.</p> <p>* Survey of material to make Horticultural tool in Nepal .</p> <p>* Improvement and extension of equipment .</p>	<p>* Survey of agricultural equipment.</p> <p>---The reality of general agricultural equipment on fruit growers have been known.</p> <p>---The reality of agricultural implement on the market have been known.</p> <p>* Study of material for making horticultural tools.</p> <p>---Suitable material have been found.</p> <p>* Extension of improved equipment have been done.</p> <p>---Extension through Demo-farm and trainees.</p> <p>* Blacksmith training.</p> <p>---Start of three months training.</p>	<p>* Trial to develop grafting knife, pruning saw, pruning scissors, ladder, anti-bird net and harvesting bag.</p> <p>* Cooperate-operate with farmer to solve any problem on their field and improve their equipments.</p> <p>* Recruit blacksmith from six districts for the extension.</p>	<p>* Verification on practical utility of equipments developed in center.</p> <p>* Selling of equipment developed in the center.</p>	* Will be completed by Nov..97

## II. TRAINING

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Long term training.	(1) Improvement of training.	<ul style="list-style-type: none"> <li>* Improvement on selection method of trainees.</li> <li>* Making regulations of training.</li> </ul>	<ul style="list-style-type: none"> <li>* Selection method was discussed between both side.</li> <li>--Candidate is decided by Team Leader and Project Manager.</li> <li>* Establishment of selection of trainees.</li> <li>--Criteria have been established.</li> </ul>	<ul style="list-style-type: none"> <li>* Improvement on reasonable implementation and system for training.</li> </ul>	<ul style="list-style-type: none"> <li>* Activity as the Project have don.</li> </ul>	
	(2) Improvement of curriculum and implementation of training .	<ul style="list-style-type: none"> <li>* Improvement of training curriculum</li> <li>* Basic cultivation techniques.</li> <li>* Operation and management of agromachinery.</li> <li>* Extension method.</li> </ul>	<ul style="list-style-type: none"> <li>* Improvement of curriculum.</li> <li>--Curriculum have been established.</li> <li>* Improvement of training method.</li> <li>--8 trainees divide to 2 groups such as deciduous grope of 4 trainees and citrus grope of 4 trainees.</li> <li>--Export and guest lecturer given technical lecture to trainees.</li> <li>-- Conducted study tour to apple cultivation aria.</li> <li>* Individual theme study has been guided.</li> <li>--All trainees presented own study on closing ceremony.</li> </ul>	<ul style="list-style-type: none"> <li>* Improve the ability of Junior technicians and Junior technician assistants through practical work and lecture.</li> </ul>		<ul style="list-style-type: none"> <li>* Will be completed by Nov.,97</li> </ul>
	(3) Development and improvement of training materials.	<ul style="list-style-type: none"> <li>* Development and improvement of materials for lecture.</li> <li>* Development and improvement of materials for practical training.</li> </ul>	<ul style="list-style-type: none"> <li>* Development of materials for trainees.</li> <li>--Text books on each section have been made.</li> <li>--Using foreign text box as sub training text.</li> </ul>		<ul style="list-style-type: none"> <li>* Improvement of present materials.</li> </ul>	<ul style="list-style-type: none"> <li>* Will be completed by Nov.,97</li> </ul>
	(4) Evaluation of training.	<ul style="list-style-type: none"> <li>* Execution of evaluation.</li> </ul>	<ul style="list-style-type: none"> <li>* Execution of evaluation .</li> <li>--Evaluation have done on the forth year.</li> <li>* Study of organizing evaluation.</li> </ul>		<ul style="list-style-type: none"> <li>* Study of evaluation method.</li> </ul>	<ul style="list-style-type: none"> <li>* Should be completed by Nov.,97</li> </ul>
2. Short term training.	Short term training will be implemented by Nepali counterparts/side.					

### III. EXTENSION

Item	Subject of technical Guidance	Activity	Progress	Goal	Remaining Activity	Remark
1. Demonstrati on farm management	(1) Site selection development and management of demo-farm.	<p>* Advice to the set up nine demonstration farm; 2 established. 7 new. (with the cooperation of ADOs)</p> <p>* Development of extension method.</p> <p>* Technical extension in the vicinity of Demo-farms.</p>	<p>* Demo-farms have been established.</p> <p>---Nine Demo-farms of varieties and training forms are different.</p> <p>* Management of Demo-farms.</p> <p>---All Demo-farms are managed by ex-long term trainees that keep relation with C/P &amp; AC/P.</p> <p>---Assembly training have done twice on the pruning season.</p> <p>(Citrus)-Among three new citrus Demo-farm, greening diseases is occurred in one Demo-farm and cultivator has been changed.</p> <p>(Deciduous)-</p> <p>* Technology transfer of young tree cultivating management.</p> <p>---It is on going.</p>	<p>* Establishment of reasonable system of technology transfer to ADO, farmers and nursery farmers through this project.</p> <p>* Improvement of cultivation technique differently depending on harvesting scale and cultivation surrounding would be manage independently.</p>	<p>* Study of transportation of fruits (about box, container).</p> <p>* Technical transfer of mature tree management to Demo-farm owners.</p>	<p>* Should be continued by the Nepalic side.</p> <p>* Should be continued after Nov.,97</p>
2. Circuit guidance.	(1) Improvement on planning and method of circuit guidance.	* Implementation of circuit guidance reasonably.	<p>* Study of Circuit Guidance Method and timing.</p> <p>---Ex-trainees are guiding farmers utilizing cultivation calendar.</p> <p>---Field working record sheet have distributed to farmers. (NOV., 96)</p> <p>---Circuit guidance continually doing twice a month in the vicinity of Kathmandu.</p> <p>* Plant protection campaigns.</p> <p>---Foot rot prevention campaigns is conducting systematically by C/P, A/CP &amp; JT/JTA.</p> <p>* Technical Guidance to nursery farmers</p> <p>---It has been doing.</p> <p>* Monitoring to extension effectiveness.</p> <p>---It have done.</p>	<p>* Make good working surround of JT &amp; JTA to support self finding of problem solution.</p> <p>* Support to establishment of nursery farmers cooperative.</p>	<p>* Continue technical transfer on fruit growing and extension method to C/P &amp; AC/P.</p>	<p>* Should be continue after Nov.,97</p>

3. Seminar.	(1) Planning of seminar.	* Implementation of seminar and exchange ideas, opinions.	* Seminar has been held, participated by concerned persons of Horticulture. * Seminar for Demo-frame owner and ex-trainees has been held twice a year.		* Making system to hold seminar regularly.	* Should be continued by the Nepali side after Nov.,97
4. Publication.	(1) Development of publication method.	* Extension of improved techniques.	* Deciduous fruit cultivation calendar have been published and distributed. * Citrus cultivation calendar have been published and distributed. * Quarterly Newsletter have been publishing. * Persimmon astringency removing method has been advertised by publishing in Newspapers. * Local TV channel reported at demo-frame and the program had broadcasted .	* Establishment of field management calendar.	* Continue of technical publication.	* Should be continued by the Nepali side after Nov.,97

INCEPTION REPORT  
ON  
THE JOINT EVALUATION  
OF  
THE HORTICULTURE DEVELOPMENT PROJECT  
PHASE II  
IN  
THE KINGDOM OF NEPAL

7 JULY, 1997

JAPAN - NEPAL  
JOINT EVALUATION COMMITTEE



## PURPOSE OF THE EVALUATION

### 1 . Aims of the Evaluation

The evaluation activities were performed with the aims of:

- 1) Verifying the degree of achievement of the Project target set in R/D and modified in the occasion of mid-term evaluation;
- 2) Assessing whether the Project has chance of fully attaining sustainability after the termination of the cooperation period;
- 3) Assessing what sort of effects are being produced, to what extent they are produced and how far reaching they are, if they are already evident; and
- 4) Determining whether it is proper to terminate the Japanese cooperation as originally designed.

### 2 . Items of the Evaluation

The following items were evaluated.

- (1) Degree of Achievement
  - 1) Consistency with plans at higher levels
  - 2) Degree of achievement of Project purpose
  - 3) Degree of achievement of activity target
  - 4) Degree of achievement of input target
- (2) Project Impact ( Project level, Sector level ,Regional level and Macro level )
  - 1) Technical Impact
  - 2) Institutional Impact
  - 3) Economic Impact
  - 4) Socio-cultural Impact
  - 5) Environmental Impact
  - 6) Other Impact
- (3) Prospects for Sustainability
  - 1) Prospects for organizational sustainability
  - 2) Prospects for financial sustainability
  - 3) Prospects for material and technical sustainability
  - 4) Factors inhibiting sustainable management and operation
- (4) Recommendations for Post-Project activities

## SCHEDULE OF THE PROJECT EVALUATION

### 1 . First Joint Evaluation Committee Meeting

Formation of the Committee, Self-introduction

Erection of the leader of the Committee

Confirmation on TOR of the Committee and each member's

Confirmation of the methods and schedule of the Evaluation

### 2 . Joint Evaluation Practice

The practice will be done by the Committee members. Each specific field is covered by a pair of Japanese and Nepalese member, and the conclusion and the recommendation will be mutually prepared by all the members.

The following practices are to be suggested.

#### 1) Document Study ( Presentation by the Project Team Members )

A series of documents, which indicates the input, activities and achievements of the Project, will be submitted by the Project team members. The documents will be presented by the Project team members who are responsible for each field of Project activities.

#### 2) Interview Study ( Interview based on the Document Study )

An interview to clarify the documents submitted by the Project Team members, and to evaluate the impact, sustainability, post-project development and other aspects of the Project.

#### 3) Field Survey

The practical effects or impact of the Project will be studied through field surveys on Project sites, farmers, markets and other related areas.

### 3 . Preparation of the Draft Final Evaluation Report

A draft of the Final Evaluation Report will be prepared by the Committee members. The contents of the report is found in the attached sheet.

### 4 . Second Joint Evaluation Committee Meeting

Confirmation of the Evaluation Report

Preparation for presenting the Report to the Joint Coordinating Committee

### 5 . Presentation of the Report to the joint Coordinating Committee

The report will be presented to the Joint Coordinating Committee of the Project and the Joint Coordinating Committee will decide whether to take the result of the evaluation into account or not.

The Minutes of the Discussions of the Joint Coordinating Committee will be signed between the secretary of the Ministry of Agriculture, Nepal and the Project Team Leader of JICA, and witnessed by the Leader of the Joint Evaluation Committee.

Date	Time	Schedule
Jul. 09 (Wed.)	11:00	First Joint Evaluation Committee Meeting
10 (Thr.)	11:00	Evaluation I ( Presentation by the Project )
11 (Fri.)	11:00 12:30	Evaluation II ( Tour on Kirtipur Center and Field ) Evaluation III ( Individual Interview )
12 (Sat.)		Day off
13 (Sun.)	9:00	Field Trip for Japanese Members Pharpin demo. farm, Horticulture shop, and Fruit markets
14 (Mon.)	10:00	Evaluation IV ( Field Observation ) Grape demo. farm and orchards in Lalitpur, Japanese pear and Persimmon demo. farm in Kavre, and Citriculture demo. farm in Panchkhal
15 (Tue.)	11:00	Report Making
16 (Wed.)	10:30 14:00 16:00	Reporting to the DOA Second Joint Evaluation Committee Meeting Reporting to JICA Nepal Office
17 (Thr.)	10:30 14:00 15:00	Reporting to the Secretary of MOA Joint Coordinating Committee ( Presentation of the Evaluation report ) Signing on the Minutes of the Joint Coordinating Committee

## METHODS OF THE EVALUATION

### 1 Degree of Achievement

#### (1) Consistency with plans at higher levels

Briefly itemize (indicate) what sort of consistency the Project purpose had with the higher level plans at the beginning and has at present, and specify the main factors of the Project contributing to the achievement of higher plans or reasons for failure in achieving them. If there are any major changes on higher level plans, specify and describe the reasons of such changes.

#### (2) Degree of achievement of Project purpose

Examining whether the Project purpose is set properly to achieve the Overall goal. Indicating whether the Project purpose has been achieved by evaluating the status of target achievement. In case if the Project purpose is not fulfilled, specifying major inhibiting factor.

#### (3) Degree of achievement of activity target

Briefly describe (itemize) the status of activity target achievement compiled by the field of activities set. If some of the activity target are not achieved, specifying these items and the reason of incompleteness.

#### (4) Degree of achievement of input target

Specifying the input from the Japanese side and the Nepalese side to the Project. If the Project design shown in R/D is not fulfilled, specify the items and the reason.

### 2 Project Impact

#### (1) Backgrounds of Impact

Indicating what sort of positive/negative impact is being produced by the Project, if any of them are confirmed to appear, in particular reference to the following impacts.

##### 1) Technical Impact

##### 2) Institutional Impact

##### 3) Economic Impact

##### 4) Socio-cultural Impact

##### 5) Environmental Impact

##### 6) Other Impact

#### (2) Reach of impacts and circle of beneficiaries

Indicating how far each impact found through the above study and divide the beneficiaries, classify specific benefits, and the degree of benefits received by the Project level, Sector level, Regional level and Macro level.

### 3 Prospects for Sustainability

#### (1) Prospects for organizational sustainability

Indicating whether the positioning of the operating agency of the project is clearly defined in the organizational structure. Also indicating whether the implementing agency has acquired sufficient administrative and financial ability to sustain the necessary post-Project activities.

Indicating whether the agency has secured staff members fully capable of managing and operating the post-Project activities.

#### (2) Prospects for financial sustainability

Indicating the approximate amount of re-current cost to implement post-Project activities and the source of budget. If there are good financial chances to secure the adequate budget for sustaining the post-Project activities by the H.M.G.N.'s, specifying reason.

If the Project has departments generates profits, specify whether such profits can cover all or part of the post-Project activities.

#### (3) Prospects for material and technical sustainability

Indicating whether the transferred technology is appropriate to the Nepalese situation, whether the technology level of the Nepalese C/P is enough for implementing the post-Project activities independently, and whether the Nepalese capabilities for management and operation of facilities and equipment are enough.

Indicating whether Nepalese staff members capable enough to handling transferred technology through the Project will be stayed for long-time and whether efforts will be made to maintain and develop such technologies.

Specifying whether the C/P transferred acquired technologies through the Project to their colleagues or juniors.

#### (4) Factors inhibiting sustainable management and operation

If there are factors inhibiting management and operation, specifying the background of such factors, countermeasures etc.

### 4 Recommendations for post-Project activities

indicate the recommendations found through the results of above evaluation, and summarize the reasons for making the judgment.

## CONTENTS OF THE FINAL EVALUATION REPORT (DRAFT)

Which will be presented to the " Joint Coordinating Committee " of the Project

- 1 . OUTLINE OF THE EVALUATION
  - 1 – 1 Outline of the Project
  - 1 – 2 Purposes of the Evaluation
  - 1 – 3 Composition of the Joint Evaluation Committee
  - 1 – 4 Schedule of the Evaluation
  
- 2 . ABSTRACT OF THE EVALUATION RESULTS
  
- 3 . METHODS OF JOINT EVALUATION
  - 3 – 1 Efficiency: Efficiency of the Outputs to the Inputs
  - 3 – 2 Achievement/ Fulfillment of the Project Purposes
  - 3 – 3 Impacts made by the Project
  - 3 – 4 Appropriateness of the original Project Design
  - 3 – 5 Sustainability and Post-project Development
  
- 4 . RESULTS OF THE EVALUATION I
  - Achievements of each field of the Activities
  - 4 – 1 Efficiency
  - 4 – 2 Achievement of the Project purpose
  - 4 – 3 Impacts made by the Project
  - 4 – 4 Appropriateness of the original Project Design
  
- 5 . RESULTS OF THE EVALUATION I I
  - Sustainability and Post-project Development
  
- 6 . CONCLUSION
  - 6 – 1 Conclusion of the Evaluation Results
  - 6 – 2 Recommendations for Post-project activities

## ANNEXES

- 1 . Inputs to the Project ( Japanese/ Nepalese )
- 2 . Activities and Achievements of the Project
- 3 . Items found to be un-achieved under the Project

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終了時評価調査団員名簿

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The Horticulture Development Project in Nepal Phase II

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