

独立行政法人国際協力機構

ブータン王国

ブータン国園芸作物研究開発・普及支援プロジェクト

技術協力プロジェクト事業完了報告書

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1. プロジェクト概要

1) プロジェクト名

(和) 園芸作物研究開発・普及支援プロジェクト

(英) Horticulture Research and Development Project (HRDP)

2) プロジェクト実施期間

2010年3月21日～2015年3月20日(5か年)

3) ブータン側関係機関

責任機関: ブータン王国農林業省農業局

(Department of Agriculture, Ministry of Agriculture and Forests; DOA/MoAF)

実施機関: 農林省農業局ウエンカル再生可能天然資源研究開発センター

(Wengkhar Renewable Natural Resource Research and Development Center
; RNR-RDC Wengkhar)

協力機関: モンガル県、ルンチ県、タシガン県、タシヤンツェ県、ペマガッツエル県

サンドルupp・ジョンカール県、農業官・郡農業普及員

(Dzongkhag Agricultural Office; DAO)

国立種子センター

(National Seed Center; NSC)

東部地域農業マーケティング・協同組合事務所

(Regional Agricultural Marketing Service and Cooperative; RAMCO)

対象地域¹: モンガル県、ルンチ県、タシガン県、タシヤンツェ県、ペマガッツエル県

サンドルupp・ジョンカール県

4) プロジェクト計画²

(1) 上位目標

対象地域の収入源として、園芸農業の普及が進む。

(2) プロジェクト目標

プロジェクトで研修を受けた農家と普及活動による受益農家が、園芸農業の商業化に向けた適正技術を実践する。

(3) 成果

1- 対象地域において、生産と販売の可能性をふまえた園芸農業の技術と作物が特定される。

2- ウエンカルセンターにおいて、園芸農業に関する技術研修の実施体制が強化される。

3- ウエンカルセンター、種苗生産農家、国立種子センター(NSC)タシ・ヤンツェ種子生産農場において、種苗の提供体制が確立される。

¹ 別添「HRDP プロジェクト対象地図」

² PDM Ver. 5 (2014年11月25日)。別添「PDMの変遷」

- 4- 東部地域農業マーケティング・協同組合事務所の協力のもと、マーケティング活動を行うグループが形成あるいは活性化される。

(4) 活動

- 1-1 AREP³、1郡3品運動、持続可能な土地管理プロジェクト、その他関連事業の成果を踏まえ、標高（海拔 600～2000m）に適した園芸作物を特定する
- 1-2 農業生産環境地帯に応じた園芸農業の技術および作物を開発する
- 2-1 ウェンカルセンターで実施されてきた研修をレビューする
- 2-2 普及員と農家を対象とした園芸農業研修の計画と教材を作成する
- 2-3 ウェンカルセンターおよびプロジェクト対象地域において、技術研修を実施する
- 2-4 農民間普及を促進する
- 3-1 ウェンカルセンターにおいて、種苗の生産体制を構築する
- 3-2 商業化に向けて、民間の種苗生産体制を構築し、強化する
- 3-3 NSC タシ・ヤンツェ種子生産農場を再整備する
- 4.1 調査結果を踏まえ、マーケティング活動を試行するサイトおよび作物を特定する
- 4.2 特定されたサイトにおいて、農家グループ/組合を活性化し、その組織を通じたマーケティング活動を試行する

(5) 投入実績⁴

① 日本側

・専門家

長期； チーフアドバイザー/園芸 1人 (60M/M)

業務調整/農家組織専門家延べ 2人 (54M/M)

短期； 研修/普及 6人 (18M/M)、病虫害 2人 (5M/M)、園芸栽培振興 2人 (6M/M)

- ・ローカルコスト負担： 3500万円（運転手・圃場季節作業員給与、研修費、農業用資機材、普及資材、試験・研究用備品など）
- ・機材供与： 5361万円（車両、掘削機、耕運機、農業用資材、電気柵など）
- ・研修員受入： 53人（本邦研修 14人、ネパール第3国研修 39人）

② ブータン側：

- ・カウンターパート (C/P)： 累計 37人（2015年3月；28名、内 WengkharRDC26名）
- ・ローカルコスト負担： 6440万ニュルタム
（カウンターパート等人件費、出張費、農業用資機材等）
- ・施設・設備： ウェンカルセンター内にプロジェクト事務所と研修圃場の提供。

³ 東部2県農業生産技術開発・普及支援計画プロジェクト (Agriculture Research and Extension Support Project in Lhuntse and Mongar)

⁴ 別添「List of Input HRDP; (Terminal) 150314」

2. プロジェクトの要約

1) ブータン国農業生産の現状

ブータン経済に占める農業分野の割合は年々減少傾向にあるが、農業就業人口は約60%と依然高く、第11次5ヵ年計画（20013-2018）においても農業振興は最重要開発課題に位置付けられている。営農形態はパロ、ティンプーを中心とする西部および南部地域の一部の果樹生産、稲作栽培を除くと典型的な自給自足農業である。

西部や南部地域の丘陵地は比較的なだらかで、一筆当りの面積は大きく、米やリンゴ・柑橘・工芸作物（生姜・カーダモンなど）の他、畜産・養魚が行われている。単位面積当たりの収量は比較的高く、また、日本などの支援（無償・技協）により農業機械化が進んできている。

東部地域の地形は丘陵地から急傾斜を一気に河川に下るため、扇状耕作地は少なく、農耕地は丘陵斜面の畑が多い。農家の耕作一筆面積は小さく、水田は数アールの段水田であり、灌漑施設整備もそれほど進んでおらず、多くは天水耕作となっている。このような状況から機械化農業の推進は難しい。栽培作物は比較的水の豊かな地域の稲作を除くとメイズやソバ・ジャガイモなどの雑穀食用畑作物の割合が大きく、伝統的な焼畑農業は減少したものの旧態依然の粗放農業が行われている。

近年、ブータン政府は、東部地域における換金作物の導入による収入向上を図り、西部地域との経済格差是正、都市部への人口流失を抑制する農業政策を打ち出し、同地域の開発に乗り出しているが、地形・地理的・気候・気象・土壌の肥沃度など物理的な緒問題とともに、東部住民のおおらかな性格から農業生産に関わる技術・技能の移転・向上には多くの課題が指摘される。

道路開発は急速に進んでおり、ほぼ全郡の郡役所（Geog Center）までは道路が通じ、ここ数年で道路の質はともかく多くの山村まで農道が整備されつつある。

こうした山岳国における換金農産物は、主に米、園芸作物、畜産品である。

米は需要・貯蔵性・輸送性・栽培の容易さ、更に稲わらに至るまでの利用性があり、主要穀作物である。優良品種の導入、育苗から肥培、水管理を徹底することで、増収を図ることはそれほど難しくない。

畜産業は、宗教的な教示から殺生を忌避する傾向が年々強まってきており、乳および農耕用の役牛、産卵養鶏が主流で、養豚は減少している。乳生産、養鶏共に生産性を高めるには高栄養飼料が重要であるが、濃厚飼料は殆どインドからの輸入であり年々価格が上昇し採算を圧迫している。牛は粗放的な放牧／繋牧であり、特に乳生産において急がれるのは良質な牧草の生産確保であるが、乾期（冬季）の厳しい乾燥と低温化では冬季の飼料草の生産確保は至難の業となる。

園芸作物の導入は、他の一次産業に等しい困難があるものの、インド・バングラデシュなど人口の多い近隣国にはない高地冷涼気候を活かした園芸作物による開発は可能である。但し、園芸作物の生産物は品質を求められることから、良質な生産を行うため

には、土壌改良を含めたある程度の継続管理と栽培技術が求められる。本プロジェクトはその課題解決に取り組む技術協力であった。

2) プロジェクトが目指した技術協力

山岳国のブータン農業、特に園芸における優位性は、近隣国にはない高地故の冷涼気候を利用することであるが、先に記したように自然環境的・物理的な困難も存在する。プロジェクトの実施・運営には、丘陵地農業の優位性と困難性を見極めつつ事業計画を立て、主に次の5項目を念頭に事業を実施した。

- (1) C/P や普及員への技術・技能移転を通じ、彼らが仕事への興味・面白さを認識し、そのセンスを身に付ける。
- (2) 技術的に裏付けられた自信を持った普及指導によって農家からの信頼を得、かつ彼らの普及リスクを軽減する。
- (3) 魅力（収入）ある園芸農業による地方農村の活性化と若い農業後継者の育成を図る。
- (4) 近隣国と競合せず、輸送性に富む園芸作物・品種を開発・選定、種苗を生産する。
- (5) 農家で適用／栽培可能な普及素材を提示・提供する。

対象地域の園芸作物生産環境・適地性を把握することは事業を進める上での要である。東部6県の地理的な特徴は、標高200mから2200mの格差、地形・斜面の向きや河川沿いにより異なる微気象、降雨量や霧の発生状況、更に土壌の肥沃度、病虫害、農家の意欲などの生産環境をよく理解し、それらに見合った園芸作物・品種を選定し、農家に提示・普及する必要があった。

HRDPはAREPの後続プロジェクトであり、暖温帯性のウエンカルセンター（標高1700m）、温帯性気候のカンマ（Khangma；標高2100m）、亜熱帯のリミタン（Lingmithang；標高700m）サブセンターにAREPが導入した各園芸作物・品種が結実期を迎え、異なる生産環境への適正作物選定に十分なデータの活用が可能であった。

プロジェクトの成否あるいは円滑な運営はJICA専門家とC/P他相手側関係者の相互の信頼関係の如何に掛かっている。要は人であり、研究員、普及員、農家との関わり合いを重視して進めてきた。

C/Pへの技術移転は、主にセンター圃場業務・普及現場での協働を通じ、更に一人ひとりに担当作物・県を持たせ、責任の明確化、自主性の醸成に努めた。

また、啓発の観点から、域内農家への園芸作物普及と共に、野菜・果実品評会を各県持ち回りで開催。農家グループの生産物販売所設立。生産環境の近似性があるネパールでのC/P・普及員らの視察研修を実施してきた。

こうした手法の目的は、技術の移転を行うと共に、彼らの興味・自信をより向上させ、信頼の醸成を高めることにある。技術・自信・相互信頼を高めることは、活動の現場においてアイデアの創出に繋がり、技術の応用を可能にする。実際に農家へ普及する園芸

作物の栽培管理技術は、彼らに受け入れられ易い技術や現地資材の利用に絞り込む必要があるため、応用技術の模索は極めて重要となる。

ブータンでは無償教育制度の充実により、児童生徒のほぼ全てが基礎教育を受けるようになって久しく、高等教育に進む者も年々増加しているが、高学歴化に伴って農業などの肉体労働より楽な仕事を求める若者の都会への流失が続き、農村によっては村行事や農耕の維持が難しくなっている。その一方で、修了試験の可否や家庭の事情などにより中高等教育進級を諦めざるを得ない者も少なくないことから、プロジェクトではこうした若い農業後継者にフォーカスして園芸作物栽培を奨励してきた。

前プロジェクトから継続した亜熱帯から温帯性の高地までの園芸作物選定を経て、実際に普及する素材の育成を行う必要がある。センター圃場での野菜種子、果樹苗木生産体制は整備したが限界（生産可能な苗木は1万本程度まで）があるため、野菜種子生産農家・苗木生産農家を研修し委託生産を開始した。

3. 活動実績／成果⁵

プロジェクト目標：プロジェクトで研修を受けた農家と普及活動による受益農家が、園芸農業の商業化に向けた適正技術を実践する。

東部6県で753農家がプロジェクトによる直接・間接の研修を受けて計14,549本、261農家が苗木提供を受けて計6988本の果樹を植栽⁶。殆どの農家で野菜の樹間栽培を開始。更に、種苗生産農家14、苗木生産農家8が良質な種苗生産・販売を行なっている。多くの果樹は結実期に至っていないが一部収穫を得ている農家も出始めている

成果1：対象地域において、生産と販売の可能性をふまえた園芸農業の技術と作物が特定される。

AREP以前から継続した試作試験結果や農家の栽培難易度を重視する他、貯蔵・輸送性、市場性等の適正を検討し、奨励園芸作物・品種を選抜した。

1) 適正果樹の選抜⁷

果樹の奨励作物及び品種は、標高1000m以下の亜熱帯、1000m～1500mの暖帯気候及び1600m～2200mの暖温帯気候の3生産環境帯を対象とした適正作物・品種の確定を行った。

① 柑橘

・文旦

果実肥大・糖度・クエン酸のバランスに優れた2系統(R2-P9、R3-P4)、交配樹として1系統(R4-P5)を選抜し奨励品種とした。文旦はこれまでのところ、グーリーニング病に抵抗性があるとみられ発病はない。またミバエの被害を受けていないことから、亜熱帯域に適した果樹として期待される。

・在来マンダリン

全国の柑橘産地から200系統の果実を収集分析し、その中から比較的優良と思われる系統を選定し、センター圃場の同一条件下で植栽試験を行った。また、同時にネパール園芸で選抜した1系統を植栽した。

ネパール園芸で選抜し種子導入したTarku、Mongar県Kengkhar3系を奨励品種とし、今後の穂木採取用に植栽。Tarkuはブ国の品種登録を申請した。

⁵ 別添「Plan of Operation Progress; (Terminal) 150314」「Implementation Process (Terminal) 150314」「Project Progress (Terminal) 150314」

⁶ 別添「Database of Orchards Development in Mongar, Lhuntshe, Trashigang, Trashiyangtse, Pema Gatshel, Samdrup Jongkhar Dzongkhag」

⁷ 別添「Fruit Orchard Map 2015」

・中山間地奨励カンキツ

低標高地域に発病するグリーンング病の影響を受けない中山間地（標高 1400－1700m）の柑橘品種として期待され、比較的寒さに強いと思われる約 20 品種の試作試験結果から、吉田ポンカン・太田ポンカン・大津 4 号・クレメンティンの 4 品種を奨励品種として選抜し、品種登録を申請した。

② 落葉果樹

・ナシ

12 品種の試作結果から、比較的病虫害に強く、果肉硬度があり、貯蔵性に富み、輸送性があることなどを重視し、早生種を中心に、八雲・名月・長十郎・豊水の 4 品種を普及奨励品種として確定した。早生種はミバエが幼虫になる前の産卵間もなく収穫するため、果実の被害はほとんど見られない。

・柿

甘柿 8 品種から早生系（次郎）、晩生系（富有）、交配樹（禅寺丸）の 3 品種を奨励品種として確定した。交配樹品種の禅寺丸種は、甘柿としても用いられる。柿は比較的適地も広く、ウェンカルンカルセンターや AREP で普及した農家での柿栽培は全て無農薬栽培で、豊富な日照量を得て、良質な柿生産が行われており、今後東部地域の有望樹種としている。

・キウイ

早生系 1 品種（W.Yellow）、晩成系 1 品種（W.Green）および交配樹♂を選抜した。

キウイは柿と共に東部の丘陵地帯に最も適している果樹であり、病虫害に強く無農薬で栽培が可能で、栽培適地も広い。また貯蔵・輸送性に優れるが、平棚を作る必要があることと、整枝・剪定を行うことが必須となるため、これまで園芸作物栽培を行ってきた中規模以上の農家に普及したい果樹である。

・クルミ

クルミは粗放栽培に耐えることから、農林省は過去数十年に渡って東部へのクルミ植栽を進めてきた。ただ母樹選定を行っていなかったため、殻の軟らかい品種（soft shell）14 品種を試作し、2 品種の優良系統選抜を行った。

・ローカル市場・自家消費果樹：モモ、スモモ

桃の B.Cream・倉岳品種、スモモは HoneyRosa・Soldum・大石早生を近場市場の果樹奨励品種とした。

市場へのアクセスや梱包資材が整わない現状にあっては、栽培適地であっても貯蔵・輸送性に劣る果実は、近郊市場及び自家消費樹種となることから、苗木生産は限定的に行うこととし、モモやスモモは在来モモに高接ぎし、品種更新を行っている。

③ その他の果実・果菜

果樹ではないが果物として、スイカやインド種メロンは低標高の亜熱帯気候で良質の生産が可能である。玉ネギ同様に、水田裏作物としての普及素材価値は高い。メロンは暖温帯域までの栽培が出来ることを確認した。また同標高帯の適正果樹としてアボカドを試作し、3系統を選抜した。

④ 果樹台木類の選抜

・カンキツ台木

基本的に USDA 強勢カラタチを用いるが、土壌条件の良くない農家畑では Ranpur Lime もしくは実生樹とし、樹勢を強くする。Troyer citrange 台木は雨季期間が長く、水分過多土壌となるブータンでは不向きである。

・ナシ台木

在来豆ナシを利用する。カキの台木は、日本種の2系統、ネパール1系統を用いる。在来渋柿の台木利用も可能であるが、未熟種子・不稔種子が多く、発芽率が極めて悪く、台木の大量育成は難しい。

・キウイ台木

キウイ果実の種子を用いる。在来サルナシ種子台木は親和性があり台木として利用出来るが、種子が小さく生育も遅い。

・アボカド台木

アボカド実生樹果実は比較的小粒果で結実数が多く、台木種子として用いる。在来マンゴー台木と同様に考えてよい。

2) 奨励野菜の試作

① 冬季野菜

気象的に冬季野菜が栽培に適し、山間地の冷涼気候を活用した夏場生産が可能で、また近隣国の生産量は少なく、端境期野菜となり競合しない園芸作物となる。国内の異なる標高と気候を利用することによって、6月頃から生産が始まり翌年3月までの生産が可能である。

地場消費としては、高菜、からし菜、ハウレンソウ、ブロッコリ、九条葉ネギなどの葉物野菜。遠隔都市部や近隣国への輸出の可能性もある貯蔵・輸送性に富む野菜は、キャベツ・カリフラワー・大根・人参・えんどう豆・玉ネギなどとなり、それほど種類は多くない。

既に、これらの野菜栽培が行われており、販売量も徐々に増加している。また、種子生産は種子農家を育成し、委託生産が行われている。

② 夏季野菜

乾季（冬季）後半から雨季の初め（3月～6月）は冬季野菜生産が難しいため、夏野菜を以って補うこととし、トウガラシ・カボチャ・ズキニ・ナス・キュウリ・ピーマン・トマト・インゲン等の試作栽培を行ってきた。

特にトウガラシの消費量は多く、多種多様であることから、在来品種からの選抜を行った結果、Yangtsepa 品種が収量、嗜好も良い。雨季のトマト価格が高いこともあって、トマトは10品種の試作を行ったが、7月以降の生産は立ち枯れ病や尻腐れ病の発生で難しい。ズキニは比較的低温でも栽培が容易であるが、ブータンでは嗜好性に劣る。作り易さ、輸送性を優先しての選抜では、カボチャ・インゲンなどに優位性があり、つるなしインゲンや大豆は果樹の間混作としても奨励している。

3) ミバエのモニタリング・防除試行⁸

近年、温暖化に伴いミバエの発生地域が広がり、柑橘のみならず栽培標高の高いナシ・柿などでも被害を受けるようになってきている。このため、当初計画にはなかったが、2012年・2013年に病虫害の短期専門家を派遣、発生状況のモニタリングを実施。これまで8種のミバエを同定、2種が未同定で新種の可能性がある。更に、モンゴル県・ルンチ県の9カ所で誘引殺虫・被害果実の収集埋設による被害軽減を試行し、モニタリングを継続している。

対象地域には野生のアボガドやグワバなど寄生樹も多く、またインド・バングラデシュと陸続きでもありであることから、ミバエの根絶は至難であり、その防除対策には国を挙げての対応が求められる。

成果2. ウェンカルセンターにおいて、園芸農業に関する技術研修の実施体制が強化される。

AREP で実施した研修を見直し・修正。各種マニュアル・ハンドブック等を作成・更新⁹するとともに、以下の研修¹⁰を実施した。

1) 研究員・普及員研修

① 園芸作物栽培研修

主に新卒採用の全国の RNR-RDC 研究員補、県普及員を対象に、毎年3日間の果樹を中心とした栽培技術研修。計79名を研修した。

② ネパール視察研修

⁸ 別添「identified_14_fruit_flies_to_bhutan_20131225」

⁹ 別添「List of extension materials developed by the project」

¹⁰ 別添「List of Training Course conducted by HRDP」

生産環境の近似性があるネパールにおいて、1985～1999年にかけて実施したネパール園芸開発計画プロジェクトの成果が広く波及していることから、先進事例視察研修として、C/P・普及員を毎年7・8名選抜し、約1週間、計31名を研修した。

2) 農家研修

対象作物・普及形態により以下の研修を実施。

① 温帯果樹展示農家

比較的高度な栽培管理を要することから、①導入（啓発）、②定植・樹体管理、③摘果、④収穫／果実処理と、実際の栽培管理のタイミングに合わせて、実技を中心に総日数14～16日／年となるシリーズ研修を実施。併せて樹体管理用の剪定鋏・鋸などの農具も提供。途中で脱落する農家もあるが、最も集中的な実技研修となる10日間の定植・樹体管理研修を終え、プロジェクトチームによる現地定植指導を受けて植付けに至った農家は151となった。

② 柑橘団地農家研修

柑橘は域内でも早くから栽培されているが、在来品種が中心で粗放的な栽培となっていることから、2年次より各県1村を選択し、推奨品種を普及し団地としての産地化を図る。植付け前に2～3日間の定植・樹体管理研修を実施。対象農家が多くなるため、ウェンカルセンターで各団地4～5名を研修。残る農家は研修農家が伝える農家間研修を実施。センター研修受講者は94名、農家間研修、更にプロジェクトチームによる現地定植指導を受けて植えた農家は382となる。

③ 梨・柿団地農家研修

AERP・HRDPの温帯果樹展示農家の一部で収穫を得るようになり、周辺農家の栽培希望も増えてきたことから、4年次より梨・柿団地の形成を開始。

3年次はタシガン県の1村21農家を対象に、内4名を温帯果樹展示農家研修に加え、残る農家は研修農家が伝える農家間研修を実施。4年次はタシヤンツェ県1村12農家、ルンチ県1村7農家を対象に、周辺の優良展示農家をリソースとしてプロジェクトチームが指導しつつ定植・樹体管理研修を実施した。

④ 野菜種子・果樹苗木生産農家研修

園芸作物の普及に伴い増加する域内の種子需要に応えるため、これまでの普及農家から特に優良な農家を選抜し、種子・苗木生産農家を育成。

種子生産農家は毎年同農家を対象に2～3日間研修を実施し、前年の栽培を振り返り、良質な種子生産のため技術の改良・向上を図るとともに、次年度の栽培計画、更に3年次からは営農簿記研修を加えた。苗木生産農家は戸別現地指導を行うとともに、一部は温帯果樹展示農家研修に加えた。数年かけて優良農家を絞り込み、現在は14種子生産農家、8苗木生産農家が比較的良質な種苗生産を行なっている。

⑤ 野菜栽培研修

ウエンカルセンターで行う各種果樹栽培研修の一環で樹間栽培向けの野菜種子を配布し研修を行う他、玉ねぎ団地では育苗・定植・収穫時に各地で20名前後の1日研修を実施。¹¹総対象農家は318となった。

⑥ 園芸作物品評・競技会

良質な園芸作物を一般に紹介するとともに優良農家の意欲を更に醸成する目的で毎年建国記念日に各県持ち回りで野菜・果物の品評・競技会を開催。

一般に農産物は品質は考慮されず重量単価で売買されるため、品質に対する意識の低い普及員および農家に、出典農産物の準備（収穫後処理）、評価の視点（色・形・サイズ・熟度・締まり）などを説明・指導。1～4年次で総計213名が参加。5年次に開催を予定していたモンゴル県は独自に開催した。

⑦ 農産物加工講習

モンゴル県2、サンドロップ・ジョンカール県1の農家婦人グループおよび郡担当普及員、総計59名を対象に、プラムジャム・金柑ネクター等の加工研修を実施。

成果3. ウエンカルセンター、種苗生産農家、国立種子センター（NSC）タシ・ヤンツェ種子生産農場において、種苗の提供体制が確立される。

成果1. で選抜した推奨野菜・果樹を中心に野菜母種子、果樹台木用種子・台木・苗木・穂木などを生産し、農家に普及する他、一部は王室・他RNR-RDC・NSCなどにも供給された。

① ウエンカルセンター圃場

種苗生産は野菜母種子85/Kg/年、果樹苗木8500本/年程度まで拡大し、今後とも適切な管理と労力を集中すれば野菜種子100Kg/年、果樹苗木10,000本/年程度の生産は可能と思われる。

② NSCタシ・ヤンツェ種子生産農場

圃場拡張・農道・かん水施設整備などを行い、NSCに移管。更に梨・桃など温帯果樹を栽植。野菜母種子、果樹台木用種子の提供、栽培指導を行ったが、同農場には栽培技術を有する管理者が居らず、また作業員も定着せず頻りに増減しており、安定的に良質な園芸作物の種苗生産・供給を行う体制には至っていない。

③ 種苗生産農家

¹¹ 別添、「List of Training Course conducted by HRDP」

成果 2. ④を通じて育成。研修の他、母種子・台木種子の他、灌水ホース、防鳥用の蚊帳、パッキングシーラー、ラベルなどの生産資材を支援している。(パッケージ容器は3年次より農家負担)。種苗生産は高度な栽培管理技術を要するため、脱落する農家もあるが数年かけて優良農家を絞り込み、プロジェクト終了時点で一定の技量・品質を保つと評価される農家は種子生産農家 14、苗木生産農家 8¹²であり、これら農家の種苗は県農業普及局などが買い上げ農家に普及する他、一部はウェンカルセンターでも買い上げている。また、一部農家とは NSC が委託栽培契約を結び始めている。

④ 他の RNR - RDC、NSC パロ本場

毎年、要望に応じて果樹台木用種子・穂木などの提供を行っているが、それぞれ専従スタッフと圃場を有しており、自立的な生産継続のためには自ら台木・穂木用の母樹を育成・栽培することが望まれる。

成果 4¹³. 東部地域農業マーケティング・協同組合事務所の協力のもと、マーケティング活動を行うグループが形成あるいは活性化される。

① 農家グループ共同販売所 (OSFS)

RAMCO・DAO と連携し、サンドロップ・ジョンカール県オロン郡の野菜生産グループを対象に共同販売所を設置。

国道沿い用地を県より無償で借用し、建築資材および大工・左官など熟練工賃金をプロジェクトで支援。建設に係る役務を農家グループが行う協同事業として建設。併せて、パッキング・値決め・陳列・販売・会計管理等の研修を行った。

グループ運営で営業を開始したが、利害調整でグループ内の軋轢が生じ、プロジェクト終了時点ではグループの女性 2 名が施設を借上げ、農家からの農産物の購買を行う個人営業方式となっている。販売所の売り上げは季節により変動があるが、月当たり 4 万 Nu (約 8 万円) 前後で推移し、月 1 万 Nu 以上の収入を得ている農家もある。

RAMCO が MAGIP 等を通じて設置している共同販売所も全て店貸し営業方式となっているが、個人主義意識が強く、金銭にともなう軋轢が生じ易い状況では真のグループ営業の定着は容易ではなく、更なる啓発・工夫と試行が必要である。

② High-end マーケット開拓

世界中で超高級リゾートを展開する Aman Resorts グループで、国内 5 カ所のリゾートを運営する Amankora への野菜・果実販売を模索。Amankora 側からは購入したいとの要望を受け、High-end マーケットの需要・販売の可能性を確認した。

但し、農家側は学校給食向け契約栽培で余力がないとのことで具体的な販売には至っていない。当初関心を示していた農家の姿勢後退は、計画栽培・規格統一・梱包などの面倒を敬遠したものと推測される。

¹² 別添「List of Private Nurseries and Vegetable seed growers established by the Project」

¹³ 2012 年 10 月の中間評価を経て PDM (V. 4) で新たに設定。別添「PDM の変遷」

③ 大消費地（ティンブー）マーケット開拓

ウェンカルセンターの野菜・果物をティンブーの B-Coop で試行販売。主都でも農林省関係を中心とする公務員や在留邦人などに「ウェンカル農産物」はブランドとして認知され始めており販売は良好であった。

東部から首都への輸送には2～3日間の時間と費用を要し、西部・西南部とは価格・鮮度面で競争力が劣るが、他地域との産地競合が少なく、比較的価格が高く、且つ日持ちが良く傷み難い作物として、梨・柿・キウイ・メロンなど果物類。野菜ではカボチャ（日本種系）・ズッキーニ・白菜などが有望と思われる。

④加工食品生産

3農家婦人グループを対象にプラムジャム・金柑ネクター等の加工研修を実施。製品は域内および一部はティンブーでも販売された。

プロジェクトでの取り組みは試行に留まったが、これらの加工食品は保存・輸送性が高く、研修したグループの関心も高い。一部グループは Wengkharr RNR-RDC より原料の提供を受けて生産・販売を継続しており、農家に普及したプラム・金柑が今後収穫可能となれば、商業的生産ベースに乗るものと思われる。

⑤農家簿記研修

経営意識が比較的高いとされる種子農家を対象に簡易な営農・会計簿記を作成し研修を行ったが、農家の多くは識字が困難であり、簿記を実践したのは14農家中4農家に留まった。

関係機関が実施する類似の研修は知識偏重で、指導者が国内外の研修等で修得した知識・様式をそのまま導入することが多いが、自らの氏名も書けない者が多い農家への簿記普及には更なる簡便化の工夫と識字教育を含む長期的な取り組みが必要となる。

4. プロジェクトの実施運営上の課題とそれを克服するための工夫、教訓

1) 実施関係機関の課題と取り組み・工夫

ブ国農林省は2010年、全国に西部、中西部、中部、東部の4ヶ所にあったRNR-RC(Research Center)を南部に1ヶ所加え、またRCをRDC(Research Development Center)と改名し、試験研究センターからも普及活動を行えるようにした。これはAREP時に試験研究職員の普及活動が制限されていたため、AREPより農林省に申し入れを行っていたことによる。

他方、当初から懸念していた農業普及所(DAO)の指示系統は、現在も県知事の管轄下であり、RDCとDAOが一体化した普及体制には至っていない。

相応の知識や意欲があっても出しゃばらないことへの美德があるとされる慣習的な影響もあり、多くの公務員は指示待ち、受け身の態勢を取っているように見受けられる。出る杭は打たれる上意下達社会であり、自身の創意工夫を積極的に提案し難い環境も政府事業の効率性・有効性を阻害している一要因と考える。

プロジェクト開始から1年間は、研究職が長く普及に関心の薄い前P.Dが異動になっていたにも関わらずウェンカルセンターに居座り続けたため、計画に沿った活動の制約を受けていた。後任P.Dは普及出身でAREPからのC/Pでもあり、プロジェクトの目指す目的・成果と活動に理解があり積極的な業務活動が可能になった。

ウェンカルセンターは、標高1620m~1750mの北西斜面に位置し、ブータン農業の平均標高に近い。また野菜栽培やその種子生産、暖温帯果樹(ナシ・カキ・キウイなど)や在来柑橘を除く導入カンキツの栽培適地である。低温に抵抗性のないカンキツグリーンニング病媒介昆虫キジラミは生息できず同病の発病の恐れはなく、それらの苗木生産にはやや低温で生育は遅いものの育苗が可能なることもあり、標高・耕地の向きや気候的などの諸条件は5RNR-RDCの中でも最も園芸作物の栽培環境に恵まれていると言える。

ただ、耕土は浅く、礫を含み肥沃土でないため、掘削機による深耕が必要であった。肥沃化には、年2~3回の草刈り取りや放牧地からの家畜糞の収集による堆肥作りを進め、近年は少しずつ肥沃化しつつある。

2) 事業・技術分野の現状と課題、取り組み・工夫

西部や南部にはリンゴ、カンキツといった換金果樹があり、また比較的商業的な野菜の生産も行われているが、東部地域においては、一部の南部地域の柑橘を除くと、目立つ果樹栽培は行われず、野菜栽培も自給程度でその生産は限定的であった。市場規模が小さく、大消費地への輸送に不利な遠隔地であるため、農家の生産意欲・意識の向上が進まなかったためと推測される。

南部地域は在来柑橘、西部や南部にはリンゴ、カンキツといった換金果樹があるが、カンキツグリーンング病の蔓延、ミバエやウリミバエの被害は甚大であり、有機農業を標榜するには、こうした多くの問題を一つずつクリアしていかなければならない。

一般的に東部地域の耕作地は肥沃な場所が少なく。雑穀類と自給的な野菜を主に栽培してきた農家の多くは、果樹も胡桃や野生樹木と同じ概念があり、耕作していない荒地に適当に植えておけば何れ大きくなるといった認識が根強い。

ブータンのスローガンとも言える有機農業は、自然環境に依存しつつ最小限の管理を行う粗放栽培の上に立っており、何も栽培管理をしないことそのものが有機農業の名に置き換えられているように伺える。

こうした現状や問題をみると、従前の自給的粗放栽培が最も適した農耕ということになるが、それでは商業的への移行は進まない。まずは全ての農家を均等に対象とするのではなく、現状変革への意欲があって、栽培適地の農家にフォーカスし換金作物の導入を進めることが必要と思われる。

プロジェクトでは、特に果樹の導入に当っては、啓発の意味からも農家には果実の試食を必ず行うようにし、実感・嗜好性を確認し、栽培意思の有無を確かめ、農家圃場に出向き最も肥沃地に植えつけるように指導、Layoutを行い、苗木の配布に時には植穴の確認を行うことにより、導入果樹の定着に務めた。

3) 目標達成度および効率性・インパクト(有効性)・妥当性・自立発展性を高める工夫・教訓

プロジェクト終了時評価は2014年11月に行われており、活動にあたる当事者が改めて事業評価をするものではないが、以下のように考察する。

① 目標達成度

「研修・普及した農家が園芸農業の商業化に向けた適正技術を実践する」とするプロジェクト目標からみれば、研修した果樹展示農家の全てにおいて植付けが行われ、AREPでの普及農家を含めて一部の果樹は結実期を迎えている。また果樹農家らが間混作する野菜や、種子生産委託農家による種子が同農家および県普及所等を通じて域内農家に波及し生産・販売が始まっており、概ね目標達成をしている。

ただし、何れの地域・農家でも、園芸作物栽培は比較的肥沃地でかん水を得られるなどの好条件が前提となり、飛躍的な生産拡大は難しい。また、栽培技術や生産物の質という視点からは、未だ多くの課題を残している。

「園芸作物が対象地域において収入源として定着する」とするプロジェクト上位目標の達成には、普及した果樹の多くが結実期に至っておらず、なお時間を要するが、徐々

に園芸作物の栽培面積が広がりを見せており、栽培条件の良い農家や市場に近い地域では、今後のポストプロジェクトの継続もあり、ある程度達成されると思われる。

なお、2014年末に、1985～1999年にかけて実施したネパール園芸開発計画のその後を見学したところ、相手側実施期間の果樹苗木販売日には苗木を求めて数百人が列をなし、整理券を配り販売していた。既にオレンジの輸出・加工を始めた農家グループも現れ、またナシ、甘柿、キウイが豊富に市場に出回っていた。農家の生産意欲が高く、市場も比較的大きいネパールであってもプロジェクトの成果が拡大・波及に20年以上の時を必要としたことを考えれば、ブータンでの園芸作物の定着、生産拡大には数十年単位の期間が必要と思われる。

② 効率性

HRDPでは、AREPによる実施機関の体制・施設整備がある程度進み、PDや主任研究員など主要なC/PもAREPから継続し、普及員や農家への周知も進んでいることから比較的スムーズにプロジェクト活動を進めることが出来た。

● クライテリアに沿った農家選定と集中的な研修・普及

これまでのブータン政府・ドナーによる園芸普及は、種苗配布のみ、あるいは種苗配布と簡単な説明で実施されていたが、環境に適さない作物／品種の導入や農家の理解・管理不足等により多くの果樹は枯死し残存していない。

プロジェクトでは、特に永年作物で幼木期の管理が重要となる果樹展示農家の普及・研修では、地形・自然環境・交通アクセス等の立地条件、農家の圃場と意欲などのクライテリアに沿って選定した農家を対象に、①導入・啓発、②定植および冬季の樹体管理、③摘果、④収穫／果実処理と、実際の栽培管理にかかる実技中心の研修を段階・季節に応じて年4回実施し、更に栽培管理状況の確認フォローアップを行うことで、農家の意欲を喚起し、実際の栽培を促進した。

受益農家を数的に見れば効率性は低いものの、概述のような現状を踏まえれば、結果的に有効性・持続性を高める効率的なアプローチであると考ええる。

● 実際の栽培管理作業を通じたカウンターパートへの技術移転

センターにおける実際の栽培管理を通じた技術・技能移転は、多様な園芸作物の栽培管理、種苗生産、収穫物の評価など多岐に渡る。普及材料である種苗生産だけでも中期的な計画に基づき、台木種子生産から育苗・接ぎ木、更には資材の竹育成まで含めて数年間に渡る業務となり、年間を通して複数の業務を同時並行的に進めることになる。

これらのセンター圃場作業に加えて、各種研修や普及業務があり、C/Pは常に忙しい状態になるが、C/Pと協働することでC/Pを活性化し、自主性を醸成した。

こうした活動を通じた技術移転は対象人数が限られ時間を要するが、多様な園芸作物を、理論でなく実践的な技術を通じて農家に指導・普及活動を担う人材を育成するには、このようなアプローチが有効・効率的であると考えられる。

なお、農家への普及に当っては、各県毎に担当 C/P を任命し、責任を持って計画、普及活動を進めることで効率的な展開ができたが、作物の担当指名では C/P らの異動や新配属職員の知識・経験不足から、困難な面があった。

③ インパクト（有効性）

AERP で導入・普及した果樹は結実期を迎え、モンガルを中心に市場の野菜は品揃え、量ともに格段に増加し、園芸作物が新たな収入源となりつつあることを域内農家も認知し始めており、種苗の希望者は年々増加している。また、プロジェクトの農産物はウェンカルブランドとして定着し、地域住民や県・農林省関係者に留まらず王室・政府要人からも信頼を得るまでに至っている。

プロジェクトが実施した実技中心の農家研修（Hand on Practice）と普及材料の組み合わせによる普及手法（Systematic Training / Out-reach Extension）を、農林省は他の全 RDC にも導入することを決定。また IFAD や世銀プロジェクトにおいてもその手法を取り入れ始めており、プロジェクトのインパクトは東部 6 県に留まらず、全国的に波及しつつある。

プロジェクトの評価が高まるにつれ、メディアでも取り上げられる機会が多くなり、全国規模で JICA の農業プロジェクトとして周知されるようになってきた。

また、プロジェクト後半には 4 代前国王、5 代国王、首相、各大臣ら要人のセンター訪問が相次いだ。2014 年の National day では、これまでなかった優良農家への叙勲が行われ、叙勲した大半の農家はプロジェクトが研修・巡回指導した農家であった。これは王室を始め政府が農業開発の重要性とともに、そこで果たした JICA 技術協力プロジェクトの有効性を高く評価している査証でもありと考える。

④ 妥当性

ブータンの換金性換金作物による所得の向上、食料自給率向上を目的とした農業開発において、主要な産業・作物は、米であり畜産業、園芸作物及び工芸作物と考えられる。前述のように米、畜産は現状維持の域から改良を促すことは困難な状況にある。また工芸作物には、南部のコーヒーやカードモンなどが考えられるものの、近隣諸国に比べて非常に高い労働賃金、にも関わらず肉体労働を敬遠する若年層を中心とする農村からの人口流出に伴う労働者不足により、建築や土木現場で多くの近隣国労働者を雇用している現状では、労働集約的な農業振興は難しい。

こうした中、2000 年策定の 20 年ビジョンにおいては、国土開発の重点課題は水力発電、2 番目に園芸作物の振興が謳われている。

プロジェクトが導入・普及してきた園芸作物は、山岳国ブータンの高い標高の冷涼な気候を利用した園芸作物であり、近隣国と比較してもそんな色はなく、有利性のある

作物といえる。特に東部地域のように水田耕作の少ない畑作農家に、換金性が高く、かつ国策として生産の拡大が求められる野菜や果樹の導入を図ったこと、またその技術移転をこれまでにない現場レベルでの実践的な手法で実施し、普及定着率を高めたことは整合性と妥当性が認められる。

園芸作物栽培には比較的高度な技術・技能を備える必要があることから、プロジェクトによる普及活動は一定の条件を満たす農家に対して集中的に行った。広大な東部6県から見れば普及農家・村落は点に留まる。これを特に開発の遅れている東部全域に波及するには更に長い年月を要するが、点ではあっても早い段階で換金性の高い作物・品種を導入紹介し、技術・技能の蓄積を図らねば20年30年後の園芸作物栽培に未来はなく、これからの園芸作物の定着拡大に向けた布石として極めて重要だったと考える。

⑤ 自立発展性(持続性)

個別専門家・AREP・HRDPと継続してきた技術協力によって、普及作物素材はほぼ確定し、普及手法のベースは出来ており、既に果実や野菜の生産物販売も始まっている。また、センター近隣農家を中心に、植栽希望者は年々増加してきている。しかしながら、農家の意識や取り組みを見る限り、実際には始まったばかりの感は否めず、今後20～30年の息の長い継続が求められる。

これまでの指導により、一部新任者を除くC/Pへは種苗生産から栽培管理、研修・普及手法の技術移転と蓄積は行えている。また、普及活動を通じて対象6県の生産環境の知識、普及員・農家の情報を十分に蓄積しており、現状のC/Pらが在籍する期間はある程度の活動は継続されると期待される。他方、業務(仕事)に対する認識・責任意識の醸成は、文化の改変を行うレベルほどに難しく、地道な活動継続の過程で自らの意思を更に高めることを期待する。

ウェンカルセンターは、プロジェクト終了後もセンター圃場に於ける種苗生産、農家研修・普及の継続を念頭にPost Project Strategyとして纏め、来年度以降の事業計画作成を進めている。

継続事業は主にIFAD支援による東部地域での農業開発事業である「Market Access and Growth intensification Project (MAGIP; 2011～2015年)」、その後継案件として検討されている「Comprehensive Market Focused Agriculture and Rural Livelihood Enhancement Project (CARLEP; 2016年～)」の一環として進められることになり、予算的な問題は少ないと考えられる。

ローンを中心とした協力事業は、一部グラントによる関係者の各種視察研修や外注コンサルタントによる講義等の研修はあるものの、現場での技術指導・移転は伴わず、事業計画策定から実施・予算執行はブ側関係機関に委ねることとなる。MAGIPの事例

では、縦割りの関係機関がそれぞれ計画を机上で作成し、実施の相当部分を外注、種苗や農業用資材を配布するにとどまっているが、技術的な活動を伴わない農業開発・普及事業は片肺エンジンの感が否めない。

CARLEP では HRDP のアウトリーチ手法を積極的に取り入れるとしているが、園芸作物はウェンカルセンターが現場での技術的活動（計画から栽培管理・農家普及まで）を担うエンジンとして中心的な役割を担うことが期待されており、これまで JICA が行ってきた 14 年間の技術協力の成果が大きな資産として活用されることになる。

但し、AREP・HRDP と共に活動を行ってきた経験豊富な一部 C/P の編入学や異動が予定されている。ここ数年の傾向をみると、こうした異動に伴う補充要員は何れも新卒もしくは現場経験不足な職員に取って代わりつつあり、今後 5 年単位で C/P の多くがウェンカルセンターから異動することが予想されることから、継続事業は徐々に質・量ともに縮小してゆく可能性がある。

県知事の監督下で県／郡の農業普及を担う、普及員についてもプロジェクト活動や研修を通じて技術・技能の底上げに務め、普及農家の選定、植付け後のフォローや、各県持ち回りで実施した園芸作物品評会などを通じて連携を図り、一部の県では昨年より独自に品評会を行うなど活動が活発して来ている。

ブータン人、特に公務員は目新しいことには関心を示すが、継続・維持管理を不得手としている。それは彼らの特性でもあろうが、個人主義的傾向が強く、上司は指示はするがやり方は個人任せで、失敗・過失・不正などを咎めるのは「徳がない」とされる社会文化もあり結果責任を殆ど問われない。具体的に指導・教示する先輩も少なく、難しさ・責任と表裏の関係にある仕事の面白さ、やりがいを感じるに至らず、結果を求めず従事するだけで是とする風潮が根底にあると思われる。

生産・普及に関わる個々の技術・技能を高めることは、結果リスクの大半を回避でき、仕事への興味を向上させる源となる。適正な技術の習得によって不安を払拭し、リスクを負わずことなく奨励作物の導入を進めることで、農家の信頼を得、更に自信を持って業務に臨めるように、農林省／農業局・県をはじめとする関係機関が協力・支援することである。

特に普及員は技術や必要な資材を伴わず徒手空拳的な活動を強いられ、意欲はあっても思うような活動が困難になっている。実践的技術の習得機会や必要資材の支援。何よりも、努力と結果に基づく不公平感のない業務評価制度の構築を急ぐ必要がある。

個々の研究員や普及員においては、実戦的な技術の習得は元より、仕事や作物への関心・観察眼を高めると共に、積極的なアイデアの創出が求められる。

他方、実戦的な栽培管理技術については期待するような能力・意識の向上は見られず、実態を伴わない出張旅費の請求を行う普及員も少なからず居るとされる状況では、普及員による主体的・実践的な普及活動を期待することは難しいと思われる。

本プロジェクトの終了式において、プロジェクトが育成した展示農家の中から各県4名の篤農家、6県計24名を選抜¹⁴し、農家間普及の要として任命した。こうした篤農家を農家普及のリソースとして認定・活用する試みの成果は未知数であるが、各地域の農家リーダーとして応えてくれることに期待したい。

種苗生産体制の強化については、ウェンカルセンターに於ける生産拡大、国立種子センター（National Seed Center：NSC）タシヤンツェ支場の再生支援、種子生産農家の育成を通じて、ある程度の供給体制は整った。また、一部の種子生産委託農家に対し、国立種子センター（National Seed Center：NSC）も委託・買い上げを行うなど関連機関の相互連携が始まっている。

⑥ プロジェクトの自立発展性向上のために、今後受入国が取り組む必要のある事項

プロジェクトが実施した園芸作物では、亜熱帯から温暖帯域までの適正作物を特定し、開発に向けた方向性を明確に提示し、既にそれらの普及を開始しており、それを着実に継続するに尽きる。

⑦ 類似プロジェクト、類似分野への今後の協力実施にあたっての教訓、提言

JICAは2000年より東部の園芸開発を支援してきており、個別専門家・2次に渡るプロジェクトを実施してきた。中でも果樹のような作物は生育に時間がかかり、収量・品質などの分析を経た作物・品種選定、栽培技術の確立・技術移転にも一定の期間が必要なことから長期的な支援が必要であり、HRDPに至ってその成果が発現している。こうした農作物の試験研究・普及事業には大規模な投入の必要性はなく、それほどの予算をかけない長期間の継続的な協力・支援が効果的と云える。

これまでブ農林省は農家への簡単な座学研修と種苗配布を組み合わせた普及を中心に実施してきたが、思うような効果を得られなかった。それは地域の栽培環境を考慮しない一律的な種苗配布、お座成りな座学研修に起因していると考えられる。

HRDPの対象とした東部地域は、降雨量1600mm前後で比較的温暖な標高1400～2200mが9割を占める。JICAプロジェクトではこうした生産環境を十分に把握し、栽培条件を満たす農家への集中的な研修と農家圃場での作付けを組み合わせることによって、技術と園芸作物の定着を図った。

開発が遅れ、識字困難な農家が大半を占めるブータンのような後発途上国では、座学やハンドブックなどのテキスト教材による技術普及は困難であり、AREP・HRDPのといった現場での実践活動を柱とするアプローチが農家の技術習得や園芸作物の普及には効率的・有用であると考えられる。

¹⁴ 別添「List of the Farmer to Farmer Extension Resource Parson」

集中的な投入で環境を整えやすい試験場レベルにおける園芸作物を育成してみせることはそれほど難しいものではないが、試験場で育成した園芸作物を農家レベルに導入するには、相当の工夫と労力を要する。

プロジェクトでは農家の興味を得、受け入れやすい適正作物を提示し、極力現地で入手可能な資材を利用し、さらに基礎的教育・知識のない農家でも実践可能な簡素化した技術に絞り込んで普及することに務めた。

普及に当たっては、県担当 C/P を軸に関係者を総動員し、休日の活動もしばしばであり、C/P らの労を惜しまない協力がなければ成し得ない。プロジェクトの円滑な運営には C/P らとの信頼の上に立った良好な関係が不可欠となる。こうした現場型のプロジェクト業務に携わる専門家は、一般に緩い規律や規範など社会文化の違いを許容し、「情を伴った道理（技術を含む）」がなければ相手側との良好な信頼関係は築けない。更に加えるならば、自らの待遇（金銭）に固執しない人が望ましい。

プロジェクトが対象とした地域は東部 6 県の広大な範囲であり、アクセスの悪い地域も多かった。園芸作物のように丁寧なフォローを行う必要のある作物の普及には、プロジェクトの規模、内容、予算に応じた対象域の絞り込みが必要と思われる。

5. PDM の変遷および合同調整委員会開催記録

プロジェクト開始前、詳細設計調査で作成された PDM¹⁵以降、合同終了時評価時の第 4 回 JCC¹⁶まで 4 度に渡って PDM が改訂¹⁷された。主な内容・経緯は下記のとおり。

| Vir. | 改訂日 | 主な改定内容 | 経緯 |
|------|---------------------|--|--|
| 1(0) | 2009 年 9 月 8 日 | | 詳細設計調査において、定量的指標数値が未定の「Tentative PDM」。これを基にプロジェクトが開始されたことから「Ver. 1」とする。 |
| 2 | 2010 年 12 月 23 日 | V. 1 の数値指標、外部条件の他、成果・活動の文言を一部修正。 | 2010 年 3 月 21 日にプロジェクトを開始。ベースライン調査結果を踏まえ、第 1 回 JCC で検討・協議し改訂。 |
| 3 | 2012 年 10 月 22 日 | プロ目指標を対象耕作地の%から面積に修正。種苗生産体制にかかる成果 3. 活動・指標に NSC タシヤンツェ支場を追記。新たにグループマーケティングにかかる成果・活動・指標を加え、前 Ver. 3 の活動 1-3~5 を統合。 | 合同中間評価調査で、既に活動が行われている NSC タシヤンツェ支場の再生支援を追認。更に、日本側調査団の提言を受けてグループマーケティングを成果に加えることとし、第 2 回 JCC で改訂。 |
| 4 | 2013 年 2 月 12 日 | 成果 2 指標 2-3 を変更。成果 4 の文言を修正。 指標 2-3 ; 研修評価が 100%向上 ⇒研修参加者の 80%以上に適切かつ有効と評価される | JICA 本部との検討を経て、不明瞭な文章、不適切な指標（研修内容は受けた農家の評価を受けて随時修正しているが 100%が満足することは考え難い）を見直し第 3 回 JCC で改訂。 |
| 5 | 2014 年 11 月 25 日 | 上意目標指標の文言・数値を改訂。 1-1 ; 収入が、2020 年までに 80% 増加する（ベースライン値 8400N） ⇒（園芸作物販売収入が）2020 年までに Nu20,000 に向上する。 1-2 ; 500 名の農家が研修を受け、その農家が農民間普及を実施する。 ⇒2020 年までに 800 名の農家が研修を受ける。 | 2014 年 11 月に実施された合同終了時評価で既に上位目標が達成されていることが確認されたため、2020 年を目途に更に高次の指標を設定し、第 3 回 JCC で協議し改訂。 |

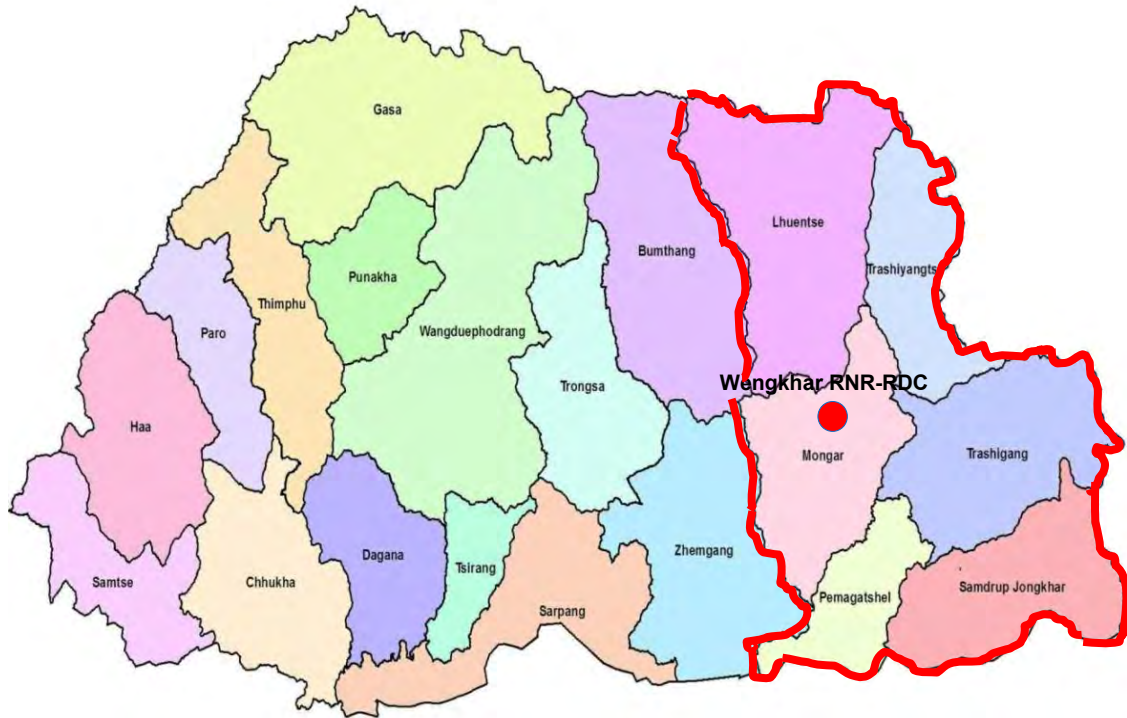
以上

¹⁵ 別添「Tentative PDM (PDM 1)」

¹⁶ 別添「Implementation Process ; 1. Meetings ; JCC Meetings」

¹⁷ 別添「HRDP PDM の変遷 Ver. 2 - Ver. 5（修正箇所を赤字標記）」

ブータン国園芸開発研究・普及支援プロジェクト対象地域



県・郡区分 (6 県 70 郡)

Geog Boundary of Eastern Region



List of the Input

1. Dispatch of Experts

| No. | Name | Specialty | Period_from | Period_to | Days | Affiliation |
|-----|---------------------|---------------------------------------|-------------|------------|----------|------------------------------|
| 1 | Mr.Satoshi YAMANAKA | Training and Extension | 2010/9/19 | 12/25/2010 | 98 days | VSOC |
| 2 | Mr.Satoshi YAMANAKA | Training and Extension | 1/4/2011 | 3/16/2011 | 72 days | VSOC |
| 3 | Mr.Satoshi YAMANAKA | Training and Extension | 7/10/2011 | 10/7/2011 | 90 days | VSOC |
| 4 | Mr.Satoshi YAMANAKA | Training and Extension | 11/18/2011 | 3/16/2012 | 120 days | VSOC |
| 5 | Mr.Satoshi YAMANAKA | Training and Extension | 6/16/2012 | 9/13/2012 | 90 days | VSOC |
| 6 | Dr. Seiichi MORIYA | Entomologist | 9/9/2012 | 10/28/2012 | 50 days | National Agr, Recerch Center |
| 7 | Kr. Koji NAKATA | Promotion of Horticulture cultivation | 31/1/2013 | 7/3/2014 | 36 days | OADA |
| | Mr.Satoshi YAMANAKA | Training and Extension | 12/12/2013 | 7/3/2014 | 75 days | VSOC |
| 8 | Dr. Seiichi MORIYA | Entomologist | 5/6/2013 | 7/27/2013 | 82 days | National Agr, Recerch Center |
| 9 | Mr.Satoshi YAMANAKA | Promotion of Horticulture cultivation | 10/14/2013 | 3/12/2014 | 150 days | VSOC |
| 10 | | | | | | |

1-2 Long-term

| | Name | Specialty | Period_from | Period_to | Days | Affiliation |
|---|----------------------|-----------------------------------|-------------|-----------|-----------|-------------|
| 1 | Mr.Yuichi TOMIYASU | Chief Adviser /Horticulture | 3/20/2010 | 3/20/2015 | 5 years | VSOC |
| 2 | Ms. Yoshiko HAGIWARA | Coordination/Farmers Organization | 8/13/2010 | 8/12/2012 | 2 years | JOCA |
| 3 | Mr. Kenichi SASAKI | Coordination/Farmers Organization | 9/9/2012 | 3/20/2015 | 2.5 years | CSJ |

List of the Input

2. Assignment of Bhutanese C/P

| No. | | Name | Affiliation | Areas of Speciality | Assigned Period | Employment Period in the Institution | Remarks |
|-----|-------------------------|--------------------|---|----------------------------------|-----------------|--------------------------------------|--|
| 1 | 1st Project Director | Chencho Norbu | Director, DoA, MoAF | Management | 2 Years | 2010-2012 | Got transferred to DoFPS w.e.f July 2012 |
| 2 | 2nd Project Director | Tenzin Dhendup | Director General, DoA, MoAF | Management | 2 Years | 2012 - 2014 | Got transferred from DoL to DoA w.e.f June 2012. Promoted as Secretary of MoAF w.e.f May 2014 |
| 3 | 3rd Project Director | Ganesh B. Chetri | Offtg. Director General, DoA, MoAF | Management | 1 Year | 2014 - till date | |
| 4 | Project Manager | Lhap Dorji | Program Director, RNR RDC Wengkhari | Management | 5 Years | 2004 - till date | |
| 5 | Couterpart | Kinley Tshering | Dy. Chief Research Officer, RNR RDC Wengkhari | Horticulture | 5 Years | 2004 - till date | |
| 6 | Counterpart | Loday Puntsho | Dy. Chief Research Officer, RNR RDC Wengkhari | Horticulture | 5 Years | 2004 - till date | |
| 7 | Counterpart | Sonam Gyeltshen | Senior Research Officer, RNR RDC Wengkhari | Horticulture | 4 Years | 2007 - 2013 | On study leave w.e.f Dec. 2013 |
| 8 | Counterpart | Dhanpati Dhungyel | Senior Research Officer, RNR RDC Wengkhari | Horticulture | 5 Years | 2002 - till date | |
| 9 | Counterpart | Domang | Senior Research Officer, RNR RDC Wengkhari | Extension/Research Communication | 4 Years | 2004 - 2013 | Transferred to BAFRA, Mongar w.e.f 2013 |
| 10 | Counterpart | Tshetrim | Research Officer, RNR RDC Wengkhari | Horticulture | 1 year | 2014 - till date | Transferred from Samdrupjongkhar Dzongkhag w.e.f Mar. 2014 |
| 11 | Counterpart | Karma Tenzin | Senior Research Assistant, RNR RDC Wengkhari | Horticulture | 5 Years | 2005 - till date | |
| 12 | Counterpart | Ugyen Sonam | Senior Research Assistant, RNR RDC Wengkhari | Horticulture | 5 Years | 2010 - till date | |
| 13 | Counterpart | Ugyen Norbu | Senior Research Assistant, RNR RDC Wengkhari | Horticulture | 5 Years | 2005 - till date | |
| 14 | Counterpart | Gyeltshen Tshering | Senior Research Assistant, RNR RDSC Khangma | Horticulture | 4 Years | 1999 - 2013 | Transferred to RDC Bajo w.e.f 2013 |
| 15 | Counterpart | Khampa | Senior Research Assistant, RNR RDSC Khangma | Horticulture | 2 Years | 2001 - 2012 | Transferred to Mongar Dzongkhag w.e.f 2012 |
| 16 | Counterpart | N. B. Rai | Research Assistant, RNR RDC Wengkhari | Horticulture | 4 Years | 2004 - 2014 | Resigned from civil service in March 2014 |

| | | | | | | | |
|----|-------------|------------------|---|--------------|----------|-----------------------|---|
| 17 | Counterpart | Thinlay Penjor | Research Assistant, RNR RDC Wengkhar | Horticulture | 5 Years | 2008 - till date | |
| 18 | Counterpart | Sonam Tshomo | Research Assistant, RNR RDC Wengkhar | Horticulture | 5 Years | 2010 - till date | |
| 19 | Counterpart | Phuntsho Wangdi | Research Assistant, RNR RDC Wengkhar | Horticulture | 2 Years | 2010 - 2012 | Resigned from civil service in 2012 |
| 20 | Counterpart | Lotey Jamtsho | Field Assistant, RNR RDC Wengkhar | Horticulture | 2 Years | 2001 - 2012 | Transferred to RDSC Tsirang w.e.f 2012 |
| 21 | Counterpart | Tshering Pemo | Research Assistant, RNR RDC Wengkhar | Horticulture | 3 Years | July 2012 - till date | |
| 22 | Counterpart | Mandhira Acharya | Research Assistant, RNR RDC Wengkhar | Horticulture | 3 Years | July 2012 - till date | |
| 23 | Counterpart | Yangchen Dema | Research Assistant, RNR RDC Wengkhar | Horticulture | 2 Years | July 2013 - till date | |
| 24 | Counterpart | Yeshi Lhadon | Research Assistant, RNR RDC Wengkhar | Horticulture | 2 Years | July 2013 - till date | |
| 25 | Counterpart | Phuntsho | Senior Research Assistant RNR RDSC Lingmethang | Horticulture | 4 Years | 2005 - 2014 | Transferred to Lhuntshe Dzongkhag w.e.f Jan 2014 |
| 26 | Counterpart | Sonam Tashi | Senior Research Assistant RNR RDSC Lingmethang | Horticulture | 5 Years | 2002 - till date | |
| 27 | Counterpart | Gyelpo | Senior Research Officer, RNR RDSC Khangma | Horticulture | 4 Years | 2005 - 2013 | Resigned from civil service in 2013 |
| 28 | Counterpart | Kelzang Lhadon | Senior Research Officer, RNR RDSC Khangma | Horticulture | 5 Years | 2009 - till date | |
| 29 | Counterpart | Sangay Jamtsho | Senior Research Officer, RNR RDSC Khangma | Horticulture | 2 Years | 2009 - till date | On study leave w.e.f 2012 |
| 30 | Counterpart | Subash Rana | Research Assistant, RNR RDSC Khangma | Mushroom | 2 Years | 2011 - 2013 | Transferred to Trashigang Dzongkhag w.e.f 2013 |
| 31 | Counterpart | Tshering Dorji | Senior Extension Supervisor, RNR RDSC Khangma | Mushroom | 2 Years | 2013 - till date | Transferred from Tashiyangtse Dzongkhag w.e.f 2013 |
| 32 | Counterpart | Sangay Dorji | Lab. Assistant, RNR RDSC Khangma | Mushroom | 4 Years | 2011 - till date | Transferred from Trongsa Dzongkhag w.e.f. 2011 |
| 33 | Counterpart | Sonam Rinchen | Research Assistant, RNR RDC Wengkhar | Horticulture | 8 months | July 2014 - till date | New appointment |
| 34 | Counterpart | Sonam Pelden | Research Assistant, RNR RDC Wengkhar | Horticulture | 8 months | July 2014 - till date | New appointment |
| 35 | Counterpart | Duptho Wangmo | Research Officer, RNR RDC Wengkhar | Horticulture | 3 months | Jan 2015 - till date | New appointment |

| | | | | | | | |
|----|-------------|----------------|---|--------------|----------|----------------------|-----------------|
| 36 | Counterpart | Pradeep Rai | Research Officer, RNR RDSC Khangma | Horticulture | 3 months | Jan 2015 - till date | New appointment |
| 37 | Counterpart | Thinley Wangdi | Research Officer, RNR RDSC Lingmethang | Horticulture | 3 months | Jan 2015 - till date | New appointment |

List of the Input

3. Counterpart Staff Training in Japan

| | Name of participant | Affiliation | Position at that time | Current Position | Field of training/ Name of the Course | Contents | Period_from | Period_to | Days | Implementing Institution |
|---|---------------------|-------------------------|--|---|---|---|-------------|------------|---------|--|
| 1 | Kinley Tshering | RNR RDC Wengkhar | Senior Research Officer | Dy. Chief Research Officer | Fruit Cultivation and postharvest handling | Fruit orchard management techniques. Harvesting, packaging and processing techniques. Institutional visits to Research Centres, Farms, etc. | 2011/10/1 | 2011/12/22 | 82 days | Oita Prefectural Agriculture College, Mie, Oita |
| 2 | Thinlay Penjor | RNR RDC Wengkhar | Research Assistant | Research Assistant | Vegetable Cultivation and seed production techniques | Vegetable cultivation techniques both protected and open cultivation. Vegetable seed production techniques. Institutional visits to Research centres & farms. Farm stay in farmers field. | 2011/10/1 | 2011/12/22 | 82 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 3 | Kiran Subedi | Pemagatshel Dzongkhag | Dzongkhag Agricultural Officer | Dzongkhag Agricultural Officer (on study leave) | Rural Development by Agriculture Promotion | Rural development plan and policies. Community mobilization and ways to enhance community participation. Technologies to enhance agriculture production. Social changes phenomenon and its implications & importance. | 2011/8/7 | 2011/9/17 | 40 days | JICA Hokkaido International Center |
| 4 | Kelzang Lhadon | RDSC Khangma | Research Assistant | Research Assistant | Horticulture (Fruits) nursery production and cultivation techniques | Fruit cultivation & Seeding production techniques. Institutional visits to Research centres & farms. Farm stay in farmers field. | 2013/1/16 | 2013/3/21 | 65 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 5 | Tshering Dorji | Trashiyangtse Dzongkhag | Assistant Dzongkhag Agricultural Officer | Senior Research Assistant, RDSC Khangma | Horticulture Extension & Public Relation | Agriculture extension system. Farmers organization and marketing system. Institutional visits to Research centres, farms & markets.. | 2013/1/16 | 2013/3/21 | 65 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 6 | Bhim Raj Gurung | RAMCO, Mongar | Marketing Specialist | Marketing Specialist | Community Capacity and Rural Development - Focusing on One Village One Product Movement | Conceptual Framework of Community Capacity Development for Rural Development, and Planning & Evaluation. | 2013/10/23 | 2013/11/10 | 19days | JICA Kyushu International Center |

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|----|----------------|---------------------------|--------------------------------------|--------------------------------------|---|--|------------|------------|---------|--|
| 7 | Kunzang Palden | Samdrupjongkhar Dzongkhag | Dzongkhag Agricultural Officer | Dzongkhag Agricultural Office | Community Capacity and Rural Development - Focusing on One Village One Product Movement | Conceptual Framework of Community Capacity Development for Rural Development, and Planning & Evaluation. | 2013/10/23 | 2013/11/10 | 19days | JICA Kyushu International Center |
| 8 | Sonam Tshomo | RNR RDC Wengkhar | Research Assistant | Research Assistant | Fruit cultivation (Deciduous fruits & Citrus) | Fruit/Vegetable cultivation and seeding production techniques. Harvesting, packaging and processing techniques. Institutional visits to Research centres & farms. | 2014/1/22 | 2014/3/20 | 58 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 9 | Tshering Pemo | RNR RDC Wengkhar | Research Assistant | Research Assistant | Fruit cultivation (Deciduous fruits & Citrus) | Fruit/Vegetable cultivation and seeding production techniques. Harvesting, packaging and processing techniques. Institutional visits to Research centres & farms. | 2014/1/22 | 2014/3/20 | 58 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 10 | Karma Tenzin | RAMCO, Mongar | Marketing Assistant | Marketing Assistant | Horticulture crop postharvest, processing, marketing & farmer's enterprise | Farmers organization and marketing system. Fruit/Vegetable cultivation, harvesting, packaging and processing techniques. Institutional visits to Research centres, farms & markets.. | 2014/1/22 | 2014/3/20 | 58 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 11 | Nawang | Trashiyangtse Dzongkhag | Chief Dzongkhag Agricultural Officer | Chief Dzongkhag Agricultural Officer | Farmer led Extension Method | Agriculture extension system. Local Industrial Promotion with Community Capacity Development. Rural Development, and Planning & Evaluation. | 2014/5/6 | 2014/6/6 | 32 days | JICA Hokkaido International Center |
| 12 | Lhap Dorji | RNR RDC Wengkhar | Program Director | Program Director | Community Capacity and Rural Development - Focusing on One Village One Product Movement | Conceptual Framework of Community Capacity Development for Rural Development, and Planning & Evaluation. | 2014/9/23 | 2014/10/12 | 30 days | JICA Kyushu International Center |

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|----|----------------|------------------|-------------------------|-------------------------|---|---|-----------|------------|---------|--|
| 13 | Tshetrim | RNR RDC Wengkhar | Senior Research Officer | Senior Research Officer | Fruit and Vegetable Cultivation (deciduous Fruit, Citrus) | Fruit/vegetable cultivation techniques. Harvesting, packaging and processing techniques. Rural agricultural development. Institutional visits to Research centres & farms | 2014/9/23 | 2014/11/21 | 60 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |
| 14 | Mandir Acharja | RNR RDC Wengkhar | Research Assistant | Research Assistant | Fruit and Vegetable Cultivation (deciduous Fruit, Citrus) | Fruit/vegetable cultivation techniques. Harvesting, packaging and processing techniques. Rural agricultural development. Institutional visits to Research centres & farms | 2014/9/23 | 2014/11/21 | 60 days | Kagoshima Asia Pacific Intercultural Countryside Centre, Kakakuma, Kagashima |

4 Counterpart Staff Training in Third countries (Nepal)

| | Name of participant | Affiliation | Position at that time | Current Position | Field of training/ Name of the Course | Contents | Period from | Period to | Days | Implementing Institution |
|---|---------------------|---------------------------|--------------------------|--|---------------------------------------|--|-------------|-----------|--------|--|
| 1 | Phurpa Thinley | Tshenkhar Geog, Lhunthse | Junior Extension Officer | Senior Extension Supervisor | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |
| 2 | Sonam Phuntsho | Balam Geog, Mongar | Junior Extension Officer | Junior Extension Officer (Study leave) | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |
| 3 | Ugyen Sonam | Shmuar Geog, Pemagatshel | Junior Extension Officer | Junior Extension Officer (Transferred to Samtse) | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |
| 4 | Dorji Laythro | Lauri Geog, S/jongkhar | Junior Extension Officer | Junior Extension Officer | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |
| 5 | Sonam Gaki | Kanglung Geog, Trashigang | Junior Extension Officer | Junior Extension Officer (Transferred to Paro) | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |

| | | | | | | | | | | |
|----|-------------------|--------------------------------|--------------------------|--|----------------------------------|--|-----------|-----------|--------|--|
| 6 | Tshering Tenzin | Tongzhang Geog, Trashiyangtse | Junior Extension Officer | Junior Extension Officer | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |
| 7 | Tawla Dorji | RNR RDC Wengkhar | Farm Technician | Farm Technician | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2010/2/12 | 2010/2/18 | 7 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre, Lumle Research |
| 8 | Thinley Choden | Drepong Geog, Mongar | Junior Extension Officer | Junior Extension Officer (Study leave) | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 9 | Gembo Dorji | Samkhar Geog, Mongar | Junior Extension Officer | Junior Extension Officer | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 10 | Jitshen Wangchuk | Lhuntshe | Junior Extension Officer | Junior Extension Officer | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 11 | Choni Lhamo | Phuntshothang Geog, S/jongkhar | Junior Extension Officer | Junior Extension Officer | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 12 | Ugyen Tenzin | Bumdeling Geog, Trashiyangtse | Junior Extension Officer | Junior Extension Officer | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 13 | Tshering Wangchuk | Chimung Geog, Pemagatshel | Junior Extension Officer | Junior Extension Officer (Transferred to Khamdang) | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 14 | Nar Bdr. Rai | RNR RDC Wengkhar | Research Assistant | (Resigned from civil service) | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |
| 15 | Pema Thinlay | RNR RDC Wengkhar | Research Assistant | Research Assistant | Horticulture Study trip to Nepal | Institution, research centres and demo farm visits | 2011/2/21 | 2011/2/25 | 5 days | Nepal Agriculture Research Centre, ICIMOD, Central Horticulture Centre Nepal |

4.1 List and specifications of Horticulture Research and Development Project Equipments for 2010

condition A: Good B: Fair C: Bad

| No. | Equipments | No. | Maker | Detail of equipments | Price in Yen | Total X1,000 (Yen) | Condition | Remarks |
|-----|---------------------------------------|---------------|---------------|--|--------------|--------------------|-----------|------------|
| 1 | Cheese cloth | 10 packs | Teijinn | w270cmX L 100m 23% | 15 | 75 | | Consumable |
| 2 | Vinyl for green house | 10 sheets | Okamoto | Sun shine ennbi, T 0,075mmX W 9m X L 28m | 20 | 200 | | Consumable |
| 3 | Nobi ace | 10 sheets | MkPlastic | T 0,075mm X W 7m L 25m | 15 | 150 | | Consumable |
| 4 | Fruit container | 150 container | | Gifu plastic MB-20B 45L, 52cn 37cmX30cm yellow | 0.6 | 90 | A | |
| 5 | Pruning scissor | 50 piece | Okatusne | No 101, 18cm | 2.9 | 145 | | Consumable |
| 6 | do sack | 50 piece | Okatusne | No108, 210cm | 0.9 | 45 | | Consumable |
| 7 | Harvest scissor | 200 piece | Okatusne | No301, 16 c m、 for fruit harvesting | 0.7 | 140 | | Consumable |
| 8 | Bush cutter blade | 100 piece | Shibata | 8 blade for grass cutting | 0.8 | 80 | | Consumable |
| 9 | Auto balance | 2 sets | Yamato | D-100(2kg-100kg) | 70 | 140 | B | |
| 10 | measuring tape | 5 sets | Yamayo | 19-JSI first grade 5.5m, FC-19-55 | 6 | 30 | B | |
| 11 | measuring tape | 5sets | Yamayo | Millionreal both side, JIS 1st, MRT50m | 20 | 100 | B | |
| 12 | Electric fence | | | | | | | |
| | Monster TS type | 1 set | Nishiwaki | 9V battery, 9V/12VC, for 4.5km | 50 | 50 | C | |
| | Monster MAI type | 1set | Nishiwaki | AC100V, for 4km | 50 | 50 | C | |
| 13 | Sprinkler | 20 set | sannei suisen | whole cercle sprinkler PC520-13 | 4 | 80 | A | |
| 14 | Soft Nozzle | 20 piece | do | PN66-1S-M | 1.2 | 24 | | Consumable |
| 15 | eTrex Venture HC for altitude measure | 3set | ETREX | eTrex Venture HC NO,63209 | 29.4 | 88.2 | A | |
| 16 | Death more | 100 pack | Arth | 4 set box | 0.5 | 50 | | Consumable |
| 17 | Rotary blade | 10 set | Kubota | for Kubota power teiler K120 | 20 | 200 | | Consumable |
| 18 | Power tailer K120 | 1 set | Kubota | Power teiler K-120 with rotary set | 781 | 781 | B | |
| 19 | Excavator parts | | Hokuet-K | Ax50u manufacture in 2000/2001 | | | | Consumable |
| | Ax50u (produt in 2000/01) | | | engine type ISUZU 4LE1, Serial No,888A000201 | | | | |
| | | | | AIR MAN PARTS CATALOG No, 39555-81000 1998,Dec | | | | |
| | 1.PANEL;GAUGE | 1 set | do | Electric part page 044-12, Part No,4403739 | 60 | 60 | | |
| | 2.Oil Filter | 5 sets | do | PARTs CATALOG 1994-2003 ISUZU GENUINE PAR | 2.6 | 13 | | |
| | | | | Parts No,894456-7412 | | | | |
| | 3. THERMOSTAT | 1 set | do | ISUZU 4LE 1用 76.5。C, Part No, 897160-6540 | 40 | 40 | | |
| | 4. STARTER | 1 set | do | page-044.4LE 1, 0-60A | 50 | 50 | | |
| | 5. HOSE;WATER RAD | 1 hose | do | key No, 55 (1-11A) | 10 | 10 | | |
| | 6. HOSE;WATER RAD | 1 hose | | key No,128 (1-11A) | 10 | 10 | | |
| | 7. CLIP; HOSE RAD | 2 piece | | key No,20(A) (1-11A) | 0.8 | 1.6 | | |
| | | 1 piece | | key No,20(B) | 0.8 | 0.8 | | |
| | | 1 piece | | key No,20© | 0.8 | 0.8 | | |
| | 8. AIR DUCT | | | | | | | |
| | HOSE;CONN | 1 set | | key No,232(B) 897145-2440 (1-31A) | 3 | 3 | | |

4.2 List and specifications of Horticulture Research and Development Project Equipments for 2011

condition A: Good B: Fair C: Bad

| No. | Equipments | No. | Maker | Detail of equipments | EX-Godown | Price in Yen (CIF) | Total X1,000 (Yen) | Condition | Remarks |
|-----|---------------------|-----|---------------------|---|-----------|--------------------|--------------------|-----------|------------|
| | [From Japan] | | | | | | | | |
| 1 | Hose for water work | 10 | Kakuichi | ID 15mm、OD 20mm、Outside (green and semitransparent) | 9,200 | 12,438 | 124 | | Consumable |
| 2 | Hose for water work | 10 | Kakuichi | ID 18mm、OD 23mm、Outside (green and semitransparent) | 8,080 | 10,924 | 109 | | Consumable |
| 3 | Shovel | 10 | Kinboshi | GS Pipe Shovel No.5015 980mm | 1,860 | 2,515 | 25 | | Consumable |
| 4 | MIKA Rope | 20 | Ishimoto maolan | New MIKA Rope 9mm x500m Black | 1,760 | 2,380 | 48 | | Consumable |
| 5 | Malti | 10 | Takii | Takii original malti black 0.02mm x135cmx50m | 990 | 1,338 | 13 | | Consumable |
| 6 | Grafting tape | 300 | Tokyonahiro | 0.05mmX30mmX100m | 650 | 879 | 264 | | Consumable |
| 7 | Plastic sheet | 5 | MKV Plastic | Nobi ace Mirai Multipurpose 0.05mmx150cmx100m | 10,600 | 14,331 | 72 | | Consumable |
| 8 | Bird Net | 10 | Morishita | 20mm 200tubo 18x36m | 18,800 | 25,418 | 254 | | Consumable |
| 9 | Bird Net | 6 | Morishita | 20mm 300tubo 18x54m | 28,100 | 37,991 | 228 | | Consumable |
| 10 | Pruning scissor | 50 | Okatsune | No.101 180mm | 2,600 | 3,515 | 176 | | Consumable |
| 11 | do sack | 50 | Okatsune | No108, 210mm | 850 | 1,149 | 57 | | Consumable |
| 12 | Mushroom injector | 3 | Nihonnourinshukin | No.1 | 4,600 | 6,219 | 19 | A | |
| 13 | do spare | 2 | Nihonnourinshukin | spare A | — | | 0 | | |
| 14 | do spare | 3 | Nihonnourinshukin | spareB | 1,300 | 1,758 | 5 | | Consumable |
| 15 | Ortrun | 10 | Takedaykuhin | 1kg | 1,400 | 3,199 | 32 | | Consumable |
| 16 | Homaicoat | 5 | Nippon-soda | 100mg | 650 | 1,268 | 6 | | Consumable |
| 17 | Roundup | 2 | Rikengreen | 2l x10bottle | 7,600 | 14,820 | 30 | | Consumable |
| 18 | Benreat | 30 | Sumitomokagakuengei | 500g | 5,200 | 10,140 | 304 | | Consumable |
| 19 | Sumichion emulsion | 20 | Nihonnouyaku | 500ml | 2,900 | 5,655 | 113 | | Consumable |
| 20 | Beaker | 20 | Tokyo glass | No.1725 product code .371-01-01-016 1000ml | 1,100 | 2,514 | 50 | | Consumable |
| 21 | Beaker | 20 | Tokyo glass | No.1826 product code 198-19-01-46, 1000ml, | 760 | 1,737 | 35 | | Consumable |
| 22 | Beaker | 30 | Tokyo glass | product code 416-01-13-09 1000ml | 400 | 914 | 27 | | Consumable |
| 23 | Conical flask | 30 | Tokyo glass | product code 371-01-30-09, 200ml | 540 | 1,234 | 37 | | Consumable |
| 24 | Schale | 50 | Tokyo glass | product code792-02-12-11,type100,size105X20 | 850 | 1,942 | 97 | | Consumable |
| 25 | Measuring cylinder | 5 | Tokyo glass | product code834-11-18-11, 1000ml | 7,200 | 16,452 | 82 | | Consumable |
| 26 | Measuring cylinder | 5 | Tokyo glass | product code834-11-18-07, 200ml | 1,740 | 3,976 | 20 | | Consumable |
| 27 | Rubber bellows | 3 | Tokyo glass | product code125-23-05-05 No.8 50 X 120L | 1,780 | 4,067 | 12 | | Consumable |
| 28 | Automatic burette | 2 | Tokyo glass | product code 371-33-02 5mmx15mm | 45,700 | 104,425 | 209 | A | |
| 29 | Stir bar | 10 | Tokyo glass | product code 007-17-33-02 5mmx15mm | 130 | 297 | 3 | | Consumable |

| | | | | | | | | | |
|----|------------------------------|----|-------------------------------------|---------------------------------|-------|--------|----|--|------------|
| 30 | fruit knife | 5 | Sugikio | No.220-127401 105mm do sack | 1,780 | 4,067 | 20 | | Consumable |
| 31 | Oxalic acid solution (N/10) | 5 | Wako pure chemical industries, Ltd. | No.154-00475 0.05mol/l 500ml | 1,360 | 3,108 | 16 | | Consumable |
| 32 | Sodium hydroxide | 3 | Wako pure chemical industries, Ltd. | No. 197-02125 NaOH=40.00 S.500g | 980 | 1,911 | 6 | | Consumable |
| 33 | Phenolphthalein | 1 | Wako pure chemical industries, Ltd. | No. 162-01072 S.25g | 1,360 | 3,108 | 3 | | Consumable |
| 34 | Ethanol | 10 | Wako pure chemical industries, Ltd. | No. 324-00015 500ml | 1,000 | 1,950 | 20 | | Consumable |
| 35 | Sodium hypochlorite solution | 7 | Wako pure chemical industries, Ltd. | No. 197-02206 500ml | 640 | 1,248 | 9 | | Consumable |
| 36 | Ammonium molybdate | 2 | Wako pure chemical industries, Ltd. | No. 018-08961 100g | 7,140 | 16,315 | 33 | | Consumable |
| 37 | Potassium tartrate | 1 | Wako pure chemical industries, Ltd. | No. 166-04515 500g | 1,110 | 2,536 | 3 | | Consumable |
| 38 | Sulfuric acid | 1 | Wako pure chemical industries, Ltd. | No. 197-09945 500ml | 1,400 | 2,730 | 3 | | Consumable |
| 39 | Sodium bicarbonate | 2 | Wako pure chemical industries, Ltd. | No. 195-01325 500g | 2,890 | 6,604 | 13 | | Consumable |
| 40 | Hydrogen peroxide | 3 | Wako pure chemical industries, Ltd. | No. 081-4215 500ml | 770 | 1,502 | 5 | | Consumable |
| 41 | Octane | 2 | Wako pure chemical industries, Ltd. | No. 159-00062 25ml | 3,830 | 7,469 | 15 | | Consumable |
| 42 | Sodimu hexametaphosphate | 2 | Wako pure chemical industries, Ltd. | No. 199-02065 500g | 1,870 | 4,273 | 9 | | Consumable |
| 43 | Potassium chloride | 1 | Wako pure chemical industries, Ltd. | No. 163-03545 500g | 940 | 2,148 | 2 | | Consumable |

| | | | | | | | | | |
|----|--|----|-----------------------------|-------------------------------|--------------------|-----------|--------------|---|------------|
| 44 | Magnesium Test | 1 | Fujiwara scientific company | product coad 16124-1M 50枚 | 5,100 | 11,654 | 12 | | Consumable |
| 45 | Calcium Test | 1 | Fujiwara scientific company | product coad 16993-1M 50枚 | 10,700 | 20,865 | 21 | | Consumable |
| 46 | Potassium Test | 1 | Fujiwara scientific company | product coad 16992-1M 50枚 | 9,540 | 18,603 | 19 | | Consumable |
| 47 | Floodlight | 2 | Shibata | ST-300TD Reflector floodlight | 3,550 | 4,800 | 10 | A | |
| 48 | Vice | 1 | Anzen Motor | VO-4J(E100-100) Vice100mm | 30,400 | 41,101 | 41 | A | |
| 49 | Chain Saw | 1 | Shingu Shoko | SVK3520D | 72,600 | 98,155 | 98 | A | |
| | | 2 | | 14" Chain Drive Links | 3,950 | 5,340 | 11 | | Consumable |
| 50 | Brashcutter | 5 | Ryobi | EKK-2600 | 26,900 | 36,369 | 182 | B | |
| | | 10 | | Bolt cover Assy | 710 | 960 | 10 | | Consumable |
| | | 5 | | Spark plug | 520 | 703 | 4 | | Consumable |
| | | 5 | | Throttle lever | 380 | 514 | 3 | | Consumable |
| | | 10 | | Scattering protective cover | 3,200 | 4,326 | 43 | | Consumable |
| 51 | Threshing Machine | 1 | Kubota | HS500 | 796,200 | 1,076,462 | 1,076 | A | |
| 52 | Rice Polishing Machine | 1 | Yanmar | MR1900E | 296,300 | 400,598 | 401 | A | |
| | | 1 | | Stap down transformer | 147,000 | 198,744 | 199 | A | |
| | | 5 | | 1G3136-85120 Lining | 4,800 | 6,490 | 32 | | Consumable |
| | | 5 | | 1G3136-85130 Lining sensor | 440 | 595 | 3 | | Consumable |
| | | 5 | | 1G3136-85162 Fan | 4,400 | 5,949 | 30 | | Consumable |
| | | 5 | | 1G3137-31170Spare net | 4,000 | 5,408 | 27 | | Consumable |
| 53 | Video Editing Software | 1 | AH Software | movie Pro | 14,300 | 19,334 | 19 | A | |
| 54 | Venire Caliper | 3 | Nakamura Mfg. | KSM20FF | 5,500 | 7,436 | 22 | A | |
| 55 | Refractometer | 3 | Atago | 2313 Master-M | 10,700 | 14,466 | 43 | A | |
| | | | | Sub Total | | | 4,911 | | |
| | | | | | | | | | |
| | [Local Procurement by JICA Office] Nu.1.00=1.50 | | | | Unit Price (Nu) | | | | |

| | | | | | | | | | | |
|----|-------------------------|---|--------|-------------------------------|--------------------|--|------------------|--------------|--------|------------|
| 54 | 4WD Truk (Toyota Hilux) | 1 | Toyota | Hilux 4x4 2500cc Trrbo Diesel | 1,319,151 | | 1978726.5 | 1,979 | A | BG-1-A2084 |
| | | 1 | Toyota | Hilux 4x4 2501cc Trrbo Diesel | 1,381,953 | | 2072929.5 | 2,073 | A | BG-1-A2105 |
| | | | | | Sub Total | | | 4,052 | | |
| | | | | | | | | | | |
| | | | | | | | Total | | | |
| | | | | | | | Transport | | | |
| | | | | | Grand Total | | | 8,963 | x 1000 | |

4.3 List and specifications of Horticulture Research and Development Project Equipments for 2012

condition A: Good B: Fair C: Bad

| No. | Equipments | No. | Maker | Detail of equipments | Price in Yen (CIF) | Total X1,000 (Yen) | Condition | Remarks |
|-----|----------------------------|-----|---------------------------------------|--|--------------------|--------------------|-----------|------------|
| | [From Japan] | | | | | | | |
| 1 | Fruit fly survey material | 14 | SnakeiKagaku Naiyakoubo | YU-GERUA – D9, etc. | 12,301 | 172 | | consumable |
| 2 | Avoid the Birds Net | 21 | Morishita Co. Ltd | 18m*36m | 50,803 | 1,067 | | consumable |
| 3 | Avoid the Birds Net | 20 | Morishita Co. Ltd | 18m*54m | 70,426 | 1,409 | | consumable |
| 4 | Mica Wire | 20 | IshimotoMaoran | 9mmx501m | 2,115 | 42 | | consumable |
| 5 | Grafting Tape | 300 | Tokyo Meiko | 0.05mmx30mmx101m | 223 | 67 | | consumable |
| 6 | Cheesecloth | 10 | Teijin | ECO301 | 33,843 | 338 | | consumable |
| 7 | Embossing label Maker | 2 | Dymo | M-1596 | 158,585 | 317 | A | |
| 8 | Plastic tag T type | 100 | Osaka Naniwa Engeu | Gold label T type | 1,108 | 111 | | consumable |
| 9 | Plastic tag large size | 200 | Osaka Naniwa Engeu | Jumbo lavel A | 76 | 15 | | consumable |
| 10 | Plastic tag for tree | 200 | Osaka Naniwa Engeu | Memorial tree label | 70 | 14 | | consumable |
| 11 | Color plastic tag | 100 | Osaka Naniwa Engeu | Color label with copper wire | 548 | 55 | | consumable |
| 12 | Pipe House parts (set) | 1 | Toto Kogyo, Aisei Tokuhatsu, Sanei | Film, Spring, Pipe rectangular, Pipe holding, packer, Spring Clamp, Pipe Door | 289,354 | 289 | A | |
| 13 | West bag for tools | 30 | KH Kiyo | SA09K | 2,202 | 66 | | consumable |
| 14 | Grain moisture tester | 2 | Oga Electronic | TA-6 | 44,930 | 90 | A | |
| 15 | Fruit penetrometer | 3 | Takemura Electric | Takemura Electric FHM-2 | 49,014 | 147 | A | |
| 16 | Digital Scale | 2 | A and D | SK-31K | 26,458 | 53 | A | |
| 17 | Soil Hygrometer | 2 | Takemura Electric | DM-7 | 3,735 | 7 | A | |
| 18 | Soil PH measure | 2 | Takemura Electric | PH-2 | 14,004 | 28 | A | |
| 19 | Tension meter | 3 | Takemura Electric | DM-9 | 11,437 | 34 | A | |
| 20 | Rain gauge | 4 | Fird Pro | SimplelLog-RN2 | 107,944 | 432 | A | |
| 21 | Inclinometer Angle | 3 | STS | DL-156V | 22,071 | 66 | A | |
| 22 | Nut Crackers | 10 | Furusawa Seisakusho | Nut Crackers | 1,531 | 15 | A | |
| 23 | Voice recorder | 2 | Sony | ICD-UX524F(JE) | 11,641 | 23 | A | |
| 24 | Display Panel (Cloth Type) | 15 | Lion | MP-4 | 75,855 | 1,138 | A | |
| 25 | Display Panel | 5 | Lion | Display Panel | 80,700 | 403 | A | |
| 26 | Brushcutter blade | 100 | Makita | A-17604 | 762 | 76 | | Consumable |
| 27 | Electric Fence | 10 | Suematsu Electronics | ACE12-4S | 98,028 | 980 | A | |
| 28 | Power Sprayer | 3 | Maruyama Seisakusho | MS332EA | 179,427 | 538 | A | |
| 29 | Spear parts of Excavator | 1 | Hokuetsu Kogyo | Spear parts of Excavator | 420,610 | 421 | | Consumable |
| | | | | Sub Total | | 8,416 | | |

| [Local Procurement by JICA Office] Nu.1.00=1.60 | | | | Unit Price (Nu) | | | | | |
|---|------------------------------|-----|---------------|--------------------|--------------------|------------------|---------------|------------|--|
| 31 | Weighing Scale | 1 | Salter | Platform Type 5Kg | 4,200 | 6,720 | 7 | A | |
| 32 | Weighing Scale | 1 | Psela | Scale Type 5Kg | 8,550 | 13,680 | 14 | A | |
| 33 | Weighing Scale | 1 | Salter | Platform Type 10Kg | 4,500 | 7,200 | 7 | A | |
| 34 | Weighing Scale | 1 | Salter | Scale Type 10Kg | 4,200 | 6,720 | 7 | A | |
| 35 | Altimeter | 10 | Brigo | Altimeter | 10,200 | 16,320 | 163 | A | |
| 36 | Digital Camera | 2 | Sony | DSC-W610 | 9,000 | 14,400 | 29 | A | |
| 37 | Flat Screen TV | 1 | LG | 32CS410 | 30,000 | 48,000 | 48 | A | |
| 38 | Deep Freezer | 1 | 345HTQ | 345HTQ | 31,000 | 49,600 | 50 | A | |
| 39 | Pruning Saw | 100 | Chang Long | 250mm | 580 | 928 | 93 | Consumable | |
| 40 | Secateurs | 100 | Solo Thailand | 3143 | 920 | 1,472 | 147 | Consumable | |
| 41 | Farm Tractor | 1 | Farm Trac | Farm Trac 60 | 637,500 | 1,020,000 | 1,020 | B | |
| 42 | Trailer for Tractor | 1 | Malhotra | Trailer 2 Wheeler | 125,000 | 200,000 | 200 | A | |
| 43 | Disc Plough | 1 | MBMW make | Disc Plough | 48,000 | 76,800 | 77 | A | |
| 44 | Tiller | 1 | Rigid | Nine Tyne | 33,500 | 53,600 | 54 | B | |
| 45 | Cornflake Machine with Moter | 5 | Abarsh | CM1 | 110,000 | 176,000 | 880 | B | Exchange Motor to Kirloskhar engine with AMC |
| 46 | Farm Tractor | 1 | Farm Trac | Farm Trac 60 | 641,500 | 1,026,400 | 1,026 | A | |
| 47 | Trailer for Tractor | 1 | Malhotra | Trailer 2 Wheeler | 147,000 | 235,200 | 235 | A | |
| 48 | Disc Plough | 1 | MBMW make | Disc Plough | 55,500 | 88,800 | 89 | A | |
| 49 | Tiller | 1 | Rigid | Nine Tyne | 42,000 | 67,200 | 67 | B | |
| | | | | | Sub Total | | 4,212 | | |
| [Local Procurement by Projet] Nu.1.00=1.60 | | | | | Unit Price (Nu) | | | | |
| 50 | Air Conditioner | 1 | Bluester | 2T 2HW2YA | 46,000 | 73,600 | 74 | A | |
| | | | | | Sub Total | | 74 | | |
| | | | | | | Total | | | |
| | | | | | | Transport | | | |
| | | | | | Grand Total | | 12,701 | x 1000 | |

4.4 List and specifications of Horticulture Research and Development Project Equipments for 2013

condition A: Good B: Fair C: Bad

| No. | Equipments | No. | Maker | Detail of equipments | Price in Yen (CIF) | Total X1,000 (Yen) | Condition | Remarks |
|-----|--|-----|---------------------|--|--------------------|--------------------|-----------|------------|
| | [From Japan] | | | | | | | |
| 3 | Green House Plastics | 10 | Mitsubishi Plastic | Easter 0.1x900x2800 | 34,982 | 350 | | Consumable |
| 4 | Green House Plastics | 20 | Mitsubishi Plastic | Easter 0.1x700x2500 | 24,014 | 480 | | Consumable |
| 5 | Shade nets | 5 | DIO Chemicals Ltd | DIO Net 1010 | 41,897 | 209 | | Consumable |
| 6 | Parafilm film (Grafting Tape) | 50 | Sansho | 94-2542-5 | 2,806 | 140 | | Consumable |
| 7 | Sprinklers | 20 | SAN-EI Faucet Mfg. | PC520-13 | 5,536 | 111 | A | |
| 8 | Sprinklers | 20 | East Water Net | ES-20LH-W | 12,418 | 248 | A | |
| 9 | Fruit harvester secateur | 200 | Kitasho | No.301 | 808 | 162 | | Consumable |
| 10 | Bush cutter and parts | 6 | Makita | MEM2610U | 39,198 | 235 | A | |
| 11 | Bush cutter blade | 100 | Nikko Mfg | Black 8 blade | 747 | 75 | | Consumable |
| 12 | Mechanic tool kit | 3 | Maeda Metal Ind. | TSA3120 | 55,165 | 165 | A | |
| 13 | Table Top Grinder/Cutter | 3 | Makita | GB801with grinding stone, Stepdown transformer 1KV | 24,642 | 74 | A | |
| 14 | Metal cut blade | 100 | Nippon Resibon co. | Pro 1 cut straight | 788 | 79 | | Consumable |
| 15 | Wheel Barrow | 10 | Pluswise co. | Wehlbarrow cat, with spare tire | 1,624 | 16 | A | |
| 16 | Prefilter cartridge for distillation unit | 5 | Advantec Tokyo | RF000141 | 25,929 | 130 | | Consumable |
| 17 | Ion exchange cartridge for distillation unit | 4 | Advantec Tokyo | RF000131 (2pcs/set) | 26,003 | 104 | | Consumable |
| 18 | Potable Moisture Meter | 3 | Shizuoka Seiki Co. | CD-5 | 45,484 | 136 | A | |
| 19 | Poly Bag | 10 | Sansho | No.11 200x300mm 1000pcs/set | 3,927 | 39 | | Consumable |
| 20 | Poly Bag | 5 | Sansho | No.13 260x380mm 1000pcs/set | 10,249 | 51 | | Consumable |
| 21 | GPS Navigtor | 2 | Garmen | GPSMAP 62S English version | 50,870 | 102 | A | |
| 22 | | | | Sub Total | | 2,907 | | |
| | [Local Procurement by JICA Office] | | Nu.1.00=1.63 | | Unit Price (Nu) | | | |
| 23 | Green House Plastics | 12 | | UV Stabilized 120GSM Cross | 10,800 | 17,604 | | Consumable |
| 24 | Knapsack sprayer | 6 | ASPEE | ASPEE Hi-tech Sprayer 16L | 3,600 | 5,868 | 35 | A |

4.5 List and specifications of Horticulture Research and Development Project Equipments for 2014

condition A: Good B: Fair C: Bad

| No. | Equipments | No. | Maker | Detail of equipments | Unit Price in Yen (CIF) | Total X1,000 (Yen) | Condition | Remarks |
|-----|---------------------------------|-----|--------------------|----------------------------|-------------------------------|--------------------------|-----------|------------|
| | [From Japan] | | | | | | | |
| 1 | Chemicals for Fruit fly control | 70 | Sankei Chemical | Protein20E 1L | 3450 | 242 | | Consumable |
| 2 | | 40 | Sankei Chemical | Yugerua D8 10Pcs | 4600 | 184 | | Consumable |
| 3 | | 70 | Sankei Chemical | Yugerua D8 Tex plate 45Pcs | 12420 | 869 | | Consumable |
| 4 | | 20 | Kokusai Eisei | Panamax plate 2Pcs | 400 | 8 | | Consumable |
| 5 | Antiformin (Fungicides) | 5 | Kanto Chemical | Antiformin Pr.G 500ml | 4,290 | 21 | | Consumable |
| 6 | Parts for Kobelco excavator | 5 | Kobelco | Point | 39,784 | 199 | | Consumable |
| 7 | | 2 | Kobelco | Rubber Lock | 3,254 | 7 | | Consumable |
| 8 | | 2 | Kobelco | Locking Pin | 3,254 | 7 | | Consumable |
| 9 | | 4 | Kobelco | Seal Dust | 10,602 | 42 | | Consumable |
| 10 | | 2 | Kobelco | Seal Dust | 4,409 | 9 | | Consumable |
| 11 | | 2 | Kobelco | Seal Dust | 11,652 | 23 | | Consumable |
| 12 | | 3 | Kobelco | Shim (0.5) | 1,889 | 6 | | Consumable |
| 13 | | 3 | Kobelco | Shim (0.9) | 2,834 | 9 | | Consumable |
| 14 | | 3 | Kobelco | Shim (1.2) | 3,254 | 10 | | Consumable |
| 15 | | 3 | Kobelco | Shim (2.0) | 5,039 | 15 | | Consumable |
| 16 | | 2 | Kobelco | Shim (0.9) | 7,768 | 16 | | Consumable |
| 17 | | 2 | Kobelco | Shim (0.5) | 6,928 | 14 | | Consumable |
| 18 | | 2 | Kobelco | Shim (2.0) | 7,768 | 16 | | Consumable |
| 19 | | 2 | Kobelco | Shim (1.2) | 4,304 | 9 | | Consumable |
| 20 | | 2 | Kobelco | Shim (0.9) | 3,254 | 7 | | Consumable |
| 21 | | 2 | Kobelco | Shim (0.5) | 3,254 | 7 | | Consumable |

| | | | | | | | | |
|----|------------------------------------|-----|-------------|--|---------|-----|---|------------|
| 22 | | 2 | Kobelco | Shim (2.0) | 8,922 | 18 | | Consumable |
| 23 | | 2 | Kobelco | Bush | 60,358 | 121 | | Consumable |
| 24 | | 2 | Kobelco | Bush | 66,761 | 134 | | Consumable |
| 25 | | 2 | Kobelco | Bush | 73,269 | 147 | | Consumable |
| 26 | | 2 | Kobelco | Bush | 86,075 | 172 | | Consumable |
| 27 | | 2 | Kobelco | Bush | 29,707 | 59 | | Consumable |
| 28 | Parts for Bush Cutter MEM264 | 100 | Makita | Replacement Blade | 1,155 | 115 | | Consumable |
| 29 | | 10 | Makita | Throttle Lever | 1,470 | 15 | | Consumable |
| 30 | | 10 | Makita | Throttle Cable | 1,365 | 14 | | Consumable |
| 31 | | 10 | Makita | Bolt Guard | 735 | 7 | | Consumable |
| 32 | | 10 | Makita | Bolt Guard | 52 | 1 | | Consumable |
| 33 | | 10 | Makita | Bolt Guard | 105 | 1 | | Consumable |
| 34 | | 5 | Makita | Gear Case | 15,011 | 75 | | Consumable |
| 35 | Parts for Bush Cutter EKK-2600 | 20 | Ryobi | Bolt Cover | 1,365 | 27 | | Consumable |
| 36 | | 10 | Ryobi | Throttle Lever | 2,834 | 28 | | Consumable |
| 37 | | 10 | Ryobi | Throttle Cable | 2,099 | 21 | | Consumable |
| 38 | Electric Tool Set | 2 | Hozan | Electric Tool Set | 130,163 | 260 | A | |
| 39 | | 2 | | Conversion Plug for Soldering Iron | 315 | 1 | | |
| 40 | Tripod Stepladder (Long Size) | 5 | Alinco | Tripod Stepladder (3.3m) | 53,115 | 266 | A | |
| 41 | Tripod Stepladder (Middle Size) | 5 | Alinco | Tripod Stepladder (2.4m) | 32,961 | 165 | A | |
| 42 | Tripod Stepladder (Short Size) | 5 | Alinco | Tripod Stepladder (1.5m) | 23,408 | 117 | A | |
| 43 | Cheesecloth (White) | 20 | Kuraray | Cheesecloth (180cmx100m) | 34,535 | 691 | | Consumable |
| 44 | Cheesecloth (White) | 10 | Kuraray | Cheesecloth (230cmx100m) | 65,606 | 656 | | Consumable |
| 45 | Net Repair Thread | 60 | Daito net | Net Repair Thread (1.5mmx1700m) | 735 | 44 | | Consumable |
| 46 | Band for Plastic Greenhouse | 10 | Tokyo Tobar | Band for Plastic Greenhouse (9mmx500m Black) | 30,336 | 303 | | Consumable |
| 47 | Four Nails Fork for Agriculture | 20 | | Four Nails Fork for Agriculture | 3,674 | 73 | | Consumable |

| | | | | | | | | |
|----|----------------------------|----|-----------------|--|---------|-----|---|------------|
| 48 | Chovel | 20 | | Chovel | 2,099 | 42 | | Consumable |
| 49 | Digital Balance | 4 | AND | Digital Balance (50g~5000g) | 11,967 | 48 | A | |
| 50 | | 4 | | AC Adapter for Digital Balance | 2,519 | 10 | | |
| 51 | Water Distilling Apparatus | 1 | Yamato science | Water Distilling Apparatus (WS220) | 527,054 | 527 | A | |
| 52 | | 1 | Yamato science | Base Stand for Water Distilling Apparatus | 85,026 | 85 | | |
| 53 | | 1 | Yamato science | Feed-water Inlet Unit for Water Distilling Apparatus | 34,010 | 34 | | |
| 54 | | 1 | Yamato science | Drainage Trap for Water Distilling Apparatus | 226,840 | 227 | | |
| 55 | Hardness Meter for Fruit | 1 | EFFEGI | Penetrometer (0~13kg) | 42,093 | 42 | A | |
| 56 | Weighing Balance | 5 | AND | Weighing Balance (0.1~200g) | 7,453 | 37 | A | |
| 57 | | 5 | | AC Adapter for Balance | 2,519 | 13 | | |
| 58 | Laboratory Tools/Materials | 10 | Shibata Science | Whole Pipette (5ml) | 630 | 6 | | Consumable |
| 59 | | 10 | Shibata Science | Whole Pipette (10ml) | 735 | 7 | | Consumable |
| 60 | | 10 | Shibata Science | Messcylinder (100ml) | 2,204 | 22 | | Consumable |
| 61 | | 5 | Shibata Science | Messcylinder (200ml) | 2,834 | 14 | | Consumable |
| 62 | | 3 | Toky Glass | Rubber Bulb with Reservoir | 2,624 | 8 | | Consumable |
| 63 | | 3 | Toky Glass | Teflon Coating Spatula (180mm) | 3,674 | 11 | | Consumable |
| 64 | | 3 | Toky Glass | Glass Funnel (75mm) | 630 | 2 | | Consumable |
| 65 | | 10 | Toky Glass | Stirring Bar (5x15mm) | 315 | 3 | | Consumable |
| 66 | | 12 | Toky Glass | Washing Bottle (100ml) | 315 | 4 | | Consumable |
| 67 | | 3 | Shibata Science | Widemouthed Tubulated Bottle 5L | 3,674 | 11 | | Consumable |
| 68 | | 3 | Shibata Science | Widemouthed Tubulated Bottle 10L | 5,249 | 16 | | Consumable |

| | | | | | | | | |
|----|-----------------------|----|-------------------|---|--------|-----|--|------------|
| 69 | | 3 | Shibata Science | Widemouthed Tubulated Bottle 20L | 7,453 | 22 | | Consumable |
| 70 | | 10 | Shibata Science | Tweezers (120mm) | 105 | 1 | | Consumable |
| 71 | | 3 | Shibata Science | Qualification Filter Paper (125mm) | 1,365 | 4 | | Consumable |
| 72 | | 1 | Shibata Science | Washing Brush (tapered x5) | 1,889 | 2 | | Consumable |
| 73 | | 1 | Shibata Science | Washing Brush (sponge x5) | 3,359 | 3 | | Consumable |
| 74 | | 10 | | Border Label (Red 25x40mm) | 3,674 | 37 | | Consumable |
| 75 | | 10 | | Border Label (Blue 25x40mm) | 3,674 | 37 | | Consumable |
| 76 | | 3 | Shibata Science | Magnestar (Stirrer 500ml) | 14,276 | 43 | | Consumable |
| 77 | | 3 | | Step-down Transformer for Magnestar | 4,304 | 13 | | Consumable |
| 78 | | 3 | Kashimura | Conversion Plug for Step-down Transformer | 315 | 1 | | Consumable |
| 79 | | 2 | Carton | Head Loupe (103x49 lens) | 13,436 | 27 | | Consumable |
| 80 | | 5 | Atago | Handy Type Refractometer (Brix 0.0~20.0%) | 21,204 | 106 | | Consumable |
| 81 | | 3 | Nigata Seiki | Vernier Caliper (0~200mm) | 7,453 | 22 | | Consumable |
| 82 | | 3 | Kokuyo | Manual Type Counter (4 digit) | 2,099 | 6 | | Consumable |
| 83 | | 2 | Advantec | Ceramic Heater for Water Distilling Apparatus RF00047 | 41,883 | 84 | | Consumable |
| 84 | Agricultural Chemical | 2 | Nippon Juso | Homai Coat | 2,624 | 5 | | Consumable |
| 85 | | 2 | Nippon Juso | Topsin-M WP | 4,304 | 9 | | Consumable |
| 86 | | 50 | Nissan Chemical | Malathion Emulsion | 1,470 | 73 | | Consumable |
| 87 | | 30 | Sumitomo Chemical | Benlate Water Dispersible Powder | 8,503 | 255 | | Consumable |

| | | | | | | | | | |
|----|---|---|----------------|----------------------|---------------------------|--------|-------------|--------|------------|
| 88 | | 1 | Kanto Chemical | Phenolphthalein | | 2,204 | 2 | | Consumable |
| 89 | | 5 | Kanto Chemical | Oxalate Solution | | 5,144 | 26 | | Consumable |
| | | | | | Sub Total | | 7195 | | |
| | [Local Procurement by JICA Office] Nu.1.00=¥1.71 | | | | Unit Price (Nu) | | | | |
| 90 | LED TV | 1 | Samsung | LED48 UA48H5100AKXXT | 86,828 | 86,828 | 87 | A | |
| | | | | | Sub Total | | 87 | | |
| | | | | | | | | | |
| | | | | | Grand Total | | 7282 | x 1000 | |

List of the Input

5. Local Cost covered by Project(JICA)

Not including equipment procured and Training cost in Japan

2010 (from April 2010 to March 2011)

applied rate 1.00Nu=1.90Yen

| | Contents | Amount(JPY) | Amount(BTN) |
|--------------|--|------------------|------------------|
| | Local Personal (Driver/Labor) | 608,931 | 320,490 |
| | Travel Expense | 810,730 | 426,700 |
| | Equipment/Material/Consumable Goods/Fuel | 3,548,740 | 1,867,758 |
| | Operation and Maintenance | 28,131 | 14,806 |
| | Training | 878,305 | 462,266 |
| | Construction | 0 | 0 |
| | Miscellaneous expense (Elec./Tel/Other) | 789,195 | 415,366 |
| Total | | 6,664,033 | 3,507,386 |

2011 (from April 2011 to March 2012)

applied rate 1.00Nu=1.70Yen

| | Contents | Amount(JPY) | Amount(BTN) |
|--------------|--|------------------|------------------|
| | Local Personal (Driver/Labor) | 997,152 | 586,560 |
| | Travel Expense | 889,076 | 522,986 |
| | Equipment/Material/Consumable Goods/Fuel | 2,498,230 | 1,469,547 |
| | Operation and Maintenance | 118,327 | 69,604 |
| | Training | 14,000 | 462,690 |
| | Construction | 458,174 | 269,514 |
| | Miscellaneous expense (Elec./Tel/Other) | 708,866 | 416,980 |
| Total | | 5,683,825 | 3,797,881 |

2012 (from April 2012 to March 2013)

applied rate 1.00Nu=1.50Yen

| | Contents | Amount(JPY) | Amount(BTN) |
|--------------|--|------------------|------------------|
| | Local Personal (Driver/Labor) | 1,005,998 | 670,665 |
| | Travel Expense | 820,565 | 547,043 |
| | Equipment/Material/Consumable Goods/Fuel | 2,666,652 | 1,777,768 |
| | Operation and Maintenance | 945,515 | 630,343 |
| | Training/Meeting | 1,331,595 | 887,730 |
| | Construction | 338,240 | 225,493 |
| | Miscellaneous expense (Elec./Tel/Other) | 96,485 | 64,323 |
| Total | | 7,205,048 | 4,803,365 |

2013 (from April 2013 to March 2014)

applied rate 1.00Nu=1.65Yen

| | Contents | Amount(JPY) | Amount(BTN) |
|--------------|--|--------------------|--------------------|
| | Local Personal (Driver/Labor) | 1,013,513 | 614,250 |
| | Travel Expense | 860,074 | 521,257 |
| | Equipment/Material/Consumable Goods/Fuel | 2,631,263 | 1,594,705 |
| | Operation and Maintenance | 313,012 | 189,704 |
| | Training/Meeting | 1,386,602 | 840,365 |
| | Construction | 1,627,448 | 986,332 |
| | Miscellaneous expense (Elec./Tel/Other) | 225,864 | 136,887 |
| Total | | 8,057,775 | 4,883,500 |

2014 (from April 2014 to March. 2015)

applied rate 1.00Nu=1.775Yen

| | Contents | Amount(JPY) | Amount(BTN) |
|--------------|--|--------------------|--------------------|
| | Local Personal (Driver/Labor) | 1,391,146 | 783,744 |
| | Travel Expense | 633,143 | 356,700 |
| | Equipment/Material/Consumable Goods/Fuel | 2,888,275 | 1,627,197 |
| | Operation and Maintenance | 562,141 | 316,699 |
| | Training/Meeting | 1,713,738 | 965,486 |
| | Construction | 4,438 | 2,500 |
| | Miscellaneous expense (Elec./Tel/Other) | 240,209 | 135,329 |
| Total | | 7,433,088 | 4,187,655 |

List of the Input

6. Local Cost covered by RGoB

| Obj code | Content | Bhutan side in BTN | | | | | Total |
|----------|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------------------|-------------------|
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | |
| | | July, 2010 to June, 2011 | July, 2011 to June, 2012 | July, 2012 to June, 2013 | July, 2013 to June, 2014 | July, 2014 to June 2015 | |
| 1.01 | Pay and Allowances | 4,711,000 | 4,692,000 | 4,805,398 | 4,880,244 | 9,556,560 | 28,645,202 |
| 2.01 | Other Personnel Emoluments | 1,466,000 | 1,489,000 | 1,501,200 | 1,537,778 | 631,800 | 6,625,778 |
| 11.01 | Travel - Incountry | 2,945,000 | 3,132,000 | 2,571,240 | 3,067,415 | 3,396,583 | 15,112,238 |
| 14.01 | S&M-Office supplies, printing, publications | 46,000 | 139,000 | 82,499 | 70,799 | 71,400 | 409,698 |
| 14.03 | S&M-Fertilizers, chemicals and inoculants | 74,000 | 127,000 | 116,737 | 120,768 | 264,000 | 702,505 |
| 14.04 | S&M Seeds and Seedlings | 39,000 | 453,000 | 98,500 | 75,357 | 113,000 | 778,857 |
| 14.06 | S&M-Uniform, extension kits | 90,000 | 179,000 | 216,647 | 129,240 | 135,000 | 749,887 |
| 15.02 | MOP-Vehicle | 785,000 | 805,000 | 872,189 | 1,030,189 | 109,483 | 3,601,861 |
| 15.05 | MOP-Equipment | 222,000 | 185,000 | 205,665 | 257,968 | 259,166 | 1,129,799 |
| 15.06 | MOP-Plantation | 347,000 | 366,000 | 325,566 | 353,569 | 324,166 | 1,716,301 |
| 15.07 | MOP-Computers | 14,000 | 27,000 | - | 57,138 | 11,400 | 109,538 |
| 17.03 | Transportation | 75,000 | 76,000 | 92,397 | 32,811 | 181,200 | 457,408 |
| 17.08 | Meetings and celebrations | 8,000 | 40,000 | 14,614 | 184,500 | 16,500 | 263,614 |
| 24.03 | Contribution-Provident Fund | 413,000 | 428,000 | 439,180 | 162,000 | 343,800 | 1,785,980 |
| 45.02 | Training | 144,000 | 257,000 | 196,386 | 187,500 | 225,000 | 1,009,886 |
| 52.08 | Tools and implements | 182,000 | 265,000 | 245,000 | 220,500 | 395,500 | 1,308,000 |
| | Total | 11,561,000 | 12,660,000 | 11,783,218 | 12,367,776 | 16,034,558 | 64,406,552 |

List of the Input**7. Land, Building, Office, and Facility provided by RGoB**

| No. | Item | Place | Component |
|-----|--------------------|-----------------------------------|--|
| | F.Y. 2010-2011 | | |
| | Office building | Research Block, RNR RDC Wengkhari | Office, Meeting hall, Laboratory, Stores |
| | Research farm land | RNR RDC Wengkhari | |
| | | | |
| | F.Y. 2011-2012 | | |
| | Office building | Research Block, RNR RDC Wengkhari | Office, Meeting hall, Laboratory, Stores |
| | Research farm land | RNR RDC Wengkhari | |
| | | | |
| | F.Y. 2012-2013 | | |
| | Office building | Research Block, RNR RDC Wengkhari | Office, Meeting hall, Laboratory, Stores |
| | Research farm land | RNR RDC Wengkhari | |
| | | | |
| | F.Y. 2013-2014 | | |
| | Office building | Research Block, RNR RDC Wengkhari | Office, Meeting hall, Laboratory, Stores |
| | Research farm land | RNR RDC Wengkhari | |
| | | | |
| | F.Y. 2014-2015 | | |
| | Office building | Research Block, RNR RDC Wengkhari | Office, Meeting hall, Laboratory, Stores |
| | Research farm land | RNR RDC Wengkhari | |

| Plan of Operation: Version 5 (Progress update_March 2015) | | | | Actual implementation (Progress) | | | | | | | | | | | | Plan | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|---------------------|---|--|----|----|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|---|---|---|---|---|---|---|---|---|----|----|
| Project Title: Horticulture Research and Development Project in the Kingdom of Bhutan (HRDP) | | | | 2010 | | | | 2011 | | | | 2012 | | | | 2013 | | | | 2014 | | | | 2015 | | | | | | | | | | | | | | |
| | | | | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | 2Q | 3Q | 4Q | 1Q | | | | | | | | | | | | | | |
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| Project Period: March 2010 – March 2015 | | | | Project Period | [Blue bar spanning all months from March 2010 to March 2015] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Target Area: Mongar, Lhuntse, Trashiyangtse, Trashigang, Pemagatshel, Samdrup Jongkhar | | | | JCC | [Blue bars with asterisks in 2010 Q2, 2011 Q2, 2012 Q3, 2013 Q2, 2014 Q3] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Target Group: Concerned government staff and horticulture farmers in the target area | | | | PCCM | [Blue bars with asterisks in 2010 Q2, 2011 Q4, 2012 Q4, 2013 Q4] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | WGM | [Blue bars with asterisks in 2010 Q3, 2011 Q9, 2012 Q7, 2013 Q10, 2014 Q9] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | Joint Evaluation | [Blue bars with asterisks in 2012 Q6, 2014 Q9] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Outputs and Activities | | Expected Results of | JICA Experts | Person in | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output 1 | Horticulture farming practices and crops in target areas are | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-1 | Identify appropriate horticulture crops according to the agro-ecological zones (600-2000m) by reviewing AREP, OGTP plan, SLMP and other related studies | Agro-ecological zone established. Crop suitable areas identified in the project sites. | Horticulture Expert | RDC W (H) | [Blue bars from March 2010 to March 2015] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-2 | Develop horticulture farming practices and appropriate crops according to agro-ecological zones. | Horticulture farming practices developed according to agro-ecological zones. | Horticulture Expert | RDC W (H, FS, RCO) | [Blue bars from March 2010 to March 2015] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Output 2 | Technical training system on horticultural crops for | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-1 | Review the previous training programs on horticulture in RNR-RDC, Wengkhari | Training needs identified | Extension Expert | RDC W (RCO & H) & DAOs | [Blue bars in 2010 Q2, 2010 Q3, 2011 Q2, 2012 Q2, 2013 Q2, 2014 Q2] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-2 | Prepare training plan and materials for training programs on horticulture for Extension Officers and farmers | Training curriculum, training plan and materials developed | Extension Expert | RDC W (RCO & H) | [Blue bars in 2011 Q4, 2012 Q4, 2013 Q4] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-3 | Provide technical training in RNR RDC Wengkhari and project sites | Technical capacity enhanced | Extension Expert | RDC W (RCO & H) | [Blue bars in 2010 Q2, 2010 Q3, 2011 Q2, 2011 Q3, 2011 Q4, 2011 Q9, 2012 Q2, 2012 Q3, 2012 Q4, 2013 Q2, 2013 Q3, 2013 Q4, 2014 Q2, 2014 Q3, 2014 Q4] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-4 | Facilitate farmers to farmers extension | Farmers to farmer extension activities conducted | Extension Expert | RDC W (RCO) DAOs, EAs & Trained farmers | [Blue bars in 2015 Q1] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Implementation Process

1. Meetings

1) JCC Meetings

| Date | Type of Meeting | Major Agendas | Attendance |
|-------------|---|--|--|
| 23 Dec 2010 | 1 st Joint Coordination Committee Meeting (Venue; Thimphu) | <ul style="list-style-type: none"> • Project implementation approaches, progress updates, issues, constraints and measures taken by both Japanese and RGoB side. • Findings of project baseline study • Proposed changes in the project design matrix and finalization of the PDM by the committee members. | <ol style="list-style-type: none"> 1. Sherab Gyeltshen, Chair Secretary, MoAFs, Thimphu 2. Tomoki Nitta, Resident Representative, JICA Bhutan Office, Thimphu 3. Kunihiro Shiraishi, Project Formulation Advisor, JICA Bhutan Office, Thimphu 4. Chencho Norbu, Director, Department of Agriculture MoAFs, Thimphu 5. Kinlay Dorji, Program Officer, JICA Bhutan Office, Thimphu 6. Karma Sonam, Sr. Planning Officer, PPD, MoAFs, Thimphu 7. Norbu Wangchuk, Sr. Planning Officer, GNHC, Thimphu 8. Kinlay Tshering, Chief Horticulture Officer, DoA, MoAFs, Thimphu 9. Y. Tomiyasu, Team Leader HRDP JICA, RNR RDC Wengkhari 10. Satoshi Yamanaka, Training and Extension Expert, HRDP JICA, RNR RDC Wengkhari 11. Yoshiko Hagiwara, Project Coordination Expert, HRDP JICA, RNR RDC Wengkhari 12. Lhap Dorji, Offtg. Program Director, RNR RDC Wengkhari 13. Kinley Tshering, SRO Horticulture, RNR RDC Wengkhari 14. Sonam Gyeltshen, RO Horticulture, RNR RDC Wengkhari |
| 22 Oct 2012 | 2 nd Joint Coordination Committee Meeting (Venue; Thimphu) | <ul style="list-style-type: none"> • Joint Mid Term Evaluation Results and Recommendations • Revised Project Design Matrix and the Plan of Operation based on the MTR. • Sign the Memorandum of Minutes of the MTR – HRDP | <ol style="list-style-type: none"> 1. Dasho Sherab Gyeltshen Secretary, MoAF Bhutan 2. Mr. Tomkii Nitta, Chief Representative, JICA Bhutan Office Thimphu Bhutan 3. Mr. Yuichi Tomiyasu, Team Leader HRDP JICA, RDC Wengkhari 4. Mr. Kenichi Sasaki, Coordination / Farmers Organization, HRDP JICA RDC Wengkhari 5. Dr. Jiro Aikawa Senior Advisor, JICA (Mission Team Leader) 6. Ms. Arisa Kikuchi, Rural Development Department, JICA (Mission Member) 7. Mr. Jun Totsukawa, Evaluation Analysis, Sano Planning Co. Ltd. Japan, Consultant 8. Ms. Kunzang Lham Sangay, Offtg. Chief Program Coordinator, Development Cooperation, GNHC 9. Mr. Norbu Wangchuk, Sr. Planning Officer, Plan Monitoring and Coordination Division, GNHC (Mission Member) |

| | | | |
|--------------|---|---|---|
| | | | <p>10. Tashi Yangzom, Planning Officer, Representative of the Policy and Planning Division, MOAF</p> <p>11. Mr. Ganesh B Chettri, Agriculture Specialist, DoA MOAF</p> <p>12. Ms. Kinlay Tshering, Chief Horticulture Officer, Horticulture Division, DoA MOAF</p> <p>13. Mr. Dorji, National Citrus Commodity Coordinator, Horticulture Division, DoA MoAF</p> <p>14. Mr. Sangay Dendup, National Fruits and Nuts Commodity Coordinator, Horticulture Division, DoA MOAF (Mission Member)</p> <p>15. Kinley Tshering, Sr. Research Officer, RNR RDC Wengkhar</p> <p>16. Lhap Dorji, Program Director, RNR RDC Wengkhar</p> |
| 12 Feb. 2014 | 3 rd Joint Coordination Committee Meeting (Venue; Mongar) | <ul style="list-style-type: none"> • Progress update • Revised Project Design Matrix and the Plan of Operation • Sharing of information on future Technical Cooperation Projects | <p>1. Sherub Gyaltsen, Dasho Secretary, MOAF</p> <p>2. Masanori Sunada, Project Formulation Advisor JICA Bhutan Office, Thimphu</p> <p>3. Kinlay Dorji, Sr. Program Officer JICA Bhutan Office, Thimphu</p> <p>3. Yuichi Tomiyasu, Team Leader, HRDP JICA, RDC Wengkhar</p> <p>4. Kenichi Sasaki, Project Coordinator / Farmers Organization, HRDP-JICA, RDC Wengkhar</p> <p>5. Satoshi Yamanaka, Horticulture Cultivation (Short Term), HRDP-JICA, RDC Wengkhar</p> <p>6. Lhap Dorji, Program Director, RNR RDC Wengkhar</p> <p>7. Lakey, Dy. Horticulture Officer, Horticulture Division, DoA, MoAF, Thimphu</p> <p>8. Sangay Jamtsho, Marketing Officer, RAMCO, Mongar</p> <p>9. Tshering Penjor, Principal Research Officer (Citrus and Plant Protection), RDC Wengkhar</p> <p>10. Kinlay Tshering, Dy. Chief Research Officer (Soils), RDC Wengkhar</p> <p>11. N B Rai, Research Assistant (Horticulture), RDC Wengkhar</p> <p>12. Thinlay Penjor, Research Assistant (Horticulture), RDC Wengkhar</p> <p>13. Mandira Acharya, Research Assistant (Horticulture) RDC Wengkhar</p> <p>14. Yangchen Dema, Research Assistant (Horticulture) RDC Wengkhar</p> <p>15. Yeshe Lhadon, Research Assistant (Horticulture) RDC Wengkhar</p> |
| 25 Nov 2014 | 4 th Joint Coordination Committee Meeting (Venue: Thimphu) | <ul style="list-style-type: none"> • Progress update • Outcome of terminal evaluation report. • Recommendations | <p>1. Tenzin Dhendup, Dasho Secretaery, MoAF</p> <p>2. Yumiko Asakuma, Chief Rep. Bhutan JICA Office, Thimphu</p> <p>3. Ayumi Ohshima, Mission Leader, JICA HQ, Tokyo</p> <p>4. Sho Takano, Dy. Chief Rep. Bhutan JICA Office,</p> |

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| | | <p>of terminal evaluation.</p> <ul style="list-style-type: none"> • Post project sustainability strategies | <p>Thimphu</p> <ol style="list-style-type: none"> 5. Topshiko Shimada, Consultant, JICA Mission 6. Masanori Sunada, Project Formulation Advisor, Bhutan JICA Office, Thimphu 7. Kinlay Dorji, Chief Program Officer, Bhutan JICA Office, Thimphu 8. Azusa Fujiie, Mission member, JICA HQ, Tokyo 9. Hiroyuki Ikeda, Mission member, JICA HQ, Tokyo 10. Kinlay Tshering, CHO, Horticulture Division, MoAF 11. Pema Wangchuk, Dy. CAO 12. Tenzin Drugyel, Dy. CAO 13. Lakey, Dy. CAO 14. Choni Dendup, DAMCO, MoAF 15. Sangay Dendup, Sr. AO 16. Tshering Tobgay, Sr. AO 17. Kunzang L Sangay, Dy. CPO, GNHC 18. Norbu Wangchuk, CPO, GNHC 19. Sonam Tobgyal, Sr.PO, GNHC 20. Yuichi Tomiyasu, Chief Advisor, HRDP-JICA 21. Keinichi Sasaki, Project Coordinator, HRDP-JICA 22. Lhap Dorji, PD, RNR RDC Wengkhari 23. Kinley Tshering, Dy. CRO, RNR RDC Wengkhari |
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2) Regular Meetings

| Date | Type of Meeting | Major Agendas | Attendance |
|---|--|--|--|
| <1st year of the Project> | | | |
| 24 May 2010 | 1 st PCCM or Project Launch Meeting (Venue: RDC Wengkhari) | <ul style="list-style-type: none"> • HRDP-JICA: Background and Project Profile • Proposal on project implementation strategies, approaches, focus crops and target areas. • Reconciliation of plan of operation with 10th FYP and OGTP plan. | <ol style="list-style-type: none"> 1. Director, DoA, MoAF, Thimphu. 2. Dasho Dzungdag, Dzongkhag Administration, Mongar Dzongkhag 3. Specialist, Farming Systems, RDC Wengkhari 4. Kunihiro Shiraishi, Project Formulation Advisor, JICA Bhutan Office, Thimphu 5. Representative from Horticulture Division, DoA, Thimphu 6. Chief Advisor, HRDP-JICA, RDC Wengkhari 7. DAOs of Six Eastern Dzongkhag 8. Coordinator, RAMCO, Mongar 9. Offtg. Program Director, RDC Wengkhari 10. Dy. Chief Adm. Officer, RDC Wengkhari 11. Sector Heads and Officers RDC Wengkhari 12. OICs RDSC Khangma/ Lingmethang/ Nangkhori 13. All the Horticulture staff |

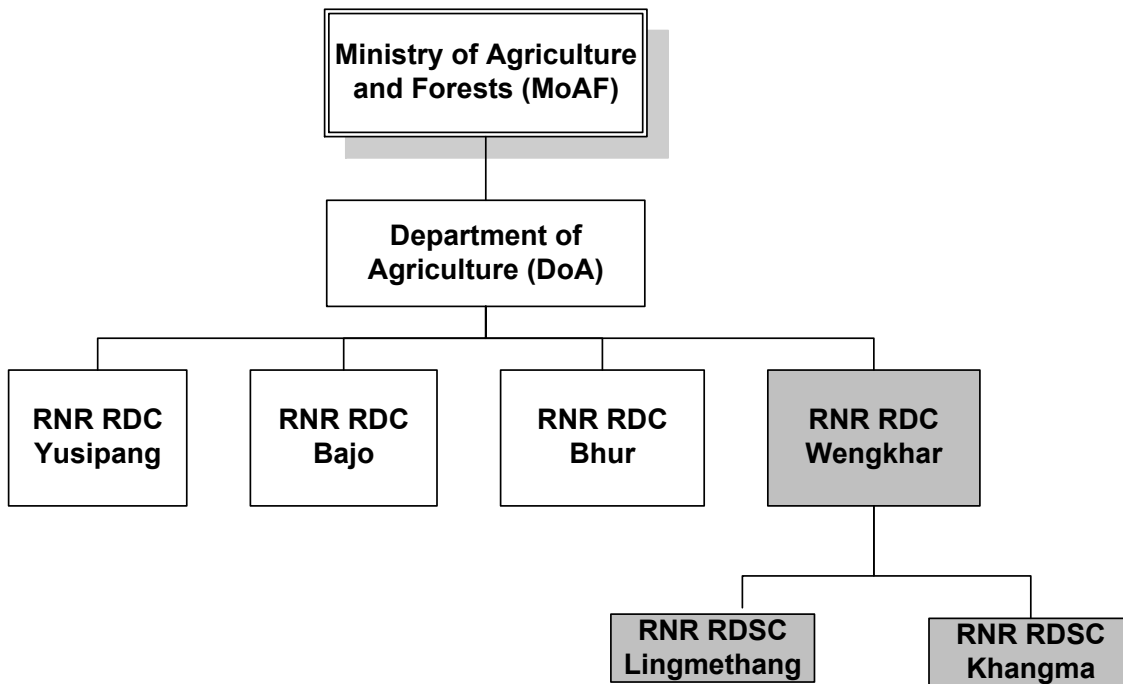
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|---|--|--|--|
| <p>2 Sept 2010 – S/jongkhar 3 Sept 2010 - Pemagatshel 20 Sept 2010 – Trashigang 21 Sept 2010-Tashiyangtse</p> | <p>Dzongkhag Familiarization and project awareness seminar for the Dzongkhag Administration Officials. (1st Working Group Meeting)</p> | <ul style="list-style-type: none"> • HRDP-JICA: Background and Project Profile • Project implementation strategies, approaches, focus crops and target geogs. • Crop technologies to be promoted. • Monitoring & evaluation of project activities. | <ol style="list-style-type: none"> 1. Dasho Dzondag 2. Dasho Dzongrab 3. Dzongkhag Agriculture Officer 4. Dzongkhag Planning Officer 5. DYT Chairman 6. 2-3 Geog Agriculture Extension Officers 7. Program Director, RDC Wengkhar 8. Chief Advisor, HRDP-JICA, RDC Wengkhar 9. Project Coordinator, HRDP-JICA, RDC Wengkhar 10. Respective Project Focal Persons from RDC Wengkhar |
| <2nd year of the Project> | | | |
| <p>17 Oct – 7 Nov 2011</p> | <p>2nd Working Group Meeting (Conducted in each of the six eastern Dzongkhags)</p> | <ul style="list-style-type: none"> • Progress update of project in each of the Dzongkhags • Follow ups required from the stakeholders • Activities in pipeline for 2012-2013 in each of the Dzongkhags | <ol style="list-style-type: none"> 1. DYT Chairman 2. Dzongkhag Agriculture Officers 3. Assistant DAOs 4. All the Geog Agriculture Extension Officers (Trashigang-13, Pemagatshel-8, Mongar-15, S/jongkhar-7, Tashiyangtse -8, Lhuntshe-9) 5. Y. Tomiyasu, Chief Advisor, HRDP-JICA 6. S. Yamanaka, Extension Expert, HRDP-JICA 7. Program Director, RDC Wengkhar 8. Sonam Gyeltshen, SRO, RDC Wengkhar 9. Ugyen sonam, SRA, RDC Wengkhar 10. Karma Tenzin, SRA, RDC Wengkhar 11. Ugyen Sonam, SRA, RDC Wengkhar 12. N. B. Rai, RA, RDC Wengkhar 13. Sonam Tshomo, RA, RDC Wengkhar |
| <p>25 Nov 2011</p> | <p>2nd Project Coordination Committee Meeting</p> | <ul style="list-style-type: none"> • Review and evaluate the progress of the technical cooperation project in the region. • Review and endorse the work plans developed by the working group members. • Give recommendati | <ol style="list-style-type: none"> 1. Dasho Dzongdags of 6 eastern Dzongkhags 2. Dzongkhag Planning Officers of 6 eastern Dzongkhags 3. Dzongkhag Agriculture Officers of 6 eastern Dzongkhags. 4. Coordinator, RAMCO, Mongar 5. JICA Experts 6. Program Director, RDC Wengkhar 7. Sonam Gyeltshen, SRO, RDC Wengkhar 8. Ugyen sonam, SRA, RDC Wengkhar 9. Karma Tenzin, SRA, RDC Wengkhar 10. Ugyen Sonam, SRA, RDC Wengkhar 11. N. B. Rai, RA, RDC Wengkhar 12. Sonam Tshomo, RA, RDC Wengkhar |

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| | | ons to the project management team and JCC members for effective implementation of the project activities. | |
| <3rd year of the Project> | | | |
| 20 Aug 2012 – Trashigang 22 Aug 2012 – Pemagatshel & Mongar 24 Aug 2012 – S/jongkhar & Tashiyangtse 29 Aug 2012 – Lhuntshe | 3 rd Working Group Meeting (Conducted in each of the six eastern Dzongkhags) | <ul style="list-style-type: none"> Review of 2nd WGM and progress update of project in each of the Dzongkhags. Follow ups required from the stakeholders. Activities in pipeline for 2012-2013 in each of the Dzongkhags. Suggestions or recommendations if any. | <ol style="list-style-type: none"> DYT Chairman Dzongkhag Agriculture Officers Assistant DAOs All the Geog Agriculture Extension Officers (Trashigang-13, Pemagatshel-8, Mongar-15, S/jongkhar-7, Tashiyangtse-8, Lhuntshe-9) Y. Tomiyasu, Chief Advisor, HRDP-JICA S. Yamanaka, Extension Expert, HRDP-JICA Program Director, RDC Wengkar Loday Phuntsho, SRO, RDC Wengkar Kinley Tshering, SRO, RDC Wengkar Domang, RO, RDC Wengkar Sonam Gyeltshen, SRO, RDC Wengkar N. B. Rai, RA, RDC Wengkar Thinlay Penjor, RA, RDC Wengkar Sonam Tshomo, RA, RDC Wengkar Tshering Pemo, RA, RDC Wengkar Mandera Acharaya, RA, RDC Wengkar |
| 18 Dec 2012 | 3 rd Project Coordination Committee Meeting Venue: (Samdrupjongkhar) | <ul style="list-style-type: none"> Updates and follow ups from 2nd PCCM, 3rd Working Group Meeting and 2nd JCC meeting. Project activity updates in the region (2010-2012) - Midterm report. Project Mid Term Evaluation findings, recommendations | <ol style="list-style-type: none"> Lhap Dorji, Program Director, RDC Wengkar Yuichi Tomiyasu, Team Leader, HRDP/JICA, RDC Wengkar Kenichi Sasaki, Coordinator, HRDP/JICA, RDC Wengkar Kiran Subedi, DAO, Pemagatshel Karma Chewang, DAO, Samdrupjongkhar Khandu Dorji, DPO, Samdrupjongkhar Galay Rabten, APO, Lhuntshe Kuenzang Peldon, ADAO, Samdrupjongkhar Sangay Wangdi, ADAO, Mongar Sonam Phuntsho, Sr. ES, Samdrupjongkhar Pelden Tshomo, EA, Orong, Samdrupjongkhar Kinley Tshering, SRO, HRDP/ RDC Wengkar Loday Phuntsho, SRO, HRDP/ RDC Wengkar Domang, RO, HRDP/ RDC Wengkar |

| | | | |
|---|--|--|--|
| | | <p>ons and follow ups.</p> <ul style="list-style-type: none"> Farmers group mobilization and marketing initiative. | <ol style="list-style-type: none"> Thinley Penjor, RA, HRDP/ RDC Wengkhari R.B. Thapa, RQI, BAFRA, Samdrupjongkhar Tsheten Dukpa, Sr. ES, Gomdar, Samdrupjongkhar Ugyen Wangchuk, AAEO, Lhuentse Tshering Penjor, ES II, Shongphu, Trashigang Tenzin Dema, ES II, Dewathang, Samdrupjongkhar Choni Lhamo, ES II, Phuntshotang, Samdrupjongkhar Sanga Choden, ES I, Martshala, Samdrupjongkhar Sonam Dorji, ES II, Langchenphu, Samdrupjongkhar Wanchuk, ES II, Pemathang, Samdrupjongkhar Sonam Gyeltshen, SRO, HRDP/ RDC Wengkhari |
| <4th Year of the project> | | | |
| <p>7 Nov 2013 – Trashigang</p> <p>19 Nov 2013 – Lhuntshe</p> <p>23 Nov 2013 – Pemagatshel</p> <p>24 Nov 2014 – Samdrupjongkhar</p> <p>23 Dec 2013 – Mongar</p> <p>7 Feb 2014 - Tashiyangtse</p> | <p>4th Working Group Meeting (held separately in each of the Dzongkhags)</p> | <ul style="list-style-type: none"> Review of 3rd WGM and Progress update of project in each of the Dzongkhags. Follow ups required from the stakeholders. Activities in pipeline for 2012-2013 in each of the Dzongkhags | <ol style="list-style-type: none"> DYT Chairman Dzongkhag Agriculture Officers Assistant DAOs All the Geog Agriculture Extension Officers (Trashigang-13, Pemagatshel-8, Mongar-15, S/jongkhar-7, Tashiyangtse -8, Lhuntshe-9) Y. Tomiyasu, Chief Advisor, HRDP-JICA K. Sasaki, Project Coordinator, HRDP-JICA Program Director, RDC Wengkhari Loday Phuntsho, Dy.CRO, RDC Wengkhari Kinley Tshering, SRO, RDC Wengkhari Domang, RO, RDC Wengkhari Sonam Gyeltshen, SRO, RDC Wengkhari N. B. Rai, RA, RDC Wengkhari Thinlay Penjor, RA, RDC Wengkhari Sonam Tshomo, RA, RDC Wengkhari Tshering Pemo, RA, RDC Wengkhari Mandera Acharaya, RA, RDC Wengkhari |
| <p>16 Dec 2013</p> | <p>4th Project Coordination Committee Meeting (Venue: Trashigang Dzongkhag)</p> | <ul style="list-style-type: none"> Updates and follow ups from 3rd PCCM & 4th Working Group Meetings. Project activity updates in the region (2010-2013) HRDP JICA | <ol style="list-style-type: none"> Dasho Dzongdag, Trashigang Dzongkhag DYT Chairman, Trashigang Dzongkhag DAOs of six eastern Dzongkhags Planning Officers of six eastern Dzongkhags Coordinator, RAMCO, Mongar Y. Tomiyasu, Chief Advisor, HRDP-JICA K. Sasaki, Project Coordinator, HRDP-JICA Lhap Dorji, Program Director, RDC Wengkhari |

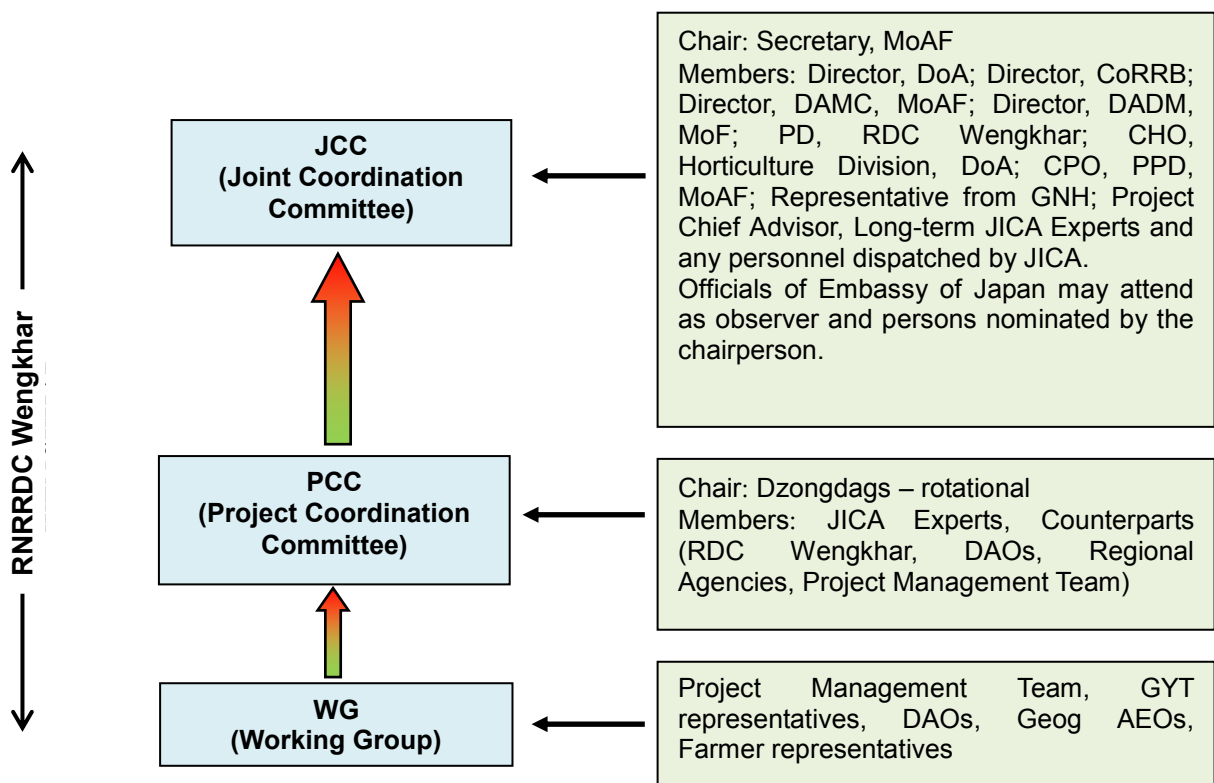
| | | | |
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| | | <p>Project Extension Approaches: Lessons for Realigning Dzongkhag Agriculture Extension.</p> <ul style="list-style-type: none"> • Points for Joint Coordination Committee Meeting for endorsement. | <p>9. Kinley Tshering, SRO, RDC Wengkhaz</p> |
| 2 March 2015 | Project Closing Ceremony | <ul style="list-style-type: none"> • Progress summary • Post-project sustainability strategy • Handing over of project completion documents to respective Dzongkhags. • Appointment of Farmer Resource Person. | <ol style="list-style-type: none"> 1. Yumiko Asakuma, Chief Rep. Bhutan JICA Office, Thimphu 2. Lungten Dorji, Dasho Dzongda, Trashigang 3. Sangay Duba, Dasho Dzongda, Tashiyangtse 4. Sangay Wangchuk, Dasho Dzongrab, Mongar 5. Kinlay Dorji, Chief Program Officer, Bhutan JICA Office 6. Kinley Tshering, CHO, Horti. Division, MoAF, Thimphu 7. Lakey, Dy. CAO, Horti. Division, MoAF, Thimphu. 8. Sangay Dhendup, Sr.AO, Horti. Division, MoAF, Thimphu 9. Kunzang L Sangay, Dy.CPO, GNHC, Thimphu 10. Phub Dorji, ADAO, Mongar 11. Ugyen Wangdi, ADAO, Lhuntshe 12. Dorji Gyeltshen, DAO, Tashiyangtse 13. D.C. Bandari, DAO, Trashigang 14. Kinzang Tshering, DAO, Pemagatshel 15. Tsheten, ADAO, Samdrupjongkhar 16. Nawang, PD, RDC Bajo 17. Yuichi Tomiyasu, Chief Advisor, HRDP-JICA 18. Keinichi Sasaki, Project Coordinator, HRDP-JICA 19. Lhap Dorji, PD, RNR RDC Wengkhaz 20. 18 National counterparts from RDC Wengkhaz 21. 24 selected trained farmers from 6 eastern Dzongkhags. |

2. Organization Chart of Implementing Agencies
(Chart)



RNR RDC – Renewable Natural Resources Research and Development Centre
RNR RDSC – Renewable Natural Resources Research and Development Sub centre

3. Implementing Structure of the Project
(Chart)



DoA: Department of Agriculture
CoRRB: Council of RNR Research of Bhutan
DAMC: Department of Agriculture Marketing and Cooperatives
DADM: Department of Aid and Debt Management
PD: Program Director
RDC: Research and Development Centre
CHO: Chief Horticulture Officer
CPO: Chief Planning Officer
PPD: Policy and Planning Division
GNH: Gross National Happiness
DAO: Dzongkhag Agriculture Officer
GYT: Geog Yargay Tshogdu
AEOs: Agriculture Extension Officers

Project Progress

Project Design Matrix Ver 5.Nov 2014 _Approved at 4th JCC 25/11/2014

Name of the Project: Horticulture Research and Development Project (HRDP) in the Kingdom of Bhutan
Target group: Horticulture farmers, horticulture staff and agriculture extension staff in the target area
Target area: Mongar, Trashigang, Lhuentse, Trashiyangtse, Samdrupjongkhar and Pemagatshel
(A: Good - B: Fair - C: Bad)

| Narrative Summary | Objectively Verifiable Indicators | Progress (A, B, C) | Achievement at the completion of the project | Reason of faster progress/delay | Prospects for Achievements |
|--|--|--------------------|---|---|----------------------------|
| Over all goal | | | | | |
| Horticulture becomes more popular as a source of income in the target area. | 1. The trained and extended farmers in the project target areas increase their average annual income from sale of horticulture produce from Nu. 8,400 to Nu. 20,000 by 2020. | A | As per the impact assessment survey finding as of May 2014 the overall average income of the trained & extended farmers stands at Nu.15,790 which is 79.85% increase from the baseline annual income as of 2014. | | 80% |
| | 2. 800 farmers are trained by RDC Wengkhar by 2020. | A | 507 farmers have been trained till Mar. 2015. | | 60% |
| Project Purpose | | | | | |
| The trained and extended farmers practice appropriate technologies for commercialization of horticulture | 1. Horticulture is practiced in about 5000 ac of arable dryland in the target area. | B | 2228.65 ac of arable dry land in the target area covered by the project intervention. | | 50% |
| | 2. 75 % of the trained farmers develop demonstration farms and conduct farmer to farmer extension. | A | 100% of the trained farmers especially those under systematic training approach have developed demo orchards in their farm land. As per the impact assessment, 86.2% of the trained farmers extended their skills to others. On an average each trained farmers have extended their skills to 6.4 other farmers. | After the training program demo orchards are established in each of the trained farmers field by providing seeds & seedlings, equipment such as secatur, pruning saw and technical support at farmers field . (Out-reach & Extension with Material) | 100% |
| | 3. 50 % of trained and extended farmers start to commercialise horticulture | A | As per the impact assessment survey 69.6% of trained and extended farmers have started to sale their horticulture produce. | The intergrated fruit and vegetable model has been promoted to all the farmers who have established fruit orchards mainly to generate additional income from sale of vegetables till the orchard reaches its economic bearing stage. Vegetable seed growers have started to sell the seeds since the first year and private nurseries have sold their planting materials. | 100% |
| Outputs | | | | | |
| 1. Horticulture farming practices and crops in the target area are identified according to production and market potential | 1-1 A horticulture development guidelines / manuals are developed. | A | Various guidelines / manuals / reports are developed such as; - Developed crop specific suitability areas for the project target areas - Project implementation approaches - Criteria for selection of farmers for training & establishment of demo orchards - Extension manual on fruit nursery production and vegetable seed production techniques - Cropping calendar for fruits and vegetables by altitude - Construction manual for low cost poly house - Walnut grafting technique - Rootstock seed extraction for citrus & stone fruits - Training materials for the farmers on orchard management - Potential clusters for commercial vegetable production identified in the region - Database of fruit orchards developed through different approaches in each of the Six Eastern Dzongkhags. - Experiences of Technical Cooperation Projects in the Eastern Region. | | 100% |

| | | | | | |
|---|--|---|--|---|------|
| 2. Technical training system on horticulture is strengthened in RNR-RDC, Wengkhar | 2-1 90 % of trained farmers apply key training contents in the field (about 100 farmers trained per year). | A | As per the impact assessment survey, 99% of the trained farmers have applied key training contents in their field. 634 farmers were trained. | Demo orchards are established in each of the trained farmers land to carry out post training activities. The selected farmers (4-6 farmers) from each of the villages are trained at RDC Wengkhar and are made to implement the post-training activities by providing the planting materials and teach other farmers of that particular citrus village. Vegetable seed growers trained are provided with necessary inputs in order to implement the post-training activities. | 100% |
| | 2-2 90 % of trained extension officers apply key training contents (about 15-20 staff trained per year). | A | A total of 79 staffs (extension & researchers) were trained till date in RDC Wengkhar. 96.8% of trained staffs applied the key training contents. | | 100% |
| | 2-3 Training organized by the project found to be relevant and effective by >80 % of the participants. | A | 99% of the training participants found the training organized by the project was relevant and effective as per the impact assessment survey of the farmers. | Hands on practice approach - more of practical knowledge imparted to the participants. | 100% |
| 3. The structure for providing seeds and seedlings is established in RNR-RDC, Wengkhar, nursery farmers, seed growers and National Seed Center (NSC) Yangtse farm | 3-1 Seed and seedling production and distribution mechanism in RNR RDC Wengkhar, nursery farmers and seed growers are developed and followed (target production of about 4500 fruit seedlings and 200 kg vegetable seeds per year) | A | <p>Seed and seedling production Grafted fruit plants (on-station) - Total production is 42422 plants in 5 years and average per year is 8484 plants. Vegetable seeds (on-station + seed growers) - Total production is 1228.78 kg and average per year is 307.2 kg</p> <p>The distribution system developed for distribution of the seeds and seedlings are as follows; <i>Fruit plants - through 3 different approaches</i> a) Systematic training & orchard development approach. b) Village development approach (Focus village) c) Direct support program.</p> <p><i>Vegetable seeds;</i> Seeds produced on-station are distributed as; a) Basic seeds maintained on-station for further multiplication for next season. b) Basic seeds of released varieties provided to National Seed Center. c) Provide seeds as one of the inputs for the participants (farmer & staffs) of the trainings organized in RDC Wengkhar. d) Vegetable production program. e) Sale of seeds to those interested to buy.</p> <p>Seeds produced by the seed growers are directly sold to Dzongkhags or farmers in their respective Dzongkhags. They are also linked up with National Seed Center.</p> | Effort of staffs and proper distribution system in place. Trained vegetable seed growers in the region. | 100% |
| | 3-2 100 % of trained farmers provided with basic materials to apply skills acquired from the training program. | A | 100% of the trained farmers are provided with materials like seeds & seedlings, tools & equipment and constant technical support. | The trained farmers were provided with seeds & seedlings and equipments according to categories of training such as secateur, pruning saw, bird net, and technical support. However, the project could not meet all the demands of the farmers such as water pipe & tank, sprayer, bird net, electric fence etc. | 100% |

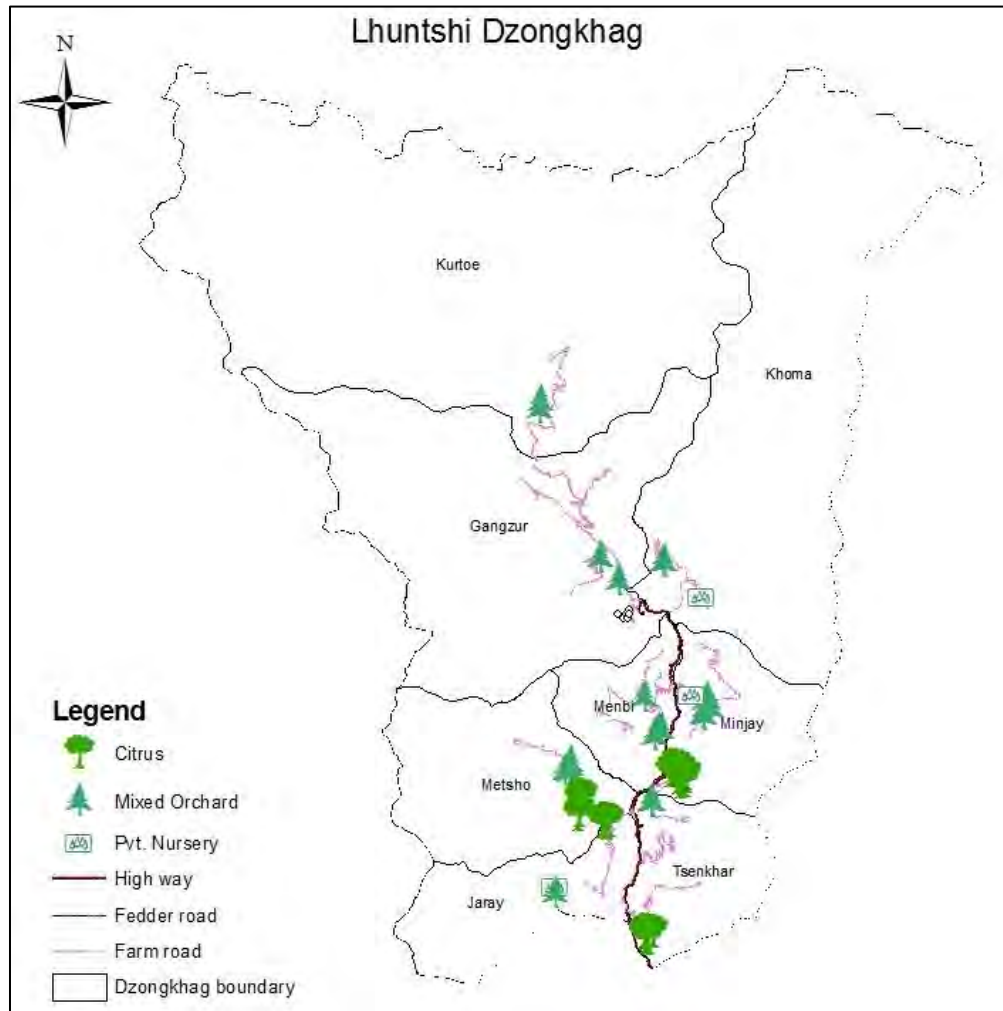
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|---|---|---|---|--|------|
| | 3-3 Seed farm in NSC Yangtse revived and begins seeds & seedling production. | A | <p>The following activities were carried out for reviving of the seed farm in Yangtse;</p> <ul style="list-style-type: none"> - Land development (making terraces feasible for cultivation and intercultural operations using farm machineries). - Construction of Internal farm road network. - Construction of irrigation facilities from water source to the farm (construction of tank at intake source, pipeline from source to farm, storage tanks inside the farm, internal irrigation networking & water harvesting pond). - Establishment of fruit mother blocks (Pear-24, Persimmon-43, Peach-20, Plum-15, Apple-5 plants). - Transplantation of the old pear plants (49 plants) into new block and constructed netting facilities for the orchard. - Provided one polyhouse materials, Ledge to Pear block, rootstock seeds, scion woods & basic seeds of vegetables for production of seeds & seedlings. - Provided technical support. - Two labourers sent for power tiller operation and maintenance training at AMC Paro and one staff trained on horticulture production techniques at RDC Wengkhari. | Availability of technical expertise and resources | 100% |
| 4. Group for marketing is mobilized and/or formed in collaboration with RAMCO, Mongar | 4-1 50% of groups in which trained farmers* belong to start horticulture marketing activities | A | 96.3 % of the groups in which the trained farmers belong to start to sell horticulture produce. 65% of the trained farmers joined the group after 2010 as per the impact assessment survey of the farmers. | Most of the trained farmers are already into groups in their respective villages. Commercial vegetable production started - 42 clusters consisting of 119 farmers groups covering 29 Geogs for commercial vegetable production identified and the growers were linked with local and outside vegetable vendors by RAMCO. | 100% |

* Farmers trained in the 5th year of the Project and farmers trained only for seed production are excluded

Notes:

Trained farmers – Farmers trained either in RDC Wengkhari or in the villages directly by project experts or RDC staff counterparts. Shall be composed of farmers trained under systematic training & orchard development, vegetable seed production, post harvest processing, marketing and focus village programs.

DATABASE OF ORCHARDS DEVELOPED IN LHUNTSHE DZONGKHAG



Horticulture Research and Development Project (HRDP-JICA)
RNR RDC Wengkhaz, Department of Agriculture
Ministry of Agriculture and Forest



PB : 132 Mongar 43001
Phone: 975 - 4 - 641 449 / 680009 / 680014
Fax: 975 - 4 - 641102

SUMMARY FOR LHUNTSHE DZONGKHAG

Profile of Lhuntshe Dzongkhag

| | |
|---------------------------------------|---|
| Location: | 27 ⁰ 23' to 28 ⁰ 04' latitude 90 ⁰ 28' to 91 ⁰ 28' longitude |
| Total Area: | 2808.53 km ² |
| Altitude range: | 900-6300 m asl |
| No. of Geogs: | 8 |
| Total Nos. of orchards: | 106 |
| Total Nos. of plants: | 5010 |
| Approximate area under fruits: | 31.313 ac |
| Nos. of private nurseries: | 3 |

Orchards developed through different Approaches (2010-2015)

| Approaches | No. of orchards | No. of plants |
|---|--|---------------|
| Mixed fruit orchard through Systematic Training Approach. | 33 orchards (31 mixed fruit & 2 citrus) | 1644 |
| Citrus Orchards through Focus Village Approach | 57 orchards (5 villages) | 2661 |
| Pear & Persimmon Orchards through Focus Village Approach | 7 orchards (1 village) | 357 |
| Direct Support Program | 8 orchards | 348 |

Orchards & Private nurseries established in different Geogs (2010-2015)

| Geog | Total No. of orchards | Total No. of plants | Type & No. of orchards | | | | Private Nursery |
|------------------|-----------------------|---------------------|------------------------|-----------|--------------------------|----------------|-----------------|
| | | | Mixed Fruit | Citrus | Pear & Persimmon Village | Direct Support | |
| Gangzur | 8 | 283 | 7 | 0 | 0 | 1 | 0 |
| Jarey | 33 | 1624 | 2 | 29 | 0 | 2 | 1 |
| Khoma | 3 | 260 | 2 | 0 | 0 | 1 | 1 |
| Kurtoe | 2 | 116 | 2 | 0 | 0 | 0 | 0 |
| Menbi | 11 | 517 | 7 | 0 | 0 | 4 | 0 |
| Menji | 23 | 1051 | 4 | 11 | 7 | 0 | 1 |
| Metsho | 15 | 728 | 5 | 10 | 0 | 0 | 0 |
| Tshenkhar | 11 | 431 | 2 | 9 | 0 | 0 | 0 |
| Dzongkhag | 106 | 5010 | 31 | 56 | 7 | 8 | 3 |

Details of orchards established through different approaches under Lhuntshe Dzongkhag

a) Mixed fruit orchards developed through Systematic Training & Orchard Development Program

| Sl. No. | Name | Village | Geog | Altitude (m asl) | Year | Crops & Nos. | | | | | | Total |
|---------|------------------|------------|----------|------------------|------|--------------|-----------|-------|------|--------|--------|-------|
| | | | | | | Pear | Persimmon | Peach | Plum | Walnut | Citrus | |
| 1. | Tsagay | Khashaling | Menbi | 1800 | 2011 | 27 | 18 | 0 | 0 | 0 | 30 | 75 |
| 2. | Karma Tenzin | Guensa | Menji | 2080 | 2011 | 25 | 15 | 0 | 0 | 0 | 0 | 40 |
| 3. | Tshering Dorji | Gangla | Khoma | 1800 | 2011 | 5 | 20 | 5 | 5 | 0 | 0 | 35 |
| 4. | Jamyang Lhamo | Ladrong | Jarey | 2000 | 2011 | 25 | 25 | 0 | 0 | 0 | 0 | 50 |
| 5. | Thinley Dorji | Ladrong | Jarey | 2010 | 2011 | 5 | 5 | 3 | 2 | 0 | 0 | 15 |
| 6. | Karma Chopel | Wambur | Tsenkhar | 1600 | 2012 | 24 | 10 | 0 | 0 | 0 | 14 | 48 |
| 7. | Rinchen Wangdi | Wambur | Tsenkhar | 1600 | 2012 | 11 | 5 | 0 | 0 | 0 | 5 | 21 |
| 8. | Sonam Darjay | Thongsa | Kurtoe | 1700 | 2012 | 34 | 6 | 6 | 0 | 0 | 0 | 46 |
| 9. | Rinchen Phuntsho | Ringbi | Kurtoe | 1700 | 2012 | 40 | 10 | 5 | 5 | 0 | 10 | 70 |
| 10. | Sangay Tshering | Gulipang | Gangzur | 1750 | 2012 | 18 | 5 | 0 | 0 | 0 | 35 | 58 |
| 11. | Ugyen Tenzin | Yurbi | Gangzur | 1400 | 2012 | 3 | 2 | 0 | 0 | 0 | 65 | 70 |
| 12. | Kuenzang Lhamo | Gorsum | Metsho | 2100 | 2013 | 8 | 9 | 5 | 2 | 11 | 0 | 35 |
| 13. | Tshering Yangzom | Gorsum | Metsho | 2200 | 2013 | 22 | 15 | 2 | 9 | 16 | 0 | 64 |
| 14. | Tshering Lhamo | Doleptang | Metsho | 2200 | 2013 | 22 | 7 | 1 | 10 | 10 | 0 | 50 |
| 15. | Pema Tshoki | Doleptang | Metsho | 2100 | 2013 | 19 | 8 | 1 | 7 | 14 | 0 | 49 |
| 16. | Yeshi | Tongthrom | Metsho | 2040 | 2013 | 14 | 8 | 0 | 4 | 2 | 0 | 28 |
| 17. | Kinzang Wangmo | Bamther | Metsho | 1520 | 2013 | 0 | 0 | 0 | 0 | 0 | 64 | 64 |
| 18. | Kinga Pemo | Bamther | Metsho | 1540 | 2013 | 0 | 0 | 0 | 0 | 0 | 64 | 64 |
| 19. | Pema Chopel | Dachugang | Menbi | 1947 | 2014 | 52 | 10 | 0 | 0 | 0 | 0 | 62 |
| 20. | Sonam Tshering | Dachugang | Menbi | 1920 | 2014 | 50 | 5 | 0 | 0 | 0 | 0 | 55 |
| 21. | Karma Tsungrab | Manjebee | Menbi | 1720 | 2014 | 30 | 10 | 0 | 0 | 0 | 17 | 57 |
| 22. | Tshetrim Rabgay | Tangmachu | Menbi | 1607 | 2014 | 5 | 10 | 5 | 5 | 0 | 20 | 63 |
| 23. | Kinzang Wangchuk | Dongpabi | Menji | 2047 | 2014 | 36 | 10 | 10 | 5 | 0 | 0 | 61 |
| 24. | Sonam Tobgay | Jalang | Menji | 1968 | 2014 | 59 | 10 | 5 | 5 | 0 | 0 | 79 |
| 25. | Phuntsho | Jalang | Menji | 2003 | 2014 | 45 | 10 | 10 | 5 | 0 | 0 | 70 |
| 26. | Thinley Dorji | Beerpa | Khoma | 1900 | 2014 | 30 | 10 | 5 | 5 | 0 | 0 | 50 |
| 27. | Ugyen Chezang | Jang | Gangzur | 1914 | 2015 | 6 | 6 | 0 | 0 | 0 | 0 | 12 |
| 28. | Kunzang Namdruk | Jang | Gangzur | 1867 | 2015 | 10 | 10 | 3 | 3 | 0 | 0 | 26 |

| Sl. No. | Name | Village | Geog | Altitude (m asl) | Year | Crops & Nos. | | | | | | Total |
|---------|----------------|----------|---------|------------------|------|--------------|------------|-----------|-----------|-----------|------------|-------------|
| | | | | | | Pear | Persimmon | Peach | Plum | Walnut | Citrus | |
| 29. | Kunzangla | Jang | Gangzur | 1914 | 2015 | 20 | 10 | 5 | 5 | 0 | 0 | 40 |
| 30. | Karma Tshering | Jang | Gangzur | 1901 | 2015 | 12 | 5 | 0 | 0 | 0 | 0 | 17 |
| 31. | Pema Rinzin | Jang | Gangzur | 1867 | 2015 | 15 | 10 | 2 | 3 | 0 | 0 | 30 |
| 32. | Sonam Wangchuk | Dangling | Menbi | 2062 | 2015 | 50 | 30 | 5 | 5 | 0 | 0 | 90 |
| 33. | Kezang Jamtsho | Dangling | Menbi | 2095 | 2015 | 25 | 15 | 5 | 5 | 0 | 0 | 50 |
| | | | | | | 747 | 329 | 83 | 90 | 53 | 324 | 1644 |

b) Orchards developed through Focus Village Approach (Pear & Persimmon Village)

| Sl. No. | Name of Farmer | Village | Geog | Altitude | Pear | Persimmon | Total |
|---------|----------------|---------|-------|----------|------------|------------|------------|
| 1. | Kondo | Jalang | Menji | 1891 | 31 | 30 | 61 |
| 2. | Deki Yangden | Jalang | Menji | 2061 | 41 | 21 | 62 |
| 3. | Cheki Wangchuk | Jalang | Menji | 1977 | 33 | 22 | 55 |
| 4. | Dorji | Jalang | Menji | 2002 | 20 | 20 | 40 |
| 5. | Tashi Tobgay | Jalang | Menji | 1970 | 30 | 23 | 53 |
| 6. | Wangmo | Jalang | Menji | 1997 | 25 | 25 | 50 |
| 7. | Thinley Pelden | Jalang | Menji | 2020 | 20 | 16 | 36 |
| | | | | | 200 | 257 | 357 |

c) Orchards developed through Citrus Focus Village Approach

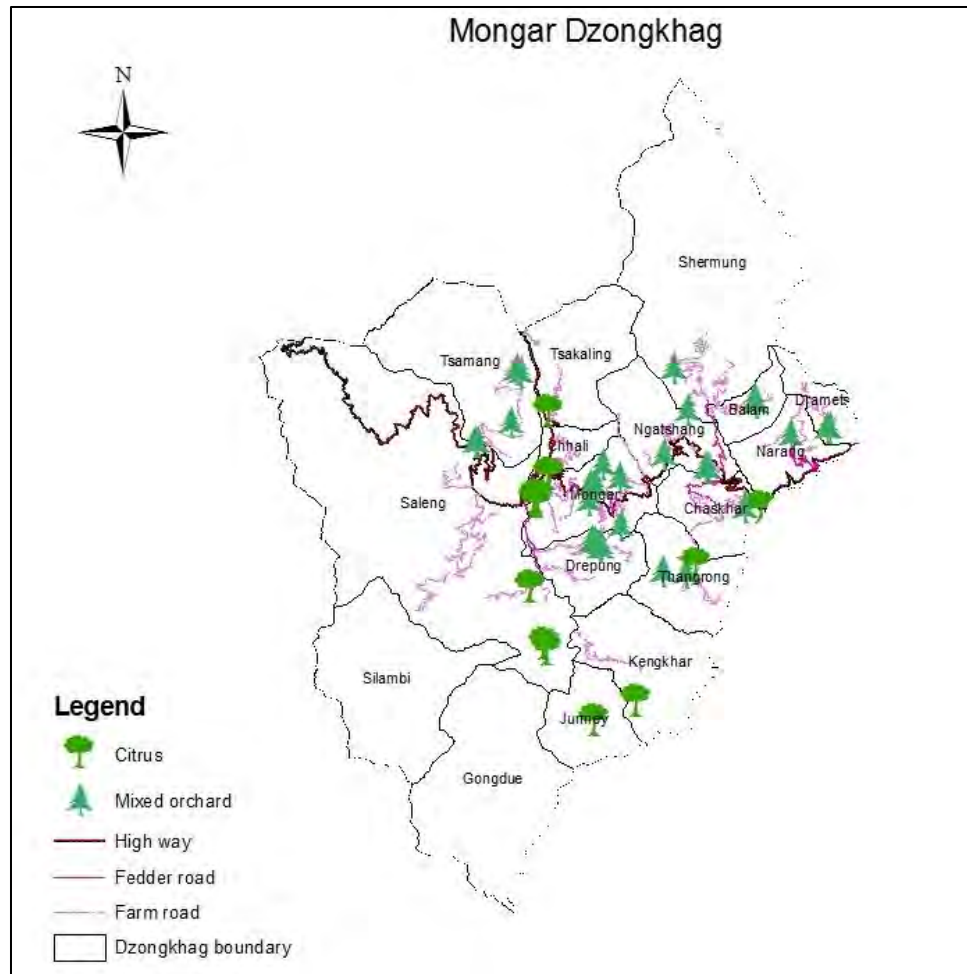
| Sl. No. | Name of Farmer | Village/ Location | Geog | Altitude range (m asl) | Year | Total |
|---------|--------------------|-------------------|-----------|------------------------|--------------|-------------|
| 1. | Lemo/Tashi Dorji | Yabi | Jarey | 1300-1400 | 2011-12 | 88 |
| 2. | Sangy wangdi | Yabi | Jarey | 1300-1400 | 2011-12 | 50 |
| 3. | Choedenmo | Zangkhar | Jarey | 1300-1400 | 2011-12 | 65 |
| 4. | Chophel | Yabi | Jarey | 1300-1400 | 2011-12 | 71 |
| 5. | Dorji | Yabi | Jarey | 1300-1400 | 2011-12 | 80 |
| 6. | Kuncho Topgyel | Yabi | Jarey | 1300-1400 | 2011-12 | 92 |
| 7. | Pema Yangzom | Yabi | Jarey | 1300-1400 | 2011-12 | 45 |
| 8. | karma yangchen | Yabi | Jarey | 1300-1400 | 2011-12 | 57 |
| 9. | Kunley Dorji | Yabi | Jarey | 1300-1400 | 2011-12 | 11 |
| 10. | Lhatru | Yabi | Jarey | 1300-1400 | 2011-12 | 77 |
| 11. | Tshewang Demo | Yabi | Jarey | 1300-1400 | 2011-12 | 71 |
| 12. | Nima Dorji | Yabi | Jarey | 1300-1400 | 2011-12 | 95 |
| 13. | Keasang Tshomo | Yabi | Jarey | 1300-1400 | 2011-12 | 76 |
| 14. | Kinzang Gyeltshen | Yabi | Jarey | 1300-1400 | 2011-12 | 83 |
| 15. | Karma Yangzom | Yabi | Jarey | 1300-1400 | 2011-12 | 92 |
| 16. | Ugyen dorji | Yabi | Jarey | 1300-1400 | 2011-12 | 50 |
| 17. | Rinchen dorji | Zangkhar | Jarey | 1300-1400 | 2011-12 | 88 |
| 18. | Tashi Dorji | Yabi | Jarey | 1300-1400 | 2011-12 | 50 |
| 19. | Yeshimo | Zangkhar | Jarey | 1300-1400 | 2011-12 | 50 |
| | | | | | Total | 1291 |
| 20. | Kesang Tshering | Obey | Metsho | 1500 | 2012-13 | 43 |
| 21. | Karma | Obey | Metsho | 1440 | 2012-13 | 39 |
| 22. | Sonam Tshomo | Obey | Metsho | 1400 | 2012-13 | 57 |
| 23. | Kunzang Dorji | Obey | Metsho | 1500 | 2012-13 | 21 |
| 24. | Rinzinmo | Obey | Metsho | 1490 | 2012-13 | 12 |
| 25. | Chimi Choden | Obey | Metsho | 1450 | 2012-13 | 51 |
| 26. | Sonam Norphel | Obey | Metsho | 1520 | 2012-13 | 90 |
| 27. | Sonam Eudon | Obey | Metsho | 1460 | 2012-13 | 61 |
| 28. | Choney Dorji | Pasadrappu | Tshenkhar | 1500 | 2012-13 | 30 |
| 29. | Pema Tenzin | Sisiyaesu | Tshenkhar | 1550 | 2012-13 | 54 |
| 30. | Sherab Gyeltshen | Pokarne | Tshenkhar | 1600 | 2012-13 | 49 |
| 31. | Chorten Jurmey | Sisiyaesu | Tshenkhar | 1550 | 2012-13 | 57 |
| 32. | Lhamo | Sisiyaesu | Tshenkhar | 1500 | 2012-13 | 31 |
| 33. | Tshewang Gyeltshen | Peladrappu | Tshenkhar | 1350 | 2012-13 | 41 |
| 34. | Karma Choden | Peladrappu | Tshenkhar | 1350 | 2012-13 | 51 |
| 35. | Karma | Peladrappu | Tshenkhar | 1400 | 2012-13 | 13 |
| 36. | Dorji | Peladrappu | Tshenkhar | 1400 | 2012-13 | 36 |
| | | | | | Total | 736 |
| 37. | Tsheten Lhamo | Kupenesa | Menji | 1490 | 2013-14 | 32 |
| 38. | Pelmo | Kupenesa | Menji | 1575 | 2013-14 | 48 |
| 39. | Lama Sonam Thinlay | Kupenesa | Menji | 1686 | 2013-14 | 83 |
| 40. | Pema Selden | Kupenesa | Menji | 1383 | 2013-14 | 40 |
| 41. | Nima | Kupenesa | Menji | 1625 | 2013-14 | 48 |
| 42. | Chodenmo | Kupenesa | Menji | 1620 | 2013-14 | 41 |
| 43. | Kinley mo | Kupenesa | Menji | 1537 | 2013-14 | 15 |

| | | | | | | |
|---|------------------|----------|-------|------|--------------|------------|
| 44. | Rinzinmo | Kupenesa | Menji | 1665 | 2013-14 | 42 |
| 45. | Khandu Wangmo | Kupenesa | Menji | 1637 | 2013-14 | 32 |
| 46. | Phomo | Kupenesa | Menji | 1362 | 2013-14 | 48 |
| 47. | Nima | Kupenesa | Menji | 1450 | 2013-14 | 15 |
| | | | | | Total | 444 |
| 48. | Sangay Chophel | Yumche | Jarey | 1735 | 2014-15 | 16 |
| 49. | Sonam Pelden | Yumche | Jarey | 1704 | 2014-15 | 26 |
| 50. | Dorji Dema | Yumche | Jarey | 1719 | 2014-15 | 17 |
| 51. | Tshering Lhamo | Yumche | Jarey | 1690 | 2014-15 | 20 |
| 52. | Kunzang Lhamo | Yumche | Jarey | 1700 | 2014-15 | 30 |
| 53. | Chungkhamo | Yumche | Jarey | 1720 | 2014-15 | 16 |
| 54. | Chophela | Yumche | Jarey | 1725 | 2014-15 | 10 |
| 55. | Tshering Yangden | Yumche | Jarey | 1725 | 2014-15 | 20 |
| 56. | Karma Dema | Yumche | Jarey | 1755 | 2014-15 | 20 |
| 57. | Tashi Yangzom | Yumche | Jarey | 1717 | 2014-15 | 15 |
| | | | | | Total | 190 |
| Grand Total (Lhuntshe): 5 villages, 57 orchards with 2661 plants | | | | | | |

d) Orchards developed through Direct Support Program

| Sl. No. | Name | Village | Geog | Year | Total Plts. | Remarks |
|---------|-----------------|---------------|---------|--------------|-------------|--|
| 1. | Kezang Tshering | Nangney | Jarey | 2010-11 | 30 | Walnut (30) |
| 2. | Chedar Tashi | Baminbrangsa | Menbi | 2011-12 | 20 | Pear (10), Walnut (10) |
| 3. | Dorji Wangchuk | Baminbrangsa | Menbi | 2011-12 | 10 | Pear (10) |
| 4. | Rinchen Dorji | Khasaling | Menbi | 2011-12 | 20 | Pear (10), Walnut (10) |
| 5. | Yeshi Dorji | Gangzur | Gangzur | 2011-12 | 30 | Walnut (30) |
| 6. | Tsangpo | Tsanpo chiwog | Khoma | 2012-13 | 175 | Walnut (175) |
| 7. | Raobi Lama | Raobi | Menbi | 2014-15 | 15 | Pear (15) |
| 8. | Zangkhar School | Zangkhar | Jarey | 2014-15 | 48 | Pear (30), Walnut (5), Peach (5), Plum (5), Loquat (3) |
| | | | | Total | 348 | |

DATABASE OF ORCHARDS DEVELOPED IN MONGAR DZONGKHAG



Horticulture Research and Development Project (HRDP-JICA)
RNR RDC Wengkhaz, Department of Agriculture
Ministry of Agriculture and Forest



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SUMMARY FOR MONGAR DZONGKHAG

Profile of Mongar Dzongkhag

| | |
|---------------------------------------|---|
| Location: | 26 ⁰ 55' to 27 ⁰ 36' latitude 90 ⁰ 57' to 91 ⁰ 29' longitude |
| Total Area: | 1944.95 km ² |
| Altitude range: | 300-4200 m asl |
| No. of Geogs: | 15 |
| Total Nos. of orchards: | 191 |
| Total Nos. of plants: | 7121 |
| Approximate area under fruits: | 44.506 ac |
| Nos. of private nurseries: | 1 |

Orchards developed through different Approaches (2010-2015)

| Approaches | No. of orchards | No. of plants |
|---|--|---------------|
| Mixed fruit orchard through Systematic Training Approach. | 30 orchards (24 mixed fruit & 6 citrus) | 1712 |
| Citrus Orchards through Focus Village Approach | 40 orchards (3 villages) | 1883 |
| Direct Support Program | 121 orchards | 3526 |

Orchards & Private nurseries established in different Geogs (2010-2015)

| Geog | Total No. of orchards | Total No. of plants | Type & No. of orchards | | | Private Nursery |
|------------------|-----------------------|---------------------|------------------------|-----------|----------------|-----------------|
| | | | Mixed Fruit | Citrus | Direct Support | |
| Balam | 2 | 113 | 2 | 0 | 0 | 0 |
| Chaskhar | 1 | 50 | 1 | 0 | 0 | 0 |
| Chali | 5 | 360 | 0 | 0 | 5 | 0 |
| Drepong | 21 | 1416 | 2 | 16 | 3 | 1 |
| Dremetsi | 2 | 41 | 1 | 0 | 1 | 0 |
| Jurmey | 1 | 52 | 0 | 1 | 0 | 0 |
| Kengkhar | 1 | 52 | 0 | 1 | 0 | 0 |
| Mongar | 133 | 3382 | 6 | 24 | 103 | 0 |
| Narang | 1 | 50 | 1 | 0 | 0 | 0 |
| Ngatshang | 3 | 162 | 3 | 0 | 0 | 0 |
| Saling | 5 | 542 | 0 | 2 | 3 | 0 |
| Shermung | 5 | 199 | 2 | 0 | 3 | 0 |
| Thangrong | 3 | 134 | 1 | 1 | 1 | 0 |
| Tsakaling | 1 | 49 | 0 | 1 | 0 | 0 |
| Tsamang | 7 | 519 | 5 | 0 | 2 | 0 |
| Dzongkhag | 191 | 7121 | 24 | 46 | 121 | 1 |

Details of orchards established through different approaches under Mongar Dzongkhag

a) Mixed fruit orchards developed through Systematic Training & Orchard Development Program

| Sl. No. | Name of Orchard owner | Village | Geog | Alt. (m asl) | Year | Crops & Nos. | | | | | | | Total |
|---------|-----------------------|---------------|-----------|--------------|--------------|--------------|------------|-----------|-----------|-----------|------------|------------|-------------|
| | | | | | | Pear | Persim mon | Peach | Plum | Apple | Walnut | Citrus | |
| 1 | Chedup | Neklog | Kengkhar | 950 | 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 52 |
| 2 | Tenzang | Resa | Saling | 1340 | 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 60 |
| 3 | Sherub Gyeltshen | Resa | Saling | 1460 | 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 56 |
| 4 | Sangay Tenzin | Laptsa | Drepong | 2000 | 2011 | 27 | 16 | 0 | 0 | 0 | 0 | 0 | 43 |
| 5 | Tshewang | Brabang | Chaskhar | 1500 | 2011 | 0 | 13 | 0 | 0 | 0 | 0 | 37 | 50 |
| 6 | Langa | Paisiphu | Ngatshang | 1753 | 2011 | 30 | 20 | 0 | 0 | 0 | 0 | 0 | 50 |
| 7 | Chungku | Yakpugang | Mongar | 1850 | 2011 | 29 | 8 | 2 | 0 | 0 | 0 | 0 | 39 |
| 8 | Tashi | Kumney | Ngatshang | 1600 | 2012 | 24 | 0 | 0 | 0 | 0 | 0 | 38 | 72 |
| 9 | Sangay Dorji | Pasiphu | Ngatshang | 1750 | 2012 | 20 | 5 | 0 | 0 | 5 | 0 | 10 | 40 |
| 10 | Kota | Boucheling | Thangrong | 1400 | 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 65 |
| 11 | Aum Sangay | Dremetse | Dremetse | 2100 | 2012 | 15 | 5 | 3 | 2 | 0 | 0 | 6 | 31 |
| 12 | Jigme Thinley | Themnangbi | Mongar | 1800 | 2012 | 70 | 10 | 5 | 5 | 10 | 20 | 13 | 133 |
| 13 | Pema Tsheten | Dalingtsoe | Tsakaling | 1280 | 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 49 |
| 14 | Sonam Dorji | Takchu | Mongar | 2150 | 2012 | 30 | 28 | 0 | 0 | 0 | 0 | 0 | 58 |
| 15 | Tobgyel | Chanshingonpa | Thangrong | 2012 | 2013 | 30 | 4 | 0 | 0 | 0 | 20 | 0 | 54 |
| 16 | Phuntsho | Pangkang | Narang | 1919 | 2013 | 26 | 4 | 0 | 0 | 0 | 20 | 0 | 50 |
| 17 | Sangay Tenzin | Bakaphai | Balam | 2010 | 2013 | 30 | 7 | 0 | 0 | 0 | 20 | 0 | 57 |
| 18 | Sangay Lhamo | Shangshong | Balam | 1918 | 2013 | 30 | 6 | 0 | 0 | 0 | 20 | 0 | 56 |
| 19 | Karma C. Dema | Sherzhong | Sherimung | 1649 | 2013 | 30 | 35 | 9 | 3 | 3 | 0 | 20 | 100 |
| 20 | Pema Gyelmo | Gangmung | Sherimung | 1820 | 2013 | 25 | 10 | 2 | 0 | 2 | 0 | 10 | 49 |
| 21 | Sherab Jamtsho | Banjar | Tsamang | 1740 | 2014 | 20 | 10 | 0 | 0 | 0 | 0 | 20 | 50 |
| 22 | Dorji Nidup | Banjar | Tsamang | 1720 | 2014 | 20 | 10 | 0 | 0 | 0 | 0 | 20 | 50 |
| 23 | Tshundu Wangmo | Thenmung | Tsamang | 1976 | 2014 | 20 | 10 | 0 | 0 | 0 | 0 | 0 | 30 |
| 24 | Driglam Zangmo | Nanggar | Tsamang | 1818 | 2014 | 34 | 20 | 0 | 0 | 0 | 0 | 0 | 54 |
| 25 | Tshewang Rinzin | Nanggar | Tsamang | 1835 | 2014 | 25 | 20 | 0 | 0 | 0 | 0 | 20 | 65 |
| 26 | Dorji Wangchuk | Beelam | Jurmey | 1085 | 2014 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 52 |
| 27 | Zangpo | Tshenkhar | Drepong | 1715 | 2014 | 5 | 15 | 5 | 10 | 0 | 0 | 15 | 50 |
| 28 | Sherab Zangmo | Takchupam | Mongar | 1816 | 2015 | 35 | 20 | 5 | 5 | 0 | 0 | 2 | 67 |
| 29 | Deki Yangzom | Takchupam | Mongar | 1823 | 2015 | 40 | 20 | 5 | 5 | 0 | 0 | 2 | 72 |
| 30 | Nawang Tashi | Changshepek | Mongar | 1626 | 2015 | 30 | 20 | 3 | 5 | 0 | 0 | 0 | 58 |
| | | | | | Total | 645 | 316 | 39 | 35 | 20 | 100 | 547 | 1712 |

b) Orchards developed through Citrus Focus Village Approach

| Sl. No. | Farmer Name | Village | Geog | Altitude (m asl) | Year | Total Plants |
|--|------------------|---------|---------|------------------|--------------|--------------|
| 1 | Neten | Donyog | Mongar | 1040-1240 | 2010-2011 | 37 |
| 2 | Sangay | Donyog | Mongar | 1040-1240 | 2010-2011 | 68 |
| 3 | Dechen | Donyog | Mongar | 1040-1240 | 2010-2011 | 51 |
| 4 | Naichu | Donyog | Mongar | 1040-1240 | 2010-2011 | 50 |
| 5 | Pema Duba | Donyog | Mongar | 1040-1240 | 2010-2011 | 50 |
| 6 | Ugyen Jungden | Donyog | Mongar | 1040-1240 | 2010-2011 | 40 |
| 7 | Tshewang Dema | Donyog | Mongar | 1040-1240 | 2010-2011 | 30 |
| 8 | Neten | Donyog | Mongar | 1040-1240 | 2010-2011 | 30 |
| | | | | | Total | 356 |
| 9 | Karma Wangchuk | Mirung | Mongar | 1300-1400 | 2011-2012 | 40 |
| 10 | Tshewang Penjor | Mirung | Mongar | 1300-1400 | 2011-2012 | 40 |
| 11 | Chundu | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 12 | Yeshey Dorji | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 13 | Gamba | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 14 | Tashi Tshering | Mirung | Mongar | 1300-1400 | 2011-2012 | 40 |
| 15 | Deki Choden | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 16 | Kezang Lhamo | Mirung | Mongar | 1300-1400 | 2011-2012 | 60 |
| 17 | Ugyen Tendar | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 18 | Kinzang Wangmo | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 19 | Tenzin Drakpa | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 20 | Kezang Phuntsho | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 21 | Pedon | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 22 | Neten Zangmo | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 23 | Tshewang Thinley | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| 24 | Kinley Tenzin | Mirung | Mongar | 1300-1400 | 2011-2012 | 50 |
| | | | | | Total | 780 |
| 25 | Nima | Drepong | Drepong | 1435 | 2013-2014 | 99 |
| 26 | Tshewang Dema | Drepong | Drepong | 1446 | 2013-2014 | 34 |
| 27 | Domo | Drepong | Drepong | 1439 | 2013-2014 | 35 |
| 28 | Phuntsho Wangdi | Drepong | Drepong | 1353 | 2013-2014 | 56 |
| 29 | Sangay Dema | Drepong | Drepong | 1444 | 2013-2014 | 25 |
| 30 | Rinchen Dorji | Drepong | Drepong | 1485 | 2013-2014 | 46 |
| 31 | Kelzang Choden | Drepong | Drepong | 1509 | 2013-2014 | 27 |
| 32 | Pema Lhadan | Drepong | Drepong | 1509 | 2013-2014 | 17 |
| 33 | Tshewang Choden | Drepong | Drepong | 1503 | 2013-2014 | 40 |
| 34 | Pema Zangmo | Drepong | Drepong | 1450 | 2013-2014 | 72 |
| 35 | Ugyen Pelden | Drepong | Drepong | 1434 | 2013-2014 | 37 |
| 36 | Chado Tshering | Drepong | Drepong | 1418 | 2013-2014 | 108 |
| 37 | Tshering Yangzom | Drepong | Drepong | 1631 | 2013-2014 | 11 |
| 38 | Karma Chonzom | Drepong | Drepong | 1541 | 2013-2014 | 35 |
| 39 | Chimmi Rinzin | Drepong | Drepong | 1441 | 2013-2014 | 60 |
| 40 | Sangay Dema | Drepong | Drepong | 1468 | 2013-2014 | 45 |
| | | | | | Total | 747 |
| Mongar: 3 villages, 40 orchards with total of 1883 plants | | | | | | |

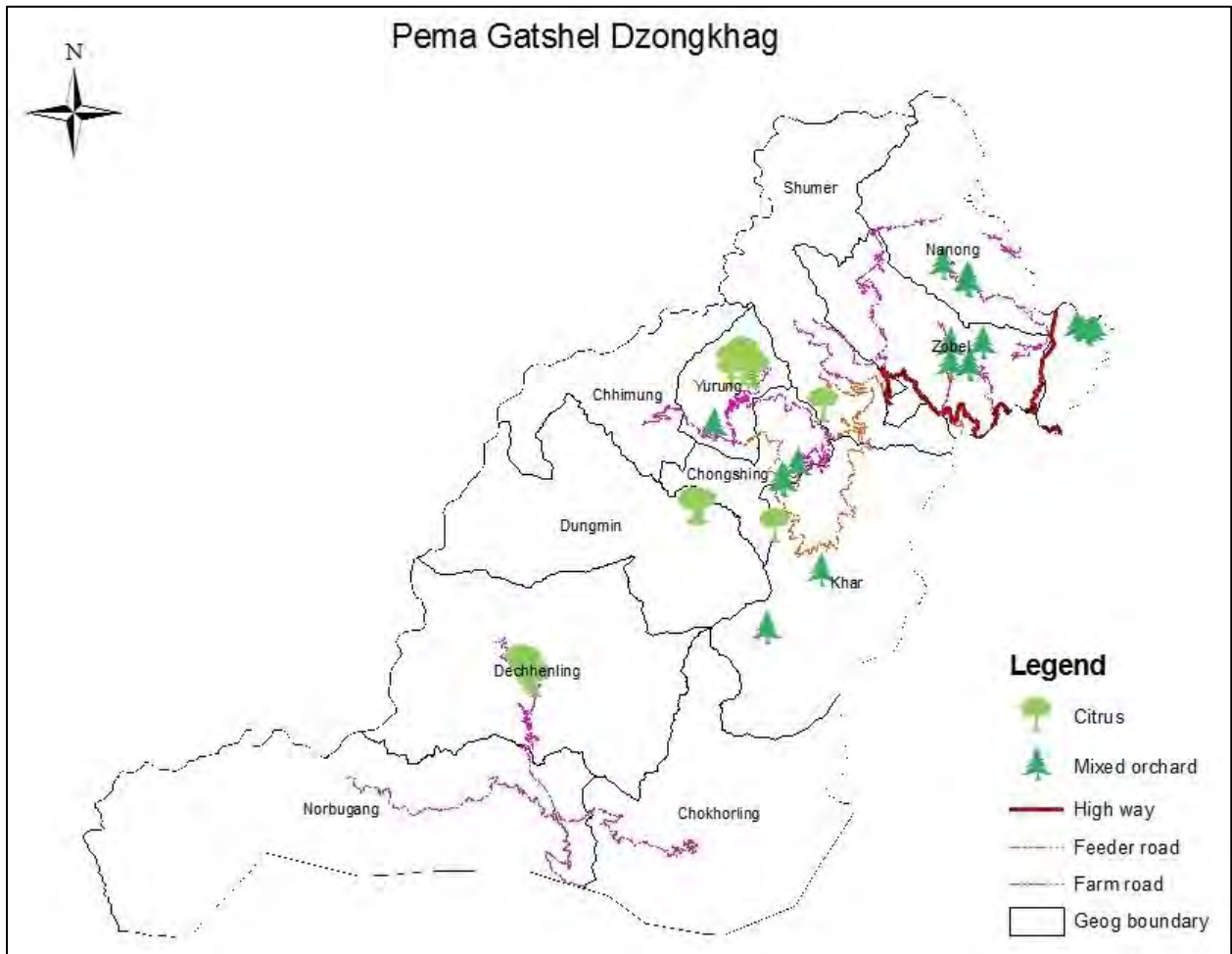
c) Orchards developed through Direct Support Program

| Sl. No. | Name | Village | Geog | Year | Total | Remarks |
|---------|------------------|------------|----------|--------------|-------------|--|
| 1 | Sonam Dorji | Phushing | Shermung | 2010-11 | 20 | Pear (20) |
| 2 | Choki Wangchuk | Phushing | Shermung | 2010-11 | 10 | Pear (10) |
| 3 | Karma Tenzin | Drepong | Drepong | 2010-11 | 195 | Pear (50), Persimmon (45), Walnut (100) |
| 4 | Phuntsho | Mongar | Mongar | 2010-11 | 15 | Pear (15) |
| 5 | Rinzin Tshomo | Mongar | Mongar | 2010-11 | 38 | Pear (20), Walnut(10), Chestnut(3), Hazelnut (5) |
| 6 | Tshering Dorji | Chali | Chali | 2010-11 | 50 | Chestnut (50) |
| 7 | Karma Tenzin | Tokari | Tsamang | 2010-11 | 170 | Citrus (170) |
| 8 | Ugyen Wangmo | Womakhar | Chali | 2010-11 | 95 | Pear (25), Walnut (70) |
| 11 | Tshering Dorji | Pangthang | Chali | 2010-11 | 30 | Pear (30) |
| 12 | Farmer Group | Drepong | Drepong | 2010-11 | 360 | Pear(180), Walnut (180) |
| 13 | Sangay Dorji | Themnangbi | Mongar | 2010-11 | 45 | Pear (15), Walnut (30) |
| 14 | Tuku | Yakpugang | Mongar | 2010-11 | 15 | Pear (15) |
| 15 | Uden | Wangling | Mongar | 2010-11 | 20 | Walnut (10), Citrus (10) |
| 16 | Rinchen Zangmo | Wangling | Mongar | 2010-11 | 30 | Walnut (10), Citrus (20) |
| 17 | Pema Tshomo | Wangling | Mongar | 2010-11 | 40 | Walnut (10), Citrus (30) |
| 18 | Ugyen Dema | Wangling | Mongar | 2010-11 | 15 | Walnut (15) |
| 19 | Ugyen Zangmo | Wangling | Mongar | 2010-11 | 20 | Walnut (10), Citrus (10) |
| 20 | Pema Tshomo | Wangling | Mongar | 2010-11 | 30 | Walnut (10), Citrus (20) |
| 21 | Yangzom | Wangling | Mongar | 2010-11 | 40 | Walnut (10), Citrus (30) |
| 22 | Tashi Pelmo | Wangling | Mongar | 2010-11 | 20 | Walnut (10), Citrus (10) |
| 23 | Chimi | Wangling | Mongar | 2010-11 | 20 | Citrus (20) |
| 24 | Kezang | Wangling | Mongar | 2010-11 | 15 | Walnut (10), Citrus (5) |
| 25 | Karma Chozom | Wangling | Mongar | 2010-11 | 69 | Walnut (30), Citrus (39) |
| 26 | Tshering Yangcen | Wangling | Mongar | 2010-11 | 42 | Walnut (4), Citrus (38) |
| 27 | Cheten Norbu | Wangling | Mongar | 2010-11 | 30 | Citrus (30) |
| 28 | Changki | Wangling | Mongar | 2010-11 | 10 | Walnut (10) |
| 29 | Sonam | Wangling | Mongar | 2010-11 | 15 | Walnut (5), Citrus (10) |
| 30 | Namgay | Wangling | Mongar | 2010-11 | 20 | Walnut (15), Citrus (5) |
| 31 | Tshewang Norbu | Wangling | Mongar | 2010-11 | 15 | Walnut (15) |
| 32 | Dechen Namgyel | Wangling | Mongar | 2010-11 | 10 | Walnut (10) |
| 33 | Jigme Wangyel | Wangling | Mongar | 2010-11 | 10 | Walnut (10) |
| 34 | Samphay | Wangling | Mongar | 2010-11 | 10 | Walnut (10) |
| 35 | Tenchozom | Wangling | Mongar | 2010-11 | 45 | Walnut (15), Citrus (30) |
| 36 | Sangay | Hurungpam | Mongar | 2010-11 | 80 | Citrus (80) |
| 37 | Rinzin Dema | Wangling | Mongar | 2010-11 | 35 | Walnut (5), Citrus (30) |
| 38 | Yangchen | Wangling | Mongar | 2010-11 | 45 | Walnut (15), Citrus (30) |
| | | | | Total | 1729 | |
| 39 | Choney Wangmo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 40 | Cholay | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 41 | Tshewang Dema | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 42 | Yuden | Yakpugang | Mongar | 2011-12 | 10 | Pear |

| Sl. No. | Name | Village | Geog | Year | Total | Remarks |
|---------|---------------------------|----------------------|----------|--------------|------------|--|
| 43 | Tshering Wangmo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 44 | Ugyen Tshomo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 45 | Choden | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 46 | Tshering Jaimo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 47 | Rinchen Wangmo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 48 | Choden | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 49 | Rinchen Wangmo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 50 | Sonam | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 51 | Karma Wangdi | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 52 | Pema Choden | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 53 | Lhendup | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 54 | Karma Choki | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 55 | Kinzang Lhamo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 56 | Thinlay Wangmo | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 57 | Pema Yangzom | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 58 | Choki | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 59 | Kinzang Choden | Yakpugang | Mongar | 2011-12 | 20 | Pear |
| 60 | Yuden | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 61 | Sonam | Yakpugang | Mongar | 2011-12 | 10 | Pear |
| 62 | Kunzang Choden | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 63 | Pema | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 64 | Tshomo | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 65 | Karma Lhamo | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 66 | Tandin | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 67 | Chimi Wangmo | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 68 | Kunzang | Wengkhar | Mongar | 2011-12 | 10 | Pear |
| 69 | Sonamla | Tokari | Tsamang | 2011-12 | 100 | Citrus |
| 70 | Jigme Zangpo | Masangdaz | Saling | 2011-12 | 170 | Citrus |
| 71 | Tshewang | Thangrong | Thangron | 2011-12 | 15 | Pear(5), Persimmon(5), Walnut (5) |
| 72 | Phintsho | Chali | Chali | 2011-12 | 80 | Pear (40), Persimmon (10), Walnut (30) |
| 73 | Sherab | Sherimung | Shermung | 2011-12 | 20 | Pear(15), Persimmon(5) |
| | | | | Total | 695 | |
| 74 | Dorji Wangda | Thridangbi | Saling | 2012-13 | 56 | Citrus |
| | | | | Total | 56 | |
| 75 | Sonam Wangmo | Themdangbi | Mongar | 2013-14 | 10 | Pear |
| 76 | Dechen Wangmo | Themdangbi | Mongar | 2013-14 | 30 | Pear (10), Persimmon (10), Walnut (10) |
| 77 | Karma | Wengkhar | Mongar | 2013-14 | 60 | Pear (30), Persimmon (30) |
| 78 | Dechen | Wengkhar | Mongar | 2013-14 | 30 | Pear (15), Persimmon (15) |
| 79-107 | Farmer group (31 farmers) | Yakpugang & Tongsing | Mongar | 2013-14 | 270 | Pear (200), Persimmon (70) |
| | | | | Total | 400 | |
| 108 | Jigme | Goenpa | Chali | 2014-15 | 105 | Walnut(100), Pear(10) |

| Sl. No. | Name | Village | Geog | Year | Total | Remarks | |
|-----------------------------|-----------------|--------------------------------------|----------|--------------|------------|--------------------|--|
| 109 | Phuntsho | Tsawang | Dremetsi | 2014-15 | 10 | Pear (5), Plum (5) | |
| 110 | Tshewang Rabgay | Dedrang | Mongar | 2014-15 | 10 | Citrus | |
| 111 | Tandin Zangmo | Dedrang | Mongar | 2014-15 | 50 | Citrus | |
| 112 | Tsampa | Mongling | Saling | 2014-15 | 200 | Citrus | |
| 113 | Karma Tenzin | Drepon | Drepong | 2014-15 | 21 | Pear | |
| 114 | Tharpai | Themdangbi | Mongar | 2014-15 | 30 | Pear | |
| 115 | Phurpa Wangmo | Themdangbi | Mongar | 2014-15 | 40 | Pear | |
| 116 | Wangchuk | Themdangbi | Mongar | 2014-15 | 50 | Pear | |
| 117 | Lemo | Themdangbi | Mongar | 2014-15 | 30 | Pear | |
| 118 | Rinzin | Themdangbi | Mongar | 2014-15 | 30 | Pear | |
| 119 | Tshering Penjor | Themdangbi | Mongar | 2014-15 | 30 | Pear | |
| 120 | Sangay Tenzin | Themdangbi | Mongar | 2014-15 | 20 | Pear | |
| 121 | Che Dorji | Themdangbi | Mongar | 2014-15 | 20 | Pear | |
| | | | | Total | 646 | | |
| Grand Total (Mongar) | | 108 orchards with 3486 plants | | | | | |

DATABASE OF ORCHARDS DEVELOPED IN PEMA GATSHEL DZONGKHAG



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SUMMARY FOR PEMAGATSHEL DZONGKHAG

Profile of Pemagatshel Dzongkhag

| | |
|---------------------------------------|---|
| Location: | 26 ^o 46' to 27 ^o 10' latitude 91 ^o 00' to 91 ^o 33' longitude |
| Total Area: | 1022.14 km ² |
| Altitude range: | 200-2700 m asl |
| No. of Geogs: | 9 |
| Total Nos. of orchards: | 66 |
| Total Nos. of plants: | 3369 |
| Approximate area under fruits: | 21.056 ac |
| Nos. of private nurseries: | 0 |

Orchards developed through different Approaches (2010-2015)

| Approaches | No. of orchards | No. of plants |
|--|--|---------------|
| Mixed fruit orchard through Systematic Training Approach. | 22 orchards (21 mixed fruit & 1 citrus) | 1370 |
| Citrus Orchards through Focus Village Approach | 38 orchards (4 villages) | 1657 |
| Direct Support Program | 6 orchards | 339 |

Orchards & Private nurseries established in different Geogs (2010-2015)

| Geog | Total No. of orchards | Total No. of plants | Type & No. of orchards | | |
|-------------------|-----------------------|---------------------|------------------------|-----------|----------------|
| | | | Mixed Fruit | Citrus | Direct Support |
| Chongshing | 11 | 468 | 3 | 7 | 1 |
| Dechiling | 9 | 446 | 0 | 9 | 0 |
| Dungmin | 14 | 583 | 0 | 12 | 2 |
| Khar | 2 | 116 | 2 | 0 | 0 |
| Nanong | 11 | 664 | 11 | 0 | 0 |
| Norbugang | 1 | 100 | 0 | 0 | 1 |
| Shumar | 1 | 52 | 0 | 1 | 0 |
| Yurung | 11 | 588 | 1 | 10 | 0 |
| Zobel | 6 | 352 | 4 | 0 | 2 |
| Dzongkhag | 66 | 3369 | 21 | 39 | 6 |

Details of orchards established through different approaches under Pemagatshel Dzongkhag

a) Mixed fruit orchards developed through Systematic Training & Orchard Development Program

| Sl. No | Name of Orchard owner | Village | Geog | Alt. (m) | Year | Crops & Nos. | | | | | | | Total |
|--|-----------------------|--------------|------------|----------|--------------|--------------|------------|-----------|-----------|-----------|-----------|------------|-------------|
| | | | | | | Pear | Persimmon | Peach | Plum | Apple | Walnut | Citrus | |
| 1. | Sangay Norbu | Lawang | Yurung | 2200 | 2011 | 27 | 24 | 0 | 0 | 0 | 0 | 44 | 93 |
| 2. | Sumtop Ningpo | Maan | Shumar | 1140 | 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 52 |
| 3. | Sonam Tashi | Khengzor | Khar | 2000 | 2011 | 42 | 20 | 0 | 0 | 0 | 0 | 0 | 62 |
| 4. | Nima Dorji | Chongshing | Chongshing | 1450 | 2012 | 33 | 10 | 0 | 0 | 10 | 0 | 10 | 63 |
| 5. | Sherab Gyeltshen | Chongshing | Chongshing | 1670 | 2012 | 35 | 10 | 0 | 0 | 0 | 0 | 12 | 58 |
| 6. | Kin Gyeltshen | Rasugang | Nanong | 1740 | 2013 | 43 | 10 | 3 | 2 | 4 | 0 | 13 | 75 |
| 7. | Sonam | Woongchilu | Nanong | 1890 | 2013 | 40 | 11 | 2 | 2 | 0 | 0 | 0 | 55 |
| 8. | Cheten Wangdi | Giri | Nanong | 2145 | 2013 | 44 | 0 | 0 | 0 | 0 | 20 | 0 | 64 |
| 9. | Sangay Dorji | Giri | Nanong | 2195 | 2013 | 40 | 0 | 0 | 0 | 0 | 28 | 0 | 68 |
| 10. | Dorji Wangdi | Wooligthang | Nanong | 1775 | 2013 | 30 | 5 | 3 | 2 | 2 | 0 | 10 | 52 |
| 11. | Dechen Zangmo | Nagtsere | Khar | 1794 | 2013 | 40 | 5 | 4 | 0 | 4 | 0 | 0 | 54 |
| 12. | Leki wangdi | Gonpasingma | Zobel | 2050 | 2014 | 50 | 10 | 0 | 0 | 0 | 0 | 0 | 60 |
| 13. | Sonam Gyeltshen | Gonpasingma | Zobel | 2028 | 2014 | 50 | 10 | 0 | 0 | 0 | 0 | 0 | 89 |
| 14. | Kotsa | Gonpasingma | Zobel | 2045 | 2014 | 60 | 20 | 0 | 9 | 0 | 0 | 0 | 55 |
| 15. | Wangmo | Tshelingkhor | Zobel | 2075 | 2014 | 60 | 10 | 5 | 5 | 0 | 0 | 0 | 80 |
| 16. | Karma Tshewang | Mandi | Chongshing | 1625 | 2014 | 23 | 20 | 0 | 0 | 0 | 0 | 0 | 43 |
| 17. | Dawa Norbu | Wooligthang | Nanong | 1807 | 2015 | 30 | 12 | 5 | 5 | 0 | 0 | 0 | 52 |
| 18. | Cheki Wangmo | Wooligthang | Nanong | 1747 | 2015 | 58 | 12 | 5 | 2 | 0 | 0 | 0 | 77 |
| 19. | Kesang Dorji | Wooligthang | Nanong | 1750 | 2015 | 28 | 12 | 5 | 5 | 0 | 0 | 0 | 50 |
| 20. | Samten | Wooligthang | Nanong | 1863 | 2015 | 48 | 12 | 3 | 3 | 0 | 0 | 0 | 66 |
| 21. | Kinzang Dorji | Wooligthang | Nanong | 1753 | 2015 | 48 | 12 | 3 | 3 | 0 | 0 | 0 | 66 |
| 22. | Tsheten Dorji | Wooligthang | Nanong | 1776 | 2015 | 18 | 12 | 3 | 3 | 0 | 0 | 0 | 36 |
| | | | | | Total | 847 | 237 | 41 | 41 | 20 | 48 | 141 | 1370 |
| Grand Total (Pemagatshel): 22 Orchards with 1370 plants | | | | | | | | | | | | | |

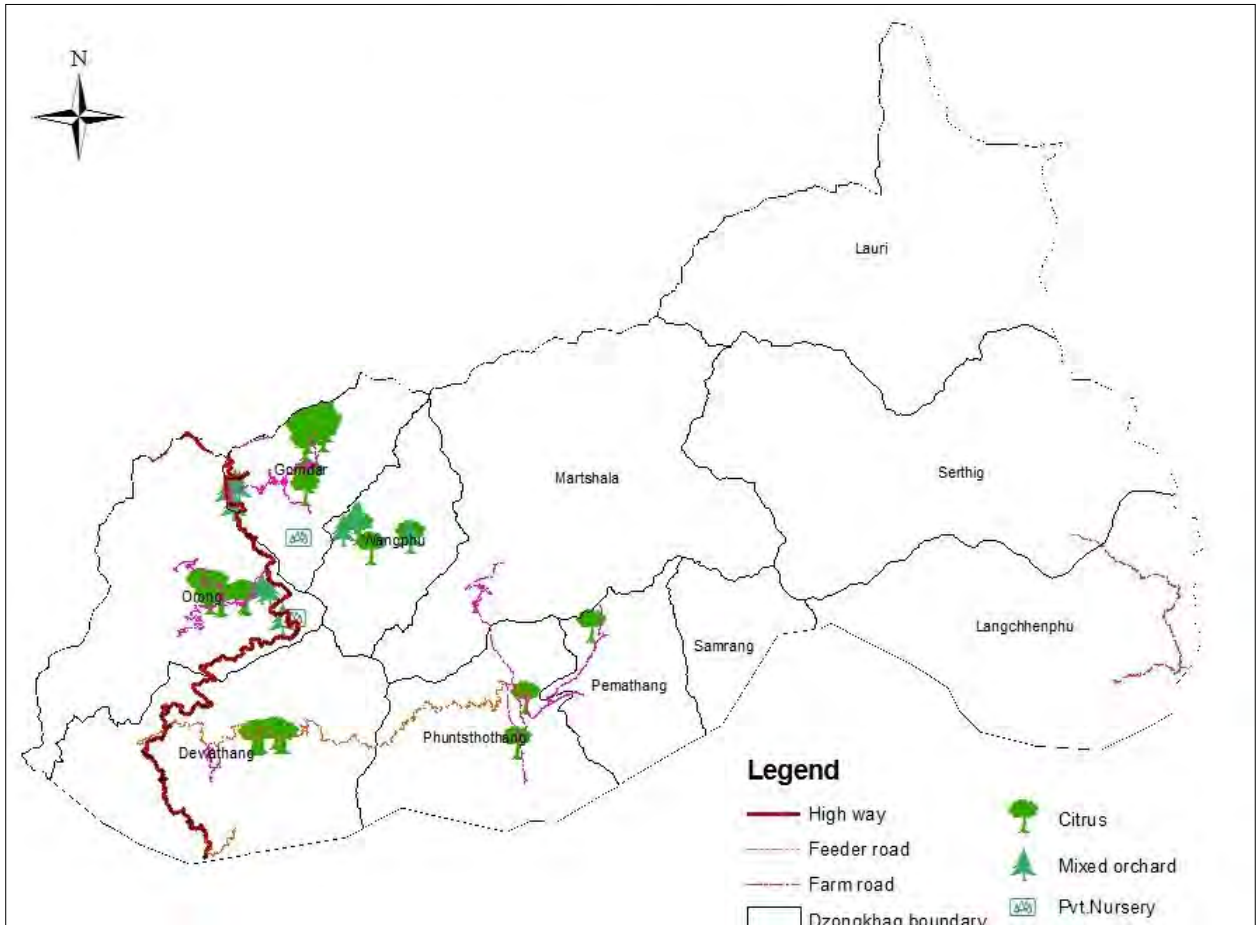
b) Orchards developed through Citrus Focus Village Approach

| Sl. No. | Name of Farmer | Village/ Location | Geog | Altitude (m asl) | Year | Total |
|--|-------------------|-------------------|------------|------------------|--------------|------------|
| 1. | Sonam Tobgay | Khangma | Yurung | 1140 | 2010-11 | 69 |
| 2. | Tashi Choezang | Khangma | Yurung | 1200 | 2010-11 | 47 |
| 3. | Kinzang Dorji | Khangma | Yurung | 1140 | 2010-11 | 49 |
| 4. | Thinley | Khangma | Yurung | 1300 | 2010-11 | 36 |
| 5. | Drakpa Wangdi | Khangma | Yurung | 1320 | 2010-11 | 42 |
| 6. | Yeshey Norbu | Khangma | Yurung | 1320 | 2010-11 | 43 |
| 7. | Samzang | Khangma | Yurung | 1400 | 2010-11 | 53 |
| 8. | Lhendu Wangdi | Khangma | Yurung | 1340 | 2010-11 | 51 |
| 9. | Thinley Gyeltshen | Khangma | Yurung | 1340 | 2010-11 | 42 |
| 10. | Gembo Dorji | Khangma | Yurung | 1500 | 2010-11 | 63 |
| | | | | | Total | 495 |
| 11. | Samten Dorji | Reezamo | Dechiling | 800 | 2011-12 | 52 |
| 12. | Thukten | Reezamo | Dechiling | 790 | 2011-12 | 50 |
| 13. | Wangchuk | Reezamo | Dechiling | 770 | 2011-12 | 25 |
| 14. | Norbu Tshering | Reezamo | Dechiling | 790 | 2011-12 | 50 |
| 15. | Chenem Norbu | Reezamo | Dechiling | 780 | 2011-12 | 52 |
| 16. | Che Tshewang | Reezamo | Dechiling | 920 | 2011-12 | 61 |
| 17. | Cheney Dorji | Reezamo | Dechiling | 860 | 2011-12 | 56 |
| 18. | Dechen Dorji | Reezamo | Dechiling | 750 | 2011-12 | 50 |
| 19. | Rinchen Norbu | Reezamo | Dechiling | 760 | 2011-12 | 50 |
| | | | | | Total | 446 |
| 20. | Sangay Wangmo | Dungmin | Dungmin | 1146 | 2012-13 | 12 |
| 21. | Choki Thinley | Dungmin | Dungmin | 1117 | 2012-13 | 11 |
| 22. | Dema | Dungmin | Dungmin | 1126 | 2012-13 | 34 |
| 23. | Sangay Lungmo | Dungmin | Dungmin | 1115 | 2012-13 | 49 |
| 24. | Dorji Tshewang | Dungmin | Dungmin | 1142 | 2012-13 | 67 |
| 25. | Rinzin Wangchuk | Dungmin | Dungmin | 1140 | 2012-13 | 35 |
| 26. | Darjay | Dungmin | Dungmin | 1126 | 2012-13 | 38 |
| 27. | Tshering Wangmo | Dungmin | Dungmin | 1155 | 2012-13 | 41 |
| 28. | Dorji Dendup | Dungmin | Dungmin | 1149 | 2012-13 | 50 |
| 29. | Tshechu Wangdi | Dungmin | Dungmin | 1120 | 2012-13 | 23 |
| 30. | Sangay Rinzin | Dungmin | Dungmin | 1122 | 2012-13 | 50 |
| 31. | Dorji Wangda | Dungmin | Dungmin | 1073 | 2012-13 | 32 |
| | | | | | Total | 442 |
| 32. | Sonam Chezom | Yumzor | Chongshing | 1690 | 2013-14 | 46 |
| 33. | Sangay Lungten | Yumzor | Chongshing | 1680 | 2013-14 | 29 |
| 34. | Lhadon | Yumzor | Chongshing | 1669 | 2013-14 | 45 |
| 35. | Dorji Wangmo | Yumzor | Chongshing | 1668 | 2013-14 | 36 |
| 36. | Ugyen Wangdi | Yumzor | Chongshing | 1625 | 2013-14 | 45 |
| 37. | Tashi Lhadon | Yumzor | Chongshing | 1618 | 2013-14 | 45 |
| 38. | Tsongzey | Yumzor | Chongshing | 1599 | 2013-14 | 28 |
| | | | | | Total | 274 |
| Grand Total (Pemagatshel): 4 villages, 38 orchards with 1657 plants | | | | | | |

c) Orchards developed through Direct Support Program

| Sl. No | Name | Village | Geog | Year | Total plts. | Remarks |
|--|-----------------|-------------|------------|--------------|-------------|--|
| 1. | Sangay Wangchuk | Thromshong | Dungmin | 2010-11 | 72 | Pear(42), Persimmon(20), Walnut (10) |
| 2. | Chedar | Tseshingzor | Norbugang | 2010-11 | 100 | Pear (20), Walnut (30), Citrus (35), Chestnut (15) |
| 3. | Sangay Wangchuk | Thromshong | Dungmin | 2010-11 | 40 | Pear (20), Walnut (20) |
| 4. | Lhaden | Lamlök | Zobel | 2010-11 | 50 | Walnut (50) |
| 5. | RNR EC | Chongshing | Chongshing | 2010-11 | 30 | Walnut (10), Citrus (20) |
| 6. | Sangay Wangchuk | Thromshong | Dungmin | 2014-15 | 29 | Avocado (29) |
| 7. | Sonam Gyeltshen | Gonpasingma | Zobel | 2014-15 | 18 | Pear (18) |
| | | | | Total | 339 | |
| Grand Total: 6 orchards, 339 plants. (Sl. No. 1 & 6 same orchard owner) | | | | | | |

DATABASE OF ORCHARDS DEVELOPED IN SAMDRUPJONGKHAR DZONGKHAG



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SUMMARY FOR SAMDRUPJONGKHAR DZONGKHAG

Profile of Samdrupjongkhar Dzongkhag

| | |
|---------------------------------------|---|
| Location: | 26 ⁰ 47' to 27 ⁰ 15' latitude 91 ⁰ 23' to 92 ⁰ 07' longitude |
| Total Area: | 1877.93 km ² |
| Altitude range: | 200-4500 m asl |
| No. of Geogs: | 11 |
| Total Nos. of orchards: | 94 |
| Total Nos. of plants: | 4095 |
| Approximate area under fruits: | 25.594 ac |
| Nos. of private nurseries: | 2 |

Orchards developed through different Approaches (2010-2015)

| Approaches | No. of orchards | No. of plants |
|--|--|---------------|
| Mixed fruit orchard through Systematic Training Approach. | 20 orchards (16 mixed fruit & 4 citrus) | 1083 |
| Citrus Orchards through Focus Village Approach | 70 orchards (5 villages) | 2867 |
| Direct Support Program | 4 orchards | 145 |

Orchards & Private nurseries established in different Geogs (2010-2015)

| Geog | Total No. of orchards | Total No. of plants | Type & No. of orchards | | | |
|------------------|-----------------------|---------------------|------------------------|-----------|----------------|-----------------|
| | | | Mixed Fruit | Citrus | Direct Support | Private Nursery |
| Deothang | 25 | 683 | 0 | 24 | 1 | 0 |
| Gomdar | 37 | 1527 | 6 | 30 | 1 | 1 |
| Orong | 27 | 1690 | 9 | 16 | 2 | 1 |
| Pemathang | 1 | 25 | 0 | 1 | 0 | 0 |
| Wangphu | 4 | 170 | 1 | 3 | 0 | 0 |
| Dzongkhag | 94 | 4095 | 16 | 74 | 4 | 2 |

Details of orchards established through different approaches under Samdrupjongkhar Dzongkhag

a) Mixed fruit orchards developed through Systematic Training & Orchard Development Program

| Sl. No. | Name of Orchard owner | Village | Geog | Alt. (m) | Year | Crops & Nos. | | | | | | Total |
|---|-----------------------|-----------|-----------|----------|--------------|--------------|------------|-----------|-----------|-----------|------------|-------------|
| | | | | | | Pear | Persimmon | Peach | Plum | Apple | Citrus | |
| 1. | Sinka | Khandoma | Gomdar | 2000 | 2011 | 10 | 15 | 0 | 0 | 0 | 0 | 25 |
| 2. | Yeshi Wangdi | Perung | Gomdar | 1900 | 2011 | 0 | 26 | 0 | 0 | 0 | 0 | 26 |
| 3. | MC Gurung | Morong | Orong | 1950 | 2011 | 41 | 24 | 0 | 0 | 0 | 0 | 85 |
| 4. | Purna Bdr Rai | Naintal | Pemathang | 1000 | 2011 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| 5. | Tshering Norbu | Dengzor | Orong | 1700 | 2012 | 25 | 10 | 0 | 0 | 0 | 40 | 75 |
| 6. | Jangchuk Dorji | Dengzor | Orong | 1800 | 2012 | 50 | 15 | 0 | 0 | 0 | 35 | 100 |
| 7. | Kezang Norbu | Laerong | Orong | 1560 | 2013 | 28 | 20 | 2 | 2 | 4 | 44 | 100 |
| 8. | Cheki Wangmo | Morong | Orong | 1680 | 2013 | 28 | 10 | 2 | 2 | 4 | 10 | 56 |
| 9. | Naku | Morong | Orong | 1540 | 2013 | 10 | 25 | 0 | 0 | 0 | 30 | 65 |
| 10. | Deki Choden | Morong | Orong | 1700 | 2013 | 40 | 20 | 3 | 3 | 4 | 12 | 82 |
| 11. | Pema Dhendup | Morong | Orong | 1800 | 2013 | 30 | 10 | 2 | 2 | 4 | 10 | 58 |
| 12. | Dorji Tshering | Narphung | Gomdar | 1800 | 2013 | 10 | 9 | 4 | 3 | 4 | 0 | 30 |
| 13. | Passang Tshering | Narphung | Gomdar | 1700 | 2013 | 20 | 10 | 3 | 3 | 4 | 6 | 46 |
| 14. | Tashi Wangchuk | Narphung | Gomdar | 1680 | 2013 | 10 | 10 | 2 | 2 | 3 | 10 | 27 |
| 15. | Tshering Nidup | Narphung | Gomdar | 1680 | 2013 | 30 | 10 | 0 | 0 | 5 | 20 | 65 |
| 16. | Tshering Dorji | Pangthang | Wangphu | 1573 | 2014 | 20 | 11 | 0 | 0 | 0 | 30 | 61 |
| 17. | Ugyen Tenzin | Shogshi | Wangphu | 1153 | 2014 | 0 | 0 | 0 | 0 | 0 | 35 | 35 |
| 18. | Lobzang | Shogshi | Wangphu | 1086 | 2014 | 0 | 0 | 0 | 0 | 0 | 24 | 24 |
| 19. | Yonten Dorji | Wangphu | Wangphu | 910 | 2014 | 0 | 0 | 0 | 0 | 0 | 50 | 50 |
| 20. | Jigme Dorji | Morong | Orong | 1785 | 2015 | 0 | 18 | 0 | 0 | 0 | 28 | 48 |
| Grand Total (S/jongkhar): 20 orchards with 1083 plants | | | | | Total | 352 | 243 | 18 | 17 | 32 | 409 | 1083 |

a) Orchards developed through Citrus Focus Village Approach

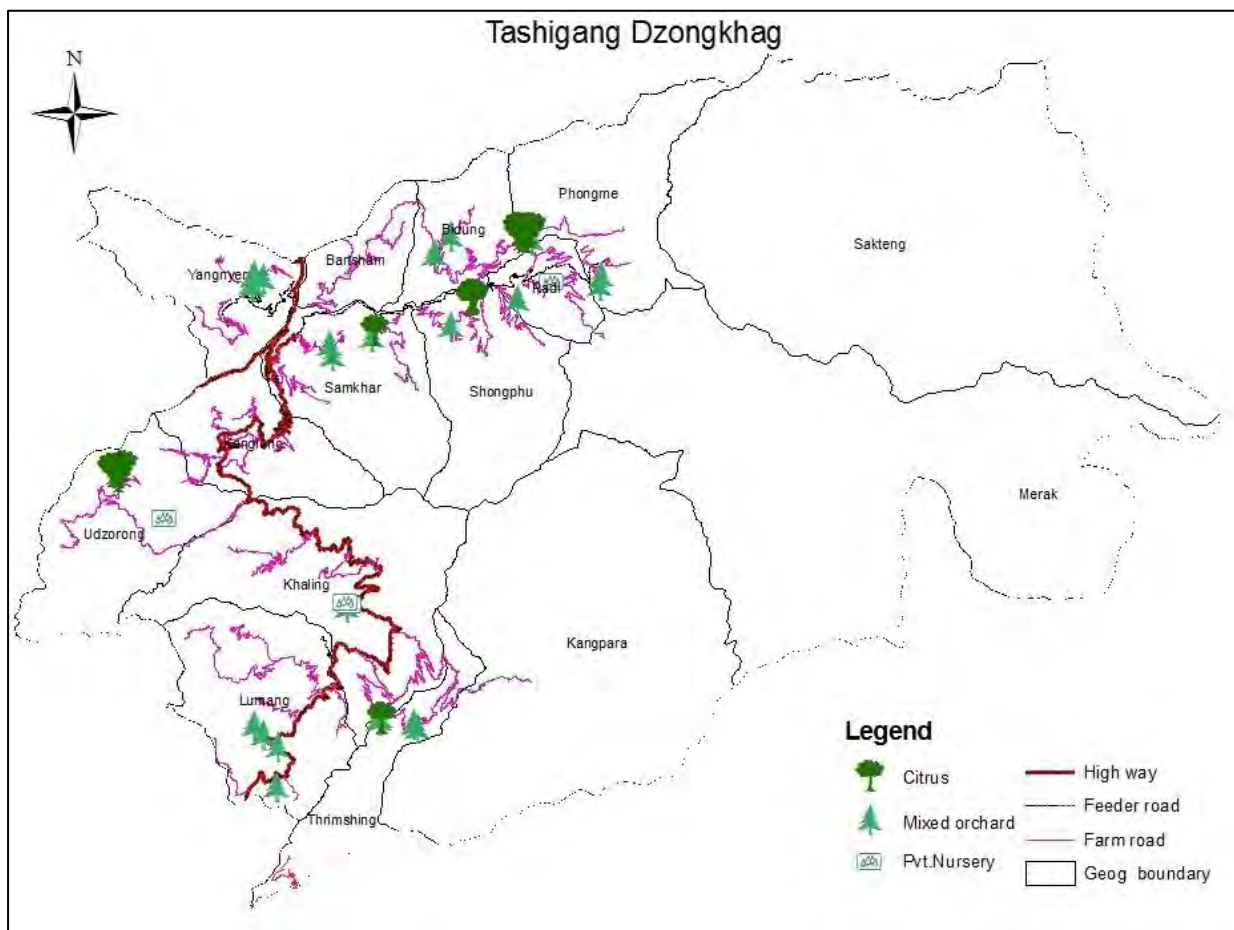
| Sl. No. | Name of Farmer | Village/ Location | Geog | Altitude (m asl) | Year | Total |
|---------|------------------|-------------------|----------|------------------|--------------|------------|
| 1. | Rinzin Dorji | Gonminang | Orong | 1400 | 2010-11 | 55 |
| 2. | Lobzang Chopel | Gonminang | Orong | 1460 | 2010-11 | 71 |
| 3. | Mon Bdr Tamang | Laerong | Orong | 1500 | 2010-11 | 70 |
| 4. | Sonam | Laerong | Orong | 1500 | 2010-11 | 64 |
| 5. | Pema Tenzin | Laerong | Orong | 1540 | 2010-11 | 56 |
| 6. | Dorji Dema | Laerong | Orong | 1520 | 2010-11 | 76 |
| | | | | | Total | 392 |
| 7. | Jigme | Rekhey | Deothang | 700 | 2011-12 | 28 |
| 8. | Nima | Rekhey | Deothang | 710 | 2011-12 | 24 |
| 9. | Tshering Darjay | Rekhey | Deothang | 750 | 2011-12 | 10 |
| 10. | Kezang | Rekhey | Deothang | 730 | 2011-12 | 23 |
| 11. | Zangpo | Rekhey | Deothang | 700 | 2011-12 | 18 |
| 12. | Rinzin | Rekhey | Deothang | 720 | 2011-12 | 23 |
| 13. | Sangay Dorji | Rekhey | Deothang | 700 | 2011-12 | 9 |
| 14. | Pema Yangzom | Rekhey | Deothang | 800 | 2011-12 | 17 |
| 15. | Nima Gyeltshen | Rekhey | Deothang | 810 | 2011-12 | 40 |
| | | | | | Total | 192 |
| 16. | Sangay Dorji | Gonminang | Orong | 1273 | 2012-13 | 68 |
| 17. | Tenzin Wangda | Gonminang | Orong | 1196 | 2012-13 | 40 |
| 18. | Yongba | Batshung | Orong | 1149 | 2012-13 | 63 |
| 19. | Nima Yoezer | Batshung | Orong | 1124 | 2012-13 | 60 |
| 20. | Yeshey Tshewang | Nagzor | Orong | 1248 | 2012-13 | 41 |
| 21. | Thudam | Nagzor | Orong | 1147 | 2012-13 | 40 |
| 22. | Karma Yangden | Nagzor | Orong | 1128 | 2012-13 | 53 |
| 23. | Dendup Tshering | Nagzor | Orong | 1135 | 2012-13 | 51 |
| 24. | Thinley Wangdi | Nagzor | Orong | 1189 | 2012-13 | 30 |
| 25. | Kinzang Dema | Nagzor | Orong | 1188 | 2012-13 | 73 |
| | | | | | Total | 519 |
| 26. | Changlopei | Kheripam | Deothang | 839 | 2012-13 | 33 |
| 27. | Tshewang | Kheripam | Deothang | 824 | 2012-13 | 19 |
| 28. | Damchu Wangdi | Kheripam | Deothang | 798 | 2012-13 | 21 |
| 29. | Tshewang Zangmo | Kheripam | Deothang | 807 | 2012-13 | 61 |
| 30. | Sonam Choden | Kheripam | Deothang | 814 | 2012-13 | 10 |
| 31. | Sherab Lethro | Kheripam | Deothang | 748 | 2012-13 | 20 |
| 32. | Wangdi | Kheripam | Deothang | 750 | 2012-13 | 10 |
| 33. | Choezom | Kheripam | Deothang | 810 | 2012-13 | 27 |
| 34. | Kinzang | Kheripam | Deothang | 800 | 2012-13 | 15 |
| 35. | Meto | Kheripam | Deothang | 726 | 2012-13 | 29 |
| 36. | Sonam Tshewang | Kheripam | Deothang | 712 | 2012-13 | 36 |
| 37. | Sonam Penjor | Dungkarcholing | Deothang | 857 | 2012-13 | 40 |
| 38. | Kotsa | Dungkarcholing | Deothang | 824 | 2012-13 | 50 |
| 39. | Sherab Gyeltshen | Dungkarcholing | Deothang | 830 | 2012-13 | 50 |
| 40. | Jigme | Bangtsho | Deothang | 820 | 2012-13 | 50 |
| | | | | | Total | 471 |
| 41. | Nidup Dorji | Brumee | Gomdar | 1453 | 2013-14 | 64 |

| | | | | | | |
|---|-----------------|--------|--------|------|--------------|-------------|
| 42. | Tashi Norbu | Brumee | Gomdar | 1413 | 2013-14 | 56 |
| 43. | Dorji Tenzin | Brumee | Gomdar | 1425 | 2013-14 | 44 |
| 44. | Karma Yoezor | Brumee | Gomdar | 1422 | 2013-14 | 69 |
| 45. | Pezom | Brumee | Gomdar | 1412 | 2013-14 | 35 |
| 46. | Nagay Dorji | Brumee | Gomdar | 1399 | 2013-14 | 42 |
| 47. | Tshering Palden | Brumee | Gomdar | 1308 | 2013-14 | 69 |
| 48. | Nagay | Brumee | Gomdar | 1260 | 2013-14 | 23 |
| 49. | Pasang Dorji | Brumee | Gomdar | 1211 | 2013-14 | 59 |
| 50. | Karma Gyeltshen | Brumee | Gomdar | 1206 | 2013-14 | 41 |
| 51. | Thinlay | Brumee | Gomdar | 1224 | 2013-14 | 42 |
| 52. | Gyeltshen | Brumee | Gomdar | 1217 | 2013-14 | 55 |
| 53. | Ugyen Dorji | Brumee | Gomdar | 1446 | 2013-14 | 37 |
| 54. | Pema Tenzin | Brumee | Gomdar | 1427 | 2013-14 | 66 |
| 55. | Sacha Zangmo | Brumee | Gomdar | 1455 | 2013-14 | 34 |
| 56. | Tashi Penjor | Brumee | Gomdar | 1426 | 2013-14 | 38 |
| 57. | Ugyen Dorji | Brumee | Gomdar | 1427 | 2013-14 | 57 |
| 58. | Sonam Wangdi | Brumee | Gomdar | 1375 | 2013-14 | 59 |
| 59. | Sangay Tenzin | Brumee | Gomdar | 1366 | 2013-14 | 25 |
| 60. | Namkha Wangdi | Brumee | Gomdar | 1271 | 2013-14 | 46 |
| 61. | Bumpa Tshering | Brumee | Gomdar | 1296 | 2013-14 | 45 |
| 62. | Dorji Duba | Brumee | Gomdar | 1310 | 2013-14 | 40 |
| 63. | Dorji Wangchuk | Brumee | Gomdar | 1161 | 2013-14 | 32 |
| 64. | Sanga Dema | Brumee | Gomdar | 1150 | 2013-14 | 25 |
| 65. | Chophel | Brumee | Gomdar | 1190 | 2013-14 | 40 |
| 66. | Tshewang Dorji | Brumee | Gomdar | 1115 | 2013-14 | 31 |
| 67. | Samten | Brumee | Gomdar | 1096 | 2013-14 | 21 |
| 68. | Kinzang Wangdi | Brumee | Gomdar | 1087 | 2013-14 | 34 |
| 69. | Melam Zangmo | Brumee | Gomdar | 1051 | 2013-14 | 34 |
| 70. | Norbu Tshering | Brumee | Gomdar | 1020 | 2013-14 | 30 |
| | | | | | Total | 1293 |
| Grand Total (Samdrupjonkhar): 5 villages, 70 orchards with 2867 plants | | | | | | |

b) Orchards developed through Direct Support Program

| Sl. No | Name | Village | Geog | Year | Total Plts. | Remarks |
|--|--------------------|----------|----------|--------------|-------------|--|
| 1. | Tashi | Morong | Orong | 2010-11 | 90 | Pear(20), Persimmon(10), Citrus(40), Peach(10), Plum(10) |
| 2. | Tashi Lhendup | Gomdar | Gomdar | 2010-11 | 15 | Pear(5), Walnut(10) |
| 3. | Tshewang Gyeltshen | Deothang | Deothang | 2010-11 | 20 | Pear(5), Walnut(10), Peach(5) |
| 4. | Dema Yangzom | Morong | Orong | 2011-12 | 20 | Pear(20) |
| | | | | Total | 145 | |
| Grand Total: 4 orchards with 145 plants | | | | | | |

DATABASE OF ORCHARDS DEVELOPED IN TRASHIGANG DZONGKHAG



**Horticulture Research and Development Project (HRDP-JICA)
RNR RDC Wengkar, Department of Agriculture
Ministry of Agriculture and Forest**



PB : 132 Mongar 43001
Phone: 975 – 4 – 641 449 / 680009 / 680014
Fax: 975 – 4 – 641102

SUMMARY FOR TRASHIGANG DZONGKHAG

Profile of Trashigang Dzongkhag

| | |
|--------------------------------|---|
| Location: | 27 ^o 22' to 27 ^o 29' latitude 91 ^o 22' to 92 ^o 07' longitude |
| Total Area: | 2204.21 km ² |
| Altitude range: | 500-4500 m asl |
| No. of Geogs: | 17 |
| Total Nos. of orchards: | 196 |
| Total Nos. of plants: | 6014 |
| Approximate area under fruits: | 37.588 ac |
| Nos. of private nurseries: | 5 |

Orchards developed through different Approaches (2010-2015)

| Approaches | No. of orchards | No. of plants |
|---|-----------------------------|---------------|
| Mixed fruit orchard through Systematic Training Approach. | 25 orchards | 1363 |
| Pear Orchards through Focus Village Approach | 21 orchards (1 village) | 578 |
| Citrus Orchards through Focus Village Approach | 39 orchards (4 villages) | 1765 |
| Direct Support Program | 111 orchards | 2308 |

Orchards & Private nurseries established in different Geogs (2010-2015)

| Geog | Total No. of orchards | Total No. of plants | Type & No. of orchards | | | | Private Nursery |
|------------------|-----------------------|---------------------|------------------------|-----------|--------------|----------------|-----------------|
| | | | Mixed Fruit | Citrus | Pear Village | Direct Support | |
| Bidung | 3 | 200 | 3 | 0 | 0 | 0 | 0 |
| Kanglung | 78 | 1610 | 0 | 0 | 21 | 57 | 0 |
| Kangpara | 26 | 382 | 0 | 0 | 0 | 26 | 0 |
| Khaling | 4 | 163 | 1 | 0 | 0 | 3 | 2 |
| Lumang | 9 | 320 | 5 | 0 | 0 | 4 | 0 |
| Phongmey | 12 | 447 | 2 | 10 | 0 | 0 | 0 |
| Radhi | 5 | 198 | 3 | 0 | 0 | 2 | 1 |
| Samkhar | 11 | 332 | 2 | 0 | 0 | 9 | 0 |
| Shongphu | 21 | 1097 | 1 | 18 | 0 | 2 | 0 |
| Thrimshing | 9 | 404 | 3 | 3 | 0 | 3 | 1 |
| Udzorong | 13 | 558 | 0 | 8 | 0 | 5 | 1 |
| Yangneer | 5 | 303 | 5 | 0 | 0 | 0 | 0 |
| Dzongkhag | 196 | 6014 | 25 | 39 | 21 | 111 | 5 |

Details of orchards established through different approaches under Trashigang Dzongkhag

a) Mixed fruit orchards developed through Systematic Training & Orchard Development Program

| Sl. No. | Name of Orchard owner | Village | Geog | Alt. (m) | Year | Crops & Nos. | | | | | | | Total |
|---|-----------------------|-------------|------------|----------|--------------|--------------|------------|-----------|-----------|----------|-----------|------------|-------------|
| | | | | | | Pear | Persimmon | Peach | Plum | Apple | Walnut | Citrus | |
| 1 | Tashi Wangyel | Lemphang | Bidung | 2200 | 2011 | 44 | 22 | 0 | 0 | 0 | 0 | 0 | 66 |
| 2 | Kinzang Wangdi | Khapti | Samkhar | 1300 | 2011 | 0 | 10 | 0 | 0 | 0 | 0 | 59 | 69 |
| 3 | Sherab Dema | Samkhar | Samkhar | 1760 | 2011 | 34 | 11 | 0 | 0 | 0 | 0 | 0 | 45 |
| 4 | Che Dorji | Thrimshing | Thrimshing | 1300 | 2011 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 8 |
| 5 | Namgay Wangmo | Donphangma | Khaling | 1800 | 2012 | 21 | 5 | 9 | 8 | 0 | 0 | 0 | 43 |
| 6 | Tobgay | Bargon | Shongphu | 1700 | 2012 | 54 | 20 | 0 | 0 | 0 | 0 | 21 | 95 |
| 7 | Tempa Gyeltshen | Dori | Bidung | 1800 | 2012 | 53 | 18 | 0 | 0 | 0 | 0 | 2 | 73 |
| 8 | Pema Wangdi | Dori | Bidung | 1800 | 2012 | 35 | 23 | 0 | 0 | 0 | 0 | 2 | 61 |
| 9 | Karma Zangmo | Changzey | Yangneer | 1850 | 2012 | 50 | 15 | 0 | 0 | 0 | 0 | 0 | 65 |
| 10 | Sonam Choden | Changzey | Yangneer | 1650 | 2012 | 30 | 15 | 0 | 0 | 0 | 0 | 0 | 45 |
| 11 | Choning | Karmagoenpa | Phongmey | 2160 | 2013 | 58 | 3 | 0 | 0 | 1 | 32 | 0 | 94 |
| 12 | Sonam Zangmo | Karmagoenpa | Phongmey | 2145 | 2013 | 60 | 3 | 0 | 0 | 2 | 13 | 0 | 78 |
| 13 | Tendrel Tshering | Tonglingpam | Radhi | 1570 | 2014 | 40 | 15 | 2 | 2 | 0 | 0 | 7 | 66 |
| 14 | Ugyen Gyeltshen | Tanglamani | Radhi | 1620 | 2014 | 30 | 10 | 2 | 3 | 0 | 0 | 7 | 52 |
| 15 | Lobzang | Bongmen | Radhi | 1950 | 2014 | 10 | 5 | 5 | 5 | 0 | 0 | 0 | 25 |
| 16 | Thinley Dendup | Darjeeling | Yangneer | 1825 | 2014 | 50 | 25 | 5 | 3 | 0 | 0 | 0 | 83 |
| 17 | Cheda Zangpo | Darjeeling | Yangneer | 1855 | 2014 | 30 | 15 | 3 | 3 | 0 | 0 | 0 | 51 |
| 18 | Thinley Gyelmo | Darjeeling | Yangneer | 1820 | 2014 | 30 | 20 | 5 | 4 | 0 | 0 | 0 | 59 |
| 19 | Dungku | Tsangpo | Thrimshing | 1906 | 2014 | 20 | 10 | 5 | 5 | 0 | 0 | 0 | 40 |
| 20 | Kinga | Tsangpo | Thrimshing | 1807 | 2014 | 20 | 10 | 5 | 5 | 0 | 0 | 0 | 40 |
| 21 | Tashi Dhendup | Moshi | Lumang | 1809 | 2015 | 18 | 10 | 1 | 2 | 0 | 0 | 0 | 31 |
| 22 | Dawa Dema | Kosphu | Lumang | 2064 | 2015 | 20 | 10 | 2 | 3 | 0 | 0 | 0 | 35 |
| 23 | Tshomo | Benangwom | Lumang | 1685 | 2015 | 7 | 10 | 2 | 2 | 0 | 0 | 0 | 21 |
| 24 | Ugyen Dorji | Wakhar | Lumang | 1800 | 2015 | 50 | 10 | 4 | 4 | 0 | 0 | 0 | 68 |
| 25 | Nima Gyeltshen | Womrong | Lumang | 1760 | 2015 | 30 | 0 | 0 | 5 | 0 | 15 | 0 | 50 |
| | | | | | Total | 798 | 295 | 50 | 54 | 3 | 60 | 102 | 1363 |
| Grand Total (Trashigang): 25 orchards with 1363 plants | | | | | | | | | | | | | |

b) Pear orchards developed through Pear Village in Rongthung, Kanglung Geog

ASIAN PEAR VILLAGE

GENERAL INFORMATION

Village: Rongthung
 Geog: Kanglung
 Dzongkhag: Trashigang
 Nos. of orchards: 21
 Total Nos. of plts.: 578
 Trained farmers: 4
 Elevation: 1618-1738 m
 Year: Feb 2014



LIST OF BENEFICIARIES

| Map ID No. | Name | No. of plts |
|--------------|------------------|-------------|
| 1 | Kinzang Dorji | 65 |
| 2 | Sangtu | 34 |
| 3 | Kunzang Dorji | 17 |
| 4 | Duptho Zangmo | 14 |
| 5 | Samba | 24 |
| 6 | Tshewang Tenzin | 18 |
| 7 | Dechen Zangmo | 38 |
| 8 | Sonam Tenzin | 40 |
| 9 | Tandin | 18 |
| 10 | Ugyen Tenzin | 16 |
| 11 | Tshering Choden | 33 |
| 12 | Chorten Tshering | 28 |
| 13 | Karma Choden | 42 |
| 14 | Karchung | 13 |
| 15 | Ugyen Wangzom | 11 |
| 16 | Sangay Dorji | 79 |
| 17 | Norbu | 12 |
| 18 | Dawa | 15 |
| 19 | Nawang Choden | 27 |
| 20 | Kelzang Tshering | 16 |
| 21 | Phuntsho | 18 |
| Total | | 578 |

FOCAL PERSON



Name: Sangay Dorji, Tshogpa
 Mobile: 17665042

Details of fruit crops & its varieties for Rongthung, Kanglung Geog

| Sl. No. | Name of Orchard owners | Altitude (m asl) | Pear | | | Persimmon | | | Kiwi Fruit | | Peach | Plum | Total |
|---------|------------------------|------------------|------------|-----------|------------|-----------|----------|----------|------------|------------|----------|----------|------------|
| | | | Hosui | Kosui | Chojuro | Fuyu | Jiro | Z'maru | W.Green | Pollinizer | B.Cream | Soldum | |
| 1 | Kinzang Dorji (Gup) | 1618 | 20 | 17 | 10 | 0 | 0 | 0 | 15 | 3 | 0 | 0 | 65 |
| 2 | Sangtu | 1641 | 20 | 10 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| 3 | Kunzang Dorji | 1656 | 12 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 4 | Duptho Zangmo | 1640 | 10 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 5 | Samba | 1660 | 15 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 6 | Tshewang Tenzin | 1624 | 10 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 7 | Dechen Zangmo | 1627 | 20 | 10 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 8 | Sonam Tenzin | 1626 | 20 | 10 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 |
| 9 | Tandin | 1660 | 10 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 10 | Ugyen Tenzin | 1663 | 10 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 11 | Tshering Choden | 1636 | 20 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| 12 | Chorten Tshering | 1665 | 20 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 13 | Karma Choden | 1683 | 25 | 10 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 42 |
| 14 | Karchung | 1673 | 10 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 15 | Ugyen Wangzom | 1679 | 10 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 16 | Sangay Dorji | 1678 | 30 | 10 | 5 | 9 | 9 | 2 | 7 | 3 | 2 | 2 | 79 |
| 17 | Norbu | 1694 | 10 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| 18 | Dawa | 1738 | 10 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| 19 | Nawang Choden | 1701 | 20 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |
| 20 | Kelzang Tshering | 1705 | 10 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 21 | Phuntsho | 1712 | 10 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| | | Total | 322 | 87 | 101 | 9 | 9 | 2 | 22 | 6 | 3 | 3 | 578 |

Pear = 510 plants, Persimmon = 20 plants, Kiwi = 28 plants, Peach = 3 plants & Plum = 3 plants.

c) Orchards developed through Citrus Focus Village Approach

| Sl. No. | Farmer Name | Village | Geog | Altitude (m asl) | Year | Total Plants |
|--|------------------|----------|------------|------------------|--------------|--------------|
| 1 | Sangay Wangchuk | Baepam | Udzorong | 1110 | 2010-2011 | 49 |
| 2 | Zangpo | Baepam | Udzorong | 1130 | 2010-2011 | 50 |
| 3 | Tenzin Wangdi | Baepam | Udzorong | 1210 | 2010-2011 | 50 |
| 4 | Yeshi Tshewang | Baepam | Udzorong | 1490 | 2010-2011 | 50 |
| 5 | Sonam Tshering | Baepam | Udzorong | 1300 | 2010-2011 | 49 |
| 6 | Pema Chedup | Baepam | Udzorong | 1110 | 2010-2011 | 50 |
| 7 | Yeshi Dorji | Baepam | Udzorong | 1130 | 2010-2011 | 48 |
| 8 | Samten Tshering | Baepam | Udzorong | 1480 | 2010-2011 | 50 |
| | | | | | Total | 396 |
| 9 | Tenjay Tshering | Phekpari | Thrimshing | 1450 | 2011-2012 | 95 |
| 10 | Ugyen Tshering | Phekpari | Thrimshing | 1430 | 2011-2012 | 121 |
| 11 | Sonam Dhendup | Phekpari | Thrimshing | 1430 | 2011-2012 | 32 |
| | | | | | Total | 248 |
| 12 | Dorji Namgay | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 55 |
| 13 | Taumo | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 48 |
| 14 | Sonam Tobgay (B) | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 32 |
| 15 | Yeshey Tenzin | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 50 |
| 16 | Norbu Gyeltshen | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 31 |
| 17 | Chhimi | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 53 |
| 18 | Sonam Tobgay (A) | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 46 |
| 19 | Sherub Wangmo | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 51 |
| 20 | Sangay Dorji | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 30 |
| 21 | Thinley Zangmo | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 50 |
| 22 | Dechen Pemo | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 53 |
| 23 | Khirzala | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 51 |
| 24 | Tshewang | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 51 |
| 25 | Tshering | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 53 |
| 26 | Lobzang | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 51 |
| 27 | Tashi Norbu | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 53 |
| 28 | Phuntsho Wangdi | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 54 |
| 29 | Trulung | Dangrey | Shonphu | 1200-1280 | 2012-2013 | 34 |
| | | | | | Total | 846 |
| 30 | Tshewang Rinzin | Phimsum | Phongmey | 1752 | 2013-2014 | 22 |
| 31 | Nima Chogyel | Phimsum | Phongmey | 1700 | 2013-2014 | 35 |
| 32 | Dorji Tshering | Phimsum | Phongmey | 1721 | 2013-2014 | 30 |
| 33 | Pema Samten | Phimsum | Phongmey | 1737 | 2013-2014 | 38 |
| 34 | Phurba Tenzin | Phimsum | Phongmey | 1551 | 2013-2014 | 31 |
| 35 | Kencho Wangmo | Phimsum | Phongmey | 1535 | 2013-2014 | 12 |
| 36 | Karchung | Phimsum | Phongmey | 1587 | 2013-2014 | 26 |
| 37 | Dorji Thinlay | Phimsum | Phongmey | 1596 | 2013-2014 | 39 |
| 38 | Tshering Yangzom | Phimsum | Phongmey | 1640 | 2013-2014 | 16 |
| 39 | Tshering Yangzom | Phimsum | Phongmey | 1565 | 2013-2014 | 26 |
| | | | | | Total | 275 |
| Trashigang: 4 villages, 39 orchards with total of 1765 plants | | | | | | |

d) Orchards developed through Direct Support Program

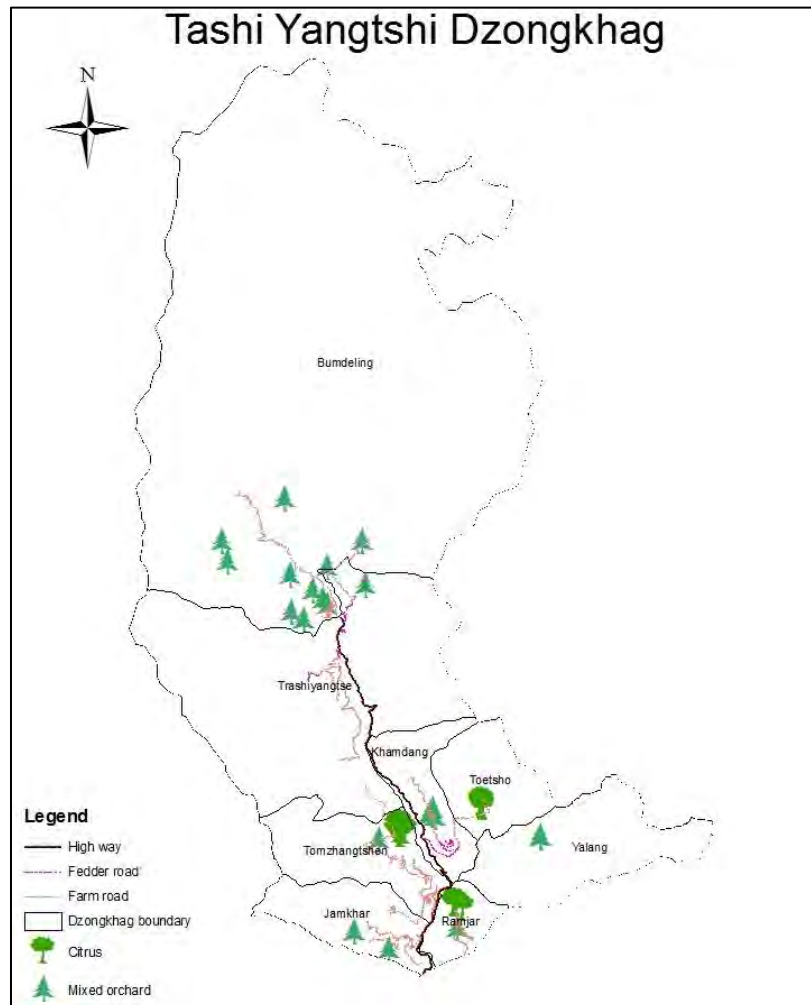
| Sl. No | Name | Village | Geog | Year | Fruit crops | | | | | | Total plts. |
|--------|------------------|--------------|----------|---------|-------------|-----------|--------|--------|----------|----------|-------------|
| | | | | | Pear | Persimmon | Walnut | Citrus | Chestnut | Hazelnut | |
| 1. | Namgay | Mertsam | Kanglung | 2010-11 | 20 | 6 | 20 | 0 | 0 | 0 | 46 |
| 2. | Karma Jamtsho | Mertsam | Kanglung | 2010-11 | 5 | 0 | 10 | 0 | 0 | 0 | 15 |
| 3. | Choney Wangmo | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 4. | Tshomo | Mertsam | Kanglung | 2010-11 | 20 | 0 | 0 | 0 | 0 | 0 | 20 |
| 5. | Tshering Lhamo | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 6. | Yezer | Zangkholum | Kanglung | 2010-11 | 3 | 0 | 3 | 0 | 3 | 3 | 12 |
| 7. | Pem Zam | Thragom | Kanglung | 2010-11 | 5 | 0 | 10 | 0 | 0 | 0 | 15 |
| 8. | Tobjay | Durung | Kanglung | 2010-11 | 20 | 0 | 34 | 0 | 0 | 0 | 54 |
| 9. | Tsheten Wangchuk | Durung | Kanglung | 2010-11 | 0 | 0 | 20 | 0 | 0 | 0 | 20 |
| 10. | Trashi Wangchuk | Naka | Kanglung | 2010-11 | 30 | 0 | 0 | 0 | 0 | 0 | 30 |
| 11. | Sangay | Namla | Kanglung | 2010-11 | 10 | 0 | 5 | 0 | 0 | 0 | 15 |
| 12. | Karma Yangdon | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 5 | 15 |
| 13. | Deki | Durung | Kanglung | 2010-11 | 10 | 0 | 0 | 00 | 0 | 0 | 10 |
| 14. | Tsheten | Yonphupam | Kanglung | 2010-11 | 5 | 0 | 55 | 0 | 10 | 0 | 70 |
| 15. | Karma | Yonphupam | Kanglung | 2010-11 | 0 | 0 | 11 | 0 | 0 | 0 | 11 |
| 16. | Sonam Tenzin | Yonphupam | Kanglung | 2010-11 | 3 | 0 | 10 | 0 | 0 | 0 | 13 |
| 17. | Tandin | Thragom | Kanglung | 2010-11 | 15 | 0 | 5 | 0 | 0 | 5 | 25 |
| 18. | Tshering Dorji | Retsang dung | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 19. | Phuntsho | Yonphu | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 3 | 3 | 16 |
| 20. | Samdrup | Rethung | Kanglung | 2010-11 | 5 | 0 | 5 | 0 | 0 | 0 | 10 |
| 21. | Norbu Tshering | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 10 | 10 | 30 |
| 22. | Nim Zangmo | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 23. | Yeshi | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 24. | Dorji | Kanglung | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 25. | Namgey Dorji | Jomsang | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 26. | Bumpa | Mertsam | Kanglung | 2010-11 | 5 | 0 | 0 | 0 | 0 | 5 | 10 |
| 27. | Trashi Wangchuk | Yonphupam | Kanglung | 2010-11 | 5 | 0 | 35 | 0 | 0 | 0 | 40 |
| 28. | Deki | Kanglung | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 2 | 0 | 12 |
| 29. | Sonam Tshering | Zangkholum | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 5 | 0 | 15 |
| 30. | Leki Wangchuk | Yonphu | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 3 | 13 |
| 31. | Tenzin Dema | Yonpu | Kanglung | 2010-11 | 15 | 0 | 0 | 0 | 5 | 10 | 30 |
| 32. | Ten Choden | Yonphu | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 5 | 5 | 20 |
| 33. | Meto Seldon | Mertsam | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 3 | 3 | 16 |
| 34. | Jigme Dorji | Yonphupam | Kanglung | 2010-11 | 5 | 0 | 0 | 0 | 20 | 0 | 25 |

| Sl. No | Name | Village | Geog | Year | Fruit crops | | | | | | Total plts. |
|--------|------------------|--------------|------------|--------------|-------------|-----------|------------|------------|-----------|-----------|-------------|
| | | | | | Pear | Persimmon | Walnut | Citrus | Chestnut | Hazelnut | |
| 35. | Kelzang | Kanglung | Kanglung | 2010-11 | 15 | 0 | 25 | 0 | 5 | 5 | 50 |
| 36. | Deki | Durung | Kanglung | 2010-11 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 37. | Dratsang | Barshong | Khaling | 2010-11 | 50 | 0 | 0 | 0 | 0 | 0 | 50 |
| 38. | Ugyen Lhadon | Gorikha | Yzorong | 2010-11 | 10 | 0 | 0 | 10 | 3 | 5 | 28 |
| 39. | Tshewang Namgay | Benshingmo | Yzorong | 2010-11 | 10 | 0 | 0 | 5 | 6 | 3 | 24 |
| 40. | Karma Tenzin | Tashiyangphu | Wamrong | 2010-11 | 20 | 0 | 0 | 0 | 0 | 0 | 20 |
| 41. | Sonam Choejay | Kangpara | Thrimshing | 2010-11 | 10 | 0 | 0 | 0 | 5 | 8 | 23 |
| 42. | Karma | Kangpara | Thrimshing | 2010-11 | 10 | 0 | 5 | 0 | 0 | 0 | 15 |
| 43. | Tshewang Getshen | Bemri | Lumang | 2010-11 | 50 | 0 | 0 | 0 | 0 | 0 | 50 |
| 44. | Sangey | Khaptey | Samkhar | 2010-11 | 10 | 0 | 0 | 30 | 0 | 0 | 40 |
| 45. | Sanga Choden | Khaptey | Samkhar | 2010-11 | 0 | 0 | 0 | 50 | 0 | 0 | 50 |
| 46. | Dorji | Rangjung | Shongphu | 2010-11 | 0 | 0 | 100 | 30 | 0 | 0 | 130 |
| | | | | Total | 526 | 6 | 353 | 120 | 85 | 70 | 1168 |
| 47. | Sangay Dorji | Zordung | Kangpara | 2011-12 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 48. | Chimi Rinzin | Zordung | Kangpara | 2011-12 | 20 | 0 | 0 | 0 | 0 | 0 | 20 |
| 49. | Nawang Choeda | Zordung | Kangpara | 2011-12 | 20 | 0 | 0 | 0 | 0 | 0 | 20 |
| 50. | Dorjee | Kurichilo | Lumang | 2011-12 | 0 | 0 | 25 | 0 | 0 | 0 | 25 |
| 51. | Lhanga | Durung | Kanglung | 2011-12 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 52. | Norbu Jaypo | Benshingmo | Udzorong | 2011-12 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 53. | Sangay Dorji | Kanglung | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 54. | Karma Tenzin | Khangma | Kanglung | 2011-12 | 25 | 0 | 0 | 0 | 0 | 0 | 25 |
| 55. | Cheten | Pam | Samkhar | 2011-12 | 30 | 0 | 10 | 0 | 0 | 20 | 60 |
| 56. | Phurpa Lhamo | Dungonpa | Radhi | 2011-12 | 30 | 0 | 15 | 0 | 0 | 0 | 45 |
| 57. | Karma Wangchuk | Pam | Samkhar | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 58. | Sangay Penjor | Benshingmo | Udzorong | 2011-12 | 30 | 0 | 10 | 0 | 0 | 10 | 50 |
| 59. | Sonam Jamtsho | Benshingmo | Udzorong | 2011-12 | 0 | 0 | 0 | 50 | 0 | 0 | 50 |
| 60. | Gyelpo | Tsangpo | Thrimshing | 2011-12 | 0 | 30 | 0 | 0 | 0 | 0 | 30 |
| 61. | Pema Wangchuk | Yonphupam | Kanglung | 2011-12 | 25 | 0 | 25 | 0 | 0 | 0 | 50 |
| 62. | Kencho Lhendup | Pam | Samkhar | 2011-12 | 5 | 5 | 5 | 0 | 0 | 8 | 23 |
| 63. | Ugyen Dorji | Kanglung | Kanglung | 2011-12 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 64. | Ten Dorji | Durung | Kanglung | 2011-12 | 20 | 0 | 5 | 0 | 0 | 0 | 25 |
| 65. | Tenzin Wangda | Yonphupam | Kanglung | 2011-12 | 25 | 0 | 5 | 0 | 0 | 0 | 30 |
| 66. | Namgay Wangdi | Mertsham | Kanglung | 2011-12 | 19 | 0 | 5 | 0 | 0 | 0 | 24 |
| 67. | Pema Zangmo | Kanglung | Kanglung | 2011-12 | 5 | 0 | 5 | 0 | 0 | 0 | 10 |
| 68. | Sangay | Dopung | Kanglung | 2011-12 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 69. | Samdrup | Mertsham | Kanglung | 2011-12 | 10 | 0 | 10 | 0 | 0 | 0 | 20 |

| Sl. No | Name | Village | Geog | Year | Fruit crops | | | | | | Total plts. |
|--------|------------------|--------------|----------|--------------|-------------|-----------|------------|-----------|----------|-----------|-------------|
| | | | | | Pear | Persimmon | Walnut | Citrus | Chestnut | Hazelnut | |
| 70. | Tashi dorji | Barshong | Khaling | 2011-12 | 50 | 0 | 0 | 0 | 0 | 5 | 55 |
| 71. | Karma Tenzin | Tashiyangphu | Khaling | 2011-12 | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| 72. | Tshomo | Mertsam | Kanglung | 2011-12 | 20 | 0 | 0 | 0 | 0 | 0 | 20 |
| 73. | Tshering Dorji | Tshenkhar | Radhi | 2011-12 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 74. | Naku | Kanglung | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 75. | Pema | Mertsam | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 76. | Yeshi | Mertsam | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 77. | Dema | Pam | Samkhar | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 78. | Nima Zangmo | Ashemdelo | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 79. | Tshewang Thinley | Yonphu | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 80. | Tashi Dorji | Mersam | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 81. | Namgey | Mertsam | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 82. | Bumpa | Mertsam | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 83. | Tshering Choden | Mertsam | Kanglung | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| 84. | Tsheten | Pam | Samkhar | 2011-12 | 5 | 0 | 0 | 0 | 0 | 0 | 5 |
| | | | | Total | 464 | 35 | 120 | 50 | 0 | 63 | 732 |
| 85. | Jangchup Dorji | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 86. | Gyelpo | Zordung | Kangpara | 2012-13 | 0 | 30 | 0 | 0 | 0 | 0 | 30 |
| 87. | Chimi Rinzin | Zordung | Kangpara | 2012-13 | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| 88. | Sangay Wangdi | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 89. | Dorji Wangchuk | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 90. | Shacha Wangchuk | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 91. | Lhawang Jamtsho | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 92. | Jamyang Tenzin | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 93. | Menlam Dorji | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 94. | Damcho Norbu | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 95. | Dorji Gyeltshen | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 96. | Tshewang Zangmo | Zordung | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 97. | Sonam Jamtsho | Zordung | Kangpara | 2012-13 | 10 | 30 | 0 | 0 | 0 | 0 | 40 |
| 98. | Dorji Wangchuk | Lamai Goenpa | Kangpara | 2012-13 | 10 | 30 | 0 | 0 | 0 | 0 | 40 |
| 99. | Dawa Gyeltshen | Bedingphu | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 100. | Dophu Tenzin | Bedingphu | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 101. | Wangda | Bedingphu | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 102. | Tobzang | Bedingphu | Kangpara | 2012-13 | 10 | 7 | 0 | 0 | 0 | 0 | 17 |
| 103. | Rinchen Tobgay | Bedingphu | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 104. | Tandin Wangchuk | Lagoen | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |

| Sl. No | Name | Village | Geog | Year | Fruit crops | | | | | | Total plts. |
|---------------------------------|-------------------|--------------------------------------|----------|--------------|-------------|------------|----------|----------|----------|----------|-------------|
| | | | | | Pear | Persimmon | Walnut | Citrus | Chestnut | Hazelnut | |
| 105. | Kinzang Wangmo | Merda | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 106. | Thinley Gyeltshen | Merda | Kangpara | 2012-13 | 10 | 0 | 0 | 0 | 0 | 0 | 10 |
| 107. | Bumpa Tshering | Zordung | Kangpara | 2012-13 | 10 | 10 | 0 | 0 | 0 | 0 | 20 |
| | | | | Total | 225 | 107 | 0 | 0 | 0 | 0 | 332 |
| 108 | Rinzin | Womrong | Lumang | 2014-15 | 15 | 0 | 5 | 0 | 0 | 0 | 20 |
| 109 | Lam Dorji | BikharGoenpa | Samkhar | 2014-15 | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| 110 | Lungjay | Bikhar | Samkhar | 2014-15 | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| 111 | Karma | Gonsiphama | Shongphu | 2014-15 | 26 | 0 | 0 | 0 | 0 | 0 | 26 |
| | | | | Total | 71 | 0 | 5 | 0 | 0 | 0 | 76 |
| Grand Total (Trashigang) | | 111 orchards with 2308 plants | | | | | | | | | |

DATABASE OF ORCHARDS DEVELOPED IN TASHIYANGTSE DZONGKHAG



Horticulture Research and Development Project (HRDP-JICA)
RNR RDC Wengkar, Department of Agriculture
Ministry of Agriculture and Forest



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SUMMARY FOR TASHIYANGTSE DZONGKHAG

Profile of Tashiyangtse Dzongkhag

| | |
|---------------------------------------|---|
| Location: | 27 ^o 22' to 27 ^o 58' latitude 91 ^o 20' to 92 ^o 46' longitude |
| Total Area: | 1449.26 km ² |
| Altitude range: | 800-6000 m asl |
| No. of Geogs: | 8 |
| Total Nos. of orchards: | 88 |
| Total Nos. of plants: | 3525 |
| Approximate area under fruits: | 20.031 ac |
| Nos. of private nurseries: | 1 |

Orchards developed through different Approaches (2010-2015)

| Approaches | No. of orchards | No. of plants |
|---|-----------------------------|---------------|
| Mixed fruit orchard through Systematic Training Approach. | 21 orchards | 1001 |
| Citrus Orchards through Focus Village Approach | 44 orchards (4 villages) | 1807 |
| Pear & Persimmon Orchards through Focus Village Approach | 12 orchards (1 village) | 395 |
| Direct Support Program | 11 orchards | 322 |

Orchards & Private nurseries established in different Geogs (2010-2015)

| Geog | Total No. of orchards | Total No. of plants | Type & No. of orchards | | | | Private Nursery |
|------------------|-----------------------|---------------------|------------------------|-----------|--------------------------|----------------|-----------------|
| | | | Mixed Fruit | Citrus | Pear & Persimmon Village | Direct Support | |
| Bumdelling | 8 | 447 | 7 | 0 | 0 | 1 | 0 |
| Jamkhar | 4 | 202 | 2 | 0 | 0 | 2 | 0 |
| Khamdang | 23 | 760 | 7 | 16 | 0 | 0 | 1 |
| Ramjar | 18 | 701 | 1 | 5 | 12 | 0 | 0 |
| Tongzhang | 17 | 699 | 1 | 16 | 0 | 0 | 0 |
| Teotsho | 7 | 340 | 0 | 7 | 0 | 0 | 0 |
| Yallang | 6 | 162 | 2 | 0 | 0 | 4 | 0 |
| Yangtse | 5 | 214 | 1 | 0 | 0 | 4 | 0 |
| Dzongkhag | 88 | 3525 | 21 | 44 | 12 | 11 | 1 |

a) Mixed Fruit Demo orchards established through Systematic Training & Orchard Development Approach

| SI. No | Name of Orchard owner | Village | Geog | Alt. (m) | Year | Crops & Nos. | | | | | | | Total |
|---|-----------------------|--------------|------------|----------|--------------|--------------|------------|-----------|-----------|----------|-----------|-----------|-------------|
| | | | | | | Pear | Persimmon | Peach | Plum | Apple | Walnut | Citrus | |
| 1 | Wangchuk | Sepmo | Yangtse | 2050 | 2011 | 35 | 20 | 9 | 3 | 0 | 30 | 0 | 97 |
| 2 | Phuntsho | Gorshing | Tongzhang | 2150 | 2011 | 20 | 15 | 0 | 0 | 0 | 0 | 0 | 35 |
| 3 | Norbu | Tsangrung | Ramjar | 2100 | 2011 | 5 | 12 | 0 | 0 | 0 | 0 | 0 | 17 |
| 4 | Neten Wangmo | Lumar | Bumdelling | 2200 | 2012 | 15 | 5 | 5 | 5 | 0 | 0 | 0 | 30 |
| 5 | Sherabla | Lumar | Bumdelling | 2150 | 2012 | 61 | 10 | 5 | 5 | 0 | 0 | 0 | 81 |
| 6 | Tsheringla | Shilling | Bumdelling | 2200 | 2012 | 33 | 10 | 10 | 10 | 0 | 0 | 0 | 63 |
| 7 | Gaydenla | Lamdra | Bumdelling | 2100 | 2012 | 35 | 10 | 10 | 10 | 0 | 0 | 0 | 65 |
| 8 | Karma | Pangthangzor | Jamkhar | 1750 | 2013 | 8 | 5 | 0 | 0 | 4 | 0 | 30 | 47 |
| 9 | Singye Wangchuk | Chema | Jamkhar | 1850 | 2013 | 30 | 15 | 1 | 4 | 0 | 0 | 0 | 50 |
| 10 | Tashi Tenzin | Yallang | Yallang | 1700 | 2013 | 10 | 10 | 0 | 5 | 1 | 0 | 18 | 44 |
| 11 | Dorji Rinchen | Yallang | Yallang | 1650 | 2013 | 10 | 9 | 0 | 3 | 1 | 0 | 15 | 38 |
| 12 | Ugyen Tshering | Fanteng | Bumdelling | 1990 | 2014 | 40 | 20 | 3 | 2 | 0 | 0 | 0 | 65 |
| 13 | Chorten Tshering | Tshaling | Bumdelling | 1880 | 2014 | 40 | 20 | 2 | 0 | 0 | 0 | 0 | 62 |
| 14 | Thukten | Gangkhardun | Bumdelling | 2105 | 2014 | 40 | 20 | 2 | 0 | 0 | 0 | 0 | 61 |
| 15 | Sangay | Sherpang | Khamdang | 1960 | 2015 | 20 | 10 | 2 | 3 | 0 | 0 | 0 | 35 |
| 16 | Singye Wangchuk | Sherpang | Khamdang | 1880 | 2015 | 15 | 16 | 0 | 0 | 0 | 0 | 0 | 31 |
| 17 | Dechen | Sherpang | Khamdang | 1858 | 2015 | 20 | 15 | 3 | 2 | 0 | 0 | 0 | 40 |
| 18 | Demo | Sherpang | Khamdang | 1880 | 2015 | 15 | 12 | 3 | 3 | 0 | 0 | 0 | 33 |
| 19 | Dumo | Sherpang | Khamdang | 1860 | 2015 | 15 | 13 | 3 | 3 | 0 | 0 | 0 | 34 |
| 20 | Tashi Phuntsho | Sherpang | Khamdang | 1890 | 2015 | 30 | 20 | 4 | 3 | 0 | 0 | 0 | 57 |
| 21 | Ugyen Wangdi | Tshenkharla | Khamdang | 1900 | 2015 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 16 |
| | | | | | Total | 497 | 283 | 62 | 61 | 6 | 30 | 63 | 1001 |
| Grand Total (Tashiyangtse): 21 orchards with 1001 plants | | | | | | | | | | | | | |

b) Orchards developed through Citrus Focus Village Approach

| Sl. No. | Name of Farmer | Village/ Location | Geog | Altitude (m asl) | Year | Total |
|---------|------------------|-------------------|-----------|------------------|--------------|------------|
| 1. | Yoko | Pangthang | Ramjar | 1400-1600 | 2011-12 | 43 |
| 2. | Chimi Wangmo | Pangthang | Ramjar | 1400-1600 | 2011-12 | 55 |
| 3. | Maylam | Pangthang | Ramjar | 1400-1600 | 2011-12 | 66 |
| 4. | Tshering Dorji | Pangthang | Ramjar | 1400-1600 | 2011-12 | 55 |
| 5. | Wangmo | Pangthang | Ramjar | 1400-1600 | 2011-12 | 70 |
| | | | | | Total | 289 |
| 6. | Karma Wangdi | Dumang | Teotsho | 1560-1650 | 2011-12 | 50 |
| 7. | Tshering Zangmo | Dumang | Teotsho | 1560-1650 | 2011-12 | 40 |
| 8. | Tashi Wangdi | Dumang | Teotsho | 1560-1650 | 2011-12 | 50 |
| 9. | Dorji Wangmo | Dumang | Teotsho | 1560-1650 | 2011-12 | 50 |
| 10. | Karma Yuden | Dumang | Teotsho | 1560-1650 | 2011-12 | 50 |
| 11. | Tashi Zangmo | Dumang | Teotsho | 1560-1650 | 2011-12 | 50 |
| 12. | Tshering Yuden | Dumang | Teotsho | 1560-1650 | 2011-12 | 50 |
| | | | | | Total | 340 |
| 13. | Tshering Dendup | Pang | Tongzhang | 1425-1700 | 2012-13 | 50 |
| 14. | Sonam Wangmo | Pang | Tongzhang | 1425-1700 | 2012-13 | 40 |
| 15. | Tashi Phuntsho | Pang | Tongzhang | 1425-1700 | 2012-13 | 47 |
| 16. | Karma Zangmo | Pang | Tongzhang | 1425-1700 | 2012-13 | 53 |
| 17. | Tashi | Pang | Tongzhang | 1425-1700 | 2012-13 | 26 |
| 18. | Tenzin Chopel | Pang | Tongzhang | 1425-1700 | 2012-13 | 50 |
| 19. | Tenzin | Pang | Tongzhang | 1425-1700 | 2012-13 | 23 |
| 20. | Yeshi Dendup | Pang | Tongzhang | 1425-1700 | 2012-13 | 26 |
| 21. | Phuntsho Wangdi | Pang | Tongzhang | 1425-1700 | 2012-13 | 16 |
| 22. | Gonpo | Pang | Tongzhang | 1425-1700 | 2012-13 | 50 |
| 23. | Kunzang Namgay | Pang | Tongzhang | 1425-1700 | 2012-13 | 21 |
| 24. | Zangla | Pangtoka | Tongzhang | 1425-1700 | 2012-13 | 57 |
| 25. | Nakshang | Lawashing | Tongzhang | 1425-1700 | 2012-13 | 73 |
| 26. | Sherabmo | Lawashing | Tongzhang | 1425-1700 | 2012-13 | 37 |
| 27. | Pema Dema | Lawashing | Tongzhang | 1425-1700 | 2012-13 | 53 |
| 28. | Samten | Lawashing | Tongzhang | 1425-1700 | 2012-13 | 42 |
| | | | | | Total | 664 |
| 29. | Damchen | Shazam | Khamdang | 1662 | 2013-14 | 24 |
| 30. | Thuketen Zangmo | Shazam | Khamdang | 1570 | 2013-14 | 33 |
| 31. | Tshering Dorji | Shazam | Khamdang | 1553 | 2013-14 | 33 |
| 32. | Jigme | Shazam | Khamdang | 1530 | 2013-14 | 13 |
| 33. | Chorten | Shazam | Khamdang | 1514 | 2013-14 | 25 |
| 34. | Sumchu | Shazam | Khamdang | 1500 | 2013-14 | 20 |
| 35. | Choden | Shazam | Khamdang | 1494 | 2013-14 | 11 |
| 36. | Tshering Dema | Shazam | Khamdang | 1477 | 2013-14 | 39 |
| 37. | Tenzin | Shazam | Khamdang | 1476 | 2013-14 | 11 |
| 38. | Kezang Dorji | Shazam | Khamdang | 1449 | 2013-14 | 53 |
| 39. | Thukten Tshering | Shazam | Khamdang | 1421 | 2013-14 | 33 |
| 40. | Kezang Dema | Shazam | Khamdang | 1502 | 2013-14 | 74 |
| 41. | Karma Lhaden | Shazam | Khamdang | 1486 | 2013-14 | 20 |
| 42. | Sonam | Shazam | Khamdang | 1528 | 2013-14 | 45 |

| | | | | | | |
|---|----------------------|--------|----------|------|--------------|------------|
| 43. | Kezang Dorji chungwa | Shazam | Khamdang | 1530 | 2013-14 | 30 |
| 44. | Neten | Shazam | Khamdang | 1525 | 2013-14 | 50 |
| | | | | | Total | 514 |
| Grand Total (Tashiyangtse): 4 villages, 44 orchards with 1807 plants | | | | | | |

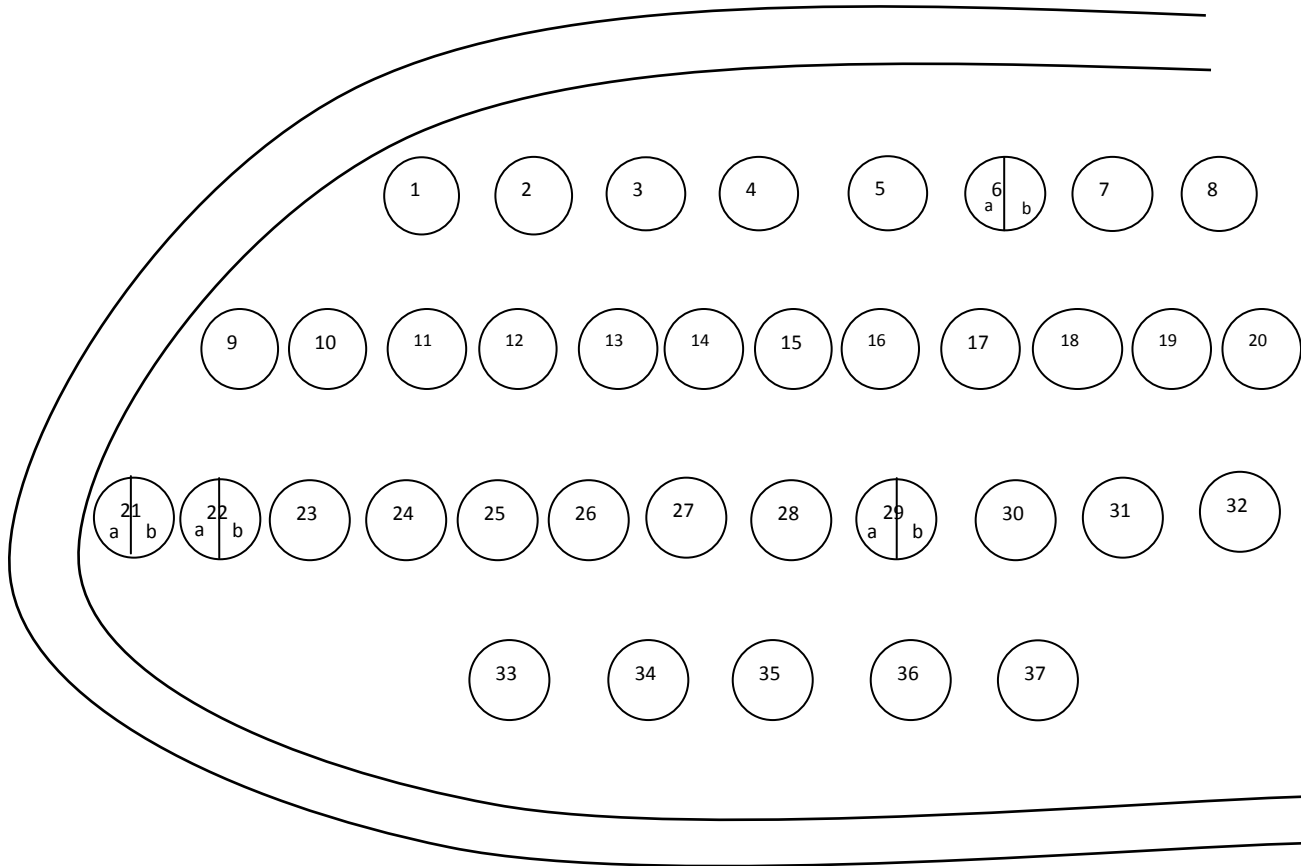
c) Orchards developed through Pear & Persimmon Village in Ramjar Geog

| Sl. No. | Name of orchard owner | Altitude (m asl) | Total Plants |
|---------|-----------------------|------------------|--------------|
| 1 | Namgay Wangmo | 1820 | 27 |
| 2 | Kinga wangmo | 1878 | 36 |
| 3 | Karma Pended | 1803 | 30 |
| 4 | Thinley | 2250 | 42 |
| 5 | Tshundu Gyeltshen | 1860 | 20 |
| 6 | Pema Choden | 2067 | 30 |
| 7 | Sherab Gyeltshen | 2250 | 52 |
| 8 | Yeshi Dema | 1881 | 40 |
| 9 | Dechen Gyelmo | 2207 | 30 |
| 10 | Namgay | 1850 | 38 |
| 11 | Yeshey Tshomo | 1825 | 30 |
| 12 | Sangay Phuntsho | 1830 | 20 |
| | | Total | 395 |

d) Orchards developed through Direct Support Program

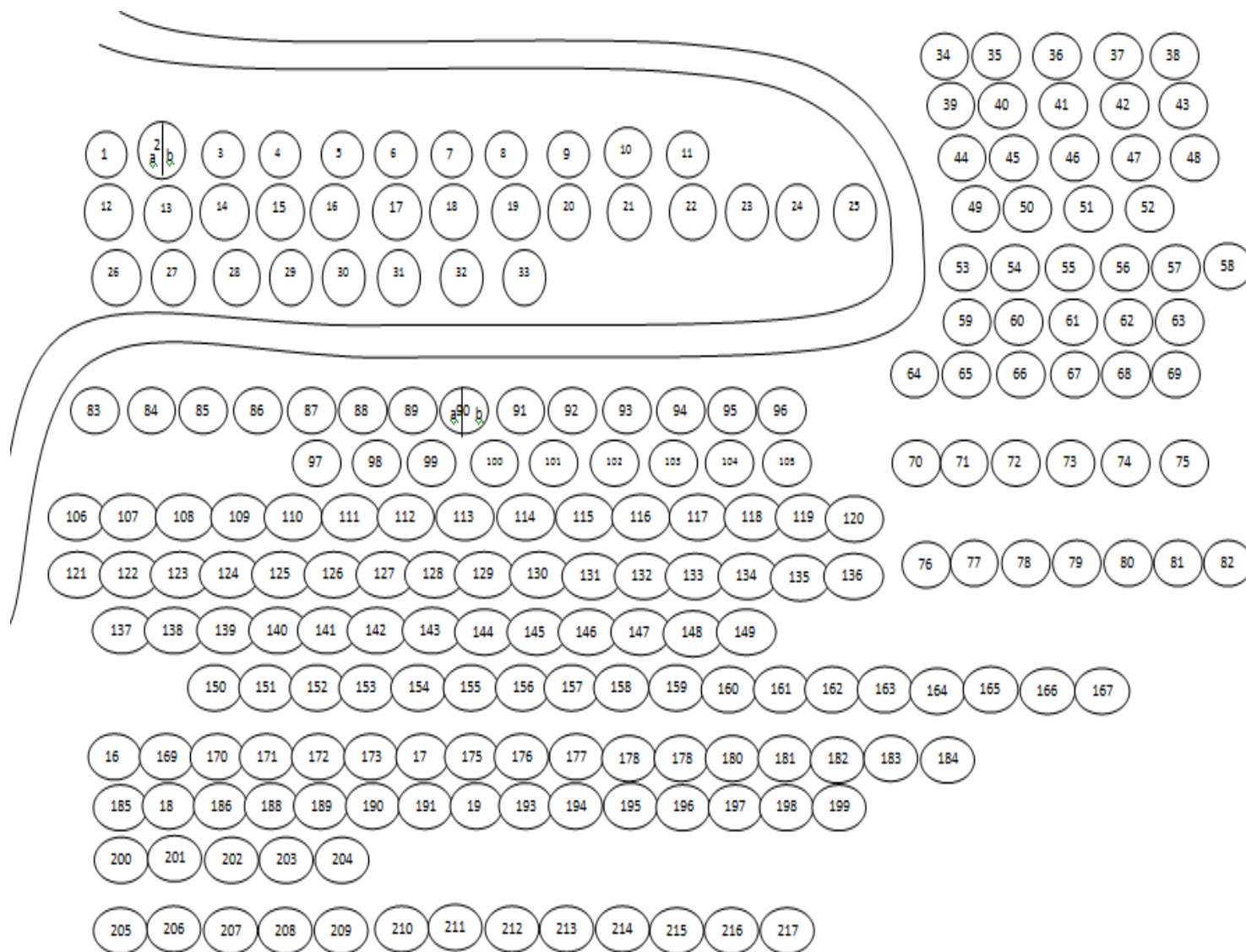
| Sl. No | Name | Village | Geog | Year | | |
|--------|-----------------|---------|-----------|--------------|------------|---------------------------------|
| | | | | | Total | Remarks |
| 1. | Sangay Wangmo | Wanglo | Yangtse | 2010-11 | 50 | Walnut (50) |
| 2. | Sangay | Jamkhar | Jamkhar | 2010-11 | 15 | Pear(10), Wlanut(5) |
| 3. | Yangtse MLSS | Yangtse | Yangtse | 2010-11 | 22 | Pear(5), Persimmon(2), Peach(5) |
| 4. | RNR EC | Yangtse | Yangtse | 2010-11 | 20 | Pear(10), Walnut(10) |
| 5. | Rigsum Gonpa | Rigsum | Bumelling | 2011-12 | 20 | Pear(20) |
| 6. | Lam Tshering | Thragom | Yallang | 2011-12 | 20 | Pear(20) |
| 7. | Lam Tashi | Thragom | Yallang | 2011-12 | 20 | Pear(20) |
| 8. | Thukten | Thragom | Yallang | 2011-12 | 20 | Pear(20) |
| 9. | Choden | Thragom | Yallang | 2011-12 | 20 | Pear(20) |
| 10. | Yangtse DFO | Yangtse | Yangtse | 2011-12 | 25 | Pear(20), Walnut(5) |
| 11. | Tsampa Wangchuk | Jamkhar | Jamkhar | 2012-13 | 90 | Citrus(90) |
| | | | | Total | 322 | |

KIWI GERMPLASM BLOCK



| Tree No | Variety |
|---------------------------------------|--------------------|
| 1,2,5,6a,15,16,17, 18,19,20,35,36 | Wengkhar Green |
| 3,4,24,25,26,28, 29a | Semtokha 2 |
| 6b,21b,22b,27,29b | Male |
| 7,8,30,31,32 | Semtokha 4 |
| 9,10,11,12,13,14, 21a,22a,23,33,34 | Wengkhar Yellow |
| 37 | Local rootstock |

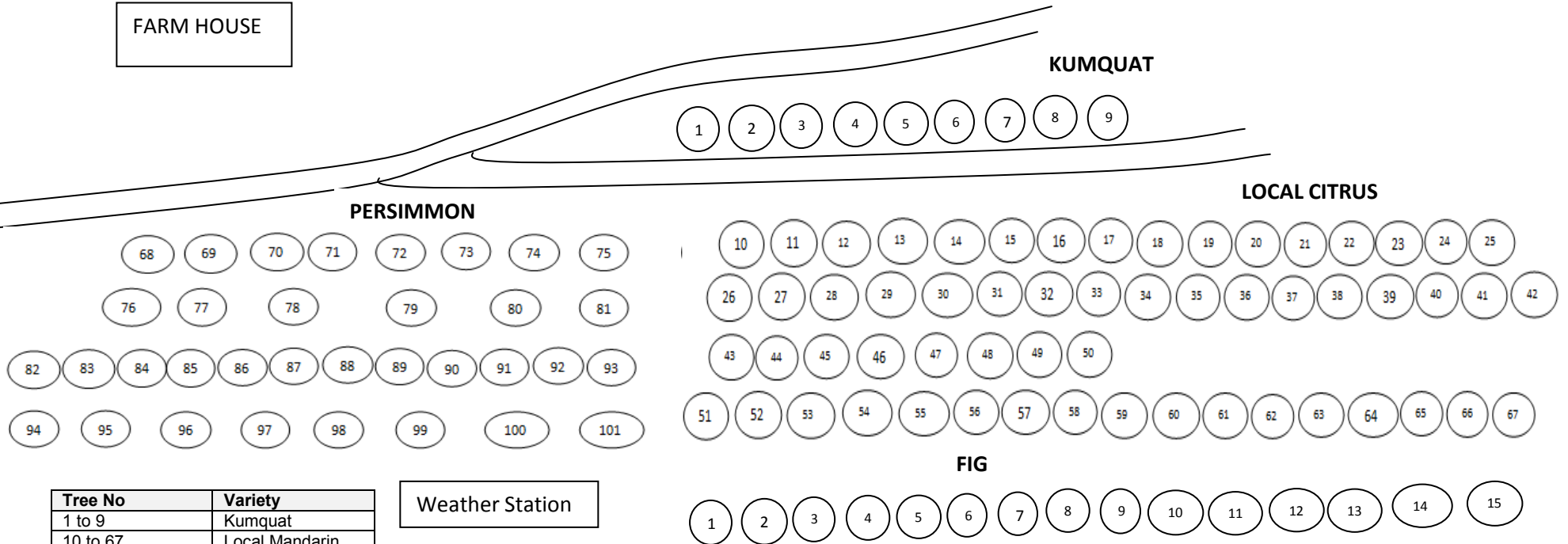
EXOTIC CITRUS GERMPLASM BLOCK



| Tree No | Variety |
|--|-------------------|
| 1,2b,12 | Navelina |
| 2a,4,34 | Mandarin |
| 3,5,13,36 | Encore |
| 6,7,8,9,10,14,15,104,120,200,202,208,209,210 | Ohta ponkan |
| 11,44,45,46,211,212,213,214 | Hayaka |
| 16,39,40,41,215,216,217 | Tsunakaori |
| 17,35,38,97,142,143,144,145,147,148,149 | Clementine |
| 18,19,26,27,53,54,55,56,57,58,86,87,88,115,116,118,159,164 | Tarku |
| 20 | Murkot |
| 21,22,24,37 | Lime |
| 23 | Lemon |
| 25 | Seminol |
| 28,29,30 | Otshu 4 |
| 31,32,33 | Yoshida Ponkan |
| 42,43 | Cleopatra |
| 47,48 | Rangpur Lime |
| 49,50,51,52,83, 106 | Dekopon |
| 59,60 | Troyer Citrange |
| 61 to 82 | USDA Trifoliolate |
| 84,85,89,90a | Kiyomi |
| 90b, 93,94,95,96 | Aoshima |
| 91,92,101,121,122,123,124,125,126,127,128,133,202 | Teisho Ponkan |
| 98,99,100,102,205,206,207 | Junar |
| 103,105,134,137,138,139,140,141 | Nepal Seedling |
| 107,108,109,110,111,112,113,114 | Okitsuwase |
| 117 | Oroblanco |
| 119 | Bcass |
| 129,130 | Nanko |
| 131,132 | Amakusa |
| 135,136 | Sweet Spring |
| 146 | Star Ruby |
| 150 to 158, 160 to 199 | Dorokha |
| Frost Eureka | 203,204 |

PERSIMMON, LOCAL CITRUS, KUMQUAT & FIG GERMPLASM BLOCK

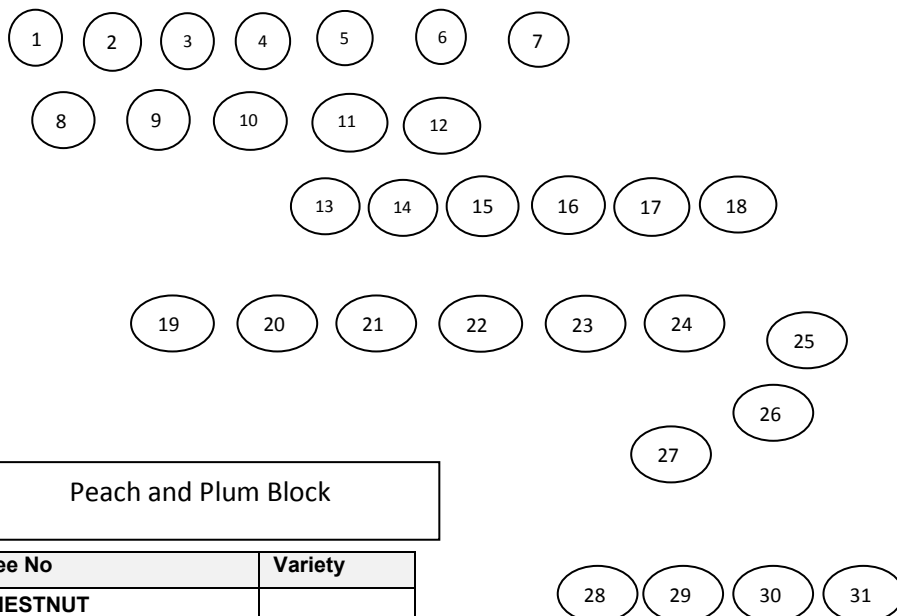
FARM HOUSE



| Tree No | Variety |
|-----------------------------|----------------|
| 1 to 9 | Kumquat |
| 10 to 67 | Local Mandarin |
| 69 to 76, 78,79,80,82,83 | Jiro |
| 77 | Fuyu |
| 81,91,92 | YB |
| 84,85,86,87,88,89 | Wengkhar Andey |
| 68,90 | Zenjimar |
| 93 | Shinshu |
| 94,95 | Japan root 1 |
| 96,97 | Japan root 2 |
| 98,99 | Zenjimar |
| 100,101 | Nankhor local |

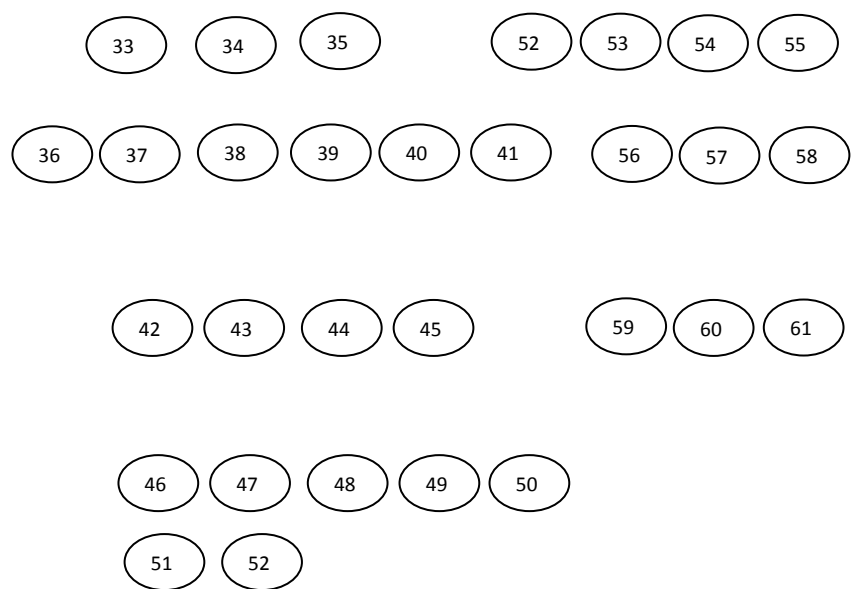
WALNUT, PECAN NUT & LAPSHI GERMPLASM BLOCK

WALNUT



Exotic Citrus Block

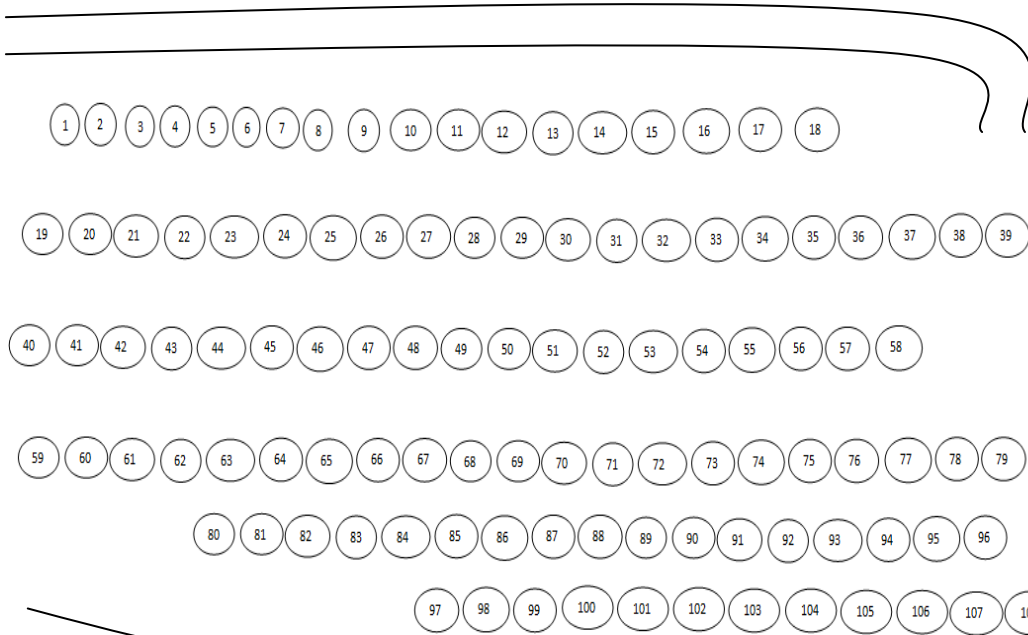
LAPSHI



Peach and Plum Block

| Tree No | Variety |
|---|----------------------|
| CHESTNUT | |
| 1,2,4,5,6,7,8,9,10,11,12,13, 14,15,16,17, 19,20,21,22,23,24,25, 27,28,29,30,31 | Chestnut seedling |
| 14,15 | No.2 |
| 3 | Morena |
| 16 | No.1 |
| 17,18 | S.Leave |
| 26,31 | Rehei |
| WALNUT | |
| 33 | Broad rien |
| 34 to 47, 49,50 | Local |
| 51 | Pecan Nut |
| 48,52 | Juglans |
| LAPSHI | |
| 52 to 61 | Lapshi |

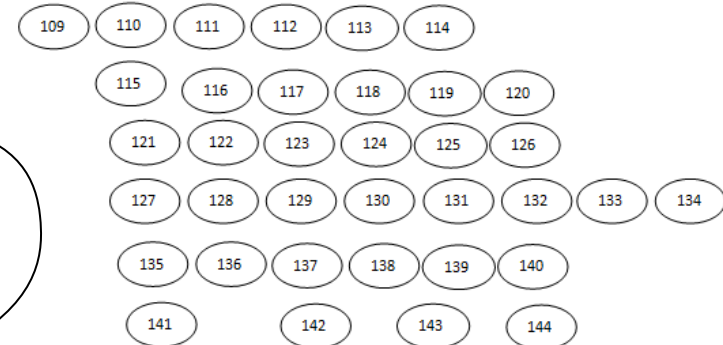
PEACH, PLUM & PERSIMMON GERMLASM BLOCK



| Tree No | Variety |
|----------------------|-------------|
| PLUM | |
| 5,6,8 | Ume |
| 10,11,13,14 | Soldum |
| 12,15,16,17,18,25,26 | Oishi wase |
| 36 | Prune |
| 23,24 | Taiyo |
| 21,22 | Kiyo |
| 27,28,29,30 | Honey Rosa |
| 31,32 | Santa Rosa |
| 37,38,39 | Plum Yellow |

| Tree No | Variety |
|-------------------------|----------------|
| APRICOT | |
| 1,3,19,20,33,35 | New Castle |
| 31 | Apricot Paro |
| PEACH | |
| 2,4,69...79 | Beauty Cream |
| 40,41,42,64,65,66,67,68 | Kuratake |
| 43,44 | Floridasan |
| 7,9,45,46,47,48,49,50 | Kawanakijima |
| 51,52 | Simizuhakuto |
| 53 to 58 | Matsumori wase |
| 59 to 63 | Nunome wase |

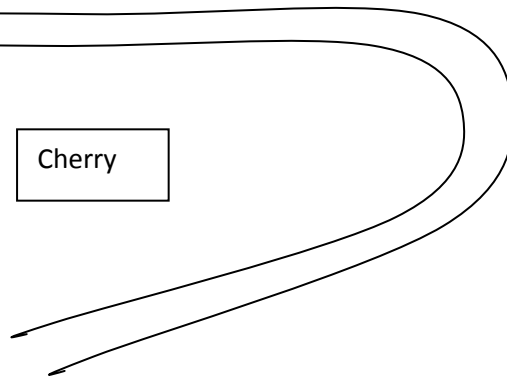
Walnut



Pear block

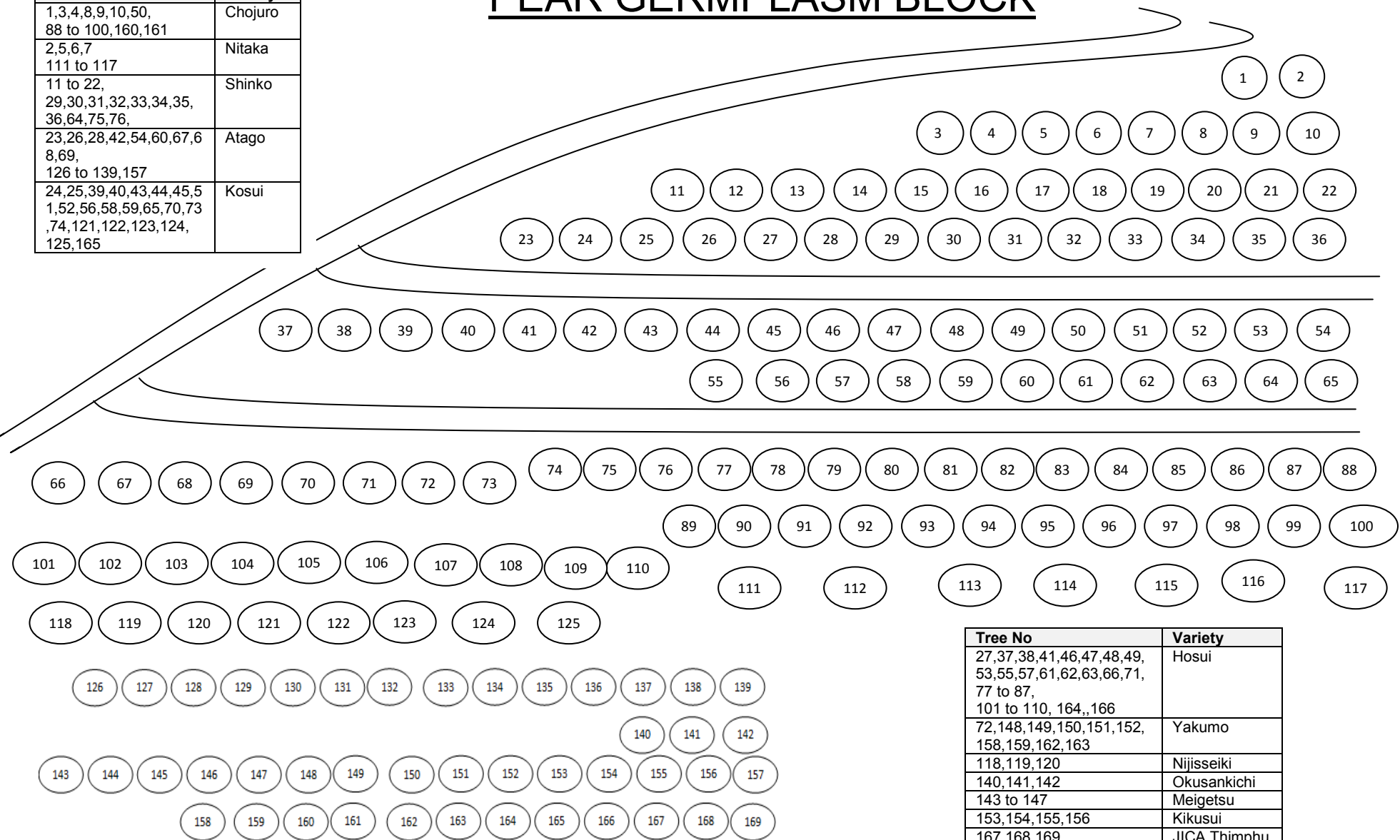
| Tree No | Variety |
|--|---------------------|
| PERSIMMON | |
| 80 | Thimphu local |
| 81,82,90,91,92,93,94,95,96,115,117,118,119,120,121,122,123,125,131,133,138,140,141 | Jiro |
| 83 to 89,100,102,103,105,108,116,124,132,134,135,136,137,139,142,143,144 | Fuyu |
| 97,98,99 | Zenjamaru |
| 104,106,107 | Hanagasho |
| 109 to 114 | Wengkhar Andey |
| 101 | Nakahara Astringent |

Cherry



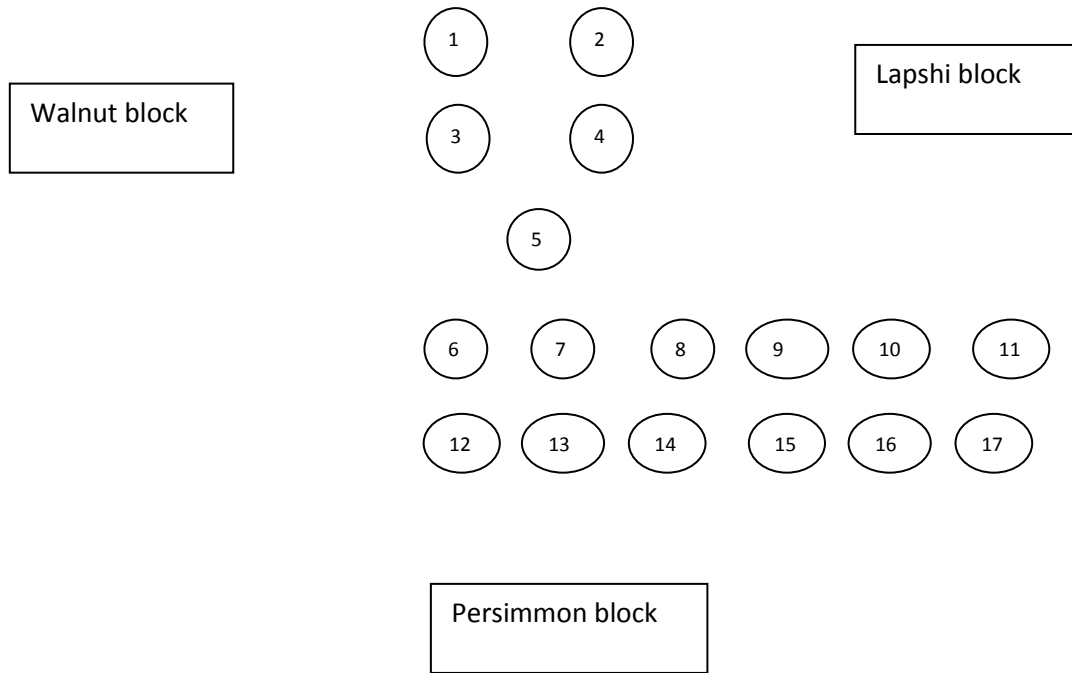
PEAR GERmplasm BLOCK

| Tree No | Variety |
|---|---------|
| 1, 3, 4, 8, 9, 10, 50, 88 to 100, 160, 161 | Chojuro |
| 2, 5, 6, 7 111 to 117 | Nitaka |
| 11 to 22, 29, 30, 31, 32, 33, 34, 35, 36, 64, 75, 76, | Shinko |
| 23, 26, 28, 42, 54, 60, 67, 6 8, 69, 126 to 139, 157 | Atago |
| 24, 25, 39, 40, 43, 44, 45, 5 1, 52, 56, 58, 59, 65, 70, 73 , 74, 121, 122, 123, 124, 125, 165 | Kosui |



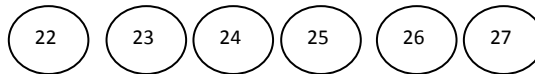
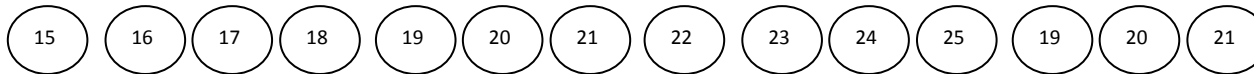
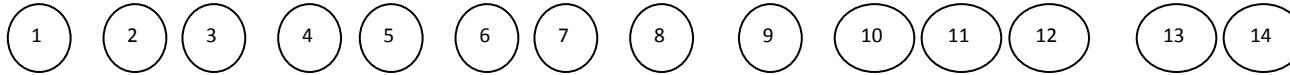
| Tree No | Variety |
|---|--------------|
| 27, 37, 38, 41, 46, 47, 48, 49, 53, 55, 57, 61, 62, 63, 66, 71, 77 to 87, 101 to 110, 164, 166 | Hosui |
| 72, 148, 149, 150, 151, 152, 158, 159, 162, 163 | Yakumo |
| 118, 119, 120 | Nijisseiki |
| 140, 141, 142 | Okusankichi |
| 143 to 147 | Meigetsu |
| 153, 154, 155, 156 | Kikusui |
| 167, 168, 169 | JICA Thimphu |

ROOTSTOCKS MOTHER BLOCK



| Tree No | Variety |
|-------------|-------------------|
| 1,2,5,10,11 | Apple rootstock |
| 3,4 | Cherry rootstock |
| 6,7 | Japan 1 Persimmon |
| 8 | Nepal |
| 9 | Gundum |
| 12,13,14 | Peach local |
| 15,16,17 | Japan 2 Persimmon |

ROOTSTOCK MOTHER BLOCK (New)

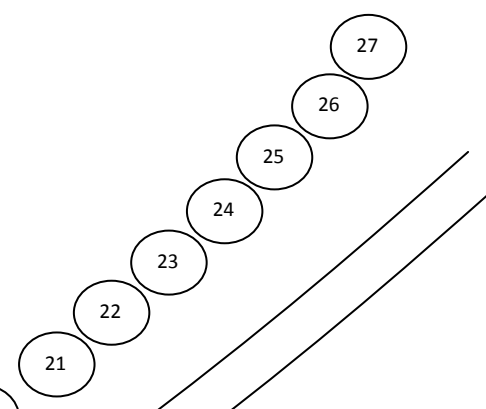
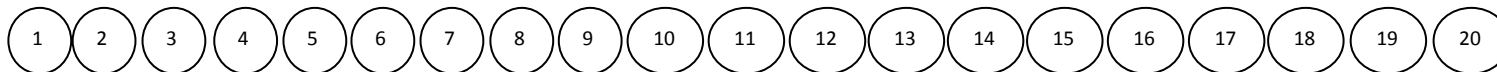


| Tree No | Variety |
|---------------|----------------------------|
| 1,2,3,4,5,6,7 | Apple Rootstock |
| 8,9,10,15 | Japan Seedling |
| 11,12,13 | Thimphu Astringent |
| 14 | Flying Dragon Trifoliolate |
| 16 | Pemagatshel local |
| 17 to 21 | Japan Persimmon 1 |
| 22 to 27 | Japan Persimmon 2 |

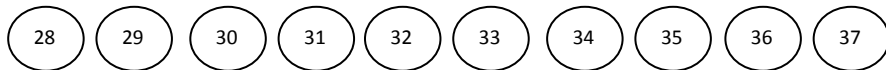
APPLE & LOQUAT GERMPLASM BLOCK

FARM HOUSE

APPLE



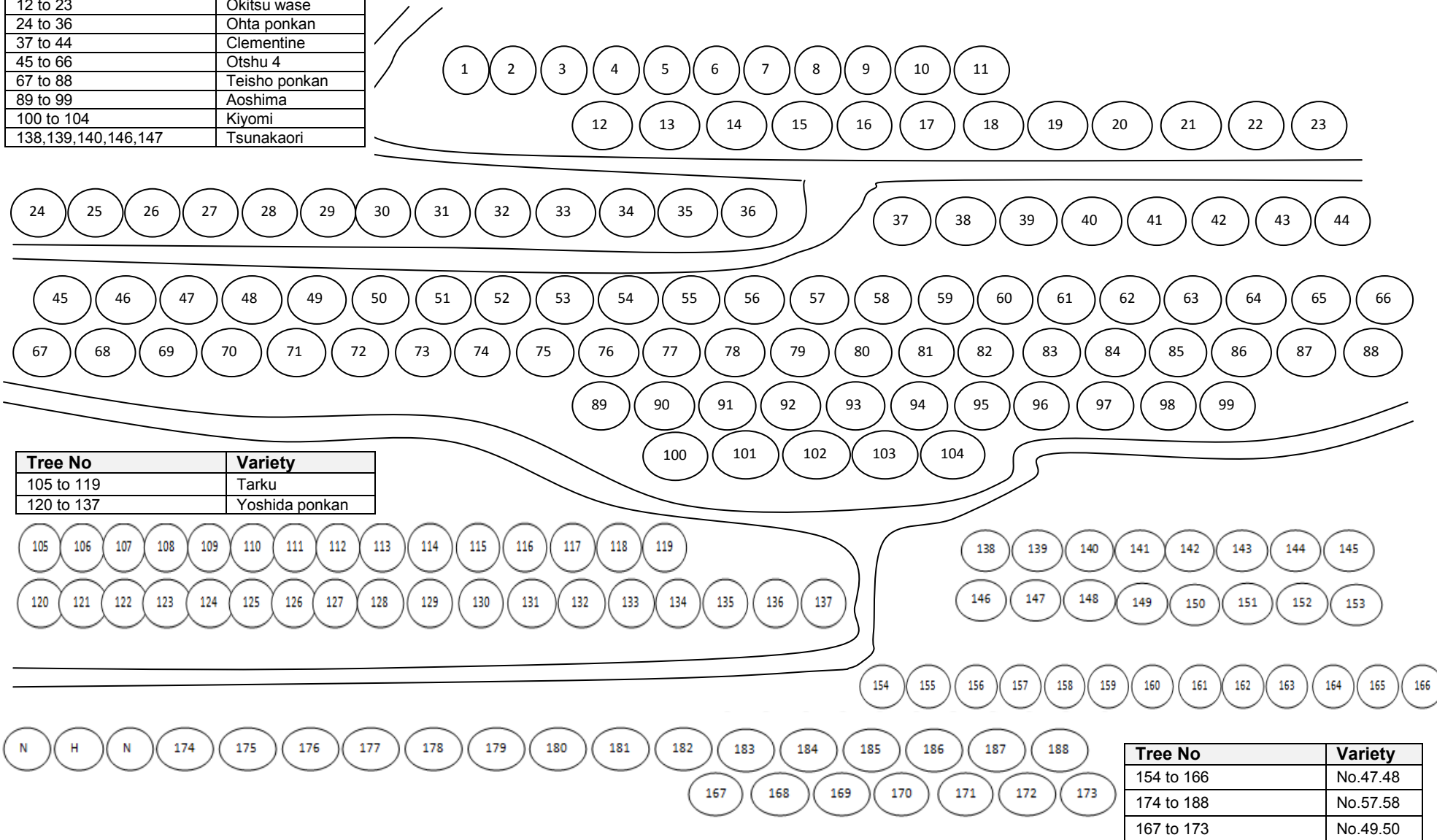
LOQUAT



| Tree No | Variety |
|-------------------------------------|---------------|
| APPLE | |
| 1 to16, 18,19,21,23,25,26, 27 | Anna Apple |
| 17,20,22 | Pollinizer |
| LOQUAT | |
| 28 to 37 | Loquat Tanaka |
| 38 to 43 | Loquat Mogi |

CITRUS GERMPLASM BLOCK (New orchard)

| Tree No | Variety |
|--|---------------|
| 1 to 11, 141,142,143, 144,145,148,149,150,151, 152,153 | Hayaka |
| 12 to 23 | Okitsu wase |
| 24 to 36 | Ohta ponkan |
| 37 to 44 | Clementine |
| 45 to 66 | Otshu 4 |
| 67 to 88 | Teisho ponkan |
| 89 to 99 | Aoshima |
| 100 to 104 | Kiyomi |
| 138,139,140,146,147 | Tsunakaori |



| Tree No | Variety |
|------------|----------------|
| 105 to 119 | Tarku |
| 120 to 137 | Yoshida ponkan |

| Tree No | Variety |
|------------|----------|
| 154 to 166 | No.47.48 |
| 174 to 188 | No.57.58 |
| 167 to 173 | No.49.50 |

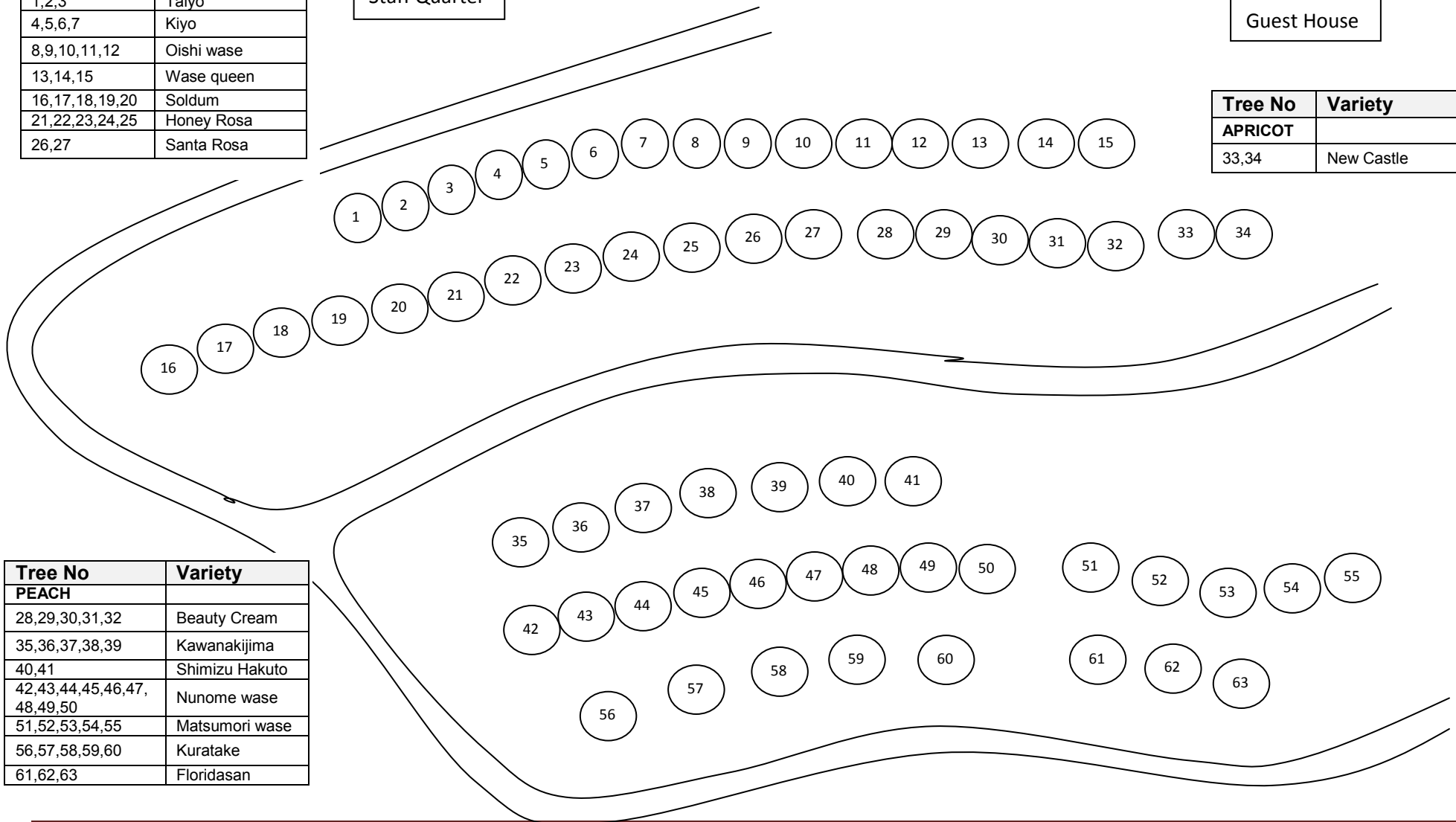
PEACH & PLUM BLOCK (New Orchard)

| Tree No | Variety |
|----------------|------------|
| PLUM | |
| 1,2,3 | Taiyo |
| 4,5,6,7 | Kiyo |
| 8,9,10,11,12 | Oishi wase |
| 13,14,15 | Wase queen |
| 16,17,18,19,20 | Soldum |
| 21,22,23,24,25 | Honey Rosa |
| 26,27 | Santa Rosa |

Staff Quarter

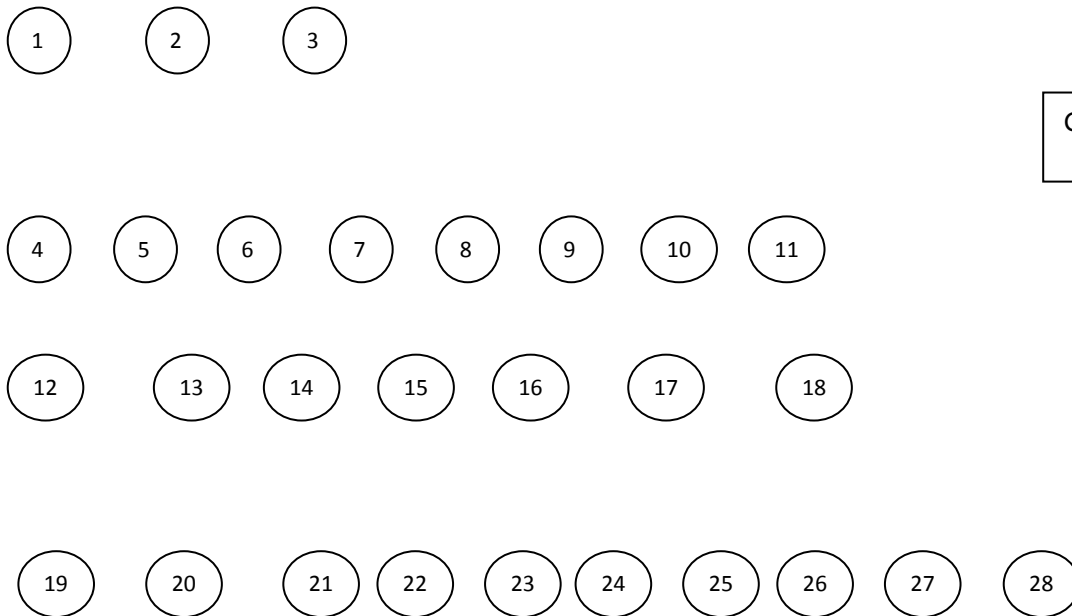
Guest House

| Tree No | Variety |
|----------------|------------|
| APRICOT | |
| 33,34 | New Castle |



| Tree No | Variety |
|----------------------------|----------------|
| PEACH | |
| 28,29,30,31,32 | Beauty Cream |
| 35,36,37,38,39 | Kawanakijima |
| 40,41 | Shimizu Hakuto |
| 42,43,44,45,46,47,48,49,50 | Nunome wase |
| 51,52,53,54,55 | Matsumori wase |
| 56,57,58,59,60 | Kuratake |
| 61,62,63 | Floridasan |

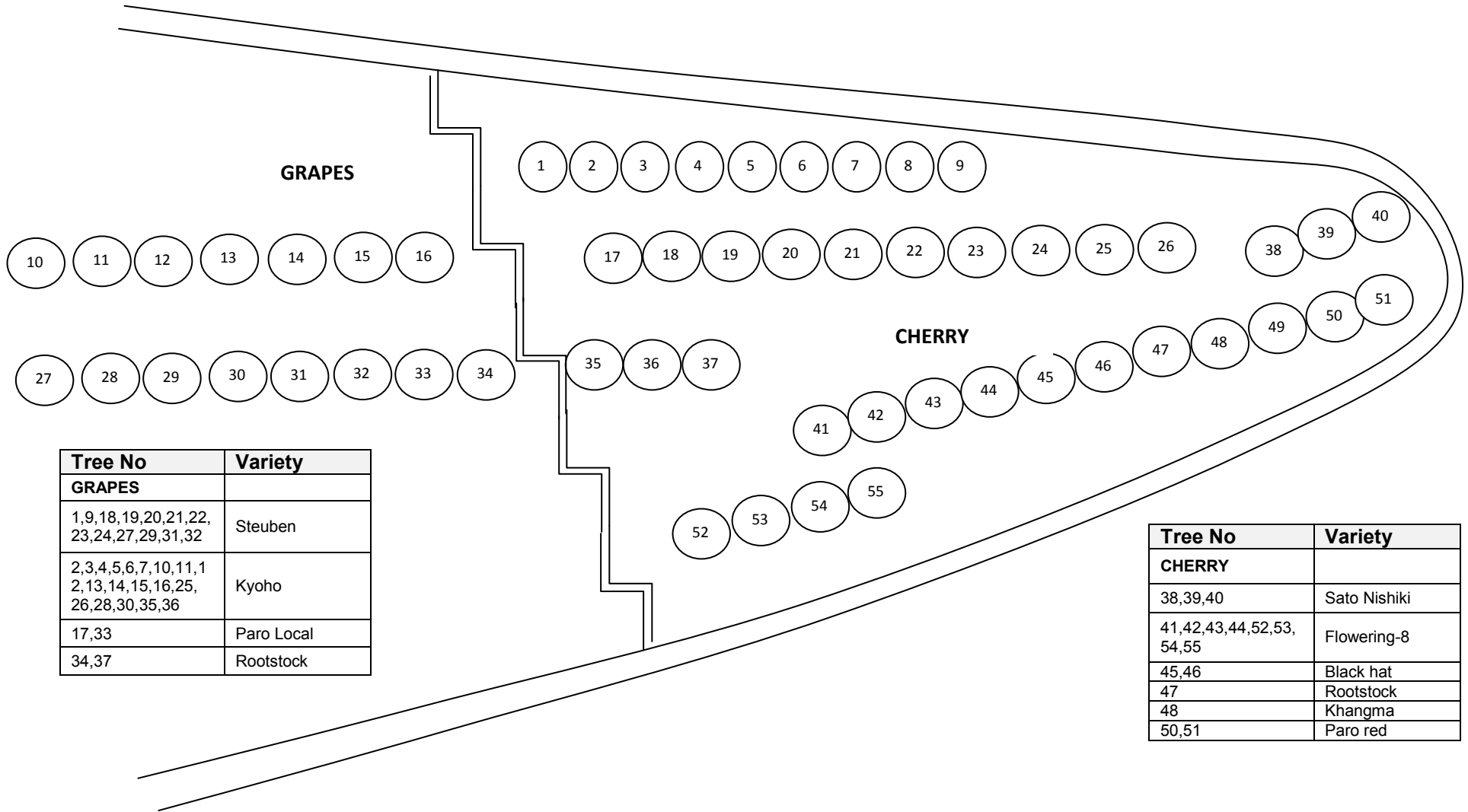
OLIVE GERMLASM BLOCK



Grapes Block

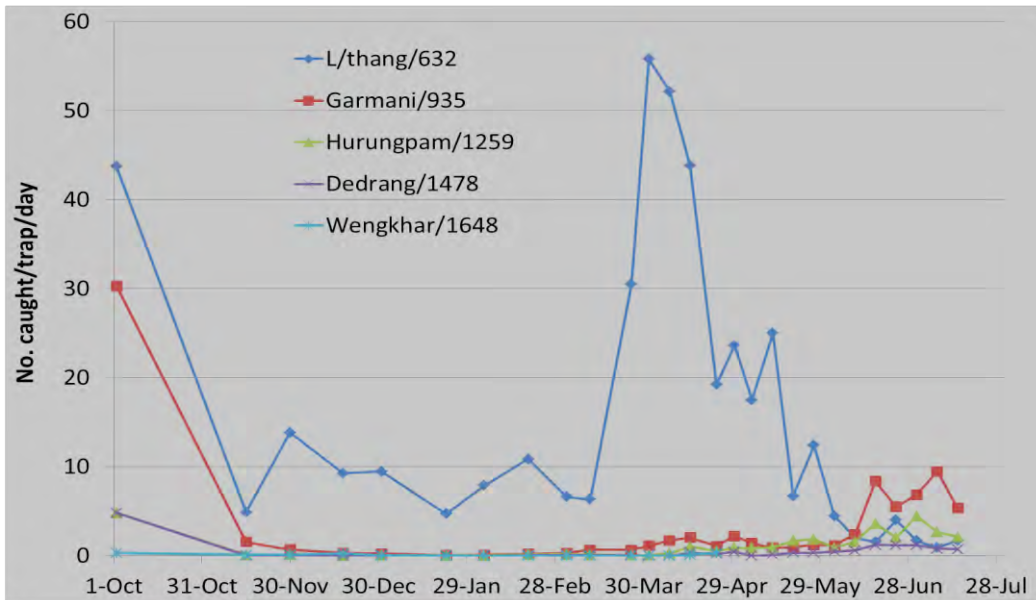
| Tree No | Variety |
|-------------------|-----------------|
| 1,2,3,19,20,21,22 | Lucca |
| 4 to 11 | Nabadilo Branco |
| 12 to 18 | Mission |
| 23 | Chanu |
| 24,25,26,27,28 | Manzanillo |

GRAPES & CHERRY BLOCK

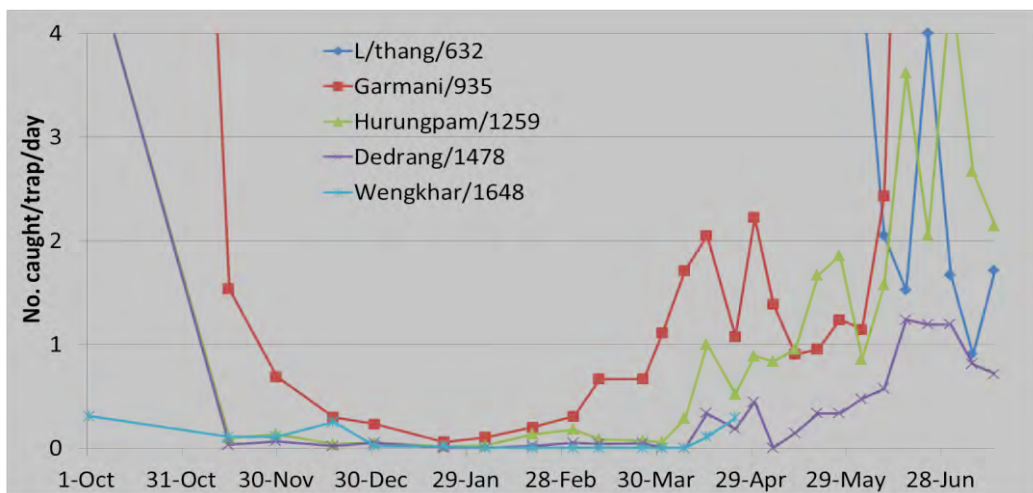


| Tree No | Variety |
|--|------------|
| GRAPES | |
| 1,9,18,19,20,21,22,23,24,27,29,31,32 | Steuben |
| 2,3,4,5,6,7,10,11,12,13,14,15,16,25,26,28,30,35,36 | Kyoho |
| 17,33 | Paro Local |
| 34,37 | Rootstock |

| Tree No | Variety |
|-------------------------|--------------|
| CHERRY | |
| 38,39,40 | Sato Nishiki |
| 41,42,43,44,52,53,54,55 | Flowering-8 |
| 45,46 | Black hat |
| 47 | Rootstock |
| 48 | Khangma |
| 50,51 | Paro red |



Seasonal occurrence of fruit flies, mostly *B. dorsalis* (2012–2013) □



Overwintering during 2012-13 and population increase in spring 2013 *B. minax* is not included

Identified fruit fly specimens sent back to 2013/12/25

| Position of the specimens | |
|---------------------------|---|
| 8 | 1 |
| 9 | 2 |
| 10 | 3 |
| 11 | 4 |
| 12 | 5 |
| 13 | 6 |
| 14 | 7 |

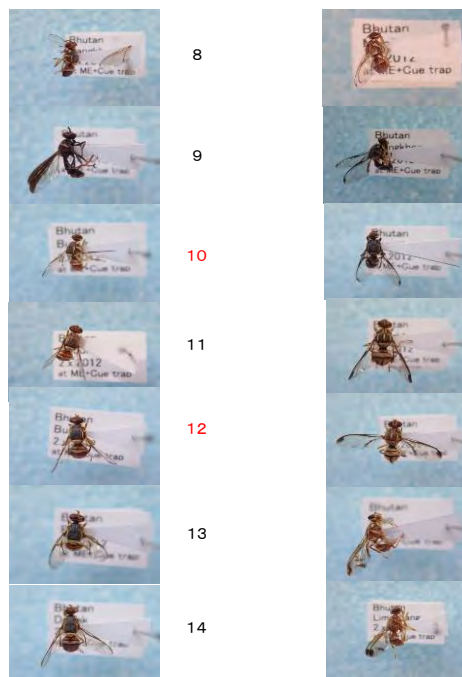


| coll. place | coll. Date | identified |
|-------------|------------|--|
| 1 Menji | 2/10/2012 | <i>Bactrocera zonata</i> |
| 2 Nangkhor | 4/10/2012 | <i>B. scutellaris</i> |
| 3 Rongthong | 2/10/2012 | <i>B. scutellaris</i> |
| 4 Langkhar | 3/10/2012 | <i>B. tau</i> complex |
| 5 Dedrang | 2/10/2012 | <i>B. tau</i> complex |
| 6 Bajo | 25/10/2012 | <i>B. cucurbitae</i> |
| 7 Limethang | 2/10/2012 | <i>B. cucurbitae</i> |
| 8 Nangkhor | 4/10/2012 | <i>B. tuberculata</i> |
| 9 Yakpogang | 17/10/2012 | <i>Dacus fletcheri</i> |
| 10 Budur | 2/10/2012 | <i>B. invadens</i> |
| 11 Budur | 2/10/2012 | <i>B. invadens</i> one of the <i>dorsalis</i> complex |
| 12 Budur | 2/10/2012 | <i>B. invadens</i> one of the <i>dorsalis</i> complex |
| 12 Budur | 2/10/2012 | <i>B. dorsalis</i> complex |
| 13 Budur | 2/10/2012 | <i>B. dorsalis</i> complex |
| 14 Doyak | 2/10/2012 | <i>B. dorsalis</i> complex |

all at ME+CL trap

determined by Dr. Kenji Tsuruta (December 21, 2013)

Handed over to NPPC on 2014/03/06
No. 2, 5, 7, 10, 12 are kept file at Wengkhar RNRRDC



List of extension materials developed by the project

| Title of Materials | Year of Publication |
|---|---------------------|
| Poster on Major activities of HRDP: Converging technology development and dissemination towards commercializing horticulture in the eastern Bhutan. | 2011 |
| Low cost Polyhouse: Construction Manual | 2012 |
| Rootstock seed extraction procedure for Citrus and stone fruits | 2012 |
| Walnut grafting through side veneer grafting | 2012 |
| Cultivation Practices for Pear: Wengkhari Lhee 1 | 2012 |
| Cropping Calendar for Fruits and Vegetables | 2013 |
| Cultivation Practices of Plum: Soldum | 2013 |
| Fruit Crops and Varieties (Revised Edition) | 2013 |
| Vegetable Seed Production Manual: Selected Cole Crops, Leafy Vegetables and Root Crops promoted by HRDP JICA / RNR RDC Wengkhari | 2013 |
| Fruit Nursery Manual: Developing planting materials for Pear, Persimmon, Peach, Kiwi and Citrus through side veneer grafting technique. | 2013 |

List of research paper/articles published during the project period

| Title of paper/article | Author | Year | Published in |
|--|--|------|--|
| Cultivating onion after paddy – Is it suitable and profitable? | Lhap Dorji et. al. | 2011 | Bhu.J.RNR. Vol 7. No.1, 1-10:2011 |
| Kiwifruit – A potential fruit crop for fruit diversification. | Sonam Gyeltshen et. al. | 2011 | Bhu.J.RNR. Vol 7. No.1, 11-20:2011 |
| Evaluation of Asian Pears – A potential varieties to diversify warm temperate fruits. | Loday Phuntsho et. al. | 2011 | Bhu.J.RNR. Vol 7. No.1, 21-29:2011 |
| Local Mandarin germplasm evaluation and selection. | Thinlay Penjor et. al. | 2011 | Bhu.J.RNR. Vol 7. No.1, 30-46:2011 |
| Impact of vegetable promotion through research outreach programme in Drepong, Mongar. | Kinley Tshering et. al. | 2013 | Bhu.J.RNR. Vol 9. No.1, 122-133:2013 |
| Small scale farming bears fruits | Passang Wangmo, Sonam Tshomo & Tshering Yangchen | 2011 | Annual RNR Magazine, Issue 1/Vol.1/2011 |
| Growing Citrus on higher altitudes | Lhap Dorji, Sonam Gyeltshen & Kinley Tshering | 2012 | Annual RNR Magazine, Issue 2/Vol.1/2012 |
| Vegetable Seed Production: A viable farm enterprise for the farmers | Kinley Tshering, N.B. Rai & Sonam Tshomo | 2014 | Annual RNR Magazine, Issue 3/Vol.1/2014 |
| Developing Fruit Orchards through multiple extension approaches promoted under HRDP-JICA | HRDP Project Team members | 2015 | Annual RNR Magazine, Issue 1/Vol. 5/2015 |
| Bulb onion production in Eastern Bhutan | Tashi Phuntsho, Kinley Tshering & Lhap Dorji | 2015 | Annual RNR Magazine, Issue 1/Vol. 5/2015 |
| Orchard development training | | 2013 | Kuensel, Aug 16, 2013 |
| Persimmon like to be the fruit of east | | 2013 | BBS, Oct 21, 2013 |
| The Japanese Persimmon/Pear experiment | | 2013 | Kuensel, Oct 21, 2013 |
| Farmer's roadside shop inaugurated: 31 farmers of Denzor now have an outlet for their produce. | | 2013 | Kuensel, Nov 28, 2013 |
| Garden of prospect | | 2013 | Kuensel, Dec 3, 2013 |
| A win-win situation: Farmers, schools & institutions benefit from vegetable program | | 2014 | Kuensel, May 12, 2014 |
| Bhudhur farmers go for onion cultivation after paddy | | 2014 | Kuensel, April 10, 2014 |
| Video material: JICA technical assistance in eastern Bhutan | | 2014 | |

List of Training Course conducted by HRDP

| | Year | Name of the Course | Period_fro m | Period_to | Days | No. of Participants | Target Participants | Remarks |
|----|------|---|-----------------|------------|---------|------------------------|--------------------------------|---|
| 1 | 2010 | Training on Jam making of Plum & Apricot | 2010/6/24 | 2010/6/25 | 2 days | 7 nos. | Farmers | Women farmers (first year trianing) |
| 2 | 2010 | Hands on training on vegetable seed production techniques | 2010/12/10 | 2010/12/11 | 2 days | 18 nos | Farmers | Seed growers |
| 3 | 2010 | Awareness on project activities & horticulture production technologies and Hands on practice on orchard layout, pit digging & mound preparation for planting. | 2010/10/8 | 2010/10/9 | 2 days | 30 nos. | Farmers | Systemetic training first year |
| 4 | 2010 | Hands on Training of Extension Staffs on Crop Competition as an Extension Methodology and farmers crop competition held at Pemagatshel Dzongkhag | 2010/12/15 | 2010/12/17 | 3 days | 40 nos | Farmers and Extension officers | 1st year |
| 5 | 2011 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2011/1/17 | 2011/1/28 | 10 days | 12 nos. | Farmers | Sytematic training first year for group 1 of farmers from S/jongkhar, Pemagatshel and Trashigang Dzongkhags |
| 6 | 2011 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2011/2/7 | 2012/2/16 | 10 days | 14 nos. | Farmers | Sytematic training first year for group 2 of farmers from Mongar, Lhuntshe 7 Tashiyangtse Dzongkhags |
| 7 | 2011 | Technical training for Extension officers | 2011/3/1 | 2011/3/3 | 3 days | 16 nos | Extention Officers | First year technical training |
| 8 | 2011 | Field day on vegetable nursery raising techniques | 2011/3/4 | 2011/3/8 | 4 days | 121 nos | Farmers | Kholongchu vegetable production program |
| 9 | 2011 | Hands on practice on fruit thinning | 2011/6/10 | 2011/6/11 | 2 days | 42 nos | Farmers | Systemetic training first year plus orchards owners from Mongar |
| 10 | 2011 | Farmers training on Jam making | 2011/7/21 | 2012/7/22 | 2 days | 8 nos | Farmers & Staff from RAMCO | Women farmers (2nd year training) |
| 11 | 2011 | Hands on practice on fruit harvesting & post-harvest handling. | 2011/10/10 | 2011/10/11 | 2 days | 18 nos | Farmers | Systemetic training first year |
| 12 | 2011 | Awareness on project activities & horticulture production technologies and Hands on practice on orchard layout, pit digging & mound preparation for planting. | 2011/10/3 | 2011/10/4 | 2 days | 31 nos | Farmers | 2nd year systematic training |
| 13 | 2011 | Hands on training on citrus orchard management (citrus focus village orchard owners) | 2011/12/13 | 2011/12/14 | 2 days | 42 nos | Farmers | Citrus focus village |

| | | | | | | | | |
|----|------|---|------------|------------|------------|----------|--|---|
| 14 | 2011 | Hands on Training of Extension Staffs on Crop Competition as an Extension Methodology and farmers crop competition held at Tashiyangtse Dzongkhag | 2011/12/15 | 2011/12/17 | 3 days | 48 nos | Farmers and Extension officers | 2nd year |
| 15 | 2011 | Hands on training on vegetable seed production techniques | 2011/12/20 | 2011/12/21 | 2 days | 15 nos | Farmers | Seed growers (2nd year) |
| 16 | 2012 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2012/1/3 | 2012/1/13 | 10 days | 13 nos | Farmers | 2nd year systematic training for group 1. |
| 17 | 2012 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2012/2/7 | 2012/2/16 | 10 days | 16 nos | Farmers | 2nd year systematic training for group 2. |
| 18 | 2012 | Technical training for extension officers and researchers | 2012/2/27 | 2012/2/29 | 3 days | 24 nos. | Extension Officers & researchers from other RDCs | 2nd year technical training |
| 19 | 2012 | Hands on training on vegetable seed harvesting, processing and packaging | 2012/6/7 | 2012/6/8 | 2 days | 15 nos | Farmers | Seed growers (3rd year) |
| 20 | 2012 | Hands on training on fruit thinning | 2012/6/21 | 2012/6/22 | 2 days | 16 nos | Farmers | 2nd year systematic training |
| 21 | 2012 | Plum jam making for the processing group and extension officer of Mongar | 2012/8/24 | - | 1 day | 13 days | Farmers & Extension Officers | Women farmers (3rd year training) |
| 22 | 2012 | Awareness on project activities & horticulture production technologies and Hands on practice on orchard layout, pit digging & mound preparation for planting. | 2012/8/30 | 2012/8/31 | 2 days | 39 nos | Farmers | 3rd year systematic training |
| 23 | 2012 | Hands on practice on fruit harvesting & post-harvest handling. | 2012/9/25 | 2012/9/26 | 2 days | 14 nos. | Farmers | 2nd year systematic training |
| 24 | 2012 | Field day on onion nursery raising for bulb onion production as a relay crop after paddy in the region. | 2012/9/1 | 2012/12/1 | 1 day each | 117 nos. | Farmers | 1st year |
| 25 | 2012 | Hands on Training of Extension Staffs on Crop Competition as an Extension Methodology and farmers crop competition held at Samdrupjongkhar Dzongkhag | 2012/12/15 | 2012/12/17 | 3 days | 56 nos. | Farmers and Extension officers | 2nd year |
| 26 | 2012 | Hands on training on citrus orchard management (citrus focus village orchard owners) | 2012/12/26 | 2012/12/27 | 2 days | 20 nos. | Farmers | Citrus focus village |
| 27 | 2013 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2013/1/1 | 2013/1/11 | 10 days | 17 nos. | Farmers | 3rd year systematic training for group 1. |

| | | | | | | | | |
|----|------|---|------------|------------|------------|----------|--|---|
| 28 | 2013 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2013/1/22 | 2013/2/1 | 8 days | 17 nos. | Farmers | 3rd year systematic training for group 2. |
| 29 | 2013 | Technical training for extension officers and researchers | 2013/2/26 | 2013/2/28 | 2 days | 18 nos. | Extension Officers & researchers from other RDCs | 3rd year technical training |
| 30 | 2013 | Farm book keeping & seed processing training for vegetable seed growers | 2013/4/16 | 2013/4/18 | 2 days | 14 nos. | Farmers | Seed growers (3rd year) |
| 31 | 2013 | Field day on onion harvesting, curing & post-harvest handling. | 2013/5/17 | 2013/5/27 | 1 day each | 119 nos. | Farmers | 1st year onion growers |
| 32 | 2013 | Hands on practice on fruit thinning, harvesting & post-harvest handling of fruits | 2013/8/6 | 2013/8/8 | 2 days | 27 nos. | Farmers | 3rd year systematic training |
| 33 | 2013 | Awareness on project activities & horticulture production technologies and Hands on practice on orchard layout, pit digging & mound preparation for planting. | 2013/9/3 | 2013/9/4 | 2 days | 39 nos. | Farmers | 4th year systematic training |
| 34 | 2013 | Hands on Training of Extension Staffs on Crop Competition as an Extension Methodology and farmers crop competition held at Trashigang Dzongkhag | 2013/12/15 | 2013/12/17 | 3 days | 58 nos. | Farmers and Extension officers | 3rd year |
| 35 | 2013 | Hands on training on citrus orchard management (citrus focus village orchard owners) | 2013/12/26 | 2013/12/27 | 2 days | 23 nos. | Farmers | Citrus focus village |
| 36 | 2014 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2014/1/1 | 2014/1/11 | 10 days | 20 nos. | Farmers | 4th year systematic training for group 1. |
| 37 | 2014 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2014/1/22 | 2014/2/1 | 8 days | 19 nos. | Farmers | 4th year systematic training for group 2. |
| 38 | 2014 | Technical training for extension officers and researchers | 2014/2/26 | 2014/2/28 | 2 days | 21 nos. | Extension Officers & researchers from other RDCs | 4th year technical training |
| 39 | 2014 | Farm book keeping & seed processing training for vegetable seed growers | 2014/4/24 | 2014/4/25 | 2 days | 15 nos. | Farmers | Seed growers (4th year) |
| 40 | 2014 | Hands on practice on fruit thinning, harvesting & post-harvest handling of fruits | 2014/6/16 | 2014/6/17 | 2 days | 35 nos. | Farmers | 4th year systematic training |
| 41 | 2014 | Farmer-to-Farmer extension program on fruit & vegetable processing for the farmer group of Orong | 2014/7/15 | 2014/7/16 | 2 days | 43 nos. | Farmers | Farmer group of Orong |

| | | | | | | | | |
|----|------|---|-----------|-----------|---------|---------|---------|--|
| 42 | 2014 | Awarenes program coinciding with harvest of pear variety Hosui | 2014/8/7 | 2014/8/8 | 2 days | 23 nos. | Farmers | Pear & Persimmon Focus village |
| 43 | 2014 | Awareness on project activities & horticulture production technologies and Hands on practice on orchard layout, pit digging & mound preparation for planting. | 2014/9/11 | 2014/9/12 | 2 days | 33 nos. | Farmers | 5th year systematic training |
| 44 | 2015 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2015/1/5 | 2015/1/14 | 10 days | 14 nos. | Farmers | 5th year systematic training for group 1. |
| 45 | 2015 | Farmer-to-Farmer extension training on fruit orchard management | 2015/1/29 | | 1 day | 13 nos. | Farmers | Pear & Persimmon village Ramjar, Tashiyangtse |
| 46 | 2015 | Hands on practice on fruit orchard management (Planting, training & pruning, basin making, fertilization, etc.) | 2015/2/2 | 2015/2/10 | 8 days | 19 nos. | Farmers | 5th year systematic training for group 2. |
| 47 | 2015 | Farmer-to-Farmer extension training on fruit orchard management | 2015/2/12 | | 1 day | 8 nos. | Farmers | Pear & Persimmon village Jalang, Menji, Lhuntshe |
| 48 | 2015 | Hands on training on citrus orchard management (citrus focus village orchard owners) | 2015/3/9 | 2015/3/10 | 2 days | 6 nos. | Farmers | Citrus focus village |

List of Private Nurseries and vegetable seed growers established by the project



| Name | Village & Geog | Dzongkhag | Crop | Contact |
|---|---------------------------|------------------|--------------------------------------|----------------|
| <i>Private Nursery Operators</i> | | | | |
| M. C. Gurung | Morong, Orong | S/jongkhar | Persimmon, Pear | 17882933 |
| Sangay Chopel | Rechanglu, Gomdar | S/jongkhar | Persimmon, Pear, Peach | 17407944 |
| Samten | Monangkholo, Khaling | Trashigang | Persimmon, Pear | 17721536 |
| Choki Dorji | Monangkholo, Khaling | Trashigang | Persimmon, Pear | 17720938 |
| Lobzang | Bongmen, Radhi | Trashigang | Persimmon, Pear, Walnut | 17980150 |
| Samten | Udzorong | Trashigang | Persimmon, Pear, Walnut, Apple | 17797087 |
| Thinlay Dorji | Beerpa, Khoma | Lhuntshe | Walnut, Pear, Persimmon | 17881664 |
| Thinlay Dorji | Ladrong, Jarey | Lhuntshe | Walnut, Pear, Persimmon | 17788735 |
| Tashi | Menji | Lhuntshe | Persimmon | 17489323 |
| Zangpo | Tshekhar, Drepong | Mongar | Pear, Persimmon | 17763177 |
| Dorji Phuntsho | Yakpugang | Mongar | Pear, Persimmon | 17661818 |
| <i>Vegetable Seed Growers</i> | | | | |
| M. C. Gurung | Morong, Orong | S/jongkhar | Broccoli, Cauliflower, Carrot | 17882933 |
| Lobzang | Laerong, Orong | S/jongkhar | Cauliflower, Carrot | 17700400 |
| Langa Tenzin | Tshelingkhor, Zobel | Pemagatshel | Cauliflower, Carrot, Radish | 17869861 |
| Tshewang Rinzin | Samkhar | Trashigang | Cauliflower, Carrot, Mustard Green | 17659851 |
| Sherab Dema | Nangrey, Samkhar | Trashigang | Cauliflower, Carrot | 17659898 |
| Chey Dorji | Thrimshing | Trashigang | Cauliflower, Carrot, Radish | 17532904 |
| Sonam Yangki | Thrimshing | Trashigang | Cauliflower, Carrot | 17844557 |
| Sonam Choden | Yakpugang, Mongar | Mongar | Broccoli, Carrot | 17722123 |
| Dorji Zangmo | Laptsa, Drepong | Mongar | Broccoli, Carrot, Cauliflower | 17700657 |
| Rinzin | Themdangbi, Mongar | Mongar | Carrot, Cauliflower, Radish, M.Green | 17695185 |
| Ugyen Tenzin | Yurbi, Gangzur | Lhuntshe | Carrot, Cauliflower | 17710273 |
| Tsagay | Khashaling, Menbi | Lhuntshe | Broccoli, Carrot | 17706771 |
| Chimi Wangmo | Pangthang, Ramjar | Tashiyangtse | Cauliflower, Mustard Green | 17733683 |
| Karchung | Pangthang, Ramjar | Tashiyangtse | Carrot, Cauliflower | 17797016 |

Farmers nomination list for the closing ceremony of HRDP-JICA

Date: 2 March 2015

Venue: RNR RDC Wengkhari, Mongar

| SI. No. | Name | Village | Geog | Dzongkhag | Contact No | Field of experience | Year |
|---|--------------------|------------|------------|--------------|------------|---|---------|
|  | Ugyen Tenzin | Yurbi | Gangzur | Lhuntshe | 17706771 | Vegetable Seed Grower/Mixed fruit orchard | 2011-12 |
|  | Tsagay | Khashaling | Menbi | Lhuntshe | 17710273 | Vegetable Seed Grower/Mixed fruit orchard | 2010-11 |
|  | Tshering Dorji | Gangla | Khoma | Lhuntshe | | Mixed fruit orchard | 2010-11 |
|  | Tashi | Menji | Menji | Lhuntshe | 17489323 | Private Nursery (Persimmon)/Citrus orchard | 2010-11 |
|  | Karma Choning Dema | Shermhung | Shermhung | Mongar | 17652293 | Processing / Mixed fruit orchard | 2012-13 |
|  | Dorji Zangmo | Laptsa | Drepong | Mongar | 17700657 | Vegetable Seed Grower/ Vegetable producer | 2010-11 |
|  | Dorji Phuntsho | Yakpugang | Mongar | Mongar | 17661818 | Mixed fruit orchard/Fruit nursery/Vegetable seed grower/Vegetable producer/Mushroom | 2010-11 |
|  | Tshewang Rinzin | Naggar | Tsamang | Mongar | 17704736 | Mixed fruit orchard | 2013-14 |
|  | Norbu | Tsanrung | Ramjar | Tashiyangtse | 17914161 | Vegetable producer/Mixed fruit orchard | 2010-11 |
|  | Dorji Rinchen | Yallang | Yallang | Tashiyangtse | 17701230 | Mixed fruit orchard | 2012-13 |
|  | Wangchuk | Sep | Yangtse | Tashiyangtse | | Mixed fruit orchard / Vegetable seed grower | 2010-11 |
|  | Ugyen Tshering | Fangteng | Bumdelling | Tashiyangtse | 17406709 | Mixed fruit orchard | 2013-14 |
|  | Sangay Dorji | Rongthung | Kanglung | Trashigang | 17665042 | Mixed fruit orchard | 2013-14 |
|  | Sherab Dema | Samkhar | Samkhar | Trashigang | 17659898 | Mixed fruit orchard/Vegetable Seed Grower | 2010-11 |

| | | | | | | | |
|---|------------------|-------------|------------|-------------|----------|--|---------|
|  | Thinlay Dhendup | Drajeeling | Yangneer | Trashigang | 17233383 | Mixed fruit orchard | 2013-14 |
|  | Tashi Wangyel | Lempang | Bidung | Trashigang | | Mixed fruit orchard | 2010-11 |
|  | Samten | Udzorong | Udzorong | Trashigang | 17797087 | Private Nursery | 2013-14 |
|  | Sherab Gyeltshen | Mandi | Chongshing | Pemagatshel | | Mixed fruit orchard | 2011-12 |
|  | Sangay Dorji | Giri | Nanong | Pemagatshel | 17862729 | Mixed fruit orchard | 2012-13 |
|  | Sonam Gyeltshen | Gonpasingma | Zobel | Pemagatshel | 77423665 | Mixed fruit orchard | 2013-14 |
|  | Yeshe Wangdi | Perung | Gomdar | S/jongkhar | | Mixed fruit orchard | 2010-11 |
|  | Jangchuk | Denzor | Orong | S/jongkhar | 17880753 | Mixed fruit orchard / Vegetable producer | 2011-12 |
|  | M. C. Gurung | Morong | Orong | S/jongkhar | 17882933 | Mixed fruit orchard/Vegetble seed grower/Nursery | 2010-11 |
|  | Dorji Dema | Laerong | Orong | S/jongkhar | | Citrus orchard / Vegetable producer | 2010-11 |

Appendix II Tentative PDM (Ver.1)

Project Design Matrix (Version 0) drafted by RNRRDC- Wengkhar/MoA and the preparatory study team on September 8th 2009.

Name of the Project: Horticulture Research and Development Project in the Kingdom of Bhutan (HRDP)

Project Period: January 2010 – January 2015

Target area: Mongar, Lhuntse, Trashiyangtse, Trashigang, Pemagatshel, Samdrup Jongkhar

Target group: Concerned government staff and horticulture farmers in the target area

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptions |
|--|--|---|---|
| <p>Overall Goal Horticulture becomes more popular as a source of income in the target area.</p> | <p>1. The trained and extended farmers in the project increase income by XX % by 2020. 2. XXXXX of new farmers is trained by RC Wengkhar and extended by the trained farmers by 2020.</p> | <p>Dzongkhag agricultural annual reports in the target area</p> | |
| <p>Project Purpose The trained and extended farmers practice appropriate technologies for commercialization of horticulture.</p> | <p>1. Horticulture is practiced in XX % of arable land in the target area. 2. XX % of the trained farmers prepares the model farms and conduct farmer to farmer extension. 3. Selected trained and extended farmers increase their income by XX %.</p> | <p>1. Project reports 2. Dzongkhag agricultural annual reports in the target area</p> | <p>1. Road construction in the target area is completed in 10 years.</p> |
| <p>Outputs 1. Horticulture farming patterns in the target area are identified based on production and market potential. 2. Technical training system on horticulture for extension officers and farmers is strengthened in RNRRDC-Wengkhar 3. The structure for providing seeds and seedlings to training participants is established in RNRRDC-Wengkhar and nursery farmers.</p> | <p>1-1 A horticulture development guideline/manual is produced. 2-1 XX % of trained farmers applies key training contents in the fields. 2-2 XX % of trained extension officers extends key training contents. 2-3 Evaluation by the training participants improves by XX %. 3-1 100% of trained farmers is supplied with seed and seedlings as specified in training plans.</p> | <p>1. The guideline/manual 2-1 Project monitoring reports 2-2 Project training reports 2-3 Project monitoring reports 3. Project training reports</p> | <p>1. Outbreak of pests and diseases does not occur. 2. Significant changes in market do not occur. 3. Extreme natural calamities do not occur.</p> |
| <p>Activities 1-1 Identify appropriate horticulture crops according to the zones (600m to 2,000m above sea level) by reviewing the results of AREP. 1-2 Conduct surveys on horticulture marketing focusing on areas and crops with potential of commercialization.</p> | <p>Inputs Japanese Side 1. Dispatch of experts A. Long-term (1) Chief Adviser / Horticulture (2) Training/ Coordinator</p> | <p>1. Transfer of major counterpart does not occur.</p> | |

| | | |
|---|---|--|
| <p>1-3 Identify trial marketing sites and crops based on the surveys.</p> <p>1-4 Form farmers' groups/cooperatives in the sites and initiate trial marketing through the organizations.</p> <p>1-5 Formulate and update a horticulture development guideline/manual.</p> | <p>(3) etc.</p> <p>B. Short-term</p> <p>(1) Marketing</p> <p>(2) Agro preservation/processing</p> <p>(3) etc.</p> <p>2. Training of counterparts</p> <p>3. Provision of equipments</p> <p>4. Allocation of operational costs for the Project</p> | |
| <p>2-1 Review the previous training programs on horticulture in RNRDC-Wengkhar.</p> <p>2-2 Prepare the plans and teaching materials for new training programs on horticulture for extension officers and farmers.</p> <p>2-3 Implement the trainings in RNRDC-Wengkhar.</p> <p>2-4 Facilitate farmer to farmer extension.</p> <p>2-5 Follow up and monitor the trained extension officers and farmers on the sites.</p> | <p>Bhutanese Side</p> <p>1. Assignment of counterpart personnel and administrative staff</p> <p>(1) Project Director</p> <p>(2) Project Manager</p> <p>(3) Counterpart personnel</p> <p>(4) Administrative staff</p> <p>(5) Secretaries, drivers for Japanese experts and other staff accordingly</p> <p>2. Provision of land, building, and other necessary facilities</p> <p>3. Allocation of operational costs for the Project, e.g. 10 ESP.</p> <p>4. Allocation of training costs e.g. seeds, seedlings, per diem, etc.</p> | <p>Preconditions</p> <p>1. Inclusion of the project activities into regular annual Dzongkhak / Geog plans is ensured.</p> <p>2. Human resources in RNRDC-Wengkhar are sufficient.</p> <p>3. The farmers in the target area do not oppose the project activities.</p> <p>4. The dormitory construction of RNRDC-Wengkhar should be completed for the use of the project.</p> |
| <p>3-1 Develop the production system for seeds and seedlings at RNRDC-Wengkhar for training participants.</p> <p>3-2 Strengthen production of seeds and seedlings at community nurseries for commercialization.</p> | | |

Project Design Matrix Ver. 5 approved at the Fourth JCC held 25/11/2014

Name of the Project: Horticulture Research and Development Project (HRDP) in the Kingdom of Bhutan
Target group: Horticulture farmers, horticulture staff and agriculture extension staff in the target area
Target area: Mongar, Trashigang, Lhuentse, Trashiyangtse, Samdrupjongkhar and Pemagatshel

Ver. 5 25 Nov., 2014

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptions |
|---|--|---------------------------------------|--|
| Over all goal | | | |
| Horticulture becomes more popular as a source of income in the target area. | 1. The trained and extended farmers in the project target areas increase their average annual income from sale of horticulture produce from Nu. 8,400 to Nu. 20,000 by 2020. | Annual reports | Market for horticulture crops expand |
| | 2. 800 farmers are trained by RDC Wengkhar by 2020. | Project reports | Trained farmers are keen to extend their skills to others; other farmers show interest |
| Project Purpose | | | |
| The trained and extended farmers practice appropriate technologies for commercialization of horticulture | 1. Horticulture is practiced in about 5000 ac of arable dryland in the target area. | Project reports. | Market access is improved. Farmers allocate land for horticulture crops |
| | 2. 75 % of the trained farmers develop demonstration farms and conduct farmer to farmer extension. | Project reports | Outbreak of pests and diseases does not occur. |
| | 3. 50 % of trained and extended farmers start to commercialise horticulture | Project reports | Significant changes in market does not occur |
| Outputs | | | |
| 1. Horticulture farming practices and crops in the target area are identified according to production and market potential | 1-1 Horticulture development guidelines / manuals are developed. | The guideline/ manual | |
| 2. Technical training system on horticulture is strengthened in RNR-RDC, Wengkhar | 2-1 90 % of trained farmers apply key training contents in the field (about 100 farmers trained per year). | Project monitoring reports | |
| | 2-2 90 % of trained extension officers apply key training contents (about 15-20 staff trained per year). | Project training reports | |
| | 2-3 Training organized by the project found to be relevant and effective by >80 % of the participants. | Training evaluation report | |
| 3. The structure for providing seeds and seedlings is established in RNR-RDC, Wengkhar, nursery farmers, seed growers and National Seed Center (NSC) Yangtse farm | 3-1 Seed and seedling production and distribution mechanism in RNR RDC Wengkhar, nursery farmers and seed growers are developed and followed (target production of about 4500 fruit seedlings and 200 kg vegetable seeds per year) | Seeds and seedlings Register | Conducive environment for nursery and seed growers (such as market, farmers interest, certification) |
| | 3-2 100 % of trained farmers provided with basic materials to apply skills acquired from the training program. | Training reports | |
| | 3-3 Seed farm in NSC Yangtse revived and begins seeds & seedling production. | Farm records Physical verification | |

| | | | | |
|--|--|---|--|----------------------|
| 4. Group for marketing is mobilized and/or formed in collaboration with RAMCO, Mongar | 4-1 50% of groups in which trained farmers* belong to start horticulture marketing activities | Reports | | |
| Activities | Inputs | | | |
| | Japanese Side | Bhutanese Side | | |
| 1-1 Identify appropriate horticultural crops according to the agro-ecological zones (600 to 2000 m amsl) by reviewing AREP, OGTP plan, SLMP and other related studies. | 1. Dispatch of experts (Long term) Chief Advisor / Horticulture, Coordinator / Farmer Organization 2. Dispatch of experts (Short term) as required 3. Training of counterparts 4. Provision of equipments 5. Allocation of operational costs for the project | 1. Assignment of counterpart personnel and administrative staff - Project Director / Project Manager - Counterpart personnel - Administrative staff - Secretaries, Drivers for Japanese experts and other staff accordingly 2. Provision of land, building, and other necessary facilities 3. Allocation of operational costs for the Project, e.g., 10 ESP 4. Allocation of training costs e.g., seeds, seedlings, per diem, etc. | Transfer of major counterpart does not occur. | |
| 1-2 Develop horticulture farming practices and appropriate crops according to agro-ecological zones | | | | |
| 2-1 Review the previous training programs on horticulture in RNR-RDC, Wengkhari. | | | | |
| 2-2 Prepare training plans and materials for training programs on horticulture for extension officers and farmers. | | | | |
| 2-3 Provide technical trainings in RNR-RDC, Wengkhari and project sites. | | | | |
| 2-4 Facilitate farmer to farmer extension. | | | | |
| 3-1 Develop the production systems of seeds and seedlings in RNR-RDC, Wengkhari. | | | | Preconditions |
| 3-2 Develop/ strengthen the production system for seeds and seedlings at private nurseries for commercialization. | | | | |
| 3-3 Reviving of seed farm at National Seed Centre, Yangtse. | | | | |
| 4.1 Identify trial marketing sites and crops based on surveys | | | | |
| 4.2 Mobilize farmer's groups/cooperatives in the sites and initiate trial marketing through organization. | | | 1. Inclusion of the project activities into regular annual Dzongkhag/ Geog plans is ensured. 2. Human resources in RNR-RDC, Wengkhari are sufficient. 3. The farmers in the target area do not oppose the project activities. 4. The dormitory construction of RNR-RDC, Wengkhari should be completed for use | |

* Farmers trained in the 5th year of the Project and farmers trained only for seed production are excluded

Notes:

Trained farmers – Farmers trained either in RDC Wengkhari or in the villages directly by project experts or RDC staff counterparts. Shall be composed of farmers trained under systematic training & orchard development, vegetable seed production, post harvest processing, marketing and focus village programs.

Project Design Matrix Ver. 4 at the Third JCC held 12/02/2014

Name of the Project: Horticulture Research and Development Project (HRDP) in the Kingdom of Bhutan
Target group: Horticulture farmers, horticulture staff and agriculture extension staff in the target area
Target area: Mongar, Trashigang, Lhuentse, Trashiyangtse, Samdrupjongkhar and Pemagatshel

Ver. 4 Feb., 2014

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptions |
|--|--|---------------------------------------|---|
| Over all goal | | | |
| Horticulture becomes more popular as a source of income in the target area. | 1. The trained and extended farmers in the project increase income by 80 % by 2020 (current baseline of Nu..8400) | Annual reports | Market for horticulture crops expand improves |
| | 2. 500 farmers are trained by RDC Wengkhar and the trained farmers extend their skills to others . | Project reports | Trained farmers are keen to extend their skills to others; other farmers show interest |
| Project Purpose | | | |
| The trained and extended farmers practice appropriate technologies for commercialization of horticulture | 1. Horticulture is practiced in about 5000 ac of arable dryland in the target area. | Project reports. | Market access is improved. Farmers allocate land for horticulture crops |
| | 2. 75 % of the trained farmers develop model demonstration farms and conduct farmer to farmer extension. | Project reports | Outbreak of pests and diseases does not occur. |
| | 3. 50 % of selected trained and extended farmers start to commercialise horticulture | Project reports | Significant changes in market does not occur |
| Outputs | | | |
| 1. Horticulture farming practices and crops in the target area are identified according to production and market potential | 1-1 Horticulture development guidelines / manuals are developed. | The guideline/ manual | |
| 2. Technical training system on horticulture is strengthened in RNR-RDC, Wengkhar | 2-1 90 % of trained farmers apply key training contents in the field (about 100 farmers trained per year). | Project monitoring reports | |
| | 2-2 90 % of trained extension officers apply key training contents (about 15-20 staff trained per year). | Project training reports | |
| | 2-3 Training evaluation organized by the training participants improve by 100% project found to be relevant and effective by >80 % of the participants. | Training evaluation report | |
| 3. The structure for providing seeds and seedlings is established in RNR-RDC, Wengkhar, nursery farmers, seed growers and National Seed Center (NSC) Yangtse farm | 3-1 Seed and seedling production and distribution mechanism in RNR RDC Wengkhar, and nursery farmers and seed growers developed and followed (target production of about 4500 fruit seedlings and 200 kg vegetable seeds per year) | Seeds and seedlings Register | Conducive environment for nursery and seed growers operators exist (such as market, farmers interest, certification) |
| | 3-2 100 % of trained farmers provided with basic materials to apply skills acquired from the training program. | Training reports | |
| | 3-3 Seed farm in NSC Yangtse revived and begins seeds & seedling production. | Farm records Physical verification | |

| | | | |
|--|---|--|--|
| 4. Group for marketing is mobilized and/or formed Mobilizing group for marketing is former and made to function in collaboration with RAMCO, Mongar | 4-1 50% of groups in which trained farmers* belong to start horticulture marketing activities | Reports | |
| Activities | Inputs | | |
| <p>1-1 Identify appropriate horticultural crops according to the agro-ecological zones (600 to 2000 m amsl) by reviewing AREP, OGTP plan, SLMP and other related studies.</p> <p>1-2 Develop horticulture farming practices and appropriate crops according to agro-ecological zones</p> <p>2-1 Review the previous training programs on horticulture in RNR-RDC, Wengkhari.</p> <p>2-2 Prepare training plans and materials for training programs on horticulture for extension officers and farmers.</p> <p>2-3 Provide technical trainings in RNR-RDC, Wengkhari and project sites.</p> <p>2-4 Facilitate farmer to farmer extension.</p> <p>3-1 Develop the production systems of seeds and seedlings in RNR-RDC, Wengkhari.</p> <p>3-2 Develop/ strengthen the production system for seeds and seedlings at private nurseries for commercialization.</p> <p>3-3 Reviving of seed farm at National Seed Centre, Yangtse.</p> <p>4.1 Identify trial marketing sites and crops based on surveys</p> <p>4.2 Mobilize farmer's groups/cooperatives in the sites and initiate trial marketing through organization.</p> | <p>Japanese Side</p> <p>1. Dispatch of experts (Long term) Chief Advisor / Horticulture, Coordinator / Farmer Organization</p> <p>2. Dispatch of experts (Short term) as required</p> <p>3. Training of counterparts</p> <p>4. Provision of equipments</p> <p>5. Allocation of operational costs for the project</p> | <p>Bhutanese Side</p> <p>1. Assignment of counterpart personnel and administrative staff</p> <ul style="list-style-type: none"> - Project Director / Project Manager - Counterpart personnel - Administrative staff - Secretaries, Drivers for Japanese experts and other staff accordingly <p>2. Provision of land, building, and other necessary facilities</p> <p>3. Allocation of operational costs for the Project, e.g., 10 ESP</p> <p>4. Allocation of training costs e.g., seeds, seedlings, per diem, etc.</p> | <p>Transfer of major counterpart does not occur.</p> <p>Preconditions</p> <p>1. Inclusion of the project activities into regular annual Dzongkhag/ Geog plans is ensured.</p> <p>2. Human resources in RNR-RDC, Wengkhari are sufficient.</p> <p>3. The farmers in the target area do not oppose the project activities.</p> <p>4. The dormitory construction of RNR-RDC, Wengkhari should be completed for use</p> |

* Farmers trained in the 5th year of the Project and farmers trained only for seed production are excluded

Notes:

Trained farmers – Farmers trained either in RDC Wengkhari or in the villages directly by project experts or RDC staff counterparts. Shall be composed of farmers trained under systematic training & orchard development, vegetable seed production, post harvest processing, marketing and focus village programs.

プロジェクト名
対象者
対象地域

ブータン国「園芸作物研究開発・普及支援プロジェクト」
対象地域の園芸農家、ウェンカル再生可能天然資源研究開発センター(以下、ウェンカルセンター)職員、農業普及員
モンガル県、タシガン県、ルンツェ県、タシ・ヤンツェ県、サムドゥルップ・ジョンカール県、ペマガツェル県

2014年2月版

| Narrative Summary | 指標 | Means of Verification | Important Assumptions |
|--|--|-----------------------|--|
| 上位目標 | | | |
| 対象地域における収入源として、園芸農業の普及が進む | 1. プロジェクトで研修を受けた農家、及び普及活動による受益農家の収入が、2020年までに80%増加する(ベースライン値は8400N) | 年報 | 園芸作物の市場が拡大する |
| | 2. ウェンカルセンターで500名の農家が研修を受け、その農家が農民間普及を実施する | プロジェクト報告書 | 研修を受けた農家が農民間普及に熱心であり、他の農家も園芸農業に関心を示す |
| プロジェクト目標 | | | |
| プロジェクトで研修を受けた農家、及び普及活動による受益農家が、園芸農業の商業化に向けた適正技術を実践する | 1. 対象地域内の耕作可能な畑作地のうち、5000エーカーにおいて、園芸農業が実施される | プロジェクト報告書 | 市場へのアクセスが改善する農家が園芸作物の栽培地を確保する |
| | 2. 研修を受けた農家の75%が展示圃を整備し、農民間普及を実施する | プロジェクト報告書 | 病虫害が大発生しない |
| | 3. 研修を受けた農家、及び普及活動による受益農家の50%が、商業的園芸農業を開始する | プロジェクト報告書 | 市場に大きな変化が発生しない |
| 成果 | | | |
| 1. 対象地域において、生産と販売の可能性を踏まえた園芸農業の技術及び作物が特定される | 1-1 園芸農業の開発ガイドライン/マニュアルが作成される | ガイドライン/マニュアル | |
| 2. ウェンカルセンターにおいて、園芸農業に関する技術研修の実施体制が強化される | 2-1 研修を受けた農家の90%が、主な研修内容を適用する(年間の研修受講農家は約100名) | プロジェクトモニタリング報告書 | |
| | 2-2 研修を受けた普及員の90%が、主な研修内容を適用する(年間の研修受講者は約15-20名) | プロジェクト研修報告書 | |
| | 2-3 プロジェクトの実施する研修内容が、研修参加者の80%以上に適切かつ有効と評価される | 研修評価報告書 | |
| 3. ウェンカルセンター、種苗生産農家、国立種子センター(NSC)タシ・ヤンツェ種子生産農場において、種苗の提供体制が確立される | 3-1 ウェンカルセンターおよび種苗生産農家における種苗の生産および配布体制が確立される(年間生産目標:果樹苗木4500本、野菜種子200kg) | 種苗・種子登録書 | 種苗生産者にとって事業を実施しやすい環境が存在する(市場、農家の関心、認証など) |
| | 3-2 研修を受けた農家全員に対して、研修で得た技術を実践するための基本資材が提供される | 研修報告書 | |
| | 3-3 タシ・ヤンツェ種子生産農場が再生され、種苗生産が開始される | 圃場記録 物理検証 | |

| | | | | |
|---|--|---|------------------------|---------------------------------|
| 4. モンガル地域農業マーケティング・協同組合事務所の協力のもと、マーケティング活動を行うグループが形成あるいは活性化される | 4-1 研修を受けた農家の所属するグループの50%が、園芸農業においてマーケティング活動を開始する | 報告書 | | |
| 活動 | 投入 | | | |
| | 日本側 | ブータン側 | | |
| 1-1 AREP、1郡3品運動、持続可能な土地管理プロジェクト、その他関連事業の成果を踏まえ、標高(海拔600~2000m)に適した園芸作物を特定する | 1. 専門家派遣(長期) チーフアドバイザー/園芸、業務調整/農家組織 2. 専門家派遣(短期) 必要に応じて 3. カウンターパート研修 4. 機材供与 5. プロジェクト運営費の配賦 | 1. カウンターパートと管理職員の配置 - プロジェクトダイレクター / プロジェクトマネージャー - カウンターパート - 管理職員 - 日本人専門家および適宜その他のスタッフのための秘書およびドライバー | 主要なカウンターパートが異動しない | |
| 1-2 農業生産環境地帯に応じた園芸農業の技術および作物を開発する | | 2. 土地、建物、他に必要な資材の提供 | | |
| 2-1 ウェンカルセンターで実施されてきた研修をレビューする | | 3. プロジェクト運営費の配賦(作業員10人分傭人費など) | | |
| 2-2 普及員と農家を対象とした園芸農業研修の計画と教材を作成する | | 4. 種子、苗木、日当など研修経費の配賦 | | |
| 2-3 ウェンカルセンターおよびプロジェクト対象地域において、技術研修を実施する | | | | |
| 2-4 農民間普及を促進する | | | | |
| 3-1 ウェンカルセンターにおいて、種苗の生産体制を構築する | | | | Preconditions |
| 3-2 商業化に向けて、民間の種苗生産体制を構築し、強化する | | | | 1. プロジェクト活動が県/郡の定期活動計画において保証される |
| 3-3 NSCタシ・ヤンツェ種子生産農場を再整備する | | | | 2. ウェンカルセンターに十分な職員が配置される |
| 4.1 調査結果を踏まえ、マーケティング活動を試行するサイトおよび作物を特定する | | | | 3. 対象地域の農家がプロジェクト活動に反対しない |
| 4.2 特定されたサイトにおいて、農家グループ/組合を活性化し、その組織を通じたマーケティング活動を試行する | | | 4. ウェンカルセンターの宿泊施設が完成する | |

Name of the Project:

Horticulture Research and Development Project (HRDP) in the Kingdom of Bhutan

Ver. 3 Oct., 2012

Target group:

Horticulture farmers, horticulture staff and agriculture extension staff in the target area

Target area:

Mongar, Trashigang, Lhuentse, Trashiyangtse, Samdrupjongkhar and Pemagatshel

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptions |
|---|---|---------------------------------------|---|
| Over all goal | | | |
| Horticulture becomes more popular as a source of income in the target area. | 1. The trained and extended farmers in the project increase income by 80 % by 2020 (current baseline of Nu..8400) | Annual reports | Market for horticulture crops improves |
| | 2. 500 farmers are trained by RDC Wengkhari and the trained farmers extend their skills to others . | Project reports | Trained farmers are keen to extend their skills to others; other farmers show interest |
| Project Purpose | | | |
| The trained and extended farmers practice appropriate technologies for commercialization of horticulture | 1. Horticulture is practiced in about 5000 ac of arable dryland in the target area. | Project reports. | Market access is improved Farmers allocate land for horticulture crops |
| | 2. 75 % of the trained farmers develop model farms and conduct farmer to farmer extension. | Project reports | Outbreak of pests and diseases does not occur. |
| | 3. 50 % of selected trained and extended farmers start to commercialise horticulture | Project reports | Significant changes in market does not occur |
| Outputs | | | |
| 1. Horticulture farming practices and crops in the target area are identified according to production and market potential | 1-1 Horticulture development guidelines / manuals are developed. | The guideline/ manual | |
| 2. Technical training system on horticulture is strengthened in RNR-RDC, Wengkhari | 2-1 90 % of trained farmers apply key training contents in the field (about 100 farmers trained per year). | Project monitoring reports | |
| | 2-2 90 % of trained extension officers apply key training contents (about 15-20 staff trained per year). | Project training reports | |
| | 2-3 Training evaluation by the training participants improve by 100 %. | Training evaluation report | |
| 3. The structure for providing seeds and seedlings is established in RNR-RDC, Wengkhari, nursery farmers, seed growers and NSC Yangtse farm | 3-1 Seed and seedling production and distribution mechanism in RNR RDC Wengkhari and nursery farmers developed and followed (target production of about 4500 fruit seedlings and 200 kg vegetable seeds per year) | Seeds and seedlings Register | Conducive environment for nursery operators exist (such as market, farmers interest, certification) |
| | 3-2 100 % of trained farmers provided with basic materials to apply skills acquired from the training program. | Training reports | |
| | 3-3 Seed farm in NSC Yangtse revived and begins seeds & seedling production. | Farm records Physical verification | |
| 4. Mobilizing group for marketing is former and made to function in collaboration with RAMCO, Mongar | 4-1 50% of groups in which trained farmers* belong to start horticulture marketing activities | Reports | |

| Activities | Inputs | | |
|---|--|---|---|
| | Japanese Side | Bhutanese Side | |
| 1-1 Identify appropriate horticultural crops according to the agro-ecological zones (600 to 2000 m amsl) by reviewing AREP, OGTP plan, SLMP and other related studies. | 1. Dispatch of experts (Long term) Chief Advisor / Horticulture, Coordinator / Farmer Organization 2. Dispatch of experts (Short term) as required 3. Training of counterparts 4. Provision of equipments 5. Allocation of operational costs for the project | 1. Assignment of counterpart personnel and administrative staff - Project Director / Project Manager - Counterpart personnel - Administrative staff - Secretaries, Drivers for Japanese experts and other staff accordingly 2. Provision of land, building, and other necessary facilities 3. Allocation of operational costs for the Project, e.g., 10 ESP 4. Allocation of training costs e.g., seeds, seedlings, per diem, etc. | Transfer of major counterpart does not occur. |
| 1-2 Develop horticulture farming practices and appropriate crops according to agro-ecological zones | | | |
| 2-1 Review the previous training programs on horticulture in RNR-RDC, Wengkhar. | | | |
| 2-2 Prepare training plans and materials for training programs on horticulture for extension officers and farmers. | | | |
| 2-3 Provide technical trainings in RNR-RDC, Wengkhar and project sites. | | | |
| 2-4 Facilitate farmer to farmer extension. | | | Preconditions |
| 3-1 Develop the production systems of seeds and seedlings in RNR-RDC, Wengkhar. | | | |
| 3-2 Develop/ strengthen the production system for seeds and seedlings at private nurseries for commercialization. | | | |
| 3-3 Reviving of seed farm at National Seed Centre, Yangtse. | | | |
| 4.1 Identify trial marketing sites and crops based on surveys | | | |
| 4.2 Mobilize farmer's groups/cooperatives in the sites and initiate trial marketing through organization. | 1. Inclusion of the project activities into regular annual Dzongkhag/ Geog plans is ensured. 2. Human resources in RNR-RDC, Wengkhar are sufficient. 3. The farmers in the target area do not oppose the project activities. 4. The dormitory construction of RNR-RDC, Wengkhar should be completed for use | | |

* Farmers trained in the 5th year of the Project and farmers trained only for seed production are excluded

Notes:

Trained farmers – Farmers trained either in RDC Wengkhar or in the villages directly by project experts or RDC staff counterparts. Shall be composed of farmers trained under systematic training & orchard development, vegetable seed production, post harvest processing, marketing and focus village programs.

プロジェクト名
対象者
対象地域

ブータン国「園芸作物研究開発・普及支援プロジェクト」
対象地域の園芸農家、ウェンカル再生可能天然資源研究開発センター(以下、ウェンカルセンター)職員、農業普及員
モンガル県、タシガン県、ルンツェ県、タシ・ヤンツェ県、サムドゥルップ・ジョンカール県、ペマガツェル県

2012年10月版

| Narrative Summary | 指標 | Means of Verification | Important Assumptions | |
|--|---|--|--|--|
| 上位目標 | | | | |
| 対象地域における収入源として、園芸農業の普及が進む | 1. プロジェクトで研修を受けた農家、及び普及活動による受益農家の収入が、2020年までに80%増加する(ベースライン値は8400N) | 年報 | 園芸作物の市場環境が改善される | |
| | 2. ウェンカルセンターで500名の農家が研修を受け、その農家が農民間普及を実施する | プロジェクト報告書 | 研修を受けた農家が農民間普及に熱心であり、他の農家も園芸農業に関心を示す | |
| プロジェクト目標 | | | | |
| プロジェクトで研修を受けた農家、及び普及活動による受益農家が、園芸農業の商業化に向けた適正技術を実践する | 1. 対象地域内の耕作可能な乾燥地のうち、5000エーカーにおいて、園芸農業が実施される | プロジェクト報告書 | 市場へのアクセスが改善する農家が園芸作物の栽培地を確保する | |
| | 2. 研修を受けた農家の75%がモデルファームを整備し、農民間普及を実施する | プロジェクト報告書 | 病虫害が大発生しない | |
| | 3. 研修を受けた農家、及び普及活動による受益農家の50%が、商業的農業を開始する | プロジェクト報告書 | 市場に大きな変化が発生しない | |
| 成果 | | | | |
| 1. 対象地域において、生産と販売の可能性を踏まえた園芸農業の技術及び作物が特定される | 1-1 園芸農業の開発ガイドライン/マニュアルが作成される | ガイドライン/マニュアル | | |
| | 2. ウェンカルセンターにおいて、園芸農業に関する技術研修の実施体制が強化される | 2-1 研修を受けた農家の90%が、主な研修内容を実践する(年間の研修受講農家は約100名) | プロジェクトモニタリング報告書 | |
| | | 2-2 研修を受けた普及員の90%が、主な研修内容を採用する(年間の研修受講者は約15-20名) | プロジェクト研修報告書 | |
| 2-3 研修参加者による研修評価結果が100%向上する | 研修評価報告書 | | | |
| 3. ウェンカルセンター、種苗生産農家、タシ・ヤンツェ国家種子農場において、種苗の提供体制が確立される | 3-1 ウェンカルセンターおよび種苗生産農家における生産および配布体制が確立される(年間生産目標:果菜苗木4500苗、野菜種子200kg) | 種苗・種子登録書 | 種苗生産者にとって事業を実施しやすい環境が存在する(市場、農家の関心、認証など) | |
| | 3-2 研修を受けた農家全員に対して、研修で得た技術を実践するための基本資材を提供される | 研修報告書 | | |

| | | | |
|---|--|---|---------------------------------|
| | 3-3 タシ・ヤンツェ国家種子農場が再生され、種苗生産が開始される | 圃場記録 物理検証 | |
| 4. モンガル地域農業マーケティング・協同組合事務所の協力のもと、マーケティング活動を実施するためのグループが活性化される | 4-1 研修を受けた農家の所属するグループの50%が、園芸農業においてマーケティング活動を開始する | 報告書 | |
| 活動 | 投入 | | |
| | 日本側 | ブータン側 | |
| 1-1 AREP、1郡3品運動、持続可能な土地管理プロジェクト、その他関連事業の成果を踏まえ、標高(海拔600~2000m)に適した園芸作物を特定する | 1. 専門家派遣(長期) チーフアドバイザー/園芸、業務調整/農家組織 2. 専門家派遣(短期) 必要に応じて 3. カウンターパート研修 4. 機材供与 5. プロジェクト運営費の配賦 | 1. カウンターパートと管理職員の配置 - プロジェクトダイレクター / プロジェクトマネージャー - カウンターパート - 管理職員 - 日本人専門家および適宜その他のスタッフのための秘書およびドライバー 2. 土地、建物、他に必要な資材の提供 3. プロジェクト運営費の配賦(作業員10人分備人費など) 4. 種子、苗木、日当など研修経費の配賦 | 主要なカウンターパートが異動しない |
| 1-2 農業生態学的ゾーンに応じた園芸農業の技術および作物を開発する | | | |
| 2-1 ウェンカルセンターで実施された過去の研修をレビューする | | | |
| 2-2 普及員と農家を対象とした園芸農業研修の計画と教材を作成する | | | |
| 2-3 ウェンカルセンターおよびプロジェクト対象地域において、技術研修を実施する | | | |
| 2-4 農民間普及を促進する | | | |
| 3-1 ウェンカルセンターにおいて、種苗の生産体制を構築する | | | Preconditions |
| 3-2 商業化に向けて、民間の種苗生産体制を構築し、強化する | | | 1. プロジェクト活動が県/郡の定期活動計画において保証される |
| 3-3 タシ・ヤンツェ県の国家種子センターを再生する | | | 2. ウェンカルセンターに十分な職員が配置される |
| 4.1 調査結果を踏まえ、マーケティング活動を試行するサイトおよび作物を特定する | | | 3. 対象地域の農家がプロジェクト活動に反対しない |
| 4.2 特定されたサイトにおいて、農家グループ/組合を活性化し、その組織を通じたマーケティング活動を試行する | | | 4. ウェンカルセンターの宿泊施設が完成する |

Project Design Matrix Ver.2 Dec 2010 _Finalized at the First JCC held 23/12/2010

Name of the Project:

Horticulture Research and Development Project (HRDP) in the Kingdom of Bhutan

Ver. 2 Dec, 2010

Target group:

Horticulture farmers, horticulture staff and agriculture extension staff in the target area

Target area:

Mongar, Trashigang, Lhuentse, Trashiyangtse, Samdrupjongkhar and Pemagatshel

| Narrative Summary | Objectively Verifiable Indicators | Means of Verification | Important Assumptions |
|--|---|------------------------------|---|
| Over all goal | | | |
| Horticulture becomes more popular as a source of income in the target area. | 1. The trained and extended farmers in the project increase income by 80 % by 2020 (current baseline of Nu..8400) | Annual reports | Market for horticulture crops improves |
| | 2. 500 farmers are trained by RDC Wengkhar and the trained farmers extend their skills to others . | Project reports | Trained farmers are keen to extend their skills to others; other farmers show interest |
| Project Purpose | | | |
| The trained and extended farmers practice appropriate technologies for commercialization of horticulture | 1. Horticulture is practiced in 45 % of arable land in the target area. | Project reports. | Market access is improved Farmers allocate land for horticulture crops |
| | 2. 75 % of the trained farmers develop model farms and conduct farmer to farmer extension. | Project reports | Outbreak of pests and diseases does not occur. |
| | 3. 50 % Selected trained and extended farmers start to commercialise horticulture | | Significant changes in market does not occur |
| Outputs | | | |
| 1. Horticulture farming practices and crops in the target area are identified according to production and market potential | 1-1 A horticulture development guidelines / manuals are developed. | The guideline/ manual | |
| 2. Technical training system on horticulture is strengthened in RNR-RDC, Wengkhar | 2-1 90 % of trained farmers apply key training contents in the field (about 100 farmers trained per year). | Project monitoring reports | |
| | 2-2 90 % of trained extension officers apply key training contents (about 15-20 staff trained per year). | Project training reports | |
| | 2-3 Training evaluation by the training participants improve by 100 % . | | |
| 3. The structure for providing seeds and seedlings is established in RNR-RDC, Wengkhar, nursery farmers and seed growers | 3-1 Seed and seedling production and distribution mechanism in RNR RDC Wengkhar and nursery farmers developed and followed (target production of about 4500 fruit seedlings per year) | Seeds and seedlings Register | Conducive environment for nursery operators exist (such as market, farmers interest, certification) |
| | 3-2 100 % of trained farmers provided with basic materials to apply skills acquired from the training program. | Training reports | |

| Activities | Inputs | | |
|--|---|--|--|
| | Japanese Side . | | |
| 1-1 Identify appropriate horticultural crops according to the zones (600 to 2000 m amsl) by reviewing AREP, OGTP plan, SLMP and other related studies. | 1. Dispatch of experts (Long term) Chief Advisor / Horticulture, Training / Coordinator 2. Dispatch of experts (Short term) Marketing Agro preservation / processing; baseline study | | Transfer of major counterpart do not occur. |
| 1-2 Develop farming practices and appropriate crops according to zones taking on-going staple food production in the areas into account. | 3. Training of counterparts 4. Provision of equipments 5. Allocation of operational costs for the project | | |
| 1-3 Identify trial marketing sites and crops based on the surveys. | Bhutanese Side | | |
| 1-4 Form farmers' groups/ cooperatives in the sites and initiate trial marketing through the organization. | 1. Assignment of counterpart personnel and administrative staff | | |
| 1-5 Collect and disseminate information on market price and demand of horticultural products. | Project Director / Project Manager Counterpart personals Administrative staff Secretaries, drivers for Japanese experts and other staff accordingly | | |
| 2-1 Review the previous training programs on horticulture in RNR-RDC, Wengkhari. | 2. Provision of land, building, and other necessary facilities 3. Allocation of operational costs for the Project, e.g., 10 ESP | | |
| 2-2 Prepare training plans and materials for training programs on horticulture for extension officers and farmers. | 4. Allocation of training costs e.g., seeds, seedlings, per diem, etc. | | Preconditions |
| 2-3 Provide technical trainings in RNR-RDC, Wengkhari and project sites. | | | 1. Inclusion of the project activities into regular annual Dzongkhag/ Geog plans is ensured. |
| 2-4 Facilitate farmer to farmer extension. | | | 2. Human resources in RNR-RDC, Wengkhari are sufficient. |
| 3-1 Develop the production systems of seeds and seedlings in RNR-RDC, Wengkhari. | | | 3. The farmers in the target area do not oppose the project activities. |
| 3-2 Develop/ strengthen the production system for seeds and seedlings at private nurseries for commercialization. | | | 4. The dormitory construction of RNR-RDC, Wengkhari should be completed for use |



Wengkhhar RNR-RDC (標高約 1700m)



Lingmithang SC (標高約 700m)



Khangma SC (標高約 2100m)



ウエンカルセンター全景



野菜圃場



柑橘圃場



桃圃場



梨圃場

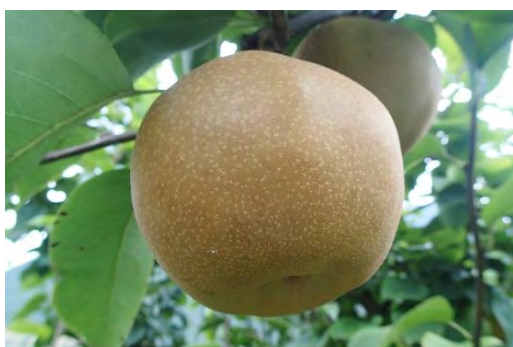
【成果1 関係】 奨励果樹



大津一4号



AREP-1



豊水ナシ



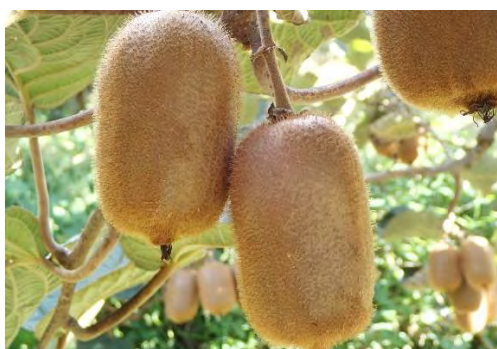
八雲ナシ



次郎カキ



富有カキ



Wengkhar Green



Wengkhar Yellow



モモ B.cream



モモ倉岳



Soldum スモモ



大石早生



田中ビワ



センター柑橘園圃 大津一4号



果実分析



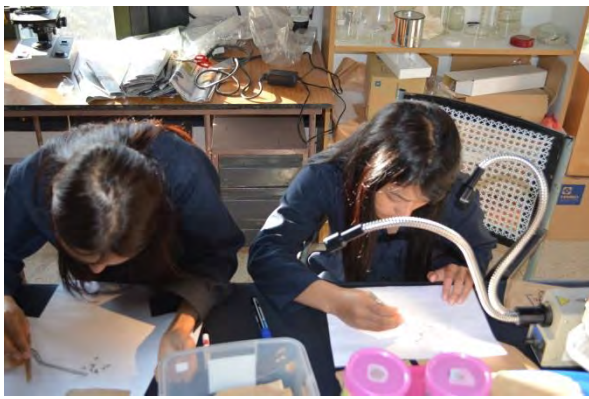
果実分析



誘殺トラップ設置



誘引捕殺されたハエ類



捕殺中 1次分類



被害果実（分解し、羽化させる）



誘引有機殺虫剤による防除試行（柑橘農家）



被害果の収集・埋設



左 ; *Bactrocera minax* 右 ; *B. dorsalis* sp. Complex

【成果 2 関係】



温帯果樹展示農家研修（講義）



温帯果樹展示農家研修（定植）



温帯果樹展示農家研修（梨整枝・剪定）



研究員・普及員研修（柑橘接ぎ木）



柑橘団地農家研修（収穫）



種子農家研修（ブロッコリー種子）



温帯果樹展示農家研修（梨収穫）



農家間研修（梨整枝・剪定）



農家間研修（梨整枝・剪定）



園芸作物品評・競技会（入選作物）



園芸作物品評・競技会（ウエンカル作物展示）



園芸作物品評・競技会（出典準備指導）



園芸作物品評・競技会（審査）

【成果 3 関係】



野菜育苗



定植 (カリフラワー)



ズッキーニ



カボチャ (手前)、高菜 (後ろ)



ブロッコリ



トマト種子採種



台木種子採種 (カラタチ)



台木育苗 (柑橘)



接ぎ木 (柑橘)



接ぎ木苗育苗 (柑橘)



接ぎ木苗 (梨)



穂木ワックス処理 (梨)



NSC タシヤンツエ支場（梨母樹園設置）



NSC タシヤンツエ支場（畑地造成後の栽培）



NSC タシヤンツエ支場（種子脱粒）



野菜種子生産委託農家（人参）



野菜種子生産委託農家（大根）



野菜種子生産委託農家（種子パッケージ）

【成果 4 関係】



農産物加工講習（プラムジャム）



プラムジャム、金柑ネクター、チップス（ポテト&バナナ）



農家グループ共同販売所（左；公共トイレ、右；販売所）



農家グループ共同販売所（パッキング指導）



農家グループ共同販売所（販売作物）



収穫後処理（梨；計量・選別）



梱包・箱詰め（梨）



普及販売（モンガル）



野菜市場（モンガル）



ロードサイド市場（モンガル；RAMCO 支援）



B-Coop（ティンパー；ウエンカルジャム）

【その他】



農道敷設（ルンチ県）



簡易保冷库（断熱材は機材の梱包材を利用）



現地材料で作った脚立



インパクトサーベイ（農家インタビュー）



ネパール園芸開発計画（1985～1999）のその後（センターでの苗木販売）