ブータン国 COVID-19下・後の農業振興 情報収集・確認調査

ファイナル・レポート 別冊

2022年1月

独立行政法人 国際協力機構(JICA)

株式会社 オリエンタルコンサルタンツグローバル 株式会社 三 祐 コ ン サ ル タ ン ツ

ブータン国

COVID-19下・後の農業振興情報収集・確認調査

目的	ブータン農業事情に関するインタビュー				
日時	2021年7月8日9:30-10:50				
会場	Zoom				
	JICA	中西部地域園芸農業振興プロジェクト 寺本さゆり専門家(チーフアドバイザー/園芸作物)			
出席者 (^{敬称略)}	調査団	 高野 正志 弘重 秀樹 土田 和弘 北 基 矢敷 裕子 今井 美樹 			

1. 寺本からプロジェクト概要について、PPT 資料に基づき説明した。

「農業は重労働」というイメージがある。農業振興に向けては、土づくり、苗づくり、リソース投入が必要不可欠である。基本的なところが十分にできていないので、基本的な投入と栽培管理ができるようになるだけで、収量は大きく伸びる。これらと併せて、在来遺伝子の活用も重要と考えている(ブータン政府は外来遺伝子に頼りすぎている)。今後のブータン農業支援として、JICA は SHEP を導入したいと考えている。 自分のプロジェクトでは、ブータン国内で生産する苗の 70%以上を生産し、それが結実するのは 3 年後以降だと考える。一方で、地方から中央へ輸送するインフラ整備が遅れる、市場アクセスが改善しない場合には鳥獣被害が増えるので、農家にとって悪い体験になると危惧している。

- 2. 上記 1. について調査団から質問し、以下について確認した。
- (1) 日本が支援するブータン農業振興案件
 - ブータンは見た目中心国であり、中身はまだまだ発展途上国という印象。人材育成の実施に当たっては、技術移転の受け皿が整っていないことが課題。優秀な人材を国外に送って研修しているが、農業分野ではそういった人材による取り組みが目立っていない(技術が十分に移転されていない)。
 - ブータンには標高差もあり、日本と同様な作物収穫の可能性がある。直接的な技術移転に繋がる SATREPS について検討してみてはどうか。
 - ハード面について、ブータン側は灌漑インフラに関する要望を強く持っている。日本はこれまでに 橋梁、溜池などのインフラ整備に取り組んできた。溜池についてはブータン人がマネできる技術 を導入する方がよいと考える。ソフトとハードの面の双方の課題に取り組むことが重要。COVIDの 影響でブルーカラー労働もインド人任せではなくブータン人でやるという意識が生まれつつあると 感じているので、このタイミングで現場監督ができるような人材が育成できれば良いと考える。
- (2) 在任中に大きく変わったところ
 - ティンプーは大きく変わった。コロナの自粛期間に投資を行うことで、街がおしゃれになった印象。
 - 地方はインドからのスナック菓子や飲料が売られるようになって、プラスチックゴミが田舎でものすごく増えた(バジョ)。
 - ラヤに満州式の半地下温室設置の指導に行ったが、同村民に困っている様子はなかった
 - ダガナの人にコロナの影響についてヒアリングをしたところ、最高だった、という回答が多くあった。
 通常、小さなコミュニティで売買される野菜が、コロナによる物流停止を受けて、行政がトラックで
 各農家を巡回して、野菜を回収・分配していた。これにより、地方農家の労働が通常よりも軽減された。
- (3) ブータンが今後取るべき政策
 - 自給自足を推進しつつ、農作物の価格統制に関する取り組みを進めていくべき。ただ、価格統制に係る最大の課題は国内に安定した生産基盤がないことである

- ブータンはバンコク行のカーゴ便を週一で飛ばしている。スナック菓子類、化粧品類が主な輸入 物資である。生鮮野菜の輸入については BAFRA が厳しい規制を敷いている。
- (4) 耕作放棄地の問題
 - 田舎に耕作の担い手がいなくなる理由は、農作物を作って確実に売れるという目測が立たない からである。自給自足分は十分に生産しているため、生活に何の支障も出ていない。
 - インフラ不足、アクセシビリティが耕作放棄地問題解決の重要な課題である。現在の農地には、 重機用の道路はもちろん農道もない。したがって、農地がどんどん森に飲み込まれていく。
 - 土地改良や換地という考え方は浸透していない。
- (5) 知識のシェア
 - 農業関係の公務員については、ノウハウは個人所有するものという考え方がある。自分がそれを 普及することで社会的地位を獲得している場合もある。
 - 農家レベルになると隣の農家の真似をするという傾向が確認できた。
- (6) 地方における農業政策(モバイル・バンキング、マイクロファイナンス)の浸透状況について
 - ブータン全国でモバイル・バンキングについてはかなり浸透している。しかし、農家レベルで見る とアカウントを持っていない、文字が読めないといった根本的な課題により、普及率は低いと考える。
 - 農家の現金収入方法は、物々交換が主流である。
 - You Tube 媒体の農民啓発教材はそうした農民の識字能力とスマートフォン所有率に寄り添ったものである。
- (7) モデル農村開発事業について
 - ブータン政府が実施しているモデル開発は、モデル開発地区を指定するだけで実質的なモデル 事業を実施していない。日本式の多様な活動を取り込んだモデル事業はブータンに合致するの ではないかと考える。
 - モデル農村事業(セマウル運動と称し)はKoikaが日本が最初に始めたオリジナルを手本 にして、アフリカ等で実施しており、ブータンにも展開している。KOICA は他にも,ジ ャガイモ種苗の無病系統供給技術設備や野菜品種の提供なども実施している
- 3. 調査団から専門家に以下について依頼した。
- 人材育成を含む今後日本の支援策について、アイデアを継続して交換し、内容整理出来た段階で再度、協議を依頼したい。

以上

ブータン国

COVID-19下・後の農業振興情報収集・確認調査

目的	ブータン農業事情に	関するインタビュー	
日時	2021年7月27日13:00-14:30		
会場	Zoom		
	信州大学	松島 憲一	
出席者 (^{敬称略)}	調査団	 高野 正志 弘重 秀樹 土田 和弘 北 基 矢敷 裕子 今井 美樹 	

- 1. 高野から本プロジェクトの概要について、ICR 和文 PPT に基づき説明した。
- 松島が自己紹介した。農水省所管の PAR アジアプロジェクトに参加し、遺伝資源に関する研究に従 事。ブータンでの活動は 2014 年までで終了している。これまでにネパール、カンボジアを担当し、現 在ミャンマーを担当しているが、昨今の国際情勢に鑑みプロジェクトが停滞しているところ。
- 3. 調査団から以下のとおり質問し、松島が回答した。
 - (1) 現地の食生活、穀物以外の栄養の摂取について
 - ・ 圧倒的にコメ文化で、赤米が好まれている。インドからの輸入米は白米。ブータン西部はそば
 処と知られており、押し出し麺(プッタ)や蕎麦掻、クレ(パンケーキみたいなものに唐辛子ソー
 スをかける)がよく食べられている。ティンプー市内には外国人向けのブータン伝統料理の店
 ができてきた。
 - 穀物以外については、いんげん、アスパラガス(ニカチュ:野生のアスパラガスと園芸種)、大根、カブ(葉のみ)、山菜、キノコ、芋(じゃがいも、さといもを総称してケワ)等をよく食べている印象がある。
 - ・ 代表的な料理として、パー(干肉、干唐辛子、干大根の煮込み)、青唐辛子のチーズ煮込み がある。
 - ・ ブータン東部の標高 2,300m 以下で水がない地域ではトウモロコシが作られている。
 - ・ 標高が高い地域(ブータン北部)では大麦が作られているが、かなり北の地域でも輸送された コメを食べているようだ。
 - 農村部の人たちの昼夜の食事は、赤米、唐辛子・チーズ煮込み、エデ(漬物的なサラダ)で、 宿に行くと朝食にひよこ豆のカレーとパン(プーリー。ネパール式。)が提供されるところもある。 ブータン国民の基本的な食事は野菜、コメ、乳、チーズ、バター茶(近年、インド産のインスタ ントミルクティーに代替される傾向)で構成されており、栄養不足や塩分過多という印象はあま りない。また、動物由来のタンパク質もしっかりと摂取できている印象。ただし、干した豚肉の 脂身が好まれており、脂肪分は過多かもしれない。
 - 南部と北部で気候や民族が異なるため、食事内容も違うと考えられる。
 - (2) 現地農家の野菜や果樹などの生産、投入財(種子や肥料など)の利用。
 - ブータン西部で生産される蕎麦や、同東部で獲れるトウモロコシは、一般的に田舎者の食べ物と認識されているが、最近ではティンプーのセレブの間で健康食として注目されている。
 - ブムタンの国境地帯(ウラ)はまつたけで町おこししていて、日本のバイヤーも買いに来る。伊那市にもウラという地域があり、地域連携を思案したこともあったが、日本側が限界集落だったために頓挫した。
 - ・ インドに輸出するためのじゃがいもやオレンジには肥料を使っている可能性ある、それ以外は 自然肥料(牛糞)を利用。
 - ・ インド産野菜は多くの化学肥料を使っているという印象があるようで、ブータン国内産の野菜 を好む人が多くいる。

- ・ ブータン国内で種を販売しているのを見たことがない(苗であれば売られていた記憶がある)。
- (3) 野菜の導入に当たって、圃場の除礫や均平・傾斜の緩和等、圃場の改良に関連する現地農家の ニーズ
 - ・ 急傾斜の土地にある農作地のため、インフラ整備が追い付いていない。
 - ・ 伝統的に長らく使ってきた棚田など以外、均平されていない。
 - ・ 栽培面積を拡大しようとして斜面崩壊を起こしているのなど、よく見た。
- (4) 農産物の販売の方法、貯蔵と自家消費について
 - ・ 地方で土日の朝に立つマーケットでは、周辺農家が朝暗いうちから収穫した野菜を、徒歩で 移動して販売する。
 - ・ 地方のマーケットで購入して他で販売する仲買人が流通しているようである。
 - ・ ティンプー周辺は流通が発達していた。現在、ティンプーへの人口集中圧が高まっており、そ れに向けた倉庫等の流通整備は必要になっているかもしれない。
 - 農家は自給率が高いという印象である。
- (5) インドとの輸出入に関して
 - インド市場では、ブムタンで獲れるじゃがいもや南部地域で獲れるオレンジは高値で取引される。
 - ・ インドのテレビ番組が流行しており、CMも外国贅沢品(コーラ、車等)に関するものが多く流 れている。これがブータン国民の購買意欲に影響していると感じる。
 - ブータン国内インフラに関し、パロに向かう国道が整備され、その国道沿いにヒュンダイ、日産等のディーラーが立ち並び、昔は田舎だった街がどんどん都会化している。これに伴い、下水処理、食料不足、マーケット不足をはじめとする都市化問題も浮上している。特に、食料問題については、適切な生産・集配システムの整備が課題。
- (6) 対ブータン日本支援の方向性について
 - 自分は唐辛子の専門家であり、ブータンでもその遺伝子研究に従事していた。ブータンでは 在来品種の保護を行っておらず、気候変動や地滑りが頻発する現状に鑑みると、伝統野菜が 絶滅する虞がある。在来品種保護に向けては、農家による種取と種の保管(ジーンバンク)が 必要であるが、種取にも技術が必要となる。伝統野菜の種取には種苗会社は従事しない。た だ行政が再委託して種苗会社に種とりを行い、交雑を防ぐ(下記でいう域内システム)ケースも ある。
 - 従来品種の保護には域内保全と域外保全がある。前者は種取のシステムをはじめとする国内 での対応、後者は外部からの交雑に対応するためのジーンバンク等。実際域内システムを稼 働させるためには、行政をその気にさせる必要があり、そのために実際に現物の交雑度合い 等を可視化するような説明が必要と思われる。
 - ブータンの国家開発計画には伝統文化の保護が明記されているため、在来品種保護との整合性が認められるのではないか。例えば、シャーエマ(一番人気のとうがらし)の形状や品質の統一に向けた取り組みはどうか。
 - 若者による農村・農業離れも大きな課題。日本では都会疲れした若者が限界集落に移住する ケースがあるが、これは先進国の文明に対する反動として存在するケースである。安定した収 入や新しい価値観がないブータンにおいては、移住する若者を創出することも、彼らを受け入 れる地域の許容力を醸成することも難しいのではないか。ただし、これらの状況については、 最後に聞き取りを行ってから時間が経っているので再確認する必要がある。

以上

Reference No.	09/08/2021
Organization	Ministry of Agriculture and Forestry in Bhutan
Place	ZOOM
Time & Date	9/08/2021 13:00-15:00 (JST), 10:00-12:00 (BTT)
Participants (name,	19 participants, See attached list
post, email/mobil)	

Record of Meeting

1. Opening Remarks: Ms. Tanaka (JICA Bhutan Office)

- JICA conducts "Data Collection Survey for Agriculture with and post COVID-19" in this year, the purpose of the survey is identifying future cooperation projects in agriculture sector.
- JICA has conducted various cooperation activities in production, research and machinery service for agricultural development in Bhutan since 1964 when Dasho Nishioka was dispatched.
- After pandemic of COVID-19, the agriculture in Bhutan got impacts in various areas. We should seek how agriculture in Bhutan will be developed. The survey team consists with several experts to cover marketing, land development, nutrition and ICT. The survey will focus on these sectors where JICA is looking for future cooperation in.

2. Opening Remarks: Ms. Kinlay Tshering (Director of DAMC)

- It is sure that COVID-19 gave impact on agriculture. Meantime, we also need to consider many influence of events such as climate change, change of people's migration, etc. for agriculture development in Bhutan.
- JICA's idea is welcome for looking components from market aspect, business promotion, land development, nutrition, and ICT. Meantime, we should look not only one part but whole picture of agriculture sector, so, we need to look end to end means production to consumptions.

3. Explanation of the Inception Report and Discussion

- Mr. Takano, team leader of the survey team explained inception report and also request to have on-line meetings with Bhutan counterparts.
- The comments below were raised from participants and discussion was carried out.

(1) Mr. Wargda Dukpa (Officiating Director of DoA)

- On slide 6, 2nd bullet, it said that during the COVID-19 pandemic, "the government focused on the production of chili peppers, tomatoes, and onions among vegetables, and no measures have been considered for other vegetables". But it is not correct. The government prioritized production of such crops but also took measures for other crops.
- On slide 11, rate of "Self-sufficient" is quite low and difference from the estimation done by the government is wider. It may need to be checked again.
- (2) Ms. Kinlay Tshering (Director of DAMC)

- Statistic division under MoAF was recently shifted to National Statistic Bureau. Before that, they has published the Agricultural Census 2020-2021. It may help the survey team to update the data.
- Since 2016, the government decreases to import chili due to using pesticide, so it might be no imported chili in 2020. It should be checked with trade statistic.
- With regards to export of potato, it was explained that most of potatoes were traded through FCBL. But it is not correct. In 2020, many of potatoes were exported by exporter directly with importer in India. Some of others are exchanged through online trading in collaboration with FCBL.
- With regards to the on-line interview, it is better to ask responsible head of department to identify key officials. For example, if the survey team want to make interview regards to production, food security, mechanization, DoA will identify the key officials. If it relates to agricultural marketing and cooperative such as group of cooperatives, private exporters association, area of interest, DAMC will identify the key officials. With regards to policy part, policy and planning department (PPD) will be responsible. Regards to Innovation and ICT promotion, ICTD under MoAF is responsible and agricultural statistics division in national statistical bureau (NSB) should be involved for data providing.
 - First contact person
 - DOA : Mr. Wangda Dukpa Officiating Director & Chief, Agriculture Research and Extension Division
 - Land development: Mr. Tshering Dukpa Officiating Chief, Agriculture Engineering Division, DoA
 - DAMC: Ms. Kinlay Tshering Director, Department of Agricultural Marketing and Cooperatives
 - Policy and Planning Division: Ms. Tashi Yangzom Deputy Chief Planning Officer, Policy & Planning Division, MoAF
 - ICT : Mr. Dawa Zangpo Senior ICT Officer, ICT Division, Directorate, MoAF
- (3) Mr. Namgay Thinlay (Chief, Agriculture Production Division, DoA)
- In line with Mr. Wargda Dukpa, the calculated "Self-sufficient" rate is low. It might be better to follow same methodology which the MoAF used.
- With regards to a slide talking about cold storage, the name of Prime Minister should be "Lotay Tshering" not "Rotai Tshering"
- (4) Ms. Tashi Yangzom (Deputy Chief Planning Officer, Policy & Planning Division, MoAF)
- Same as others, the calculated "Self-sufficient" rate is low.
- There are a lot of ICT based technologies done by the Ministries such as smart irrigation aspect, ICT survey collection. Those things should be captured in this survey.
- (5) Mr. Kozo Watanabe (Chief representative of JICA Bhutan Office)
- In the field of agriculture, JICA has been conducting various activities and currently there is several new projects just started such as 1) Agricultural mechanization project. It is under procurement stage now, 2) Integrated temperate fruit project which is technical cooperation for agricultural production after IHPP. SHEP approach will be Introducing to support the farmers introducing marketing. 3) Irrigation development. So, there

is history about JICA's technical cooperation and JICA Bhutan Office will explain on-going and next coming projects to the survey team in order to discuss future projects based on that.

- JICA has supported GNHC to develop CNDP Comprehensive National Development Plan 2030. The CNDP is including agriculture development plan and also inter-city concept. The CNDP shows GREENIST concept and it related to sustainable agriculture. This new survey should harmonize with the CNDP. JICA Bhutan Office will explain it to Bhutan counterpart in another meeting in very soon.
- Importance of nutrition issue. Nutrition needs multi-sectoral approaches, especially in education and health sector. Ministry of health already has program. MoAF is already working with Ministry of education closely. So, JICA is expected that result of this survey shall be useful not only for MoAF but also Ministry of health and Ministry of education. In this context, if it is necessary please kindly introduce the survey team to other Ministries to conduct interviews and data collection.
- (6) Mr. Namgay Thinlay (Chief, Agriculture Production Division, DoA)
- Slide 17, farm mechanization, the team may expected the main target are power tiller and tractors. However, the team will find that the necessity of other basic machines and tools to save labour intensive works.
- (7) Ms. Kinlay Tshering (Director of DAMC)
- Re-emphasizing the key point from DAMC viewpoints;
- Marketing Strategic policy is almost finalized. It should be finalized within August. JICA team can read and understand all strategy with it.
- With regard to digital marketing, the knowledge in Bhutan is limited. So, it is asked to the survey team to study deeply how to establish the platform etc. Moreover, regards to branding and property right protection, Japan has success it and based on that the survey team is requested to consider it in Bhutan. If necessary, the team will be introduced to the Ministry of Economy who interests the branding and IPR.
- Agricultural marketing system was established and need to expand in many aspects as market intelligence information.
- Market Infrastructure such as cold storage. Recommendation and support on its development is highly appreciated.
- (8) Mr. Wangda Dukpa (Officiating Director of DoA)
- For department of agriculture, food security is overall target. For that, few interventions are carried out.
- 1) irrigation DoA is looking for various type of irrigation,
- 2) labour shortage is very serious issue. So that, mechanization is required.
- 3) land development is another issue. Make feasible mechanization through land development.
- 4) Human and wildlife conflict is another issues in rural community.
- (9) Mr. Takano (Team leader of the survey team)
- The data which is not correct should be clarified and updated through discussion with Bhutan side and consensus.
- We need to interview with you soon, and our member will contact with you to arrange the meetings.

(10)Mr. Kudo (JICA Bhutan Office)

- As Ms. Kinlay said, JICA hopes that MoAF will participate to the survey and develop final result together. JICA Bhutan office will make some input and arrange another team to join ICT sector in this survey.
- Gathering all tighter, we will have another meeting to discussion future cooperation together,

4. Closing Remarks: Mr. Watanabe (JICA Bhutan Office)

• Although this survey is "data collection" and it should not only collect data from Bhutan side to Japanese Consultant, Japanese good practices and useful information should be brought to Bhutan as much as possible.





Ms. Tashi Yangzom Polycy and Planning Division of MoAF



Mr. Wangda Dukpa Officiating Director & Chief, Agriculture Research and Extension Division, DoA



Chief, Agriculture Production Division, DoA



Ms. Kinlay Tshering Director, DAMC, MoAF



Mr. Tshering Dukpa Officiating Chief, Agriculture Engineering Division, DoA



Mr. Kozo Watanabe Chief Representative, JICA Bhutan Office

Attendance List

No	Name	Title and Organization	E-mail
Bhut	an Side	l	
1	Ms. Kinlay Tshering	Director, Department of Agricultural Marketing and Cooperatives (DAMC), Ministry of Agriculture and Forests (MoAF)	kinlaytshering@moaf.gov.bt
2	Mr. Wangda Dukpa	Officiating Director & Chief, Agriculture Research and Extension Division, Department of Agriculture (DoA)	wdukpa@moaf.gov.bt
3	Mr. Namgay Thinlay	Chief, Agriculture Production Division, DoA	nthinley123@gmail.com
4	Mr. Tshering Dukpa	Officiating Chief, Agriculture Engineering Division, DoA	tshering@moaf.gov.bt
5	Mr. Yonten Gyamtsho	Chief, Marketing Development Division, DAMC	yontengyamtsho@moaf.gov.bt
6	Mr. Dawa Tshering	Chief, Market Information & Research Division, DAMC	dtshering@moaf.gov.bt
7	Ms. Tshering Wangmo	Chief, Cooperative Development Division, DAMC	twangmo@moaf.gov.bt
8	Ms. Tashi Yangzom	Deputy Chief Planning Officer, Policy & Planning Division, MoAF	tashiyangzom@moaf.gov.bt
9	Mr. Dawa Zangpo	Senior ICT Officer, ICT Division, Directorate, MoAF	dzangpo@moaf.gov.bt
10	Mr. Sunami Alfi	Gross National Happiness Commission	
11	Mr. Toden	National Statistical Bureau	
JICA	Bhutan Office		
12	Mr. Kozo Watanabe	Chief Representative, JICA Bhutan Office	Kozo.Watanabe@jica.go.jp
13	Ms. Mariko Tanaka	Representative, JICA Bhutan Office	tanaka.mariko@jica.go.jp
14	Mr. Jun Kudo	Project Formulation Adviser, JICA Bhutan Office	Kudo.Jun@jica.go.jp
15	Mr. Tshering Dorji	Project Officer, JICA Bhutan Office	Dorji-Tshering@jica.go.jp
			_
JICA	survey team	•	
16	Mr. Masashi Takano	Team Leader/ Market Accessibility, JICA Survey Team	takano-ms@ocglobal.jp
17	Mr. Hideki Hiroshige	Deputy Team Leader/ Business Promotion, JICA Survey Team	hiroshigeh@ocglobal.jp
18	Mr. Kazuhiro Tsuchida	Agricultural Land Improvement, JICA Survey Team	tsuchida@pdkikaku.co.jp
19	Mr. Hajime Kita	ICT in Agriculture, JICA Survey Team	hajime-kita@sanyu-con.co.jp

ブータン国

COVID-19下・後の農業振興情報収集・確認調査

目的	今後の調査実施方針に関する打合せ			
日時	2021年8月11日13:00-13:56			
会場	Zoom			
	JICA ブータン事務所	工藤 淳 田中 真理子		
出席者 (敬称略)	調査団	高野 正志 弘重 秀樹 北 基 矢敷 裕子 今井 美樹		

今後の調査実施方針について、以下のとおり確認した。

- 1. 調査団としては、現地調査を実施したく、隔離期間を考慮した要員計画の見直しを行いつつ、現地・ 国内 MM の振替を行いたい。隔離期間が課されている間に渡航することを前提に、基本方針として、 隔離期間以上の現地 MM を有する従事者のみ派遣することとしたい。
- 2. JICA としては、調査団の基本方針で差し支えない。ブータンのワクチン接種が進んでおり、今後隔 離緩和の可能性もあるため、引き続き様子を見ていきたい。
- 3. 調査団から①隔離期間中における稼働報告の考え方、②査証取得手続に必要な日数、について 質問したところ、JICAは①後日回答する、②おおよそ1.5か月要すると回答した。
- 4. 調査団は、8月18日(水)までに改訂版の要員計画を送付する。
- 5. 改訂版の要員計画を基に協議を行い、現地 MM の国内 MM 振替等に関する打合簿を作成する。
- 6. 渡航は9月末の現地入りを目処として、手続きを開始する。

以上

Objective	Agriculture Land Development					
Date	12/08/2021 13:00-14:00 (JST), 10:00-11:00 (BTT)					
Venue	Zoom					
Participant	DOA	Mr. Namgay Tshering, Executive Engineer, Agricultural Engineering Division (AED), <u>ntshering@moaf.gov.bt</u>				
	JICA Survey Team	Mr. Masashi Takano, Team Leader Mr. Hideki Hiroshige, Deputy Team Leader Mr. Kazuhiro Tsuchida, member Mr. Hajime Kita, member				

JICA Survey Team (hereinafter JST) confirmed the following.

1. Terminology and contents of land improvement

- In Bhutan, terms of "agriculture land development" and "sustainable land management" are generally used rather than "agricultural land improvement" or "farmland improvement".
- "Agriculture land development" includes both of rehabilitation of existing farmland and newly development.
 KPIs of Agricultural Land Development (Output 1.5) in 12th FYP are i) Fallow land brought under cultivation
 → rehabilitation and ii) Agriculture land developed → newly development.

2. Organization and institution

- Within MOAF, DOA oversees the measures for fallow land reversion and each division (ARED, APD, AED) has a responsibility for specific issues on fallow land reversion.
- NSSC is a focal institution of agricultural land development, and it has a responsibility for implementation of development including coordination, administration, and monitoring.
- Organization chart of each institution is available on the DOA Web site. The detail of AED will be shared later.

3. Implementation process

- The agriculture land development program is conducted based on the request of farmers, individual farmer or farmer's group depend on the scale of project. The application of farmers is brought to MOAF through Geog (village blocks) and Dzongkhag (districts). Technical committee of MOAF review the application and adoption will be determined. Then NSSC conduct the development.
- Agriculture land development work is carried out by beneficiaries under the technical guidance of NSSC, while MOAF provide the service of construction machinery through CMU. CMU was established for the purpose of farm road construction, however, the service for agriculture land development is provided as well in recent year.
- Private construction machinery service is also available for agriculture land development; however, the proportion is very limited due to small number of private machinery and higher cost than CMU service.

- Information on operation status of CMU machinery: JST will contact JICA Bhutan Office to obtain it.
- 4. Major issues in agriculture land development, private view of Mr. Namgay Tshering
- Shortage of construction machinery which can be used for agriculture land development.
 - ✓ Main machinery is excavator, but number is still not enough.
 - ✓ In addition to excavators, a variety of construction equipment for agriculture land development, such as removing rocks in the field, etc. is needed.

END

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Marketing Policy for Agricultural Products				
Date	August 13, 2021 10:00-12:00 (BST)				
Venue	Zoom				
Participant	DAMC	Ms. Kinlay Tshering Mr. Dawa Tshering Mr. Yonten Gyamtsho Ms. Tshering Wangmo			
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Kazuhiro TSUCHIDA Hajime KITA Hiroko YASHIKI Miki IMAI			

JICA Survey Team (hereinafter JST) confirmed the following.

- 1. RNR Marketing Policy of Bhutan: It will be finalized in August, so what is the main difference from the latest draft -2018 version?
 - DAMC issues a) National RNR marketing action plan (Iss. 2018, 3 year term), b) Dzongkhag RNR marketing action plan and c) marketing strategy policy which covers both institutional and business (production, post-harvest, marketing, and etc.) including responses to COVID-19.
 - The item a) is recently completed in June, 2021, and the new action plan considering all 20 dzongkhag will come out soon. All items will be available to share next week.
- 2. Regards to Market Profile, report on export and import trade
 - No trade related figures with DAMC, and those figures are provided by Revenue and Custom Dept in MOF
 - A comprehensive analysis report on agricultural production is not provided but its production related figures (Iss. 2021) is available.
 - Mini reports on agricultural production is available within MOAF for decision-making purpose.
 - Available data of large domestic markets will be shared to the survey team.
- 3. Challenges on distribution of agricultural products and marketing for both domestic and export. Planned project/activities related to the challenges
 - Major concerns for domestic marketing are seasonality, road network, marketing facility (processing facility, post-harvest facility, digital mapping, and etc.), dispersed farmland, formalization of export process, low production volume & quality, and product competitiveness.
 - For road network, DoA is in charge for development, and for marketing facility, there is "Marketing Infrastructure Guideline" issued by DAMC.
 - For post-harvest facility or other kinds of market infrastructures, National Post Harvest Center is undertaking for technical guidance and DAMC can undertake its functional setting but its operation and maintenance should be implemented by local government.
 - Due to imported items for example Indian agricultural products cheaper and better quality, Bhutanese products have lower competitiveness.
 - For digital mapping, the service includes information on physical location, working capacity,

capacity type (i.e. backhouse) and etc. DAMC welcome JST recommendations in order to improve the system.

- Farm Road ATLAS is O&M and monitored by Department of Agriculture (ask Mr. Wangda Dukpa and Mr. Tshering Dukpa for more information).
- Online market system established by FCBL is a commodity exchange program and mainly for export (potato, cardamon, and etc.), which is not eligible to Bhutan domestic market. DAMC is prefer to have digital purchase and selling system for domestic market, and also welcome JST recommendations on this.
- FCBL is not under DAMC but under MOF. FCBL performs as an implementing agency for DAMC projects.
- 4. The status of awareness and utilization of Agricultural Market Information System (AMIS)
 - Only the food price at 25 markets is available, but DAMC intends to add the trade volume as well to grasp the whole picture of the domestic market in Bhutan.
 - Confirmed 500 downloads so far, and to promote this system to more users, DAMC just started to advertise AMIS on TV the application using instruction video.
 - Literacy is one of the barriers to promote AMIS. DAMC is thinking of aforementioned online buying & selling platform installing visional functions with multiple languages.
 - Updating the information is done by DAMC, and ICT division for technical maintenance of the system.
- 5. Strategy to promote agricultural cooperative and farmers group, its target and objective
 - 100 agricultural cooperatives and 500 farmer groups are registered.
 - A memo for the target and objective for those organizations is provided/shared by DAMC.
 - DAMC promote activities for capacity building, woman empowerment, and woman livelihood improvement.
- 6. Projects/programme implementing in cooperation with other development partners/ donors
 - No DAMC stand-alone project
 - DAMC is implementing partner of WB, WFP, JFCL and IFAD projects but DAMC's role is marketing only in their cooperation and it is very limited.
- 7. Contact Person for Nutrition Field
 - Following persons in DoA can be the ones who know more in detail about Nutrition, but DAMC is happy to answer if there is any question as well.
 - Mr. Wangda Dukpa (Officiating Director, DoA)
 - Mr. Namgay Thinlay (Chief of Agricultural Production Division, DoA)

01:					
Objective	Agriculture Land Development				
Date	17/08/2021 13:00-14:30 (JST), 10:00-11:30 (BTT)				
Venue	Zoom				
Participant	National Soil Service Center (NSSC), DOA, MOAF	Mr. Tashi Wangdi, Program Director, <u>twangdi@moaf.gov.bt</u>			
	JICA Survey Team	Mr. Masashi Takano, Team Leader Mr. Kazuhiro Tsuchida, member Mr. Hajime Kita, member			

JICA Survey Team (hereinafter JST) confirmed the following.

1. Introduction of NSSC

- NSSC has a mandate regarding soil and land management, which compose 4 programs (former units) described below, as well as administration unit and Soil and Plant Analytical Laboratory.
 - ➤ Soil Survey Program: National Soil Map is under preparation and it is expected to come out on late of 2022 or early 2023 come out. Parallelly, National Soil Database is planned to be developed.
 - Soil Fertility Program: it provides technical advice to farmers through training program and showing best practice of soil management.
 - Soil Microbiology Program : responsible for R&D on organic fertilizer and compost.
 Currently a microbiology laboratory is planned to be constructed.
 - Land Management Program : looks after sustainable land management, it was called agriculture land development in past few years.

2. Sustainable Land management (SLM) and Agriculture Land Development (ALD)

- Recent years, DOA focus on on SLM which is more inclusive concept of management of land and soil, instead of ALD concept. SLM consists of 4 measure technology groups; 1)
 Agronomic measure (crop rotation, inter cropping technology, etc.), 2) vegetative measure (vegetation improvement in slope area, etc.), 3) structural measure (terracing, terrace consolidation to adopt farm mechanization, check dam construction in gully or land slide area, construction of contour stone bund etc.), 4) management measures.
- ALD was focusing on mainly structural measures, especially on terracing and terrace consolidation. NSSC intends to promote SLM which covers more wide and inclusive approach of measures.

3. Implementation of SLM/ALD

• M/M of the meeting with AED on August 12 shall be refer about the share of roles for SLM/ALD between NSSC and AED.

- Construction machinery of CMU has been used for agriculture land development in addition to farm road construction and maintenance work after 2017. Due to inadequate capacity (number, type) of CMU machinery, private construction machinery has been hired for agr. land development as well in recent years. Proportion of CMU machinery and private is roughly 70% CMU machine, 30% private machine (this is not accurate, and Mr. Tashi will confirm with his colleagues later). Farmers demand of CMU service is higher than private because CMU machinery cost cheaper than private one, which is 40,000Nu/acre for CMU and 54~55,000Nu/acre for private.
- NSSC is considered as a responsible agent of agriculture Land development including planning, implementation, monitoring and evaluation as well as coordination among related agencies.
- Land Management Section of DOA deals with support to land conversion, land lease, land exchange, land clearance approval, etc., but does not do anything substantive about agricultural land management.

4. Fallow land reversion (bringing back fallow land to cultivation)

- NSSC has an overall mandate to take measure for promoting fallow land reversion, however, NSSC does not have specific budget for this currently. SLM/ALD are carried out by the project base budget of GCF and GEF.
- NSSC provides support to famers, who intend to bring back fallow land to cultivation, by package manner including land development, support of production input (seed, fertilizer, irrigation facilities including drip irrigation system, water harvest pump, green house, etc.), linkage to market, and so on. Dzongkhag administration provides financial support for them. (to be confirmed in the next meeting.)
- The legal section of MOAF Directorate of Legal Service) deals with legal issues concerning fallow land development.
- National Land Commission Secretariate (NLCS) has an overall mandate of land registration.
- The reason of land keeping fallow is a complex combination of many factors, such as animal damage to crops, labor shortage, irrigation water availability, etc. For implementation of fallow land reversion, It is necessary to clarify the unique factors of addressed land through preparing inventory and to confirm feasibility.
- Currently, NSSC is working on concept development of <u>the fallow land bank</u>, which is land owners of fallow land deposit their land and lease out to farmers, by setting up task force with MOAF and NLCS. It is still very initial stage to examine the concept.

5. Exchanging opinions on the concept of model farm development proposed by the Team

- Mr. Tahi expressed interest in this concept, as it could be effectively packaged with a whole value chain, sustainable land management, fallow land bank concept, and so on.
- Possible leading institution might be DOA-APD, and it is necessary to involve DAMC, Livestock Department, and NLCS.

- It is necessary to examine carefully the criteria for candidate target village. Focusing on the market access is one idea, while dispersing whole country is another idea.
- Mr. Tashi and the Team will continue to exchange opinion on the model farm development.

6. Database of farmland

- NLCS is authority of land registration, and it has the database of land holders.
- Data concerning agricultural land use is shown in RNR Census MOAF.

7. ALD technical guidelines

- ALD Guideline was published in 2017. Land development and management had been guided by this Guidelines. Currently it is in review based on the experience of 4 years application in the field. The revised guideline will come up late 2021 or early 2022. Guideline is planned to be composed of SLM Guideline and Best Practices, and Soil Conservation Manual.
- 2017 Guideline will be shared to the Team. (received on August 18)

8. Next meeting

• Next meeting with NSSC will be held in the next week or the week next.

Objective	Plant Protection and Human-Wildlife Conflict measures by NPPC		
Date	August 13, 2021 15:00-1600 (BST)		
Venue	Zoom		
Participant	NPPC	Ms. Yeshey Dema (Program Director) Ms. Tsomo (Senior Plant Protection Supervisor) Mr. Sonam Dorji (Plant Protection Supervisor)	
	JICA Survey Team	Masashi TAKANO Kazuhiro TSUCHIDA Hajime KITA Miki IMAI	

JICA Survey Team (hereinafter JST) confirmed the following.

- 1. Brief Background of NPPC including Roles and Organization Structure
 - NPPC's main objective is to protect crops from diseases, any type of pest, and weeds.
 - There are six programs (these are used to be called "unit") in NPPC; namely, 1)Pathology Program, 2)Entomology Program, 3)Weeds Program, 4)Pest Management Program, 5)Plant Protection Product Program, and 6)Pest Surveillance Program
- 2. Operation Status of ePEST-Surveillance System
 - The system was launched in 2015 to predict the spread of diesase and pest and to give warning to farmers by mapping the type of threat and its location where the incident occurred, but it got under operation just a few months ago due to a lot of technical problems.
 - Due to budgetary limitations, the application scale is not field level, which is: NPPC staff went to the field to see the problems such as diseases and pests to collect and update the data into the system. There are plant protection experts in each ARDC (three ARDCs in Bhutan) who collect at least two data per year, so the data has not been enough collected so far.
 - NPPC is planning a training program for regional extension staff so that more and more data can be collected.
 - The concept of the system is made by NPPC staff who has not any IT background and working together with the staff from ICTD, the system was created.
- 3. Human-Wildlife Conflict (HWC)
 - NPPC also has the responsibility to protect crops from wild animals (Ministry of Forestry takes a responsibility to protect animals in HWC issues). So far, effective measures are only electric fencing.
 - NPPC used to try the beehives system to make elephants away, but due to the protocols in collecting queen bees and beehives, it is not easy to prepare beehives from outside. So NPPC is thinking of collecting the native species even though it takes time and costs.
 - NPPC has been trying to apply the bio-acoustic method to make wild animals away from the farmland since last year, but it may conclude this method is not very effective if the farmland is close to the resident area (because the animals are already used to noise) based on the trial result in the 1st year (the report on this matter will be uploaded next year June or July).
 - Other methodologies other than electronic dencing, beehives and bio-acoustic have not been taken yet by NPPC.
 - The environmental situation that farmland is always surrounded by forest makes it harder to separate the farmland and wildlife because there are multiple entry locations for animals.
 - JST sent a URL to show an example to mitigate crop damage by elephants using beehives.

- 4. Data about the amount of damage by diseases, wildlife, and any other wild threat.
 - There is no solid and consecutive data about the damage because those phenomena occur sporadically.
 - No official report is available for crop damages by diseases and/or wildthreat since there is no policy on crop insurance.
 - NPPC expects to collect exact data about crop damage by developing e-PEST Surveillance system in the future because it must be big.
 - At the moment no donor is involved to solve HWC or pest surveillance program although a small project whose duration was eleven months was undertaken by WWF for the basic survey to make the safe strategy. UNDP used to show an interest in the project before but they may have lost it.
- 5. The expectation for future JICA cooperation with NPPC
 - Capacity building in technical skills for identification part of diseases and pests (NPPC used to request to JICA before but it did not come true due to COVID-19. And also the person whose expertise is plant diseases is also needed).
 - Regarding the e-PEST Surveillance system, system management is not easy so technical support for better management is required for further system development and stabilization.
 - For HWC, there are too heavy and many tasks to do to mitigate/prevent the problem considering the capacity and budget of NPPC in this field. So NPPC needs more help on this matter.
- 6. Distribution system of Plant Protection Products (PP Products)
 - NPPC is the only channel of distributing PP products in Bhutan. Private channel is legally restricted. Plant Protection Products Program (former Plant Protection Products Unit) of NPPC is responsible for procurement and distribution of PP products as well as providing advisory services on pesticide use and safe handling to farmers and extension agents.
 - NPPC procures PP products from a private supplier (importer) company through public tendering called EGP system. Most of pesticide is imported from India at moment. The funding of the procurement is provided by a revolving fund system. The procurement budget is approximately BTN 550M.
 - Dzongkhag is required to apply a demand list of PP products to NPPC each fiscal year based on the request of farmers. NPPC determines the amount of procurement based on the demand list.
 - PP products are distributed to farmers through extension agent with technical guidance and advise.
- 7. Amount of PP product use in Bhutan
 - Because NPPC is the only supplier of PP products in Bhutan, the amount of PP products distributed by NPPC, which is found in NPPC Annual Report, can be understood as the total amount applied in Bhutan.
 - NPPC Annual Report is available for three years on NPPC Web site, and long-term data (10 years record) will be shared to the Team soon.
 - An organization called ASSR is licensed to handle fertilizer related business with a ten percent of commission fee (of WHAT?)
 - The amount of pesticide used is not changing lately although the country's strategy is to reduce the use of pesticides and shift to organic agriculture. NPPC is trying to show and demonstrate organic agriculture to farmers and trying to change their minds to pick the organic measures.
- 8. Others

• NPPC will inform JST of 12th Five Year Plan Report because the website is not working well and JST cannot obtain it.

END

Objective	Plant Protection and Human-Wildlife Conflict measures by NPPC		
Date	August 19, 2021 15:00-1600 (BST)		
Venue	Zoom		
Participant	NPPC	Ms. Karma Tshering (Chief of PPD) Ms. Kinlay Wangmo (Statistical Unit in PPD)	
	JICA Survey Team	Masashi TAKANO Kazuhiro TSUCHIDA Hajime KITA	

JICA Survey Team (hereinafter JST) confirmed the following:

- 1. Main Mandate of PPD and Concept Note
 - PPD has a mandate to facilitate and coordinate the programs in MoAF together with all the departments and agencies in MoAF, and the PPD needs an endorsement from Gross National Happiness Commission (GNHC) that treats the programs in all the Ministries in Bhutan.
 - The initial activity is to obtain approval for the support of the project activity from the GNHC and Ministry. Therefore, Mr. Karma requested the concept note of the project to appraise.

2. Answer of Questionnaire to PPD

- It will be formally answered after PPD obtains approval from the GNHC and the Ministry.
- 3. RNR Statistics Division
 - All the members in RNR Statistics Division have been moved to Agricultural Statistic Division in National Statisc Berau (hereinafter ASD-NSB) except for the staff in the statistics unit which moved to PPD.
- 4. Brief Note on Farm Road Atlas & Paddy Area Estimation
 - That information refers to many types of data such as administrative data, NLC data (National Road, land use, etc.), and google earth images by overlaying farm roads.
 - As for Paddy Area Estimation, technicians draw the paddy area using Google Earth Images, and the total area is compared to the result of the ground survey (annual sample survey).
 - The details of those systems can be obtained from the Agricultural Statistics Division in NSB.
 - PPD is using those data and additionally collecting local data to MODA system in 10 dzongkhags.
 - ASD-NSB is monitoring paddy crops using google earth images. But crop-wise monitoring is still impossible because the satellite system cannot identify the particular crop type from the mixed crop system. Terrain condition in Bhutan makes harder to utilize the satellite images for monitoring.
 - Sentinel-2A & 2B are applied for the crop monitoring (resolution:10m), which is not enough resolution considering the size of farmlands. Therefore, crop type-wise planted area is estimated through the field survey (face-to-face interviews).
 - All the paddy areas in Bhutan were already captured (mapped) by Satellite Images, but not for vegetable farmlands yet due to the reasons above.
 - This monitoring result is already reflected in the RNR statistics 2020, so the accuracy of the statistic data in paddy crops should significantly improve compared to the other years.

5. RNR Information Management System

- PPD is now working to develop the RNR information management system (all the information in the Ministry) called "Mobile Operational Data Acquisition (MODA)" platform funded by WFP and EU. In the Agricultural sector, the information collecting system is already prepared in 10 dzongkhags (and keep working for the rest of 10 dzongkhags). The data in the Livestock sector is one of the future works of PPD.
- MODA is an ongoing project with a target year to complete in 2023. The data platform is designed for the government officials (MoA, MADC, BAFRA, etc.) so far. After completion, the data may be utilized for the other systems (such as AMIS and Crop Advisory app)
- WFP initially develops MODA system, and now it is managed by only government officials without any IT background. But Ms. Kinlay Wangmo thinks IT background persons must be necessary for the government to maintain, upgrade, and fix the system after 2023.
- MODA contains much information which all the departments treat in MoAF such as water reservoir, land development status, land use, production, crop damage, other crop loss, irrigation, farm road, marketing information, greenhouse, input distribution like fertilizer, food production information, food amount for import, export, and auction, type and quantity of machinery, electric fencing, farmers group, etc.
- Ms. Kinlay Wangmo manages all the statistics data and does the extension work to teach how to input the data into the platform.

For	ms Sort by: Alphabetical ~		Show inactive (0)		Q	
	Agriculture infrastructure report (merged dataset)	96	🖹 Webform	⊘ Jul 23, 2021	🗐 (no records)	~	
	Crop loss and damage report (merged dataset)	1271	🗎 Webform	⊘ Jul 23, 2021	🗊 (no records)	~	
	crop production report (merged dataset)	0	🗎 Webform	⊙ Jul 23, 2021	🕑 (no records)	~	
	Cropcut report (merged dataset)	494	🖹 Webform	⊙ Jul 23, 2021	🗊 (no records)	~	
	Electric fencing installation report (merged dataset)	873	🖹 Webform	⊘ Jul 23, 2021	🔄 (no records)	~	
ed-dataset	V21584 machinery and equipment inventory	297	🗟 Webform	⊙ Jul 23, 2021	🗊 (no records)	~	

Available Data in MODA System



Example of Analysis Result (no. of Processing units by each Dzongkhags)

report

Location of farm road

Enter below details of the farmroad.

Select the type of reporting

	New farm	road o	onstruction	(2021	onwards)	
--	----------	--------	-------------	-------	----------	--

- O Maintenance of old farm road
- O Registration of old farm road (before 2021)

NOTE: Registration of new farmroad to be done only if the farmroad was constructed from 2021 onwards

Name of farm road	
*Dzongkhag	
none selected	•
*Gewog	
none selected	•

Example of Data Input Format (Farm Road)



Mr. Karma Tshering

Ms. Kinlay Wangmo

END

2

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	e-RNR	
Date	August 20, 2021 13:00-15:00 (BST)	
Venue	Zoom	
Participant	ICTD	Mr. Karma, Chief ICT Officer Mr. Tenzin Dendup, Dy. Chief ICT Officer Mr. Pema Gyeltshen, DY. Chief ICT Officer Mr. Tashi Tshering, Sr. ICT Officer Mr. Gayden Lhendup, ICT Officer Mr. Dawa Zangpo, Sr. ICT Officer
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Miki IMAI

JICA Survey Team (hereinafter JST) confirmed the following.

- 1. ICTD explained their responsibility and institutional structure with a meeting material in PPT. MOAF system management is undertaken by ICTD while every department is responsibility their contents respectively.
- 2. There are two main sections in ICTD; IT Section and Communications Section with 14 staff in total. Three small sections aliened under the IT section; Applications Section for developing apps, Infra & Support Section for making ICT environment such as Wifi network, and Planning & Governance Section. Under Communications Section, Publication Unit is for written outputs such as magazines, books and etc. while Audio Visual Unit is for audio outputs: video, audio, and etc.
- 3. Integrated Natural Resources Management Information System is basically for ministerial decisionmaking purpose mainly for the management of forest. Online Forestry Systemization of forest resources, is now under development.
- 4. E-RNR Extension and Advisoty System means Crop Advisory app, and now 4 crops are available to inform users of cultivatoin techniques. 2 more crops are being added sometimes.
- 5. Online payment system is a brand new system in Bhutan and the usage (accessibility to the system) should be more common. Online transaction can be integrated based on needs.
- 6. RNR helpline is not a call but an automatic guidance system called interactive voice response.
- 7. All historical parameters on climate are available in Agrometeorological Information Service, which enables providing advice on seeding or harvest timing based on meteorological and seasonal analysis.
- 8. Crop advisory app is 500 downloads as well as AMIS app.
- 9. Currently no donor funded project in ICTD, and ICTD requests for in-house capacity to develop the system of mobile apps and their content creation because those development tasks are usually ordered to companies in India. Technical assistance to use ICT to tackle the main issues in the Agricultural sector is also the ICTD's demand.
- 10. ICTD is to share the explanatory material in PPT and an interim report on the monitoring activity (mentioned in page 77 of E-RNR master plan) for E-RNR service, after the meeting.
- 11. No data on demand quantity is available while supply data is available. ICTD is currently developing a system to support organic agricultural products.
- 12. Digital divide is in Bhutan so digital related service should be universally designed; however, expected user of the system is currently an extension agency, not common farmers.
- 13. JST requested ICTD a long list for expected assistance from Japan for a discussion purpose only.

Objective	Marketing Policy for Agricultural Products	
Date	August 25, 2021 10:00-11:00 (BST)	
Venue	Zoom	
	DAMC	Ms. Kinlay Tshering
Participant	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Kazuhiro TSUCHIDA Hajime KITA Miki IMAI

JICA Survey Team (hereinafter JST):

- 1. Conducted a briefing on the study progress and the Expert's travel schedule, and Ms. Kinlay mentioned that maximum number of participants is 25 ppl for any face-to-face meeting in Bhutan according to the safe protocol. Also 14 days quarantine is applied even for local officers if they come from Red-Zone like Phuentsholing to attend a meeting;
- 2. Re-confirmed the coordination protocol for further information/data collection;
- 3. Inquired roles and responsibilities of the agencies, FMCL, STCBL and BEA.
- 4. FMCL is mainly in charge for providing machinery service. By using their machines they also have task to develop the lands where owners do not use and become fallow lands based on contract with owner. They produce crop and vegetables in the contracted land to fill domestic demands such as school and hospital feeding, and demands in winter. STCBL does not have much role because FCBL functions in agricultural sector. BEA is important stakeholders for exporting the major commodities, such as orange, apple, etc.
- 5. Noted that DAMC find the importance on incentive to farmer and on additional value on vegetable in order to expand marketing opportunity.
- 6. Found that Bhutan Government set an economic attaché at Kolkata, India and Dhaka, Bangladesh.
- 7. Confirmed DAMC is to share the contact information of FCBL, FMCL and BEA and the next meeting is scheduled on 8th of September.

Objective	Agriculture Land Development	
Date	30/08/2021 13:00-14:20 (JST), 10:00-11:20 (BTT)	
Venue	Zoom	
Participant	National Soil Service Center (NSSC), DOA, MOAF	Mr. Tashi Wangdi, Program Director, <u>twangdi@moaf.gov.bt</u>
	JICA Survey Team	Mr. Masashi Takano, Team Leader Mr. Kazuhiro Tsuchida, member

JICA Survey Team (hereinafter JST) confirmed the following.

1. Progress of the Fallow Land Bank Task Force

- The task force for Fallow Land Bank meets once every two weeks. The last task force meeting was held on August 18. Discussions have just started, and the specific concept of Fallow Land Bank has not been finalized yet.
- > The idea is to select 3 to 4 pilot districts (Dzongkhags) and conduct fallow land inventory and technical assessment.
- Future plans: Selection of pilot districts will be made at the next task force meeting (scheduled for September 2), and a workshop on the Fallow Land Bank concept will be held in early October. The target is to finalize the implementation plan by the end of this year.

2. Additional questions/concerns (continued from previous interview)

- > SLM/ALD implementation system, implementation plan and budget
 - ✓ NSSC's SLM/ALD projects are divided into two categories in the ALD Guidelines: Full Support and Technical Support Only. Full Support is implemented as a project of GCF and LDCF. Technical Support Only includes TA to Dzongkhags and other activities in the Annual Report. Even when NSSC only provides TA, it is often packaged with support from Dzongkhag and other agencies' budgets.
 - ✓ The Annual Work Plan & Budget (AWP&B) is prepared by each Dzongkhag and compiled by NSSC at the national level. With the recent shift of the administrative budget to the Dzongkhags, Dzongkhag has also become the key actor in the SLM/ALD projects. However, the level and accuracy of AWP&B varies from one Dzongkhag to another.
 - ✓ Mr. Tashi will share samples of AWP&B and a simple database (Excel table level) of ALD projects.
- > Feasibility Study of ALD project
 - ✓ According to ALD Guidelines (ALDG), ALD Committee is supposed to conduct F/S for each project requested by beneficiaries, but this is not actually done. Dewog level agriculture extension agent reviews the request and assists in obtaining Clearance Approval. The new guidelines will be revised in line with the actual situation.

- ✓ It is difficult to quantify the economic effects or impact of SLM/ALD projects, and JICA's technical support is expected.
- Cost details of ALD projects: Details are provided in the revised guidelines. <u>Mr. Tashi will</u> share the draft of the revised guidelines as reference material.
- Construction equipment: Two construction equipment are deployed in each Dzongkhag, and that equipment are belong to CMU. The cost of fuel, operator labour, etc. is paid from the Dzongkhag budget while CMU provides spare parts and maintenance.
- Relationship between FMCL's fallow land reversion activities and NSSC: When FMCL started its fallow land reversion activities, NSSC provided staff training on ALD. Since then, FMCL has been conducting its own activities and there is no linkage with NSSC's activities at present.

3. Idea development for preparing project long list

- > Model Farming Village Development Project proposed by the Team
 - ✓ The need for collaboration between the Model Farming Village Development Project and Fallow Land Bank was confirmed. Discussions on the details will continue.
 - ✓ <u>Requested that Mr. Tashi/NSSC's idea be added or modified to the Team's ideas for</u> <u>SLM/ALD interventions in the Model Farming Village Development Project. (Refer</u> <u>attached PPT)</u>
- > Other activities related to SLM/ALD for which Japan's support is expected.
 - ✓ NSSC's most a important issue nd most urgent request is support for construction equipment suitable for ALD (e.g., small and medium-sized construction equipment suitable for working on steep slopes), which is essential to promote physical development of SLM/ALD. Mr. Tashi will provide request for equipment list, specifications and pricing information.
 - ✓ Regarding the method of terrace construction on slopes and the use of machinery, Mr. Tashi would like to refer to examples in Vietnam.
 - ✓ Following above, it is necessary to promote the soft aspects of SLM (improvement of soil fertility, etc.), contribute to the entire value chain, and utilize ICT in SLM/ALD (establishment of the National Soil Database, soil fertility management using ICT technology at extension agents level, etc.).
- Mr. Tashi will organize his ideas on the project long list related to SLM/ALD and share with the Team.

4. Future Plan

The next meeting is scheduled for September 13, 13:00 JST. The expected topic is idea of the project long list.

Objective	Trading	
Date	August 31, 2021 10:00-11:15 (BST)	
Venue	Zoom	
Participant	Bhutan Exporters Association (BEA)	Mr. Tshering Yeshi
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Miki IMAI

JICA Survey Team (hereinafter JST) confirmed the following.

- 1. Role of BEA
 - BEA was established in 2003 mainly for agricultural product trade; however today BEA handles a series of products including industrial materials, and the exporting destinations are mainly India, Bangladesh and also other third countries such as EU, Hong Kong, and Japan.
 - BEA role is to narrow down the gap between the Government of Bhutan and the exporters, and to expand the exporter's network all over Bhutan and the world.
 - Under a collaboration with local farmers and DAMC, BEA sorts out potential agricultural products for global trade, which can be seen as a challenge for the agriculture promotion in Bhutan.
 - BEA experiences HR shortage; however the offices are located in all areas of Bhutan (south, east and west). BEA works together with local administrators and recently released the contact details of exporters for trade promotion. Capacity building for future HR is an imperative agenda.
- 2. Official procedures for export and import, and requirements to be an exporter
 - No official procedure for export (BEA is not responsible for import)
 - A trade license is required for an exporter. Once an exporter gets the license, he/she can be registered in BEA membership. Its registration is not mandate of exporter.
 - BEA members can obtain necessary information for export including an inspection undertaken BAFRA for the product certification
- 3. SOP (Standard Operating Procedure) for export for private exporters
 - No SOP
 - Under the COVID-19 pandemic, BEA sets a special measurement on the domestic transportation/logistics. A passenger (farmers, traders) from a low risk area with products are not allowed to come in in a high risk area in order to avoid an infection. So, the driver of the truck was changed at border between high risk area and low risk area and the truck bring products for export to India or Bangladesh.
- 4. Major challenges for agricultural product export
 - Dependency on India market and Indian labour in Bhutan. Recently, Indian government impose 38.8% of import duty on Bhutan's exporting apple, such as 35% of import duty and

3.8% of miscellaneous tax.

- Tariff barrier. Bangladesh exempts 30% of import duty on Bhutan exporting products; however, Bhutan Government imposes 30% tax on the exporting products.
- Technical barrier in logistics field such as roads, and cold storage facilities. During winter, Bhutan import potatoes from India, which Bhutan exported during summer due to their limited capacity for cold storage facilities. Apples in Nepal are originally from Bhutan via India. Since 2007, BEA has requested the Government of Bhutan to set a site for the trade inspection; however, it has not been achieved yet.
- BEA has the limited budget while FCBL gets allocated enough budget by the Government. FCBL charges 7.0 % for the auction facilitation fee (3.5% each on trader and foreign buyer). Bhutanese buyers get products from villages.
- Full organic is the world's demand today so Bhutan products should response to it. For that, certification meet with the international standard is necessary.
- Regarding orange export activities conducted in 2019-2020, BEA experienced a difficult time because the main labor force is Indians. The labor force got limited due to the pandemic, and the farmland owners had to pay double price of Indian labor force for Bhutanese workers. BEA was responsible for chartering a flight between Bangladesh and Bhutan to invite orange importers from Bangladesh.
- BEA wishes a better coordination among the stakeholders, the Ministries, local authorities, private sectors and etc.
- Vietnam and Thailand can also be Bhutanese exporting destinations.
- In order to promote export of agricultural products, Ministry of Agriculture and Dept. of Trade shall be coordinated.
- 5. The major agricultural product export season is a) potato: October December and b) orange: the end of November the end of February. The export season recently varies due to today's climate change.

END

Objective	Trading	
Date	September 1, 2021 10:00-11:30 (BST)	
Venue	Zoom	
Participant	Food Corporation of Bhutan Limited (FCBL)	Mr. Neten Wangchuk
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Miki IMAI

JICA Survey Team (hereinafter JST) confirmed the following.

- 1. Role of FCBL: FCBL is responsible:
 - To reserve mainly three essential food: rice, pulses, and oil with the adequate amount for 50% of total population in Bhutan in three month period.
 - To trade essential food and fast moving commodities such as daily products, processed foods, sugar, salt, oil, rice and etc. mainly imported from India. This is needed to stabilize commodity price in Bhutan domestic market where a price regulatory is not set.
 - FCBL receives the subsidy from the governments to maintain the stock, and to stabilize the price of three essential food during COVID-19, and stabilizing the prices of other 16 commodities were mandated by FCBL and other private companies.
 - To facilitate an auction organized at four different locations for agricultural products such as potato and vegetables as cabbage, cauliflower, bean, and spices as chili, cardamom and ginger. FCBL has been initiated the auction service for the last 40 years, and the auction is usually open from May until the end of November. Farmers should bring own product to the auction site, so they usually procure a transport service called "trackers" to deliver their products to the auction yard. During winter season, private retailers and venders (not FCBL) import the vegetables because there is no vegetable in Bhutan.
 - FCBL does not intervene domestic market so much. To undertake Buy-Back system, purchasing agricultural product in higher price and sell it in cheaper market price when the market gets less resilient. Normally, private retailers/vendors, on their own, run trading business.
 - For Quinoa branding/marketing since 2015, upon the guidance of the majesty, in order for improving the nutritious condition in Bhutan (not for export according to FCBL). Processed quinoa is produced in much cheaper price in India.
 - To manage Farm Shop whose responsibility is i) supplying farming inputs (seeds, tools, animal feeds and etc. fertilizer is not allowed to sell), ii) selling major essential commodities, and iii) collecting/buying agricultural products when there is huge productions, for providing those in rural areas equal opportunity to access market. This activity costs a lot; however it has a big social impact. FCBL aims to encourage the agriculture in rural area for establishing rural enterprises in the future.
 - To maintain systems for digital auction and grading system only eligible for potato, launched in 2016. Most of the digital auction are managed in Phunteling now. They plan to set such digital auction site, where installed grading system, at north parts in Bhutan. FCBL seeks to

collaborate with the stock exchange system as the coffee produced in the Republic of Ethiopia experienced with Starbucks Coffee. FCBL tried this by potatoes with grading system but other countries do not show much interest so far, although the amount of auction volume is increasing year by year.

- Farmers' Online Market system was also launched in 2020 as corresponding measures for COVID-19 situation. It is simple APP to sell and to buy the products. However, it is not active now may be caused that farmers' knowledge and IT-skill are not reached at that level.
- 2. FCBL Strategic Business Plan / Global Marketing Strategy
 - From political aspect, the government should allocate more budget on agricultural sector because only 2.5% of the total budget for the five year national development plan is currently allocated for agriculture.
 - From technical aspect, Bhutan should consider the farming method. FCBL can think of i) conventional farming, ii) organic farming, and iii) urbanized farming. Through these farming methods, it is important to create localized production/marketing system. Capitalizing and enhancing the marketing system by digital technology is the main strategy in a long run.
 - For marketing, it is necessary to link up with commercial farmers, to encourage them to process minor cereals (post-harvest treatment), and to enter into the external market (beyond India, Bangladesh and Nepal).
- 3. Challenges on Food Security and Marketing Agricultural Products
 - B to B relationship, not only between corporate and corporate relationship but also between farmer and farmer relationship, may work towards achieving food security in Bhutan.
 - It is imperative to set up cold storage facilities for further marketing agricultural products. The Government and FCBL have undertaken activities to establish cold storage facilities mainly for supplying schools, but not limited to (including trading purpose). Three cold storages are established, two are starting construction sooner.
 - Bhutan needs to increase production together with securing Bhutan brand for both food security and marketing since today's amount cannot respond to Indian demand.
 - It needs to develop standard and certification system on the agricultural products in order to meet the requirement for international market, such as organic products.

Objective	Japan Contribution to Bhutan Agriculture	
Date	September 2, 2021 10:00-11:00 (BST)	
Venue	Zoom	
I Participant J	DAMC	Mr. Wangda Dukpa: Acting Director Mr. Namgay Thinley: Chief Agriculture and Production Officer
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI

At the beginning of the meeting, Mr. TAKANO made a briefing on the purpose and scope of the study to Mr. Wangda and Mr. Namagay.

- DOA named the following issues as major challenges faced by farmers in Bhutan in productions:

 Poor or shortage of irrigation facilities; 2) Shortage in labour force; 3) Human and wild animal conflicts; 4) Geographical characteristics (Steep slopes) that prevents mechanization; 5) Low productivity due to poor farming skills and technologies; and 6) Low application of ICT. The annual reports of DOA will be shared later.
- 2. DOA has been implementing the School Agriculture Program with the budget of the Royal Government of Bhutan so that students learn farming skills. The best 3 schools will be awarded on October 14. DAMC has been taking the lead of the School and Hospital Feeding Program, which is also funded by the Royal Government of Bhutan
- 3. The 2014 Food and Nutrition Security Policy is primordial among legislations, policies and strategies for the nutrition sector, and it states that Ministry of Health is in charge of nutrition in Bhutan ,while MOAF is in charge of the food security. The Research Strategy will be shared later.
- 4. The National Nutrition Task Force has been put in place, in which the Chief Agriculture and Production Office takes part. It is a multisectoral task force at the operational level, led by the Director of Public Health. A document which tells the positioning of task force will be shared.
- 5. Dr. TAKANO made a presentation on the Basic Act on Food and Nutrition Education in Japan. The note on the same Act will be later shared by the JICA Study Team to DOA for consideration.

END

Objective	Agricultural Machinery Service and Commercial/Contract Farming		
Date	03/09/2021 13:00-12	03/09/2021 13:00-14:30 (JST), 10:00-11:10 (BTT)	
Venue	Zoom		
	FMCL (Farm Machinery Corporation Limited)	Mr. Karma Thinley, CEO	
Participant		Mr. Hideki Hiroshige, Deputy Team Leader	
	JICA Survey Team	Mr. Kazuhiro Tsuchida, member	
		Mr. Hajime Kita, member	
	Observer	Ms. Sayuri Teramoto (JICA expert)	

JICA Survey Team (hereinafter JST) confirmed the following.

1. Mandate of FMCL-1 : Hiring of farm machinery to farmers throughout the country

80% of the machines using hiring services is Japanese agricultural machines, such as Yammer, Kubota, Mitsubishi and etc., granted by Government of Japan. Farmers can use the machines with affordable price because Government of Bhutan subsided the price. FMCL proposed to the Government about the service price with considering costs of machine maintenance and renewal. On the other hand, the DoA in the Ministry determined the service price which is affordable for the farmer. The gap between two prices are filled by subsidies by the Government. Currently farmers pay around 45% to 50% of total cost.

2. Mandate of FMCL-2 &3 : Sales of farm machinery, spare parts and repair and maintenance of machines

- FMCL sold machines mainly Japanese products and some from India or Thailand. FMCL maintenance service cover with own service centre, farmer can come to the centre or FMCL mechanics visit farmers' place for repair the machine. Even the machine were not sold by FMCL, FMCL maintains machines as possible as they can.
- Number of service centre are provided in written document

3. Mandate of FMCL-4 : Sales of Petrol oil and lubricant (POL) and other

• Because of remote area, FMCL service centre also handle fuel for operation of machines.

4. Commercial /Contract Farming

- Commercial farming: Large scale farms are limited in Bhutan. Government obtain some areas in the Governmental area for FMCL to develop commercial farming area. Currently, FMCL made land development on the field and FMCL's staff is cultivating the area. It is expected that these are will be leased to farming cooperative or private company for long-term to make commercial farming.
- The Commercial farm is expected to be developed one for each Dzongkhag and to be core for machinery service. Mr. Kamara has idea that the commercial farm will be an aggregator like Japanese JA model, such as core organization will provide service for surrounding farmers for production technology, marketing, and

financing, would be applied for the commercial farming model.

- Contract farming: There are small scatted fallow land in urban area. The concept is that FMCL makes lease contract with land owner of these fallow land and conduct land development on these land. However, it is not progressed so much, because there is concerns that the land development will be meaning less even if FMCL develop the land, the owner will use the land for other purpose after finishing the lease for several years.
- Moreover, fallow lands in Buhtan is not able to consolidate with current laws and acts. So that, Land-bank concept is starred to discuss.

5. Other topics

- FMCL is mandated to develop the value chain but it is still in enfant stage. Processing of agricultural products is important and processing plants are needed to be developed in Bhutan. ODA loan should be used to develop such processing unit. It is also machinery service.
- It can be expected that using Drone is useful. But due to lack of relative laws to supervise its usage in Bhutan, it is not applicable now.
- With regards to production of bio-fertiliser, FMCL established such facilities.

END

寺本様との協議メモ

- ➢ FMCLは JICA 技プロを実施しており、日本が機材提供したテーラーのアタッチメントを 開発して、現在、FMCL がそれらのアタッチメントを生産、販売している。
- ▶ ティンプーパロ間以外の場所に行く場合は、ルートパーミットが必要になるので、事前に申請すること。JICA事務所と良く相談して。
- ▶ 山岳地帯なので、農業機械入れるところ少ない。石が多く土が硬いという特徴がある。
- ▶ テーラートラクターなど政府が農家に無償で配った。それをもらえなかった人が FMCL のサービスを利用する。
- みどの農家が脱穀を手でやっている。脱穀機や唐箕なども手に入らないわけではないが、農家は、よく壊れるからといって、余り使わない。一方で、各農家は電動の中国式の籾摺・精米機を持っていて、それを使って精米している。
- 農家はあまり働きたくない。お金は汚いものというイメージもある。宗教的な儀式で忙しく、できるだけ手間を掛けたくない。自分で食べるもの以上を作るインセンティブが弱い。足りなくてもインドが供給してくれる。
- ブータンは明るい社会主義。国による社会サービスが多い。ただし、公務員なので真面 目だけど働きは良くない。
- 南部国境沿いのレッドゾーンは立ち入り禁止。モンガルは、おそらく問題ない。チーズ、ビール工場などある。

Objective	Japan Contribution to Bhutan Agriculture	
Date	September 15, 2021 10:00-11:00 (BST)	
Venue	Zoom	
Participant	DAMC	Ms. Kinlay Tshering Mr. Dawa Tshering Mr. Mekh Bdr. Chhetri
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Kazuhiro TSUCHIDA Miki IMAI Hiroko YASHIKI

- 1. Prior to the meeting, DAMC shared a list of "Support solicited from JICA Project" with JICA Survey Team (hereinafter "JST"). JST confirmed the following.
- 2. For the upcoming field trip, DAMC recommended JST directly contact and coordinate with PPD. DAMC will support PPD (Policy and Planning Division) regarding VISA and the working approval, and PPD is also responsible for arranging Liaison staffs for JST during the field survey.
- 3. DAMC finds the idea of "Model Agricultural Land" since it matched with the concept DAMC introduces in their strategy paper, which is called Agriculture Economic Hub.
- 4. The scope of ICT in the field of agricultural sector, DAMC is not sure its possible application; however, DAMC have launched an application software to manage price, quantity, and harvest time, of the agricultural products.
- 5. As part of the on-going EU-Bhutan Trade Support Project, the International Trade Centre (ITC) has undertaken a research on possible trade items as known as high value commodity to export to the EU member countries, so ITC can be a good contact for JST for further clarification. DAMC expects JST to contact PPD so that future support from JICA could compliment the EU-Bhutan Project mentioned above.
- 6. For nutrition agenda, the School and Hospital Feeding Program is being implemented under a collaboration between the Department of Education and DAMC. DAMC is not in the position for assess the possibility for the estsblishment of the Basic Act on Food and Nutrition Education. The Ministry of Health is in a right position.
- 7. DAMC reminded JST team that there is no hierarchy (priority order) among the items listed in "Support solicited from JICA Project", and JST can review and comment the list. DAMC will refer a contact person in BAFRA, as BAFRA is one of the stakeholders for the improvement of certificate system for exportation.

END
ブータン国

COVID-19下・後の農業振興情報収集・確認調査

目的	今後の調査実施方針に関する打合せ		
日時	2021年9月24日12	2021年9月24日12:00-13:30	
会場	Zoom		
	JICA ブータン事務所	工藤 淳 田中 真理子	
出席者 (敬称略)	調査団	高野 正志 弘重 秀樹 北 基 矢敷 裕子 今井 美樹	

今後の調査実施方針について、以下のとおり確認した。

- 戦略的な対ブータン協力を推進していく上では、調査団側から示された4点の考えを加味しな がら検討を進めていくことに合意。
- 本業務の直接的な成果として、本業務での協力案が、ブータン側で作成される来年度要望調査に反映されることがある。
- 一度の現地セミナーでブータン側の意見を聴取・とりまとめを行うことは困難であることから、現 地調査中のブータン側との面談で、日本側の考えを打ち込んでいくことが肝要。

市場アクセス改善

- 国別研修(期間:3年)でSHEP及び課題別研修(アグリビジネス振興)を実施中。本業務で提案 するモデル農村開発の中では、両研修との棲み分け、協働可能性について検討する必要があ る。
- 農業組合や農協に関し、ブータンの農業組合の定義は広く、課題の明確化と併せて、ブータン 側の理解を深めていくことが必要。
- 他課題(認証制度、ポストハーベスト等)に関し、ブータン側は取り組みを開始・実施しているところであるが、プロジェクトの維持管理・運営がうまくいっていない印象。人材・システム能力強化が喫緊の課題であると推察する。
- ヘーゼルナッツの流通会社が大量解雇を実施した。現地調査時に訪問する。
- 第12次5か年計画、オーガニック・ブータンとの成果にどのようにつなげられるか見えたらいい。
- 調査団から JICA に対し、Ms. Kinlay のロングリストを共有する。

持続的土地利用

- 耕作放棄地が発生する根本的原因(都市移動による人口減少、灌漑、野生生物)を考慮しなが ら検討を進めていく必要がある。
- 若者の雇用促進(デセップ?、ギャルソンプロジェクト)という国家目標とマッチした対応策が提 案できるとよい。
- 機材供与に関し、日本は過去にCMUに対し無償資金協力の枠組みで機材供与を実施している。これと重複する機材供与は難しいが、ブータン側の要望を踏まえて検討・精査する。

ICT 活用

- ブータン側の取り組みを踏まえて提案いただきたい。また、病害虫アプリは立ち上げ時期は勢いがよかったが、継続的な情報発信がないために、フェードアウトしたことがあるため、持続可能性に留意すること。
- ICT 人材の育成については、政府職員(データマネジメント、システム運営)/民間(アプリ開発 等)で分けて考えること。
- JICAから調査団に対し、ファボラボ・プロジェクトについて情報共有する。

栄養

• 昨年度から南アジアを対象として栄養セクターの課題別研修を開始しており、マルチセクターの調整は重要。

現地調査

- 10月19日(火)午後に隔離期間が終了するため、アポ取りはその翌日からとする。
- 隔離施設の申し込みについて、PPD に相談する。パロの施設はインターネット状況が悪いため、 ティンプーの施設の方が良い。バックアップのインターネット(現地 SIM、モバイル Wi-Fi 等)を 準備した方がよい。

以上

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Agriculture Land Development	
Date	28/09/2021 13:00-14:20 (JST), 10:00-11:20 (BTT)	
Venue	Zoom	
	National Soil Service Center (NSSC), DOA, MOAF	Mr. Tashi Wangdi, Program Director, <u>twangdi@moaf.gov.bt</u>
Participant	JICA Survey Team	Mr. Masashi Takano, Team Leader Mr. Kazuhiro Tsuchida, member Mr. Hideki HIROSHIGE Ms. Hiroko YASHIKI

JICA Survey Team (hereinafter the Team) confirmed the following.

1. Sharing information on the survey schedule

• Information on the current travel schedule of the survey team (departure from Japan on October 3) was shared. An appointment with NSSC was set on October 21 AM. It was explained that the departure schedule may be delayed depending on the status of visa acquisition.

2. Fallow Land Bank Task Force

- The members of the Fallow Land Bank Task Force are from MOAF and the National Land Commission Secretariat. Mr. Tashi is chairing the meeting and he is the right person to interview during the field survey on Fallow Land Bank.
- 4 Dzongkhags, Trongsa (central), Trashigang (east), Tsirang (south) and Wndue (west), were selected as pilot districts of FLB. Currently, Task Force is selecting 5 to 6 target Geoks from each Dzongkhag.
- The workshop on the concept framework of FLB, which was scheduled for early October, was postponed to the third or fourth week of October.

3. Site visiting

- In response to the survey team's request, Mr. Tashi recommended candidate sites for field visits on fallow land reversion and SLM/ALD activities.
 - Trongsa: Trongsa is the best place to visit because of its active SLM/ALD and fallow land reversion. Bumuthang has a good track record in fallow land reversion, but not so much in terrace construction.
 - 2) Punaka: Punaka is suitable as a site visit for SLM/ALD in a district that is relatively close to a major city, and it is possible to make a day trip from Thinpu.
 - 3) Near Thimpu: A candidate to visit the combination of fallow land reversion and urban agriculture. APD will be the contact person for urban agriculture
- Mr. Tashi will arrange the meeting with person in charge in each Dzongkhag according to the Team's request. Based on Mr. Tashi's recommendation, the Team reviews the field trip schedule and consult with him again.

4. Possible SLM activities for consideration by JICA (Long List)

- Mr. Tashi submitted a list of activities expected of Japan's support related to SLM/ALD. (Attached at end)
- Mr. Takano explained that it would be difficult to build facilities and provide equipment through new grant aid project in Bhutan currently, and that it would most likely consist of technical cooperation projects, dispatch of experts, and dispatch of volunteers.
- As for the candidate sites for the Model Farming Village Project proposed by the Team, Mr. Tashi suggested that it would be desirable to select several sites from all over the country, taking into consideration the characteristics of each region, although it was difficult to name specific candidate sites. Since collaboration with FLB is also important, it may be possible to select some of the pilot districts of the FLB. Physical access to the market should also be considered in order to show the successful model.
- In the case of fallow land reversion, it is important to make an inventory of fallow land and to precisely assess which land is feasible to be reused and to develop an implementation plan.
- It was decided to continue the discussion by integrating and organizing the ideas from the NSSC long list and the Team.

List of possible SLM activities for consideration by JICA

- Machinery support to be used for agriculture land development, i.e. terracing on steep slopes. The current machines available with Central Machinery Unit (CMU) through grant aid from Japan are too huge and too risky to be used in terracing on steep slopes. Therefore, it would be of great benefit if JICA could support with the provision of appropriate size machines for agriculture land development. The specification of medium size machine is enclosed for reference.
- ICT in sustainable land management development of national soil database, sensor based soil nutrient assessment and application,
- Capacity building of extension supervisors, regional soil focals and the NSSC staff on precision agriculture with special focus on nutrient assessment and application
- Support to model farming village development, considering soil health as the basis and foundation of agriculture production
- Support to field equipments for soil survey, soil fertility assessment and soil biodiversity assessment.
- Laboratory equipment support for soil microbiology laboratory which is under construction. This lab will be the only microbiology lab in the country to isolate and culture soil microbes for different uses – e.g. in bio-fertilizer manufacturing.
- TA on assessing and profiling Bhutanese soil biodiversity. Currently, no soil biodiversity assessment is done due to lack of HR and technical expertise. Therefore, the current status of Bhutanese soil biodiversity is unknown.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	To understand the roles of MOH in the Nutrition Sector	
Date	September 29, 2021 10:00-11:20 (BST)	
Venue	Zoom	
	Nutrition Program, Department of Public Health Ministry of Health	Mr. Hari Prasad Pokhrel, Senior Program Officer / Nutritionist
Participant	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI

- 1. The School Feeding Program is led by the Ministry of Education (MoE) and the coverage is being expanded. The School Feeding Technical Committee (SFTC) is put into place led by MoE, and among others, MOAF, MoH, FCBL and WFP take part in it. Perishable foods are procured by schools, while non-perishable foods are procured y FCBL. The number of meals per day is determined by the type of school: day school, boarding school, etc.
- 2. The pilot of PLUS (the menu optimization application) just started in 2 Districts in August 2021, and a gradual expansion of the pilot districts is planned.
- 3. Rice and Oil for the School Feeding Program are fortified. The fortified food are imported from India (MOAF is in charge of food fortification.).
- 4. The National Nutrition Task Force (NNTF) is recently established led by the Director of Public Health, MoH, and the first meeting was held early September 2021 (The next meeting is planned for December). As development partners, WHO, UNICEF and WFP participate in it. There are some overlaps in the functions between SFTC and NNTF.
- 5. The Nutrition Program is manned with 2 staff. It sees the need for a nationwide micronutrient deficiency survey since the regional disparity worries the Nutrition Program. It is expected to have such a survey in 2022. The major target populations of the Nutrition Program are children under 5 years old and pregnant and lactating women for now, and the distribution of micronutrient supplement for the target populations is ongoing (the coverage is almost 100%), in collaboration with partners.
- 6. Currently Social and Behavioral Change Communication in Nutrition is done by each government agencies without any coordination and unification of messages.

Bhutan
Data Collection Survey for Agriculture with and post COVID-19

Objective	To learn what support WFP provides in the Agriculture and Nutrition Sector in Bhutan	
Date	October 6, 2021 14:00-16:00 (BST)	
Venue	Zoom	
Participant	WFP JICA	Svante HELMS Kencho WANGMO Phuntsho WANGMO Temmy TANUBRATA Udaya SHARMA Jun KUDO
	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Miki IMAI

- 1. Self-introduction by each of the participants
- 2. A brief explanation of the survey scope by Mr. TAKANO
- 3. Overview of the WFP support in Bhutan by Mr. HELMS
- 70% of the COVID-19 Recovery Package flew into the Agriculture sector, and it contributed to an increase of production. However, due to poor access to markets, some produce has not reached markets.
- Challenges in the Agriculture sector of Bhutan are: heavily dependent on imported food; not secured sovereignty in food (too much influence from India); poor availability of comprehensive and reliable data; poor coordination among stakeholders; wildlife-human conflicts; increase in malnutrition cases due to elevated food prices as impact of COVID-19; among others.
- WFP is enhancing the coordination among stakeholders to improve food systems and encouraged the Food System Summit Dialogue within Bhutan.
- The development partners for the Agriculture sector meet every 3 months under the coordination of WFP, and the mapping of actors (who does what, where) has been done.
- The Royal Government of Bhutan recently adopted 9 pathways to improve the food systems.
- The demand to locally produced food has been rising.
- WFP Bhutan is working on the 3 areas: D (Climate Smart Agriculture and Disaster management); N (Nutrition); and A (Agriculture).
- WFP has been engaged in the development of the National SBCC Strategies with other stakeholders such as MOE, MOH and MOAF.
- So far the School children are the major target of the activities in the Nutrition Sector, including SBCC.
- PLUS is promising to provide nutritious menu made from locally produced food to school children at a cheaper cost. (It contributed to reduce the costs of ingredients by 20%. As there is no food composition table for Bhutan, the food composition tables of India and Bangradesh are utilized for PLUS. The food price data are provided by MOAF and the Bhutan Statistic Bureau. District Dietitians assigned to the District Hospital use this PLUS to decide the menu for school children).

- Since the government policy for school food procurement has changed recently and only the local farmer groups and cooperatives are eligible for procurement, cost optimization function of PLUS tool is now limited.
- 4. Presentation on the WFP's support in the Nutrition Sector
- WFP has been working in Bhutan since 1974, and strategically had been operating the School Feeding up to 2018. After the School Feeding program was totally handed over to the Royal Government of Bhutan in 2018 (75% of all the schools and 60% of all the school going children were covered then), WFP has shifted its positions/ profile to facilitator or strategic partner to the Royal Government of Bhutan.
- Bhutanese people are suffering from the triple burden in nutrition: stunting; deficiency in micronutrients (anemia); and obesity.
- WFP is supporting in 3 sub-sectors in the Nutrition Sector: School Nutrition; Food fortification and Healthy Diet (SBCC).
- As part of its support to the School Nutrition Program, WFP has provided a plan of school kitchen (having electricity as cooking heat) and stores. In addition, a changing room for cooks is promoted.
- For the monitoring of the School Feeding, the data are integrated into MODA. The major challenge in the School Feeding Program has been poor diversification in ingredients. However, a study tells that the meal diversity score has been improved in the last 2 months,
- The regulations for food fortification were put into place. The monastic facilities are planned to benefit from fortified rice and oil gradually. MOE is committed USD 2.25 million/ 3 years.
- With the program of Healthy Diets, the school children remain the main target, but other Bhutanese are also targeted to change their eating behavior, through Edutainment and Edutrition, etc. with fun. For this program WFP also works closely with other actors, including the Healthy Drukyul Campain of the Prime Minister.
- WFP is the only development partner taking part in the School Feeding Technical Committee, led by MOE.

Mr. HELMS proposed to discuss Agriculture separately in the 2nd meeting and all other members agreed with him.

Objective	Confirmation for meeting request protocol		
Date	October 13, 2021 10	October 13, 2021 10:00-10:40 (BST)	
Venue	Zoom		
	PPD, MOAF	Sonam Euden	
Participant	ЛСА	Jun KUDO	
	JICA Survey Team (JST)	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Miki IMAI	

PPD and JST confirmed the following.

- 1. A letter should be issued from PPD to interviewees when the interviewee is the governmental/public institution including universities. When it is private, JST may directly contact them. In this regard, JST is requested to prepare a draft letter and an expected interviewee list.
- 2. JST may start coordinating with the expected interviewees including public sector when JST already knows the contact person; however, JST should inform PPD in a timely manner.
- 3. Regarding the seminar schedule on November 18th, PPD is to coordinate the participants while JST is to coordinate the venue. JST may proceed to make the venue reservation without PPD approval.
- 4. PPD is to hold an internal meeting to discuss about who will accompany with JST for the suburban area trip.
- 5. PPD is to update the status of the experts' VISA effective period.

Objective	WFP Notes on RNR Marketing Strategy	
Date	October 13, 2021 14:00-15:15 (BST)	
Venue	Zoom	
	WFP	Binai Lama
Participant	JICA	Jun KUDO
	JICA Survey Team (JST)	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Miki IMAI Kazuhiro TSUCHIDA

JST confirmed the following.

- 1. Since 2019, WFP launched assistance to agricultural sector. Until 2010, Bhutan produced commodities just for self-sufficiency and food exchange with neighbor; however for the last 10 years, Bhutan pay attention to commercialization. So, the farmers have not been changed so much. Most of their mentalities are still subsistence level.
- 2. There is no demand data by region so one cannot prepare a good marketing strategy and/or a value chain, which leads farmer's low engagement in to making profits with agricultural products. WFP has engaged in assistance for local market development through capacity development activities for farmers' cooperatives. They make linkage between farmers organization and school feeding, so the school is tangible market in the small community. However, there are many agendas to attend to value chain, such as cold-chain, packaging, logistics, and processing. Standardizing commodity quality is crucial.
- 3. MODA platform is mainly for comprehensive administrative information in agricultural sector and basically used not by farmers but by the government officials. WFP believe that the idea of merging MODA and AMIS will effectively work when all of the market segments will be integrated in the merged platform.
- 4. With regards the production, there were so many supports had been provided by many donors, like UN, FAO, etc. Then farmers productivities are increased enough for consumption. But there is not clear strategy about marketing for farmers.
- 5. Major constrain of farmers is a shortage in a) commercial opportunity only the western area is commercial, b) infrastructure, and c) aggregators. The Covid-19 pandemic remind the people of Bhutan of the importance of domestic production. It is imperative to support farmer cooperative to produce "natural aggregator".
- 6. Price affordability for farmers to purchase equipment and material for climate smart agriculture and green technologies is fair. In the past, the government make the lease 100% free but today there is cost-sharing system. Producing a domestic material is one of the key but it is still a long way to go.
- 7. Regarding IT literacy, farmers are not very familiar with IT and there is no educational activity to make them familiar although some government agencies in the Ministry of Information and Technology and some private companies took the capacity building on IT skills. Mr. Binai agrees that so far Indian IT companies took IT related projects in Bhutan due to their rich experiences, but

believes the situation will improve in the future.

8. WFP is to share their "Donor Map" later.

Objective	To understand better the School Feeding Program	
Date	October 14, 2021, 13:00-14:30 (BST)	
Venue	Zoom	
	DAMC	Mr. Yonten Gyamtsho
Participant	JICA Survey Team	Masashi TAKANO Hideki HIROSHIGE Hiroko YASHIKI Miki IMAI

JICA Survey Team (hereinafter JST) confirmed the following.

- Until 2019, school children had school meals with cheap food imported from Bangladesh and India, which tended to be contaminated with residue of chemical fertilizers and demonstrated nutritional/ health problems. On the other hand, there were farmers with surplus in their produce since their prices were relatively high in markets. The Government wanted to address the situation, to promote school feeding with locally produced food and conceptualized the School and Hospital Feeding Program (SHFP). To make it possible the amount of student stipend was increased.
- SHFP has prioritized schools to hospitals and have already reached to more than 300 schools. SHFP aims to reach the remaining more than 200 schools. Once the schools are fed, the system will be applied to hospitals, too.
- SHFP are collaborating with different actors to provide students with meals.

	Institutions/	Roles
	Organizations	
1	SHFP/DAMC/MOAF	• In coordination with SHND, Dzongkhag Government and Schools,
		negotiate with suppliers.
		Supervise the program
2	SHND/DOSE/MOE	• In coordination with Dzongkhag Government, identify schools which
		need school feeding, and facilitate schools to fulfil the requirements.
		• Distribute the student stipend to each school in consultation with the
		Dzongkhag Government
		Supervise the program
3	Dzongkhag	• To identify schools and cooperatives/ farmer groups that will be
	Government	beneficiaries of the school feeding program
		• Distribute the student stipend to each school in consultation with MOE
		Supervise the program
4	Cooperatives/	• To provide the schools with their produce in accordance with the contract
	Farmer Groups	agreement signed by them and the schools
5	BCDCL	To provide the schools with animal source food
6	FMCL	• To provide the schools with those produce which are not produced
		locally
7	FCBL	• To provide the schools with non-perishable commodities such as rice,
		oil and salt.
8	BAFRA	• To inspect the quality of food to be utilized in the school feeding.



- SHND of MOE identify schools to be targeted. A meeting is held at the targeted school with SHND, SHFP, Dzongkhag Government, Cooperatives/Farmer groups short listed by Dzongkhag Government, BCDCL, FMCL, and FCBL. The school should have prepared the demand list for food commodities with required volume and proposed prices for the coming school year, while the Dzongkhag Government shortlist potential cooperatives and farmer groups as suppliers, prior to the meeting. In consultation with the demand list provided by the school, SHFP negotiate with the suppliers for the school to meet their demand, in terms of the variety of commodities, volume, the timing of provision, prices, and the place of handing-over. Once the negotiation is done, each supplier signs a contractual agreement for a school year that states the same (the variety of commodities, agreed volume, agreed timing of provision, prices, and the place of provision, prices, and the place of handing-over, etc.).
- Currently, almost 10 to 11 commodities out of almost 20 commodities were supplied by local cooperatives/ farmer groups (C/FG). The commodities which cannot be supplied by local FG/C, are negotiated by SHFP with FMCL (potatoes, beans, etc.), BCDCL (dairy foods, meats, etc.), and FCBL (rice, oil, salt, etc.) to supply.
- There were C/FGs that failed to meet the contractual agreement by selling their produces to other markets with higher prices. However, the number of such C/FGs has been decreasing. DAMC can provide C/FGs with support, such as containers, sacks, freezers, transportation subsidy, etc. in order to facilitate them to meet the contractual agreement.
- Schools are spread over the country, and those FGs whose base is near any school could benefit from the School Feeding Program. One FG could meet the demand of 2 to 3 schools or could not meet the demand of even a school. It depends on the case.
- The costs of school meals are covered by the Government in a form of student stipend to each school through the Dzongkhag Government.
- Rudimentary packaging, high transportation costs and limited processing facilities are major problems for C/FGs in access to markets. Technology of digital marketing may be required.

Objective	To understand better the School Feeding Program	
Date	October 18, 2021, 9:00-10:30 (BST)	
Venue	Zoom	
Participant	JICA Survey Team	 Mr. Karma Wangchuk, Chief, School Health and Nutrition Division, Department of School Education, MoE Mr. Dezang Dorji, School Agriculture Program Mr. Kinzang Loday, School Feeding Mr. Sangay Tenzin, School Feeding Ms. Kunzang Deki, Nutritionist Masashi TAKANO Hideki HIROSHIGE Hiroko YASHIKI

JICA Survey Team (hereinafter JST) confirmed the following.

- The School Health and Nutrition Division (SHND), Department of School Education, Ministry of Education oversees the School Nutrition Program which is composed of: the School Agriculture Program (SAP), the School Feeding Program, the School Health Program, the School WASH (Water, Sanitation and Hygiene) Program and some advocacy works.
- The priority of SHND for external support is on: 1. SAP with mechanization; 2. Construction or rehabilitation of storage facility at schools; 3. SBCC.
- Currently more than 300 schools all over the country are engaged in SAP. It is already incorporated
 into the syllabus of the students under 8 grades. SAP is important for food security of future Bhutan.
 Under SAP, students learn how to cultivate crops. Currently they are practicing farming at schools
 with those farming tools such as spades. If mechanized farming could be shown in SAP, more youth
 will be engaged in farming in future, otherwise, we cannot stop the reduction in farming populations.
- The School Feeding Program covers 1,500 schools out of which SHND (MoE) covers 500-600 schools in rural areas. 4 municipalities of Bhutan, namely, Thimphu, Phuntsholing, Samdrup Jongkhar and Geleph are not eligible for the program.
- First, MoE approves those schools to be added to the School Feeding Program. Second, the Dzongkhag Office in charge informs the approved schools. The procurement of food by MoAF will come later.
- The menu of the School Feeding is determined by nutritionists of MoE, MoH and Hospitals. Before the application of PLUS, all the tasks were done manually. Currently in the 3 districts, PLUS is applied on a pilot basis. Cooks are also trained.
- The preparation of the SBCC Strategy started with support from WFP and suspended due to the COVID 19 pandemic. However, the Annual Work Plan was signed between WFP and MoE, and the task force members were assigned to restart the work.
- The outcome of the School Feeding has not yet been evaluated properly, although MoE has collected some data.
- In the Eastern, markets are limited and therefore, more farmer groups/ cooperatives participate in the School Feeding Program to secure necessary volume of food. Meanwhile in the Western, there are different market options, and it is not easy to have farmer groups/ cooperatives as supplier to the schools.
- The storage facilities at schools are obsolete and not functioning properly, being constructed in the 70s, 80s or 90s. Food kept there tend to be damaged and lost. With support from WFP, the facilities

are being gradually constructed/ rehabilitated.

- UNICEF, SNV and Save the Children are supporting the School WASH Program.
- For the school visits to Trongsa of YASHIKI, SHND will appoint one of their officers to accompany.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Role of BAFRA on Certification for Export	
Date	October 21, 2021 10:30-11:50 (BST)	
Venue	Zoom	
	BAFRA	Mr. Sonam Yonten
Participant	JICA Survey Team (JST)	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI

JST confirmed the following.

- BAFRA is certification body for export agricultural products, including livestock products. BAFRA has ISO17065 Food producing and processing since 2018. BAFRA also got accreditation on "Organic and Bhutan GAP" certification from accreditation body based in India, they are voluntary certifications. However, Bhutan's organic products is not yet able to export as "organic products" for India and other countries. Because every countries has own standard and Bhutan is not capable to satisfied them. Need certification body accredited by each accreditation body like Indian system, NPOP, ASEAN Standard, Japan JAS, EU, USA, etc.
- 2. Currently, there is a project by ITC, "EU-Bhutan Trade Support Project", BAFRA get financial assistance for aggregation, certification but it will be finished within 1 year and after that it is challenge for BAFRA to get financial support. 2years before, BAFRA received only 3 % of the Ministry's budget, as 60 million for a year.
- 3. BAFRA provide certification, and has "National Food Testing Laboratory", equipment is not enough capable to measure all pesticide, heavy metal and tracings. We need to send samples to nearest laboratories in India and it needs money and time. For smooth issue of Organic Certification, they need to develop capacity on laboratory testing regards to heavy metal and pesticide residues in the soil. These test should be carried out by "National Soil Service Centre" not "Food testing laboratory" under BAFRA. The items can be tested by the "National Food Testing Laboratory" is shown in web-site, the capacity and profile of Laboratory will be provided by e-mail later.
- 4. BAFRA also have several laboratories on border, entry points for export and import. They are not fully equipped enough and it related to food safety in Bhutan.
- 5. Export agricultural produce to India, Bhutan has formalized seven agricultural products for India. Regarding 14 commodities, India conducted pest-risk analysis and now formally allow to import agricultural produces from Bhutan. For those products, BAFRA provides phytosanitary certification and not have significant problems now. BAFRA tried to expand the list of agricultural products according to potential. If the agricultural products is not in the list, it will be challenge, Indian counterpart does not accept.
- 6. For pesticide issue, in 2016, there was survey and high rate of pesticide residue were confirm on chill, cauliflower and beans. These three commodities are not imported now.
- 7. For export market, BAFRA has standard for pest and disease on only mandarin, apple, matsutake mushroom, and ophicordycep sinensis. For other crops, there is no demand, phytosanitary certification is enough. For domestic market, there is draft of quality standard for 12 products but not implemented yet.
- 8. Ms Yashiki asked to introduce person in charge for nutrition and activities nutrition improvement, school feeding, and communication /education activities on food safety. <u>The person will be introduced by e-mail later.</u>
- 9. BAFRA does not have delegated ICT services. Currently each department carry activities. <u>The</u> information will be provided later on by e-mail.

10. JICA survey team introduce SATREPS, new technical cooperation for joint research to BAFRA. JICA team will send information of SATREPS to BAFRA. BAFRA will inform what kind of development of research capacity is priority.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Mountain Hazelnuts Operation	
Date	October 26, 2021 9:30-11:00 (BST)	
Venue	Zoom	
Participant	Mountain Hazelnuts (MHV) JICA	Sean Watson CEO of MHV Tenzin Chosen, Quality Control Officer Sheryl Loke, Director of Partnerships & Communivations Jeff Nicholls, Chief Operations Officer Tshering Dorji, Director of Field Operations and R&D Jun KUDO
	JICA Survey Team (JST)	Masashi TAKANO Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Miki IMAI Kazuhiro TSUCHIDA

JST confirmed the following.

- 1. Advocacy Program is key but be still incomplete. Under the MOU between MOAF and MVH, MVH runs the training to support approximately 4,400 young girls who does saving and spending for the family purpose through a lecture on benefits and how to spend money. Taking 4-5 years to harvest hazelnuts is risky proposition, but consistent income makes banks more interesting to farmers, and make them credit rating improved, which can widen economic participation broadly. MHV will share the financial literacy training material under ADB TA.
- 2. 2% of farmers (mainly live in low altitude area) do cultivate intercrops, and MHV tries to extend to the area in high altitude by make spacing wider 4mx4m or 4mx6m if the target farmland is not far away from their living area. 300+ farmers undertake rainfed irrigation system which mitigate the impact of increase in climate variety. The issue of the system is rat problem because it is plastic line. Automatic irrigation or drip irrigation can be useful in dry area, but now MHV needs to focus on the pollination and variety (grafting?) issues, so after solving those issues and farmers get constant income, this automatic system can be realized.
- 3. Field Companion is the Android based Apps brought through collaboration with a number of senior IT experts in Stanford and other American institutions (chief data scientist from WB also voluntarily dedicated 3 months to develop). It is developed based on the needs the operational needs. This system is designed for the field survey team of MH, not the farmers. But in the future, farmers may put the data using their smartphone and their voice (now it's under internal development stage).
- 4. For aggregation, a collection center is historically seen as a communication point among farmers driving from their own farms to MH; however, after the pandemic, a mobile collection which is a pick up track to collect the nuts at certain road point. This is possible because the nuts yield is not so much, so in the future collection center should be re-established where is 30 minutes to 1 hour away from individual farms to collect their crops. Farmers can earn cash via Android apps.
- 5. Yelp program 2020 is one of the projects to support unemployed youth, financed by MoLHR, and there are, other than Yelp, two more activities contributing to youth employment: fund provision to Loden Foundation (twice a year, 25,000 euros in total and spent half for two entrepreneurs, one for business to provide contract labor services for farmers, and another for producing hazelnuts oil) and supporting local entrepreneurship (local chocolate maker) through fair trading. MVH will

promote and develop agricultural service providers such as a grass cutting service with small grass cutter, which makes a lot of employees to mitigate the high unemployment rate of youth.

- 6. The Covid-19 impact was extreme since all the functions is closed during the lock-down: storage, export (last year's harvest still remain in storage due to Indian pandemic), import, border facility. The travel restriction also hindered MHV to seek new financial resources. MHV still have the same difficulty compared to the situation in January 2020, and need more time and money to fix.
- 7. MHV pointed out that they expect the Government of Bhutan to take a measure for capital waste, post-harvest training (packing quality, traceability, and certification), infrastructure, support to damaged cooperatives/farmer's group, small-mechanization support, and connection to foreign market.
- 8. Good IT system must be necessary as the back born to work with farmers. Inbuilt certification and traceability syste, payment systems, and market information system are essential IT system. Dissemination of the weather warning system is also important to prevent crop damage. The one of the most important things is, the agribusiness (understanding of whole value chain, and importance of capital) is new to most farmers in Bhutan. Then, market information which makes farmers take some decisions based on that is essential. Therefore, training on agribusiness can be the most important before giving the information to farmers.
- 9. Agri-business is quite new to Bhutanese so capacity building activity is imperatively needed in order for producing a Bhutan signature brand represented by small portion of red rice, cardamom, and herbal tea. Cross-branding is key for further development in agricultural sector.
- 10. Long term loan is important because agriculture is inherently more risky than other investments and pay off, especially for tree crops. MHV thinks you will not get money raised in Bhutan due to small capital pool, so need to raise capital from abroad.
- 11. Invitation for foreign direct investment is also critical for agricultural promotion so the related policy (FDI policy) should be reviewed by the government together with the loan policy. MHV will come back to JST for this discussion point (What kind of official support MHV expect?).

Objective	Agro-Logistic and Marketing Cooperative -ALMC		
Date	October 27, 2021 17:00-18:00 (BST)		
Venue	Bhutan Smart Shop		
Participant	Bhutan Smart Shop	Sangay Needup, the Chairperson of the cooperative.	
	JICA Survey Team (JST)	Hideki HIROSHIGE Hajime KITA	
		https://www.facebook.com/Agro-Logistics-and-Marketing- Cooperative-ALMC-103670608247551/ bhutansmartshop.com Bhutan Smart Shop Web Site	

JST confirmed the following.

- 1. Mr. Sangay opened Bhutan Smart Shop, which is first e-commerce site for agricultural products in Bhutan. During the COVID-19 Pandemic, he was invited for President Secretary's Advisory Board for agricultural logistic. He supported the activities.
- 2. ALMC is formed in 2020. Because even the private aggregator or trader help the governmental activities, it was difficult to get official back-up or certify by government, So Mr. Sangay formulate the cooperative. The cooperative has member in every 20 Dzongkhag. Main aims to ALMC is to formulate the network of the aggregators and distribute the agricultural products more effectively.
- 3. For developing the supply chain of agricultural products, it needs facilities such as warehouses, but there is very limited storage facilities in Dzongkhag.
- 4. Government is constructing three cold storage facilities. But it is doubt about economic feasibility, so, they are lokking how it is work. If he build the cold facilities, it might be in Thimphy only.
- 5. .For developing the logistics, the training is required for farmers and traders. Farmers do not understand the logistic and transportation, they put products in bag and bring, but it can be damaged easily. Trader also do not know so much about post-harvest method. If the vegetable is kept in cold storage, it should be kept once in room temperature then put in cold chamber. Otherwise, if they put warm produces into cold chamber, they are damaged easily.
- 6. Currently, financing is large issue about aggregators. Financial institutes provide loan for farmers but aggregators and traders are not able to get loan. But it need to develop value chain of agricultural products.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	DAMC Activities and draft proposed project	
Date	October 28, 2021 12:00-13:00 (BST)	
Venue	DAMC Ms. Kinley's Office	
Participant	DAMC	Ms. Kinley Tshering, Director Mr. Yonten Gyamtsho, Legal dept. Ms. Tshering Wangmo, Chief of Cooperative dept. Mr. XXX (Representative of Market Resarch)
	PPD	Ms. Sonam Euden
	JICA Survey Team (JST)	Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Kazuhiro TSUCHIDA

JST confirmed the following.

- 1. There is important issues 1)) Improvement of Marketing Access, 2) Strengthen of Institutions such as Cooperative and farmers group to be next level, 3) Market Information.
- 2. Market information system has also issues that 1) Dynamic Data Collection. In the Dzongkhag, there is agriculture officers but their primary mandate is not collecting market information. So, sometime the data update is delayed due to busy of them. 2) How to use the data with negotiation with regional market, like Indian import, Indian export,
- 3. Enterprise development is necessary. However, it is still in early stage in Bhutan, so Government should show the success model of enterprise, in trading like cold storage, processing etc. Then, private sector will find opportunities and coming. Therefore, improvement is necessary in Packing, Grading and Sorting the products to develop post harvest.
- 4. Produce of farmer group is limited and small volume. Trader of foreign counties are not interested for individuals. So the system to gather the products and increase volume of produces to be sufficient level for trading or processing is necessary.
- 5. Any support is welcome in this sector. Here, Bhutan may not be graduated from LDL because of COVID-19 situation in last two years, so Grant Aid program is still need for Bhutan. Especially development of value –chain facilities such as integrated cold storage, including sorting and grading facilities, warehouse etc. If Grant-aid is difficult, TCP (technical cooperate program) might be useful. Technical cooperate program on Post-Harvest Processing including improvement of package, value-adding, branding is fine. The target of crops will be high-value crops such as potato, fruit and vegetables like tomato.
- 6. Capacity Development program is required for marketing officer and post-harvesting officer is necessary.
- 7. If the Model Farm Program will be carried out, it might be better to select one watershed. The watershed will include different agro-ecological zones, high, middle and low attitude. If we select it in west-Bhutan, Paro-Thimphu is high-attitude area EL 2,500, Punaka is 1,200 to 1,400 then Chuka is E.L. few hundreds.
- 8. National Post Harvest Centre will be moved to under DAMC. Its sub-centers (processing plant) are in four locations. Dagapela (Dagana), Goling (Zhemgang), Lingmethang (Mongar) and Shumar (Pema Gatshel). They perform all post-harvet activities. Bhutan produce 250 products but its processing is quite few. Because of limited quantities in one place, even if the processing unit need to inport packing material, indian buyers are not response for the order. It need to gather the order to make equal business. The capacity development of the Centre is required.
- 9. Currently, Agriculture marketing officers are not in Dzongkhag. Only agriculture officer can work and play its role to development of marketing. So, currently, DAMC is asking Min. of labor to

adding agriculture officers in each Dzongkhag. RAMCO (Regional Agriculture Marketing and Cooperative) is playing role to manage marketing in region. There are two RAMCO, one in Mongar and the other is Gelephu. Each of them covers 6 Dzongkhags. In the west part, HQ, DAMC is covering remaining 8 Dzongkhag.

Objective	Courtesy call for GNHC	
Date	October 28, 2021 10:00-10:30 (BST)	
Venue	GNHC Meeting Room	
Participant	GNHC	Mr. Sonam Yarphel: Deputy Chief of Development cooperation division (in charge for JICA)
	JICA Bhutan Office	Mr. Jun Kudo: Project Formulation Advisor Mr. Tanbi: National Staff
	JICA Survey Team (JST)	Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Kazuhiro TSUCHIDA

Mr. Kudo introduced JICA survey and the team. He also requested to participate the seminar on Nov.18.

Mr. Hiroshige explained about schedule.

Mr. Sonam Yarphel will arrange a meeting with Secretary of GNHC with the survey team before the team goes to field trip.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Policy and strategy of MOFA	
Date	October 28, 2021 14:30-15:30 (BST)	
Venue	PPD Meeting Room	
	PPD	Mr. Karma Tshering Ms. Sonam Euden
Participant	JICA Survey Team (JST)	Hideki HIROSHIGE Hajime KITA Hiroko YASHIKI Kazuhiro TSUCHIDA
Documents	PPT: Bhutan Nationa PPT: Agriculture sec	al Pathways ctor Presentation made to His Majesty The King

Mr. Karma Tshering, Chief of PPD explained about Ministry's policy to JST with presentation materials.

- 1. Food System Pathway was prepared in 2021 September. Because of COVID-19, the 12th 5 years plan was difficult to continue. This is current policy of the Ministry of Agriculture and Forestry
- 2. During the interviews with related department, they may propose ideas of projects based on their priority, however, the final proposal for new projects should come up with policy and strategy of the Ministry.
- 3. Infrastructure Development (1-2 years) is priority, three cold storages are under construction, such as Wangdue phodrang, Trashigang (Khangma) and Gelephu.
- 4. Apples, mandarin, cardamom, areca nut, ginger, and potatoes stand out as crops of strategic significance to Bhutan given their export dominance
- 5. Development of Market Infrastructure and market linkage with other countries are required.
- 6. To develop food system, value chain with storage, processing and supply mechanism.
- 7. Cooperatives are weak and need to be strengthen

Objective	Agriculture Land Development	
Date	29/10/2021 15:30-16:10 (BTT)	
Venue	AED	
Participant	AED, DOA, MOAF	Mr. Namgay Thering
	JICA Survey Team	Mr. Kazuhiro Tsuchida, member

Based on the materials, the ideas of challenge, main factor, development approach, and Japan's support for sustainable land use were explained and opinions were exchanged.

Mr. Namgay Thering 's comments are as follows:

- 1. <u>About Construction Machinery</u>
 - It is true that CMU's large machines for road construction are not suitable for ALD work on sloping land. I fully agree with Mr. Tashi of NSSC about the need for appropriate construction equipment. Small and medium-sized construction machines are not uncommon in Bhutan, but they are not used for ALD work.
 - The spider-excavator is suitable for work on steep slopes and has high workability, but its high price makes it impractical to introduce (more than 10 million Nu. for a medium-sized one).
 - As explained previously, there are currently one excavator and two backhoes in each of 20 dzongkhags, and these are used for ALD works as well as farm road construction/maintenance.

2. <u>Others</u>

- The classification and price of backhoes in Bhutan is as follows
 - Small size: 4~5 ton class, 2.5~3million Nu. (made by JCB, India)
 - Medium size: 13-ton class, 5.5~6milion Nu. (made by KOBELCO, Japan)
 - ▶ Large size: 20-ton class, 7.5~8million Nu. (made by KOBELCO, Japan)
 - > About supplier of construction machinery in Bhutan
- KOBELCO distributor is available in Thimphu. (On the way to Paro)

List of possible SLM activities for consideration by JICA

- Machinery support to be used for agriculture land development, i.e. terracing on steep slopes. The current machines available with Central Machinery Unit (CMU) through grant aid from Japan are too huge and too risky to be used in terracing on steep slopes. Therefore, it would be of great benefit if JICA could support with the provision of appropriate size machines for agriculture land development. The specification of medium size machine is enclosed for reference.
- ICT in sustainable land management development of national soil database, sensor based soil nutrient assessment and application,
- Capacity building of extension supervisors, regional soil focals and the NSSC staff on precision agriculture with special focus on nutrient assessment and application
- Support to model farming village development, considering soil health as the basis and foundation of agriculture production
- Support to field equipments for soil survey, soil fertility assessment and soil biodiversity assessment.
- Laboratory equipment support for soil microbiology laboratory which is under construction.
 This lab will be the only microbiology lab in the country to isolate and culture soil microbes for different uses e.g. in bio-fertilizer manufacturing.
- TA on assessing and profiling Bhutanese soil biodiversity. Currently, no soil biodiversity assessment is done due to lack of HR and technical expertise. Therefore, the current status of Bhutanese soil biodiversity is unknown.

Objective	Agriculture Land Development		
Date	29/10/2021 11:20-13:20 (BTT)		
Venue	NSSC		
Participant	National Soil Service Center (NSSC), DOA, MOAF	Mr. Tashi Wangdi, Program Director, <u>twangdi@moaf.gov.bt</u> Hakadrukpa, Land Management Office, <u>hakadrukpa@gmail.com</u>)	
	JICA Survey Team	Mr. Kazuhiro Tsuchida, member	

Based on the materials, the ideas of challenge, main factor, development approach, and Japan's support for sustainable land use were explained and opinions were exchanged.

Mr. Tashi Wangdi's comments are as follows:

- 1. <u>Support for the construction machinery for ALD</u>
 - He understands that it is difficult to make grant aid projects for construction machinery for agricultural land improvement. There is a great need for the deployment of machinery suitable for ALD work on sloping land. It is necessary to see support for the introduction of such machines as a trial operation or demonstration test through technical cooperation programs, even if it is only a few.
 - Model farming village project is also considered as an opportunity to display the appropriate terrace construction methods and their effectiveness.
- 2. Collaboration with Fallow Land Bank
 - It is a good idea to link the Fallow Land Bank and the Model Farming Village Project. Setting target sites based on water shed, which was suggested by DAMC, is an idea, but I fear that it may be too large in the scale of the project.
 - The FLB inventory pilot project, as explained previously, has selected 4 districts and is scheduled to begin in mid-November. Based on the NLC's digital cadastral map, surveyors will conduct interviews in villages to identify fallow land lots on a hearing basis, and will not conduct any new survey or image analysis. The registered information is the use of the farmland (under cultivation or fallow) and the period of abandonment. Eventually, the system will be integrated into the NLCS system, rather than MODA or other MOAF platforms.
- 3. Others
 - Fallow Land Bank handles only private land, not including State Reserved Forest.
 - Soil fertility management is very important in the fallow land reversion. However, it is not practical to conduct individual soil surveys for fallow land.
 - The National Soil Database is scheduled to be completed in 2023.

Mr. Tashi Wangdi will accompany on the field trip from Nov-2 to 5. The detailed schedule and preparations for the field trip were discussed.

List of possible SLM activities for consideration by JICA

- Machinery support to be used for agriculture land development, i.e. terracing on steep slopes. The current machines available with Central Machinery Unit (CMU) through grant aid from Japan are too huge and too risky to be used in terracing on steep slopes. Therefore, it would be of great benefit if JICA could support with the provision of appropriate size machines for agriculture land development. The specification of medium size machine is enclosed for reference.
- ICT in sustainable land management development of national soil database, sensor based soil nutrient assessment and application,
- Capacity building of extension supervisors, regional soil focals and the NSSC staff on precision agriculture with special focus on nutrient assessment and application
- Support to model farming village development, considering soil health as the basis and foundation of agriculture production
- Support to field equipments for soil survey, soil fertility assessment and soil biodiversity assessment.
- Laboratory equipment support for soil microbiology laboratory which is under construction. This lab will be the only microbiology lab in the country to isolate and culture soil microbes for different uses – e.g. in bio-fertilizer manufacturing.
- TA on assessing and profiling Bhutanese soil biodiversity. Currently, no soil biodiversity assessment is done due to lack of HR and technical expertise. Therefore, the current status of Bhutanese soil biodiversity is unknown.

Objective	Sustainable Land Use/ School Agriculture Program		
Date	29/10/2021 14:00-15:00 (BTT)		
Venue	APD		
Participant	APD, DOA, MOAF	Mr. B.B. Rai, School Agriculture Program Coordinator	
		(raibb@yahoo.com)	
		Ms. Rinchen Wangmo, Horticulture Officer	
		(rinchenw@moaf.gov.bt)	
	JICA Survey Team	Mr. Hideki Hiroshige, sub-team leader	
		Mr. Kazuhiro Tsuchida, member	
		Ms. Hiroko Yashiki, member	

- Received a briefing on the role and scope of APD activities.
- APD is currently discussing the next RNR 5-year plan (2023~).
- Mr. B.B. Rai emphasized that young people are leaving agriculture as a cause of the fallow land. He pointed to white-collar oriented education as the biggest factor. The School Agriculture Program (SAP) is positioned as a countermeasure to this problem, and the SAP is expected to increase interest in agriculture through agricultural experience and education.
- Regarding the activities of the fallow land reversion interventions, it was confirmed that there is a difference between privately-owned land and state-owned land.
 - Activities targeting fallow land in private land: The Fallow Land Bank concept targets private land and does not touch into the state-owned forests.
 - Activities targeting fallow land in state-owned land: The development of agricultural land through FMCL's fallow land reversion was targeted at state land and aimed at attracting unemployed youth people into agriculture. The Land Use Certificate Policy ("LUC") also targeted state land and aimed to attract unemployed youth into agriculture.
- Support for urban agriculture and Peri urban agriculture: It was decided to make a site visit within/near Thimphu on Nov-8, accompanied by Mr. B.B Rai. Information on specific support measures for urban and peri-urban agriculture will be expected during the site visit.
- SAP is incorporated into the school curriculum from PP to XII grades (from primary to high school curriculum) and it addresses not only crop cultivation but also animal husbandries. The program is conducted under an MOU between MoE and MoAF. The Gewog Agriculture Extension Officers are the instructors, and they are paid for this task. The technical committee for SAP is convened by DoA once a year. The program will be devolved to the Dzongkhag Office in future.

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Objective	Aerotech Bhutan Operation	
Date	October 29, 2021 16:00-17:00 (BST)	
Venue	PPD conference room	
Participant	Aerotech Bhutan	Anuj Pradhan
	JICA Survey Team (JST)	Hajime KITA

JST confirmed the following.

- 1. Current Status on the use of Drone
 - Drone utilization is allowed only for the government's project, not for any activity of private companies.

• Drone can be flied from 50m horizontally and 90m vertically from pilots with max 6kg in loading weight, which is very strict compared to the regulation in other countries.

- · Drone companies are not allowed to sell drones to private sectors.
- 2. Example fields that the survey by drone in Bhutan has been done.
 - Land survey ordered by NLC
 - Garbage amount survey
 - Traffic volume survey ordered by MoWHS
 - · Ecological survey of wild dogs by RGoB
 - Forest survey by MoAF

*Never in agricultural purposes

Business Model of the Compnay The company was given five DJI drones from the King, and doing the followings as business:

- The aforementioned surveys
- Consulting regarding the use of drone
- Training to become a drone pilot
- · Design the program and testing the pilot

Objective	To understand better the School Feeding Program	
Date	October 29, 2021, 16:00-17:00 (BST)	
Venue	Zoom	
	FCBL	1. Mr. Dinesh Subba, Head, Institutional Supply Division
Participant	JICA Survey Team	Hiroko YASHIKI

JICA Survey Team (hereinafter JST) confirmed the following.

- Since 1974, the School Feeding Program (SFP) has been operated in Bhutan, but recently overall scenario was changed and now locally produced fresh produces need to be supplied to each school.
- FCBL has supplied 9 commodities (fortified rice, fortified oil, pulses (dal), sugar, salt, cheese, chickpeas, milk powder, tea leaves) by signing an annual MOU every year. The MOU has told to supply the commodities on a quarterly basis to the designated schools. The required volume of each commodity is calculated by MoE in accordance with their nutrition guidelines.
- The most significant challenge of SFP is no proper storage facilities at schools. Dals cannot last for 3 months, and part of the supply is lost. The FCBL has the capacity to supply to those schools on monthly basis and 24 hours per day, however, the costs will rise, and the Government has not agreed to do so.
- FCBL is going to have 5 warehoused over the country (one of them is under the construction) and will not have any problem in its capacity to supply to the indicated 500 schools.
- Under the new scheme, FCBL is expected to supply only 3 commodities, namely, fortified rice, fortified oil, and dal. After COVID, the Government ordered to always store those 3 commodities. FCBL import rice and oil from India to provide them to schools, as they are cheaper than Bhutanese ones.
- It is worried that the quality control system has not been put in place at schools to buy locally produced food. Most of them are perishables and it is better to process them so that the schools can store and utilize them fully. Indeed, if small processing units are located every corner of the country, they could contribute to an improvement of marketing.
- The problem for FCBL in the purchase is no availability of reliable data of farmers who want to sell the commodities.
- The schools have not been able to buy commodities by themselves, and first they had to seek for approval by MoE to buy anything. Under the new scheme, the schools can decide from which farmer groups, what and when they buy, although not all the farmer groups can supply their commodities as they agreed with the schools, especially in rural areas.

1. 上位計画

- ■基本的な国家開発戦略
- ■全国総合開発計画2030
 - 持続開発可能な開発の先端を行くGREENISTの国
 - 食料安全保障と農業開発に関連する開発アプローチ
 - 都市地域と農村地域の土地利用コントロール
 - ICTを用いた包括的サービスシステムの形成
 - 農業生産の振興
 - 畜産業の振興地域の形成

国土構造

- 地域格差を是正し、均衡ある開発を目指す
- 西部地域は「ビジネス・商業地域」を、中西部地域は「農業生産・研修開発地域」を目指す 都市および農村に関する開発指針
- 農村開発のアプローチとして1)生活環境の改善と、2)ソフト対策(就業機会の創出)
- ・無関税で安価なインド産農産物が国内で手に入るブータンで、第一次産業の成長による農村開発の達成は難しい課題。

農業振興

- コメ自給率の向上
- 市場志向型農業の振興
- 栄養改善

畜産業振興

- 家畜生産性の向上(牛、鶏)
- 飼養頭数の増加

1. 上位計画

- 第12次5か年計画(2018~2023年)→2020年のコロナ禍により実現不可能
- Food Systems for Gross National Happiness Transformative Pathways for Bhutan(以下、National Pathway) を2021年9月に策定。
 - →2030年にカーボンニュートラルで、環境と調和した、高い能力を有するFood Systemを実現する。
 - →GNHを最大化し、2030年のSDGsを達成する。
 - ●(1)農業生産と小規模農家の生計を維持する。
 - →土壌肥沃度、農地の確保。耕作放棄地の生産地への転換。
 - →灌漑インフラ、農道の施設整備
 - →鳥獣害対策
 - →近代的な種子、家畜種、肥料、飼料、機械等の提供。
 - ●(2)付加価値、基準、市場の拡大
 - →付加価値、民間企業、農協の保護と推進
 - →リンゴ、オレンジ、カルダモン、アレカナッツ、ショウガ、ジャガイモを戦略作物とし、輸出を推進。
 - → Food System Value Chainの改善、輸出強化にむけた認証制度の推進
 - (3) デジタルツールの活用
 - →技術普及へのデジタルツールの活用。デジタルプラットフォーム整備
 - →マーケット情報およびデジタルマーケティングの整理
 - (4)ファイナンスの確保、農業一食料セクターのリスク低減
 - →農業銀行整備、買戻し制度の見直し、農業保険制度の整備、インフラファンドの設立
 - (5)科学技術の推進
 - (6)栄養改善への積極的な取り組み
 - (7)自然第一アプローチの継続
 - (8)能力強化、協力、パートナシップの形成

2. 調査の視点

■以下の4つの視点から、課題を把握し、改善策を検討した

- 市場アクセスの改善
- 持続的土地利用(耕作放棄地対策)
- ICT活用
- 栄養、食の安全保障
- ■候補案の検討では以下を考慮した。
 - 農業省の開発方向性
 - COVID-19の影響後
 - 現状と課題
 - 日本の支援協力の可能性

Potential Field for Japan's Assistance (Draft)

Japan's Suppor	t	Activities
Integrated	(TCP) Model Farming Village Development Project	Demonstrating the development model through "Model Farming Village Development Project". The activities including fallow land management, capacity development of farmers cooperative, strengthening of value chain, combining of ICT technology
Market Access	(TCP) Capacity Building on DAMC	To prepare detailed export promotion plan based on the potential research in ASEAN market To prepare market strategy for potential crops based on Dzongkhag
	(TCP) Capacity Building on BAFRA	To strengthen Certification capacity to promote export of organic products
	(TCP) Promote on post-harvest	To promote post harvest in the certain value chain including development of post-harvest facilities, as warehouses, etc.
Sustainable Land Use	(Individual Expert or TCP) Support Program for Promoting Fallow Land Reversion	Support for developing the database of fallow land with soil and land classification information, dSupport for capacity building of planning fallow land reversion (establishment of evaluation methods for reclaiming cultivated land)
	(Individual Expert or TCP) Support Program for Strengthening the Implementation System of SLN	Capacity building of staffs on SLM interventions, Organizing campaign and demonstration of SLM g interventions to producers, strengthening of coordination and monitoring mechanism I Experience use or demonstration of suitable construction equipment for ALD/SLM in slope area, introduction of ICT in SLM
ICT Agriculture	Support for the organization of private agribusiness companies, including producers	To establish a platform where the public institute to gather comments on requirement information and ICT from private sectors, agribusiness and producers. It will be combined with other project or to be task to individual expert.
	(TCP) Capacity Building of the ICT Division to develop and operate applications, dissemination abilities	Capacity Building of the ICT Division to develop and operate applications (management purpose), Development of the function of existing APP that users wants TOT to the government officials on awareness of the system, capacity development for users' business and financial needs, and capacity building for information collection especially in spatial information
Food Security and Nutrition	(TCP) Decentralized School Feeding Program	To strengthen and expand the school feeding program based on good practices in linking schools with local farmer groups and cooperatives (with/without PLUS).
	(TCP) Enhance Social and Behavior Change Communication (SBCC) on Nutrition and Food Education	To consolidate and strengthen the SBCC in nutrition, Including the preparation of necessary act, policies and strategies
	(Individual Expert) Advisor in	To enhance multisectoral coordination in nutrition by well positioning the nutrition sector in the
	multisectoral coordination for nutrition	administrative system as a cross-cutting sector. 3
Model Farming Village Development Project (Concept)

■コンセプト

● 生産から栄養改善までのアプローチを組み合わせて実施することで、大きな効果が得られることを示す。

Primary Value Chain	Preparatory Stage Input	Cultivation	Distribution	Marketing		Branding	Selling/Cosuming
Sub-Value Chain	Info Gathering Cropping Patern Input/Finance Procurement	Plowing Seeding Crop Management Watering	Harvesting Grading CargoBooking/	Loading Transport Storing/Inspection	Storage	Stocking/Inspection	Sroring/Placing Order Display/Sale Consunmption Use
Export				Shipping	Mar ket Information		
JICA-Expert	● (Food Value-Cl	nain)					(Nutrition Improvement)
		●(Sustainab Land Management)					
				●(Pos	t Harvest Improvement)		
			(IT Agriculture (Produc	tion))		●(IT Agriculture	(Marketing))
						● (Education-Nutrition)	n Linkage) (Nutrition/Legal Development)●
Entitled Project			Model Village Construc	tion Project partly tying up	with SATREPS		

Challenge & Development Approach - Abstract

- Small, dispersed and poor access to market are main challenges in Bhutan agriculture.
- There is a tariff-free treaty between Bhutan and India, and agricultural products are tariff-free. Many of Bhutan's food self-sufficiency is imported from India. Bhutan cannot take measures such as imposing tariffs on agricultural products in order to develop its own agricultural industry.
- It was said that cheap agricultural products are imported from India to Bhutan, and due to the high cost of domestic transportation, Bhutanese products are not price competitive. Then, agricultural product wholesalers prefer imported products because of its cost and stable supply. However, due to the difference of production season between Bhutan and India, there is market demand for Bhutan products.
- Through the experience to secure food security in 2020 under COVID-19, MOAF is starting to promote vegetable production in southern Bhutan to fill demand on vegetable in winter season. Moreover, the aggregator network has been developed to cover entire countries. (Potential)
- Local markets are not able to consume the local products, so there is a need to improve access from local production areas to domestic and export markets.
- School Feeding is seen as an Eligible Market by farmers in rural areas, and The School Feeding Program bridge between local farmers and the market. The program runs based on a bilateral contact between school and farmer's group under DAMC and Dzongkak assistance. State-owned companies such as FMCL and FCBL provide required products when local farmers are not able to produce certain amount.
- Farmer's cooperative perform as a tool to connect farmers and market but they perform less in arable farming sector. Looking at livestock sector, the commercial activity is streamlined from production, collection, to marketing.

Challenge and Developmental Approach

Challenge	Major Factor	Approach
Unbalanced demand and supply	 Seasonal production Limited logistic capacity Low attention to processing Family-feeding Agri Weak access to market and its forecast Shrinking industry High dependence on India 	 Control production timing/amount Input logistic facility – storage, road, Build capacity for processing Undertake awareness-rising activity on commercial-Agri Attract youth to stay in Agri
Limited domestic marketing service	 Limited road network Poor access to market No-control on price integration Low attention to commercial-Agri 	 Strengthen road network or alternative infrastructure Set community based aggregation point Review FCBL responsibility Establish political framework on price integration Undertake awareness-rising activity on commercial-Agri
Limited strategy and partner in trade	 High dependence on India Inevitable buy-back No signature brand and few certified products Low attention to packaging 	 Review domestic political framework on Agri product Strategize buy-back along with market-oriented Agri Promote certified product thru capacity building for BAFRA Study global markets and standard/trend – branding and packaging

Potential Field for Japan's Assistance (Draft)

Challenge	Dev't Approch Japan Assistance	Remark
Unbalanced demand and	Market-oriented farming (TCP) Model farming vi	lage RNR Eco-Hub
supply due to small,	Model/showcase for Agri.	concept
distributed, family-run farmer	connecting production to	ional
	value on RNR product,	Fallow Land
Limited marketing service at	nutritious improvemen	t Bank concept
national/regional level	Policy framework on Agri-	
	promotion in domestic market	
Limited strategy and		RNR Marketing
destination for export	Export strategy thru global (TCP) CB* on DAMC (to	Strategy
	market study, grading.	
Align dependence on India and	branding, etc.	
	Internal policy framework on	
for organic	export promotion (Individual Expert) GAP	
	certificate	
Logistics infrastructure and	Along with marketing strategy,	
network are under-deve't	invite private sector and (TCP) Promote on post-	harvest
	introduce facility	
	" Capacity Building	

Challenge & Development Approach - Abstract

- Severe topography, limited land resources, and increasing land fragmentation.
- Small plots dispersed on sloping land are disadvantageous for farm mechanization and development of farmland. Working conditions are harsh.
- Farmers' access to markets is weak, and agricultural production cannot be linked to higher farm incomes.
- The lack of increase in farm income makes it difficult to invest in irrigation facilities, farmland development, farm mechanization, etc. .
- The lack of motivation among farmers is spurring a shortage of labor due to migration, relocation and changing jobs.

Challenge and Developmental Approach

Challenge	Major Factor	Approach
Fragmented land and under- utilized Agri land in urban area	 Land fragmentation Non-profitable farmland – small parcel 	 Promote transaction of Agri land thru contract farming and Fallow Land Bank Improve condition of Agri land Promote farming mechanization Improve market access for farmer Promotion of value-added agriculture
Abandoned farmland in rural area	 Lack of irrigation water Labor shortage Remote farmland Low productivity due to Inadequate condition of farmland 	 Improving irrigation facility Increase famer's income thru farmland condition and market access Improve farmland condition thru Agri land dev't Promote farming mechanization Rehabilitate abandoned land ner settlement
General		 Strengthen Sustainable Land Management (SLM) system Consolidate land information on fallow land for reversion Utilize ICT in SLM and fallow land reversion

Potential Field for Japan's Assistance



Challenge & Development Approach - Abstract

There are a number of ICT systems in operation at MoAF, but none of them are fully utilised. The reasons for this are summarised below from the perspective of both users and developers.

- Perspectives from Users
 - Weak agricultural production, marketing and distribution systems, which are the basis for development through the use of ICT, due to the lack of well-functioning farmers, private aggregators and distributors.
 - The information provided by ICT systems is not consistent with what producers want.
 - Private agribusiness companies, including farmers, do not fully understand the benefits/risks of using ICT systems.
- Perspectives from Developers
 - Considering Bhutan's unique terrain conditions and agricultural land conditions, the potential demand for remote operation is greater than in other countries, and it is desirable to be able to build a system in Bhutan. However, at present, there are not enough both ICT human resources and surveyors to collect spatial information in Bhutan, and even the private sector is not in a position to develop applications and manage data in Bhutan.
 - The development of a data platform for holistic agricultural statistical information is being promoted by the MODA Platform implemented by the WFP, and it is thought that the development of an information sharing system in collaboration with this platform will be necessary in the future.

Challenge and Developmental Approach

Challenge	Major Factor	Approach
Weak agricultural production, marketing and distribution systems, which are the basis for development through the use of ICT	Steep terrain conditions Lack of road maintenance Lack of private aggregators and distributors Lack of implementation capacity of local extension agents	Developing a model for agricultural development using ICT Linking agricultural information with ICT systems Support for private agricultural service providers and agricultural entrepreneurs
Lack of functionality in ICT systems (Existing functions alone do not directly benefit the users)	Lack of ICT human resources (not being able to develop applications and information integration services by their own people) Lack of information collecting abilities especially in spatial information	Capacity Building of ICT personnel (web application developers and data scientists) Development of the functions that users want Capacity Building of Surveyors especially in spatial information
Lack of understanding of ICT systems by users (agribusiness companies, including farmers)	Lack of financial literacy among agribusiness companies, including producers	TOT to the government (awareness of the system and capacity development for users' business and financial needs) Improving the system to make it more user-friendly

Potential Field for Japan's Assistance



Challenge & Development Approach - Abstract

- The Bhutanese are suffering from the triple burdens in nutrition (Undernutrition, Micronutrient deficiency, Overnutrition)
- Some Bhutanese may not have necessary knowledge and skills on nutrition improvement. The enhancement of the SBCC on the nutrition improvement could contribute to this end.
- RGoB promotes the multisectoral approach in nutrition. MoAF, MoH, MoE, and other related government agencies have been implementing together relevant programs by distributing roles among them.
- However, each ministry/ agency leads in the establishment of coordinating mechanisms and as a result, different task forces and technical committees with similar mandates exist at the same time. The enhancement of coordination for nutrition as a cross-cutting sector, may improve the efficiency in the implementation of relevant programs.
- RGoB implements the School Feeding Program to improve the nutrition status of the beneficiary Bhutanese through improvement on access to markets of agricultural produce. There may be needs for technical assistance to increase the number of schools with quality feeding.
- WFP is the major and only development partners in the nutrition sector, and it is important to distribute the roles and to coordinate supports between WFP and JICA.

Challenge and Developmental Approach

Challenge	Major Factor	Approach
There is a need to strengthen and expand the mechanisms for providing safer, cheaper, nutritionally balanced school meals with local produce.	RGoB has been implementing the School Feeding Program (SFP) since 2019. However, as of 2019, FGs could provide only one forth of the target schools (67 out of 263) with their produce.	Improvement and expansion of SFP.
The Bhutanese people suffer from the triple burden of malnutrition (undernutrition, micronutrient deficiency and overnutrition)	Not all the Bhutanese have relevant knowledge on nutrition. Information about nutrition has not reached some population who need it.	Enhancement of the Social and Behavior Change Communication (SBCC) to all the citizens
Mechanisms for multisectoral coordination for nutritional improvement are weak.	Although the division of labors between ministries and agencies is clear, inefficiencies occur with regard to coordination, such as the coexistence of several coordination mechanisms.	Positioning nutrition as a cross-cutting sector within the national administrative system to strengthen its coordination function

Potential Field for Japan's Assistance



END

Objective	National Statistics Bureau (NSB)		
Date	Nov 1, 2021 17:00-17:45 (BST)		
Venue	Zoom		
Participant	National Statistic Bureau	Mr. Tobden, Director and Chief of ASD	
	JICA Survey Team (JST)	Hideki HIROSHIGE Hajime KITA	

JST confirmed the following.

1. Change in Organization Structure

Due to changes in the organization structure, most of officers in RNR Statistics Division (RSD) under MoAF moved to Agricultural Statistics Division (ASD) under National Statistics Bureau. On 2nd August 2021.

2. The responsibility of ASD

ASD Surveys the primary data in RNR section to release RNR statistics (every year) and RNR census (NSB wants to make once in three or five years: next one will be released in 2023 depending on the donor fund) covered by 7 officers in ASD.

Most of the primary data are coming from Gewog Extension Officers which are nothing but data generated out of daily functions and program implementation. Annual Bhutan RNR Statistics are published based on these secondary data while agriculture statistics and Livestock statistics are primary data published based on agriculture survey and livestock census.

Getting the administrative data is still the responsibility of MoAF (PPD) using MODA platform, and it is utilized in RNR census as secondary data.

3. Schedule of RNR census and RNR statistic

Collecting the data for livestock census from November 1 until December 15, then having an agricultural survey from January 15 until February 15. Bhutan RNR statistics is published by every June.

4. The status of the geospatial information collected by NSB.

All the paddy land is already geospatially specified, but much less for other dry farmlands. There are some spatial data collected when the officers made a survey for RNR census 2019. Farm road is also identified based on the satellite data to some extent, but it is not perfect.

5. The situation of collaboration between MODA and NSB survey. What is the demarcation between them?

RNR statistics refers MODA data as secondary data for strengthening the administrative data, and official record data is taken from gewog extension officer directly to ASD, so those two data are clearly different.

6. Future Data Collection Structure

Mr. Tobden thinks MODA platform is prepared by WFP, which is tentative data server. So MoAF should build the own data server based on MODA platform in the future.

7. Monthly data of import / export of each agricultural product between India and Bhutan Ask Ministry of Finance or Ms. Kinlay Wangmo in PPD.

Primary data that I talked about during the meeting refers to all data generated through the RNR census and surveys. Secondary data are those that are already published by different agencies and those are published again through our Bhutan RNR Statistics. Most of the primary data are coming from Gewog Extension Officers which are nothing but data generated out of daily functions and program implementation. Annual Bhutan RNR Statistics are published based on these secondary data while agriculture statistics and Livestock statistics are primary data published based on agriculture survey and livestock census. In terms of periodicity:

- 1. Agriculture survey conducted in Jan-Feb
- 2. Livestock census conducted in Dec-Jan
- 3. Bhutan RNR Statistics is published by every June.

END

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	現地視察(プナカ県農家及び農家グループ視察)		
Date	11月2日 (火)		
Venue	Punakha Dzongkhag(県)		
Participant	同行者	Mr. Tashi Wangdi, Program Director, NSSC Mr. Chhoeda, Assistant District Agriculture Officer of Punakha (17437775) Mr. OOO, Gewog Agricultural Extension Officer	
	調査団	弘重秀樹、土田和弘	

10:00 Khuruthang の町でプナカ県 Assistant DAO の Chhoeda 氏と合流後インタビュー

- Chhoeda 氏は Punakha 県の Assistant District Agriculture Office。同県には MOAF から 14 名の Officer が配置されている。District Agr. Office (ボス)、Assistant Agr, Office (ここまで 2 人が県レ ベルでの配置)、Agr. Extension Office 11 名(各 Geogg に配置される普及員)、王立農場担当者 1 名(全国に 3 ヶ所(4 ヶ所?)ある王立農場のうちの一つ)。農業セクターに関する活動はすべてこ のラインにより行われるため業務の範囲が多岐にわたり、常に人手が足りない。
- 開発計画の予算は 5 カ年計画に基づいて中央で決められたものが降りてくる。各 Gewog でこの予 算シーリングの中で Gewog レベルの開発計画が立てられ実行される。Gewog ごとにその実情やニ ーズに合わせて優先度が決められ予算配分を決める。
- ALD に関して、プナカ県の特徴として現在、既存テラス工の改修・拡張はあるが新規のテラス建設 事業は少なくなっている。
- ALDの事業実施に当たっては、5農家5エーカー以上のまとまりがあり、かつ community clearance (民有地への立ち入り、伐開許可)が取れているものに優先度を置いて実施してきた。テラス工の 実施に当たっては、10年以上利用することを約束させたうえで採択している。テラス工は一度建設 すれば通常のメンテナンスで長期間にわたり利用可能であるが、一旦 fallow land にすると獣害等 ですぐにだめになる(動物が採餌のために掘り返して壊してしまう)。Hedgerow (Alley Cropping) のような「軽い」ALD 工法だと 4~5年ごとに再工事が必要となる。

11:30 Lingmukha Gewog(郡), Napchey Chiwog (村) 農家 No.1 訪問(もと Gewog 議員)

- 本人の家族は Napchey 村に移住してきて約 40 年。
- 33 農家 54 エーカーについて、政府の GCF 事業でテラス工を実施。2019 年 11 月から工事開始して6ヵ月間かけて完成した。現在テラス工になってから2回目の収穫をほぼ終えたところ。
- テラス工が導入される以前は傾斜地を拓いて陸稲、トウモロコシ等を栽培する自給農業。テラス導入後も栽培品目は変わらず陸稲とトウモロコシを中心とした自給農業で農産物の販売はしていない。(ただし、テラス工導入後間がないのでまだ本格的に営農を変えていないだけの可能性はある。 テラス工導入にともなう栽培技術指導は行っているようであるが、自給農業から一部販売を含めた 商業農業の導入等の営農全般の指導・支援は行われていない模様。)
- テラス工導入以前はすべて人力で農作業を行っていたが、テラス工導入に伴いパワーティラーを導入した(本人は「配られた」と言っており、政府から無償で提供されているようである。)。人力で

行っていた際には人を雇っており 1,000Nu.×15 日/エーカーで 15,000Nu./エーカーかかっていた ものが機械化の結果 1000Nu./エーカー(燃料代とオペレーター人件費)となった。(機械のメンテ 費用や更新費用はまるで頭にない説明であった。)

- テラス工導入以前は耕作放棄地が多く存在した。耕作を断念する理由はコストと労働の厳しさ。テ ラス工と農業機械の導入により耕作放棄地を再度利用開始したと頃も多い。一例として示されたあ る斜面の農地では、5エーカーのうち耕作利用されていたのは1エーカーのみであったがテラス工 を導入して5エーカーすべてが耕作利用されるようになったとのこと。(ただし、他のより条件の 厳しい農地が耕作を中止されたか、結果として耕作利用面積が増えたかどうかは確認できなかった ので、この点は注意が必要。)
- テラス工の実施箇所で、表土処理が行われず、山側が地山の土が露出、谷側は元表土が露出という 状態のロットが散見された。これは工事時にオペレーターの理解が不足し(あるいは時間・コスト を節約するために理解していても無視して)表土処理を行わなかったことによる。CMU オペレー ターも民間オペレーターも事業前にトレーニングを行って(Tashi氏談。ただし民間オペレーター のトレーニングは数が少なく、どれだけカバーされているか不明)。CMU オペレーターの場合は問 題ないが、一部の民間のオペレーターの場合施工に問題があるケースが存在する。普及員がすべて 工事を監理することはできないため、土地オーナー(農民)が管理する必要があるが、農民の表土 処理の重要性に関する理解が不十分な場合がある。→結局、十分な施工管理体制ができていない、 責任の所在がはっきりしていいないという問題があるように見受けられる。→後日確認したところ によれば、ALD事業は土地オーナーと施工業者(CMU 含む)との間で契約して実施され、両者 で品質を管理する責任がある。普及員は技術指導を行うのみで最終責任は土地オーナー。
- 表土処理を飛ばした工事の結果、山側は土壌条件が悪く作物の生育が悪く、谷側は肥沃度が高いため作物の生育が相対的に良いという状態になっている。ボカシ肥料を入れて土壌改良を行っているが、収量が安定するまでには3年程度かかる見込み。ボカシ肥料は技術指導を受けて自前で作っている。(富安専門家の活動とリンクしいてる模様)

Bhutan Data Collection Survey for Agriculture with and post COVID-19



13:00 Lingmukha Gewog(郡), Napchey Chiwog(村) 農家 No. 2 訪問

- 週1回プナカに農産物を売りに行っている。
- 5人で車を1台借りて本人ともども市場へ。車代は800Nu/台。



Objective	Understand Agricultural Research and Development Center (ARDC) Wengkhar Activity, and Discussion on innovative technology using ICT in future		
Date	Nov 2, 2021 9:30-12:00 (BST)		
Venue	ARDC Wengkhar		
Participant	ARDC	Mr. Lhap Dorji, Program Director Mr. Loday Phuntsho, Horticulture Specialist Ms. Karma Yamgzom, Horticulture Officer Ms. Tshering Pem, Horticulture Officer	
	MoA	Mr. Sangay Dendup, Dy Chief of APD	
	JICA Survey Team (JST)	Hajime KITA	

JST confirmed the following.

Employee: 34 officers in ARDC Wengkhar, mostly from CNR graduates. Providing cultivation trainings to around 45 farmers (1 year), and 100 short training farmers before COVID-19 pandemic.

ARDC thinks it is good time to share the information to consider the future JICA cooperation because ARDC is now doing the survey and information analysis for the 13th development plan. They made four plans as example.

1. Use of GIS in crop modelling – crop suitability, precision farming and geo spatial measurement of agriculture crops and land

Target: Researchers, extension workers and pilot farmers

Modality: TCP – capacity development and GIS data base establishment

- Research information management, establish database, integrate existing data into the system
- Use of ICT in information gathering, analysis and interpretation
- Pilot in selected villages and entire cropping system and land use
- 2. Protected cultivation of high value vegetables and soft fruits market linked to high end hotels, Schools and Institutions

Target: Commercial scale growers with focus on youths and women farmers **Modality:** Technical Cooperation Project

- Commercial scale farming of vegetables under protected structures with smart farming technologies (Mega Green houses)
- Use of ICT tools automated applications for humidity, temperature and light
- Mobile phone based apps
- Low external input or organic cultivation practices

3. Diversification of high value mushroom through research and commercialization Target: Youths of Bhutan

Modality: Technical Cooperation Project focused to youths and Commercial scale farmers – Mushroom as a climate resilient crop

- Technical Cooperation Project by team of Japanese Expert and Bhutanese Counterparts
- Domestication of native mushroom strains and spawn development
- Introduce new commercial mushrooms such as new strains of shiitake, Enoki, king oyster, Ganoderma

- Spawn production and promotion through Youth Skilling and Engagement Program (Provide capacity development through hands on practice engagement and hand holding)
- Business mode of implementation linked to Post Training and engagement program converging project support and credit investment
- Small targets of about 100 youths a year leading to establishing 100 semi commercial or commercial scale farms
- Production, Processing, Packaging and marketing (Value chain development)
- Use of climate smart technologies such as Solar driers for drying of mushroom
- 4. Commercialization and domestication of wild edible vegetables of Bhutan Target: Small scale farmers with potentials for upscaling not commercial scale Modality: Technical Cooperation Project
 - Collection and Domestication of high nutrition wild edible vegetables linked to export markets in Japan or high end hotels in Bhutan
 - Currently, a research officer from ARDSC Khangma is attending a MSc Program under JDS Scholarship in Tokyo University. The program can be taken as a Post MSc Program
 - Promotion of wild edible vegetables with select group of farmers preferably Youths (Women Farmers in particular) to take up
 - Organic Cultivation Practices

Current ICT usage

1) Chatbot system (using apps "Telegram") to control the environment in Greenhouses

- 2) Use of OpenSprinkler and dataplicity, open source system run through Rasberry Pi
- 3) Solar driers connected with the temperature sensor

Current Innovative Method in Production

4) Hydroponics with a lot of method (Deep Water Culture (DWC), Nutrient Film Technique (NFT), and Sprinkler based vertical tower system)





*Bio-acoustic system is not utilized because it did not work very well.

END

Objective	Farmers Group Activity, Gewog Extension Officer's activity and their demand		
Date	Nov 2, 2021 14:00-15:30 (BST)		
Venue	Farmland in Mongar		
	Farmers Group	7 farmers in Mongar Gewog	
Participant	MoA	Mr. Sangay Dendup, Dy Chief of APD Mr. Sangay Wangdi, Gewog Extension Officer	
	JICA Survey Team (JST)	Hajime KITA	

JST confirmed the following.

FG's information

This is small farmers group with semi-commercial*, which is 7 farmers in the group. Most of them do not have ability to read and write because they did not take education although their average age seem to be 30-40 years old (1 of them studied until 9th grade, so she can read/write a little bit). They started to tomato cultivation with drip irrigation system in greenhouse 3 years ago through the capacity building by the gewog extension officer in order to sell the tomato during winter season. They have several greenhouses which area is less than 1 acre in total) as pilot site, and plan to expand the method to their own farmland if tomato production becomes profitable. This FG is the only good example in the Gewog (13 FGs and 775 HH are existing in the Mongar Gewog) according to the Gewog extension officer.

*Definition of Semi-commercial: Farmers with cultivable land holding/long term leased land ranging from 1 to 3 acres or with proposed investment size not exceeding Nu. 1.00 million.

Current Status of Funds of FG

They earn 50,000 to 60,000 Nu/year by selling their products to Mongar market or school, and divided their benefit by 7 members. FG members deposit 700 Nu/month to FG's bank account. Now saving amount is 42,000 Nu, and will spend 17,000 Nu to buy a net.

Information Source of FG

They obtain the price information from the extension officer and the head of village or going the market by their own foot. They don't use AMIS apps because the apps seem difficult to understand (their literacy?). They want local weather information and pest/disease diagnosis system to know the timing of sun drying and to know the right way to deal with pest/disease respectively.

Transportation

They bring their products by themselves, but if there is any products shortage in other Dzonkhags, gewog extension officers arrange the trader to transport.

Responsibilities of Gewog Extension Officer

Gewog extension officer in Mongar Gewog needs to see 13 FGs and 775 households and have the following responsibilities:

- Technical Support to farmers (farming method, treatment of pest/diseases with NPPC)
- Supply seeds, fertilizer, electric fences and other farming tools
- Monitoring facilities including farm road
- · Monitoring crops such as health and extent of damage of pests/diseases/wild animals

- Marketing (linking farmers to aggregators especially any shortage is reported)
- Linking to School
- Survey market price
- Survey all the farmland (plant and harvest)

END

Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan		
Date	November 2, 2021, 10:00-12:00 (BST)		
Venue	Department of Public Health, Ministry of Health		
Participant	Nutrition Program, Department of Public Health, Ministry of Health	Mr. Laigden Dzed, Deputy Chief Program Officer/ Deputy Chief Nutritionist Mr. Hari Prasad Pokhrel, Senior program Officer and Nutritionist	
	JICA Survey Team	Hiroko YASHIKI	

JICA Survey Team (hereinafter JST) confirmed the following.

- The Nutrition Program (NP), Department of Public Health, Ministry of Health is manned with 2 officers only. The role of NP in the School Feeding Program is technical backstopping to MoE, including the advice in the menu making. Although NP has an intention to conduct monitoring on the program, so far they do not have enough budget and human resources. The National Nutrition Task Force (NNTF) meetings give NP to indirectly monitor progress in various programs related to nutrition.
- There is so far no challenge in the coordination and collaboration among MoH, MoE, MoAF and other government entities, as the distribution of roles among the government institutions is clear. However, once NGOs and more private sectors join in the coordination and collaboration of programs, it might be better to have the Office of Prime Minister or the Committee of Secretaries as coordinator.
- The consolidation of SBCC materials needs to be addressed, and this issue would be discussed in the next NNTF meeting in December 2021. The Health Promotion Division (HPD), DPH, MoH is in charge of the advocacy and communication, and the approval by HPD needs to be sought on the communication materials.
- Micronutrient deficiency in school children is concerned, especially regarding Vitamin B2, B12 and Iron. As a countermeasure, the fortified rice (Vitamin B1, B3, B6, B 9, B12, Zinc and Iron) is introduced in the School Feeding Program (SFP) to supplement Vitamin B12 and Iron, while the supplements of Vitamin B2 are separately distributed to the schools. The fortified rice is imported from India, although there was an idea to provide schools with brown rice of Bhutan, it was not adopted.
- SFP is a flagship program of RGoB. In SFP, it is supposed that farmers provide schools with their produce for the implementation of SFP. However, in general, it is concerned that **farmers are not able to meet the demand** of schools and their supply is erratic.
- Farmers are not producing a variety of crops, and they keep traditional practices. Farmers cultivate those crops which are easy to cultivate. It is important to obtain the commitment from farmers to keep the 3 principles: 1) continuous supply; 2) at an agreed price; and 3) with enough volume.
- During the winter season, there is no crop production in the northern part of the country. The produce in the southern part needs to be brought to north in winter, and vise-versa in summer. The academic year usually starts in February and ends at mid-December.
- The student stipend by Government is low. In 2019, it was proposed to raise it up to N. 2,040/student/month, but it was approved to raise it from N. 1,000/student/month only to N. 1,500/student/month. The gap needs to be met in an innovative manner.
- The mechanism for the supply from local farmers should be put into place, and the menu optimizing application, **PLUS**, which is being introduced by WFP and MoE will help the establishment of the

mechanism.

- DoA is studying some **bio-fortified food**, **especially**, **bio-fortified potatoes**. The options of orange-fleshed sweet potato and iron fortified beans sound interesting, and it could be also discussed in the next meeting of NNTF.
- For the nutrition sector, the major stakeholders are MoH, MoE and MoAF, among others. Each stakeholder has specific roles and so far there has not been any problem in the coordination among them, although it is **not clear which institution has the ultimate responsibility**. When the coordination or collaboration with private sector is required, it would be a good idea to have a stronger coordination mechanism of all the stakeholders. In such a case, **the Committee of Secretaries** could assume the role of coordinator.
- The Consolidation of SBCC in nutrition would be necessary having the Health Promotion Division of the Department of Public Health, MoH as the sole authority for approval on advocacy materials. MoH, MoE and WFP are preparing an SBCC strategy, and they do not see the necessity to have an SBCC Act, since they have not had the Health Act, yet. They want to have a strategy for SBCC to maintain a certain degree of flexibility.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan		
Date	November 2, 2021, 14:00-14:30 (BST)		
Venue	Marketing Development Division, DAMC, MoAF		
Participant	Marketing Development Division, DAMC, MoAF	Mr. Tshering Penjor, Asst. Marketing Officer Mr. Mekh Bahadur Chhetri, Marketing Asst.	
	JICA Survey Team	Hiroko YASHIKI	

JICA Survey Team (hereinafter JST) confirmed the following.

- DAMC is the nodal agency of the School and Hospital Feeding Program (SHFP), which was started with the instruction by Prime Minister in 2019. Up to date, more than 300 schools and 3 hospitals are linked with farmer groups (FGs) and cooperatives. MoE identifies 506 schools in total which need to be supplied by FGs and Cooperatives.
- On October 6, 2021, **DAMC made a presentation to Prime Minister** on the status of SHFP, and was advised **to strengthen M&E**.
- In addition to FGs and Cooperatives, FCBL, FMCL and BLDCL also supply food items to schools. The amount of the payment to FCBL is too high. Out of the total budget for SHFP amounting to Nu. 3.2 billion, Nu. 584 million goes to these SOEs. The amount of stipend/student/month has risen from Nu. 400 to Nu. 1,500 gradually, and the schools have a good purchasing power.
- There are currently **68 officers in DAMC** including 2 RAMCOs. **Almost 50% of all the DAMC officers are somehow involved in SHFP**. However, there is no officer who is engaged only in SHFP. DAMC is requesting to open another **RAMCO at Phuentsholing** to take care of the Districts in western region. It will be **open in June 2022**. As of today, 20 districts are shared among RAMCO Mongar (6 Districts), RAMCO Gelephu (6 Districts), and the DAMC Headquarters (8 Districts).
- In 2019, to start SHFP, the model Dzongkhags were selected, and a 2-day event was held in each of them to sensitize all the stakeholders. Representatives from DAMC tole FGs and Cooperatives to supply their produces to the nearby schools to feed their own children. There are more than 50 items which would be supplied by FGs and Cooperatives to complete the menu decided by MoE. FGs and Cooperatives can choose which out of more than 50 food items they will supply.
- DAMC has provided FGs, and Cooperatives **means of transportation** to ensure their regular supply to schools. In addition, up to date DAMC has provided **deep freezers** to around 400 schools. DAMC is rehabilitating **school kitchens**.
- **DAMC has not been involved in the introduction of PLUS** to schools. There is the possibility that PLUS complicates the relationship between schools and FGs/ Cooperatives. First, let FGs and Cooperatives supply what they can to schools.
- In **Punakha District**, FGs and Cooperatives keep selling their produce to Thimphu, and do not want to supply to schools within the District.
- There will be local elections on December 22, 2021.

END

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	現地視察(トンサ県農家及び農家グループ視察)				
Date	11月3日(水)、11月4日(木)				
Venue	Trongsa Dzongkhag (県)				
Participant	同行者	Mr. Tashi Wangdi, Program Director, NSSC			
	調査団	弘重秀樹、土田和弘			

11月3日(水)

14:30 Langthil Geog、Dandung Chiwogの若者グループによる営農のサンプルを視察

Geog Extension Officer Mdm. Damanthi Kumari Sunwar (17578461)が同行

グループ名: Dangdung Sonam Yarphel

代表者名: Mr.Sonam Dorji 2019 年にカレッジを卒業(Environmental science 専攻)

- 組織の経緯
 - ▶ このグループは村の若者8名(男性4名、女性4名、年齢20歳~26歳)で2021年に設立。4 月に発起人2名で普及員に相談を持ち掛け、すぐに普及員が動いてグループの設立、農地のリ ース、政府からの補助を取り付けて5月には栽培を開始している。グループの登録が完了したのは8月。
 - もともと普及員が DOA の指示の下で Fallow land のインベントリーを作成。その過程で有望な fallow land について利用希望者を募ったのがきっかけ。これは普及員が自主的に行ったもので一律に行われたプロセスではない。普及員が Geog とともに審査して積極的に支援するグループを決めた。
 - 若者グループによる fallow land reversion の立ち上げのモデルケースになると普及員は評価 している。ただし活動開始たばかりなので事業の持続性は今後の課題として残る。
- 栽培と販売
 - ▶ 10 エーカーの耕作地を確保して販売用にメイズ(2 エーカー、販売額 60,000Nu)と野菜(チリ(1.5 エーカー、販売額 50~60,000Nu)、キャベツ、カリフラワー、トマト(面積不詳、販売額合計で 20,000Nu))、ミレット(0.5 エーカー)を栽培。今年始めたばかりなので 10 エーカー全部は使っていない模様。
 - 来年以降はチリ、トマト、オニオンを中心に栽培する予定。チリに関してはハウスを使った Offseason crop も狙っている(通常期70Nu/kgのものが冬場のハウスものだと 300Nu/kg で売 れるとのこと)。
 - ▶ 種子は全量政府支援で、来年以降もそれを期待している。
 - ▶ 化学肥料は使用せずバイオ肥料(ボカシ EM 肥料)を自分たちで作って利用している。(立ち 上げ支援て2MTは受け取っているとのこと)
 - ▶ 販売先は村に隣接する発電所の従業員宿舎が最大のマーケット。他にトンサの町の市場、 FMCLともコンタクト中、School feeding program ともコンタクト、Local vender/aggregator からの引き合いもあるとのこと。

- グループの立ち上げ時の支援
 - ▶ 村内の fallow land (15 年程度放置)を土地所有者から最初の 5 カ年は無料で借りている。6 年 目以降は有償でのリース契約となるが、グループが使いたいなら契約を更新するとの約束は得 ている。)
 - ▶ 政府(ゾンカクの予算)からの支援として、
 - ◆ Land Development (農地のクリアリングと既存テラスの補修)
 - ◆ ハウス資材 (単価はハウス1棟分 5mX10m で 53,500Nu。プラスチックのみ 5mX10m で 7000Nu。プラスチックは 7~8 年使える)
 - ◆ 灌漑施設(ハウス用のドリップシステムとタンク)
 - ◆ 種子 (全量)
 - ◆ バイオ肥料 (2MT)
 - ◆ これらの政府支援は Youth group 対象の場合コストシェアなしで補助されるのを利用している。
 - ▶ その他
 - ◆ 土地所有者とのリース契約のサポート
 - ◆ 研修(起業家研修(MoLH)2週間、ARDC,RDTCの営農研修2週間程度)
- 活動上の課題
 - ▶ 雇人コストと農業機械:人件費が高く、事業開始したばかりで資金がないためになかなか雇えない。若者雇用支援の補助金 5,000Nu/月を利用している。
 - ▶ 農業機械(パワーティラー)は所有しておらずレンタルを利用。1台を6カ月継続借り上げ+ アドホックにもう1台(15~20日間)レンタルしている。農機のレンタルは自分たちの必要な タイミングで借りることができないことが多いのが問題。コストは1,500Nu/日。運転は自分た ちで。オペレータを別途雇ったら700Nu/日)
- 普及員の活動とグループの立ち上げがタイミングよくかみ合い、かつコロナ下での youth group 重 点支援の方針が合致して極めて異例のスピードで支援が実施され、スタートできたケースであり、 必ずしもこのスピード感が他でも期待できるものではないことに注意が必要。



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17:00 Gewog 普及員 Mdm. Damanthi との意見交換

- 担当 Geog 内で fallow land を再生利用している農家グループは 11 個ある。そのうち 4 つが若者グ ループ。
- Fallow land reversion に重要な要素は何と考えるか?
 - ▶ 灌漑施設と水の確保
 - ▶ 農業機械
 - ▶ 種子等の農家への資材支援
 - Capacity building

19:30 Trongsa Chief District Agriculture Officer Mr. Karma Wangchuk 、District Agriculture Officer Mr. Karma と面談

トンサ県の農業の Disadvantage

- 個人の生産量が小さいため、市場向け農産物のロットが小さく不利である。
- 農家の教育水準が高く、重労働を嫌がりホワイトカラーの職を求める傾向にある。このため農業機
 械化を積極的に進めてきた。

農地改良事業について

- トンサはプナカ等と比べて農地(集落)が分散しているため、ALDの予算の配分、実施が難しい。 また、ALDの予算が限られている。
- 県に配備されている建設機械(農道、農地改良用)は1台のみ、不足分は民間の機械をリースして いる。もし県で独自に使える機械が5台あれば状況は大きく違うと思う。
- 県で使える建機は道路建設用の大型のもの。農地改良のテラス工事では、高いところ(傾斜の急なところ)では危険で工事ができない。そのような土地では Stone band 工や hedgeraw (array cropping)工法で対応することになる。(と言っていたが、実際に Stone band や Hedgeraw を政府支援でやっているところは見られない。どこまでやっているかは不明。普及員による技術指導が行われている程度か?)これまでは農道建設に priority を置いてきたが、これからは農地改良(テラス工)にシフトしてきており、サイトの条件いあった建設機械が必要とされている。傾斜に対応した建設機械の導入を支援してもらいたい。

<u>Gewog 普及員の capacity building の必要性</u>

- 一人で農業関連の活動をすべてカバーしなければならず大変多忙となっている。また、農家からの 要望も生産技術だけでなく販売、野生生物被害、気候変動対応等、多岐にわたるようになってきて いる。要員の増加は現実的ではないため、CDを通じて CD の知識・技能を向上し、アドバイザー サービスの機能強化を図る必要がある。
- 農業労働人口の高齢化、農業労働人口の女性比率の増加が進んでいる。これは出稼ぎや移住による 農村人口の流出によるもので、特に若年層が問題。そのため、若年層の農業への取り込みを Priority target と位置付けている。

<u>Tashi 氏</u>

- 限られた人的・資金的リソースの中で効果的に活動を進めていくためには、活動のパッケージ化が 重要と考える。
- 商業農家は既に自身で youtube 等を通じて情報収集を行っており、普及員に頼っていないケースもみられる。素材は必ずしもブータン国内のものに限らない。デジタルトレーニングについては可能性が高いと考えている。
- 農家のグループ化に関しては、生産のグループ化というアプローチよりは販売のグループ化に重点 を置いたアプローチが求められる。

11月4日(木)

11:00 Nubi Geog, Pang Chiwogの女性農業グループを視察

- グループ名: Pang Thesey Deseng (Pang Vegetable Group)
- Pang 村は7世帯から成る集落。全戸から7人の女性が参加して2017年4月に設立し、2018年に 登録完了。
- 各個人の農地(0.25acre/戸)と集落内の Community land 0.3acre で野菜を生産し販売している。
 2019年から School Feeding Program に参加しており、生産した野菜は主に学校に販売している。
 グループ設立当初はトウガラシのピクルスを製造して販売していたが、市場が小さく、価格も思ったほど高く売れなかったため、野菜生産と SFP への参加へとシフトした。現在、学校からの要請に応じて 11 種類の野菜を栽培し、年間6~7 MT を生産している。各世帯はグループでの野菜生産のほかに、それぞれ自給用のトウモロコシ、コメを作っている。集落内の男性は耕起やその他力仕

事が必要な際に手伝っている。

- <u>学校への販売に感じているメリット:</u>市場に出すとすればトンサの市場になるが、そのためには移動と販売で3日仕事となる。輸送費もトンサの市場までボレロタクシーで1,500Nu.かかる。近隣(とはいえ3.8km離れているが)の学校が買ってくれればその分楽になるので、市場に比べて値段が低くても満満足している。輸送・販売の手間とコストを考えると、現在の学校の買取価格はリーズナブルであると考えている。
- <u>今後のグループ活動の展開</u>:グループメンバーは現状に満足しており、生産の拡大やより高い販売 価格をもとめて市場へ出荷するといったことは考えていないとのことであった。
- <u>記帳・販売管理</u>: グループ内に記帳掛かりを決めて帳簿を付けており、毎年の生産コストを把握している。これをもとに学校と毎年野菜の販売価格を交渉している。売り上げはグループで持っている銀行口座に振り込まれ、そこから各メンバーに配分される。現状では40,000Nu./月の売上で年間9カ月野菜を供給している。(同じ学校と2つのグループが契約しており、それぞれ2週間/月づつ生産物を供給している。)
- グループ農業の開始に当たっての政府から受けた支援
 - 種子:無償で供給されるが、不足分は自費で購入している。2020/2021年は全量無償支給された。
 - ▶ 肥料: 堆肥を自分たちで作って利用しており、化学肥料は使用していない。
 - ▶ 農薬:自費で購入している。
 - ▶ 他にグリーンハウス、電気乾燥機、ドリップ灌漑システム等の資材が SFP のもとで提供された。
 - 各種トレーニング:記帳、マーケティング、生産技術、グリーンハウスでの栽培技術等のトレ ーニングを受けた。
- 農業機械利用:集落内の農家がパワーティラーを2台所有しており、メンバーに対して必要に応じて賃耕サービスを行っている。(2,000Nu./日) なお、所有農家は Cottage and Small Industry Bank (CSI)のローンで購入したとのこと。



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Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan				
Date	November 3, 2021, 17:00-18:30 (BST)				
Venue	Hotel Yangkhil Resort				
Participant	District Education Officer	Ms. Pelden Wangmo Mobile: 17647754			
	Assistant District Agriculture Officer	Mr. Karma Wangdi E-mail: <u>kwangdi@trongsa.gov.bt</u> Mobile: 17779032			
	Marketing Assistant	Mekh Bahadur Chhetri Mobile: 17297287			
	JICA Survey Team	Hiroko YASHIKI			

JICA Survey Team (hereinafter JST) confirmed the following.

- In Trongsa Dzongkhag (District), there are 5 Gewogs and 21 schools, and all of which are implementing the School Feeding Program (SFP) with the supply from a total of 32 Farmer Groups (FGs). There are 8 boarding schools (5 public schools and 3 private schools) with the provision of 3 meals/day, 11 day schools with 2 meals/day and 2 day schools with 1 meal/day.
- This is the 2nd academic year applying the current School and Hospital Feeding Program (SHFP) in the schools, and **the Schools just renewed the contractual agreements with FGs for the 2022** academic year (From February to December). Up to date all the 21 schools are managing this new system well, but it is possible that more FGs start to sell their produce to other markets rather than schools due to better prices for their produces.
- When SHFP was started, the officers from RAMCO Gelephu facilitated the schools to make a linkages with nearby FGs.
- The amount of stipend was increased in 2019, but it is a challenge for schools to manage the program within the given stipend. Those vegetables with higher prices cannot be utilized. Before SHFP started, schools bought from middlemen those vegetable imported from India. They are cheaper than those vegetables grown in Bhutan. For instance, the price of cabbage from India was Nu. 15/kg while the price of cabbage of Bhutan is Nu. 40-50/kg.

	Frequency of	Stipend/student/month (Nu)		
	meals	Total	Amount to be	Amount to be paid to local
			paid to FCBL	FGs/ FCML/ BLDCL
Boarding Schools	3 meals/day	1,500	600	900
Day Schools with students come	2 meals/day	1,000	400	600
from remote areas				
Day Schools with students come	1 meal/day	500	200	300
from nearby households				

- Due to a variety of climatic conditions, vegetables are not available through the year in some places in Bhutan. Gewog Agriculture Extension Officers (GAEOs) conducted crop-mapping for each Gewog, to identify which FGs have potential to be suppliers to the schools.
- The volume of vegetables required by a school per day is as small as 15-20 kg, and schools are small as market for FGs. The major markets for FGs are other local markets, such as the District Markets, hydro power project communities, monastic institutions etc.. During the COVID pandemic, FGs wanted to sell the produce to other markets to get better income.
- Farmers of Tsirang and Punakha Districts do not want to sell their produce to the schools, as they can get better income by selling their produce to markets in Thimphu. Thus, the School Feeding Program in those 2 Districts are implemented with the food items imported from India.

- FGs are meeting the demand from the schools. If some members do not have enough quantity of produce for the demand, first, within the same FG, members try to complete the demand. When necessary, even between FGs, they complete one and another to meet the demand from the schools.
- The production does not have to be worried. However, in order to get better prices to the produces, FGs need to learn how to do the post-harvest handling and how to add values on their produces. In line with this, the construction of a warehouse/ cold storage at the center of District as aggregation point may be helpful. Or an auction yard could be established just like in Gelephu.
- School teachers play the roles of mess in charge and of store keeper. All the 44 cooks working for the 21 schools have been trained by MoE. A chef who have lost the job due to COVID got a position of cook at a school in Trongsa. The District Education Office considers the chef as resource person and asks him to train all other school cooks in the Dzongkhag.
- The District Education Office is promoting pot farming to all the schools in the District, as the budget for the School Agriculture Program (SAP) was cut due to pandemic. Even school teachers have bought seeds by their own pockets. The harvested pumpkins and squashes have been utilized to make soup as part of the school meals.
- SFP has been contributing to the reduction in the drop-out rates and to make those students who have to walk a long distance to the schools concentrate on the classes.
- **6 schools were selected as the PLUS Pilot schools,** and it will be applied from 2022. However, it has not been yet applied.

END
Objective	Mountain Hazelnuts Operation by ICT and Drone usage		
Date	November 3, 2021 9:30-11:00 (BST)		
Venue	MHV Conference Space		
Participant	Mountain Hazelnuts (MHV)	Jeff Nicholls, Chief Operations Officer Mukti Nath Chhetri, IT Manager	
	MoA	Mr. Sangay Dendup, Dy Chief of APD	
	JICA Survey Team (JST)	Hajime KITA	

JST confirmed the following.

- 1. Logistic Data shown on Open Street Map is collected by GPS tracking from the apps "Field Companion" and orchard location collected from the Open Data Kit (ODK) tool. However, this system cannot consider the required time for moving with the type of cars (only general time based on the google map time available).
- 2. "Field Companion" enables field staff to collect and report real-time information in a transparent manner with Remote Management and Traceability system (RMT), and make a digital survey on site with ODK tool. Outline of the function is shown in the pictures below.



- 3. MHV applies the use of drone to MoAF and now under the process of approvement. They want to use it for clarifying the orchard area with its boundary (currently, only the point data is available).
- 4. It is possible to collaborate the MODA platform data and any mobile apps because MODA platform is made by ODK.

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Objective	Operation of Regional Agricultural Marketing and Cooperative		
Date	November 3, 2021 14:00-16:00 (BST)		
Venue	RAMCO Director's room		
Participant	RAMCO	Mr. Dorji Rinchen, Specialist (Regional Marketing Coordinator) Mr. Sangay Jamtsho, Marketing Officer	
	MoA	Mr. Sangay Dendup, Dy Chief of APD	
	JICA Survey Team (JST)	Hajime KITA	

JST confirmed the following.

- 1. RAMCO is the regional office covering the 6 eastern districts focusing on post-harvest, processing, marketing, and retailing with 9 specialists (Chairman, Dy director, and 7 officers for FG and cooperatives, school linking, CSI projects, marketing infrastructure (such as construction of market shed), and COVID taskforce including 2 contact staffs for supporting all the above fields.
- 2. RAMCO is having a network with officers belonging in Dzonkhag & Gewog and private aggregators as well, but doesn't form any platform and mainly makes individual to individual communication via mobile phone to share any market related solutions.
- 3. Non-Governmental Organization, Horticulture Association of Bhutan (HAoB) is the biggest organization having more than 3000 members in Bhutan. Members are Individual Farmers, Farmers Groups & Cooperatives, Aggregators, and etc related to agribusiness. They don't have any soft platform but giving information on demand (ALMC and KMC are the life member of HAoB).
- 4. Supporting the agribusiness is one of RAMCO's mandate, but it is hard to make it successful because agribusiness is simply not attractive to youth. Now 12 groups are working in the 6 districts (2 groups in Mongar), and support them by applying Cost Sharing Mechanism, for procurement of facilities, offering free land for business, and linking to the food provider and market places.
- 5. DAMC promotes production of tomato, onion, and chilli as mandatory crops due to the impact of COVID-19 (although Mr. Forji thinks tomato cultivation should be promoted carefully vased on demand because tomato is highly perishable). COVID-19 also made registered aggregators (one in one Dzonkhag to provide the vegetables), which reinforced the connection between MoAF and aggregators. However, id doesn't work very wll because some registered aggregators monopolize products and make price higher than as it should be. Therefore, TAMCO usually avoids such aggregators.
- 6. RAMCO makes market analysis but not sharing in soft platform, and AMIS has a problem in price accuracy due to lack of survey officers and therefore no authorization.
- 7. RAMCO makes distribution adjustments when any shortage is reported, but those adjustments are always done by phone calls and no soft platform. There is no measure to prevent shortage before it occurs.
- 8. RAMCO doesn't give post-harvest training now, focusing on the market information analysis.

9. One aggregator (individual aggregator) in Mongar collects products in a pick-up truck, and takes them to Thimphu, Paro, and Trongsa. He has their own networks to get market information in those Dzonkhags, and bring summer products to those Dzonkhags during winter to make more profit. He use a pick-up truck which can load 1200kg-2000kg of products.

Objective	Operation of Youth Groups		
Date	November 3, 2021 16:00-17:00 (BST)		
Venue	Mongar, Youth Group Processing Plant		
Participant	Youth Group	7 members for milk processing 3 members for snack processing	
	MoA	Mr. Sangay Dendup, Dy Chief of APD	
	JICA Survey Team (JST)	Hajime KITA	

JST met two youth groups in Mongar Gewog engaged in agricultural sector. Those youth groups are given Land Use Certificate (LUC) of the place which used to be a market shed constructed by RAMCO, so they do not have to pay for land usage.

1. Youth Group for Milk Processing

Item	Content	Remarks
Number of	7 women	Educated until at least grade 12, so
employees		they can read & write.
Ingredients	Milk (39Nu/L)	Farmers bring the milk everyday
Products	Fresh milk (55Nu/L), Yogurt	
	(20Nu/100ml), Cheese (200Nu/kg),	
	and butter (460Nu/kg)	
Market	Mongar Market and School	Schools constantly buy yogurt
Profit (Net)	700,000 Nu/year	30% of profit is saved for the
		maintenance of facilities, and the
		rest of money is divided
Comment	Milk is constantly provided and there	
	is not much fluctuation in price	



2. Youth Group for Snack Processing

RAMCO (IFAD) supported a series of facilities such as baker, dryier, etc according to the cost sharing mechanism.

Item	Content	Remarks
Number of	3 men	All the members are graduates, so
employees		they have good skills in basic
		business activities.
Ingredients	Wheat, Quinoa, Fruits, Sugar, etc	Obtain from farmers and markets
Products	Cookies and Candies	
Market	Market in Mongar, Thimphu, Paro	Bring the products by themselves
Profit (Net)	500,000 Nu/year	some of profit is saved for the
		maintenance of facilities, and the
		rest of money is divided
Comment	They are now seeking fund for	
	automatic packing and labeling machine	
	to make their products more attractive	
	for consumers. They got ingredient	
	certificate from BAFRA, which can	
	take nutritious advantages compared to	
	other products.	





Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan			
Date	November 4, 2021, 9	November 4, 2021, 9:30-12:00 (BST)		
Venue	Sherubling Central School, Trongsa			
	District Education Officer	Ms. Pelden Wangmo Mobile: 17647754		
	Vice Principal	Mr. Dechen Wangchuk Mobile: 17971857		
	Teacher, Mess in charge	Mr. Ngaway C. Jamtsho Mobile: 17820809		
Participants	Warden, Storekeeper	Mr. Karma Jamtsho Mobile: 17943295		
	Leader of Farmer Group	Ms. Kuenzang Pelden Mobile: 17733064		
	Student	Ms. Yeshi Tenzin Mobile: 17510577		
	Student	Mr. Tshering Wangmo Mobile: 17581421		
	JICA Survey Team	Hiroko YASHIKI		

JICA Survey Team (hereinafter JST) confirmed the following.

- This is a boarding/day school for the students between 7th and 12th grades. There are 336 students (157 boarding students and 179 day students).
- During the COVID 19 pandemic, the students had to stay at school. There is no canteen within the school, and the parents can send food to their children. Junk food including Coke is not allowed to be brought into the school.
- The menu is adjusted to the reality based on the menu pre-fixed by the Ministry of Education.

Mess Menu Sherubling Central School						
SLNo	. Day	Breakfast	Lunch	Evening Tea	Dinner	
1	Monday	Rice, Rajma Dal	Rice, mixed Vegetable, Milk	Seasonal Fruit	Rice Potato fried with Chana	
2	Tuesday	Rice mixed with Spinach and Chana	Rice, Meat and Mixed Vegetable Curry, Pumpkin Soup (Soya Chunk) with Mixed Vegetables for Vegetables for Vegetarian	Milk Tea	Rice, Mixed Vegetable with Dal	
3	Wednesday	Rice mixed with Egg and Carrot	Rice, Slippery gourd and potato Datshi and Dal	Milk Tea	Rice, Chana and Saag Curry and Potato with Spinach Soup	
4	Thursday	Rice, Cabbage, Carrot Chana Fried Rice	Rice, Egg Curry, stirred fried vegetables with Dal	Milk Tea	Rice, Pumpkin, Potato, Broccol curry with Dal	
5	Friday	Soya Chunk fried rice with Milk	Rice, Chana and Spinach curry with Dal	Milk Tea	Rice, Stirred fried mushroom & cabbage with Dal	
6	Saturday	Rice Rice, Lentils and Spinach	Rice, Mixed Vegetables with Rajma Dal	Milk Tea	Rice, Mixed Vegetable and Dal	
7	Sunday	Rice mixed with Egg and Cabbage with Soup	Rice, Mixed Vegetable Curry, Pumpkin mixed with Dal	Milk Tea	Rice, Mixed Vegetable curry with Dal	

- The Vice Principal is worried that the students are not getting what they require. If the amount of stipend considers the rise of the inflation rate annually, it would ease the situation. It would be also good that the government at the central level fixes the price of each vegetable, to avoid the negotiation with FGs. Otherwise, FGs may go to look for other markets which can give them better prices.
- FCBL is supplying the School with 9 non-perishable items, namely: fortified rice, fortified oil, pulses (dal), sugar, milk powder, processed cheese, tea leaves, chickpeas (chana) and iodized salt, 4 time per year. So far, there has been no damages on the provided food items during the storage at school.
- FCBL brings the supply from the warehouse in Gelephu. Due to the road-block, sometimes FCBL

cannot bring the food items in time. In such a case the food items are provided by the FCBL headquarters and when the road-block is lifted, FCBL Gelephu needs to give the food items back.

- So far, there are 2 farmer groups (FGs) which supplies the School with vegetables. They rotate weekly. Every Friday, the storekeeper calls to the FGs in charge to order vegetables for the next week, and the supply is done every Sunday. When the vegetables are in shortage, a special order is done to FGs.
- The payments regarding the School Feeding Program for the month of August 2021 were as follows.

Agency	Amount of payment (Nu.)	%
BJee Group (FG supplying vegetables)	39,318.50	16.42%
School Agriculture Program	8,302.50	3.47%
Egg Supplier	16,170.00	6.75%
Nubi Om (FG supplying dairy products)	14,125.00	5.90%
FCBL (Meats)	25,220.00	10.53%
FCBL (Fruits)	16,500.00	6.89%
FCBL (Vegetables)	7,705.00	3.22%
FCBL (Groceries)	41,232.64	17.22%
Semjee Group (FG supplying vegetables)	67,708.00	28.27%
A General Shop	3,210.00	1.34%
TOTAL	239,491.64	100.00%

• The contract agreement with the farmer groups is made annually. The school needs the same volume of vegetables through the year in accordance with the menu. However, it is difficult for the FGs to supply the same volume of vegetables sometimes. The School agreed with the 3 FGs supplying vegetables and 1 FG supplying dairy products on the following prices for the academic year 2022.

No.	Item	Agreed price	Agreed price	Price at the Trongsa District Market as of
		(Nu./kg) at	(Nu./kg) at	November 4, 2021 (through Hearing
		Sherubling CS	Takse CS	from the vendors) (Nu./kg)
1	Potato	40	40	40
2	Cabbage	25	24	40
3	Radish	12	24	50
4	Green Chili	80	120	100
5	Cauliflower	55	44	N/A
6	Brinjal	35	24	N/A
7	Beans	55	60	N/A
8	Broccoli	55	60	100
9	Pumpkin	18	20	50
10	Saag	25	24	20
11	Ginger	150	110	200
12	Garlic	150	N/A	400
13	Coriander	100	100	100
14	Squash	12	10	N/A
15	Carrot	45	40	50
16	Peas	40	40	N/A
17	Pointed Cord	25	20	N/A
18	Onion	70	N/A	80
19	Tomato	80	N/A	100
20	Egg (Carton)	2310	220*	2800
21	Butter	400	220*	N/A
22	Cheese	60	44	N/A
23	Dry Chili	1100	N/A	750
24	Chicken		N/A	N/A
25	Fish		N/A	N/A
26	Boneless Beef		N/A	N/A
27	Pork		N/A	N/A
28	Cucumber	35	20	N/A

No.	Item	Agreed price	Agreed price	Price at the Trongsa District Market as of
		(Nu./kg) at	(Nu./kg) at	November 4, 2021 (through Hearing
		Sherubling CS	Takse CS	from the vendors) (Nu./kg)
29	Orange (pon)	150	N/A	150
30	Garlic leave	90	40	N/A
31	Spring Onion	90	40	100
32	Green Chili (small)	150	120	N/A
33	Banana (Dozen)	100	N/A	150
34	Plum	100	N/A	N/A
35	Peach	200	20	N/A
36	Ground Apple	65	40	N/A
37	Persimmon	N/A	N/A	100
38	Pear	180	N/A	N/A
39	Watermelon	80	N/A	N/A
40	Guava	150	N/A	N/A
41	Apple	150	N/A	150
42	Рарауа	N/A	N/A	N/A
43	Milk (Litre)	60	44	N/A
44	Lady Finger	N/A	N/A	N/A
45	Yogurt (700 ml)	30	20	N/A
46	Oyster Mushroom	N/A	N/A	N/A
47	Local Paneer	N/A	440	N/A
48	Lettuce	N/A	20	N/A
49	Turnip	N/A	10	N/A
50	Bitter Gourd	N/A	N/A	N/A

• 2 representatives from all the students assure the volume of food items to be used for each meal, by weighing and counting each food items in accordance with the menu.

- The students serve food by themselves, and representatives of students check if all the students eat and not to leave anything on their plates. Sometimes the prepared food is finished before all the students eat. In such a case cooks need to prepare the food separately.
- 7 households of Semjee village supply the vegetables to the School. There are a total of 20 households in the village, and the 10 households out of the 20 are forming FG. However, 3 households do not want to supply their produce to the School, saying the given prices are too low. It takes the FG leader to bring the produce to the School one hour on foot and 30 minutes by Bolero (vehicle). The FG leader keeps the record of the supply from each of the 7 households, so that the payment could be shared in accordance with the record.
- For the 7 household of Semjee village the priority market is the School. There are 3 reasons for them to prioritize the School. First, they can save the time. In case that they sell at the local markets, it takes them all day. However, when they sell to the School, they can just bring the produce, upon the order by phone. Secondly, they can get the fixed price through the year without any failure. Thirdly, the supplied produce is weighed immediately at the School upon the delivery, with the presence of the FG leader. Thus, they cannot be cheated.
- The payment was done to the group account at the bank monthly, upon issuing the invoice. The mess in charge submits all the invoices to the District Education Office, after the scrutiny. The District Education Office verifies the invoices and pass them to the District Finance Office. The District Finance Office deposit the money to the indicated account. To withdraw the deposit from the account the signs of 3 signers required. The transportation costs cannot be paid apart.
- The Gewog Agriculture Extension Officer help the 7 households, by providing necessary inputs, such as seeds and green houses for free. They are cultivating a fallow land by making an agreement with the landowner. The agreement with the landowner says that if any of the 7 households leaves from the group, the land should be given back to the landowner with the green houses already built up.
- FG has already saved Nu. 70,000, and when it reaches to Nu. 100,000, they want to start the lending services among the members. The group constitution says that the person who is leaving the group

cannot be entitled of the lending services and cannot claim the contribution to the group saving.

• FGs are interlinked and they help one and another when one FG needs more produce.



Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan					
Date	November 4, 2021, 1	14:00-16:30 (BST)				
Venue	Takse Central Schoo	ol, Trongsa				
	Principal	Mr. Sonam Rirchen Mobile: 17123071				
	Mess in Charge (Teacher)	Mr. Galax Nangchuk Mobile: 77472828				
	Head Cook	Mr. Tashi Penjor Mobile: 17976206				
	Student	Mr. Sonam Pelden				
Darticipanta	Student	Ms. Phurpa Dorji				
Farticipants	Gewog Agriculture Extension Officer	Mr. Tashi Tobgay Mobile: 17888099 E-mail: tashitobgay619@gmail.com				
	Farmer Group Chair person	Mr. Dorji Phuntsho Mobile : 14615041				
	Farmer Group Treasurer	Mr Sherab Gyeltshen Mobile : 77383939				
	JICA Survey Team	Hiroko YASHIKI				

JICA Survey Team (hereinafter JST) confirmed the following.

• This is a school where the students can learn through classical language, and the students are from all the 20 Dzongkhags. The students composition is as follows.

Total number of students	Boarding	Day-schooling		
415	405	10		
	9 th grade	10 th grade	11 th grade	12 th grade
	9	12	186	208

- There are 3 FGs in the same Gewog where the School is located and all of them are supplying vegetables to the School rotating on a weekly basis. The FGs supply vegetables by private vehicles.
- To make the contract agreement for the academic year 2022 with the 3 FGs, first, the School and the FGs made cropping calendar of all the produce of the 3 FGs through the year, to clarify actually what vegetables are available in which month.
- One of the FGs decided to supply vegetables to the School, as persuaded by the officers who came from DAMC 2 years ago. Out of all the 30 households in the village, 19 households are participating in the supply to the School. In other FGs, 38 households and 10 households participate in the supply respectively. For all the 67 households, the School is the main market, and when one FG cannot meet the demand from the School, other FGs complement with their own produce.
- The major challenge for the FG is not all members have benefitted from the provision of green house yet. The District Agriculture Office says that they cannot provide the green houses to all the households of the same group at once. So far, 9 our of the 19 households have been given the green houses, while the remaining 10 households are still waiting for.
- As the Government decided not to import Chili, Tomato, Onion from India, the District Agriculture Office has been providing FGs within the District with the necessary inputs for these 3 corps.
- The contract agreement with the farmer groups is made annually. The school needs the same volume of vegetables through the year in accordance with the menu. However, it is difficult for the FGs to supply the same volume of vegetables sometimes. The School agreed with the 3 FGs supplying vegetables and 1 FG supplying dairy products on the following prices for the academic year 2022.

No.	Item	Agreed price	Agreed price	Price at the Trongsa District Market as of
_		(Nu./kg) at	(Nu./kg) at	November 4, 2021 (through Hearing
		Sherubling CS	Takse CS	from the vendors) (Nu./kg)
1	Potato	40	40	40
2	Cabbage	25	24	40
3	Radish	12	24	50
4	Green Chili	80	120	100
5	Cauliflower	55	44	N/A
6	Brinial	35	24	N/A
7	Beans	55	60	N/A
8	Broccoli	55	60	100
9	Pumpkin	18	20	50
10	Saag	25	24	20
11	Ginger	150	110	200
12	Garlic	150	N/A	400
13	Coriander	100	100	100
14	Squash	100	100	N/A
15	Carrot	45	40	50
15	Peac	40	40	N/A
17	Pointed Cord	25	20	N/A
10	Onion	70	20 N/A	80
10	Tomato	80	N/A	100
20	Fag (Carton)	2210	N/A 220*	2800
20	Lgg (Carton)	400	220	2800
21	Chaosa	400	220	N/A
22	Dry Chili	1100	44	N/A
25	Dry Chill	1100	N/A	730
24	Chicken		N/A	N/A
25	FISH Repalace Reaf		N/A	N/A
20	Dorle		N/A	N/A
27	PUIK	25	N/A 20	N/A
28	Cucumber Orango (non)	35	20	N/A 150
29	Carlia loguo	150	N/A 40	150
30	Garrie Onion	90	40	N/A 100
31	Spring Union	90	40	100
32	Banana (Daran)	100	120	N/A 150
33	Banana (Dozen)	100	N/A	150
34	Pium	200	N/A	N/A
35	Peach Crawnal Annala	200	20	N/A
36	Ground Apple	65	40	N/A 100
37	Persimmon	N/A	N/A	100
38	Pear	180	N/A	N/A
39	Watermeion	80	N/A	N/A
40	Guava	150	N/A	N/A
41	Арріе	150	N/A	150
42		N/A	N/A	N/A
43		60	44	N/A
44	Lady Finger	N/A	N/A	N/A
45	Yogurt (700 ml)	30	20	N/A
46		N/A	N/A	N/A
4/	Local Paneer	N/A	440	N/A
48	Lettuce	N/A	20	N/A
49	Turnip	N/A	10	N/A
50	Bitter Gourd	N/A	N/A	N/A

• Fruits are too expensive to offer as recommended by the Ministry of Education. Currently only once a week, one fruit is offered to the students. Unless the amount of stipend is increased, it is difficult to provide the students with quality of food.

- The School applies the whole school approach, and the teachers rotate to be mess in charge. The mess in charge calls the FGs twice a week to obtain all the vegetable up to required volume. Within each FG, the chairperson of FG decides which member can supply each week. The records of the supply from each FG are kept by mess in charge to make the bills.
- The bills are verified at the School Management Committee before being submitted to the District Education Office. The District Education Office submits them to the District Finance Office. The DFO deposit the payment to FGs to their group accounts at bank. However, some payments to individuals are given to the School, so that those individuals can be directly paid by the School.
- The representatives from the students are selected by vote of all the students. Sometimes the meal is finished before all the students eat. The volume may be reviewed. The frequency of the provision of meat, fruit and eggs may be also increased to 2-3 times per week from once per week.
- There are 4 cooks and 2 more assistant cooks. All the cooks are not entitled to the holidays, as there are boarding students. When a cook has to take a leave, other cooks have to cover the absence. All the cooks have gone through the training given by the Ministry of Education either in Paro or in Puntsholing. The training was very helpful to improve skills.
- The part of the cooking still relies on firewood, and it would be better to have electric pans in order not to do harm the health of cooks. The original kitchen whose ceiling is too low is currently used as storage, since the School needed more space for storage. The tentative kitchen was put outside to make sure the ventilation.
- The Principal hopes that the negotiation with FGs will be done by the District Agriculture Office or the Ministry of Agriculture and Forests, but not by the principal. Although FGs look for a better price each year, it is impossible to raise the price, as far as the amount of stipend remains the same. The costs for production is increasing every year.
- In addition, the Schools need to be allowed to buy the food items from all over the country, without limiting to the same Gewog. There is a rumor that the amount of stipend for the tertiary schools is higher than other schools, although the amount should remain the same irrespective of the types of schools.







Objective	Operation of Commercial Agriculture and Resilient Livelihoods Enhancement Program (CARLEP)		
Date	November 4, 2021 13:00-14:00 (BST)		
Venue	Mongar, CARLEP office		
	CARLEP	Mr. Dorji Wangchuk, Program Director of CARLEP	
Participant	MoA	Mr. Sangay Dendup, Dy Chief of APD	
	JICA Survey Team (JST)	Hajime KITA	

JST confirmed following:

 CARLEP was designed to facilitate the transformation of a subsistence rural agricultural economy into a sustainable value chain and market driven productive sector in 6 eastern Dzongkhags. The program period was initially 7 years (2015-2022) funded by IFAD, ASAP, FCBL, RGoB, and etc, which amount reaches 31 million USD in total (of them, 45.3% is IFAD loan). The government decided to take additional fund (5 million USD for loan and 1 million USD for grant) and extended to 2025.



- 2. CARLEP office is the coordinating organization implementing holistic fields of value chain by the specialized organizations such as ARDC, RLDC and RAMCO as follows:
 - \checkmark Market-led sustainable agriculture production
 - Training/infrastructure support to Increase the number of Climate Smart Villages (CSV), which considers sustainability in farmland (SLM), crop diversification, water usage, ICT usage, and etc.
 - Training on improved production technologies for vegetable and daily production
 - Installation of post-harvest machinery (such as grading and sorting machine)
 - Giving Land Use Certificate and investment for facilities to youth for commercial agriculture
 - ✓ Value chain development
 - Organizing Multi-stakeholder platforms (MSP) meetings liking farmer groups, livestock groups, traders and schools. (155 agricultural crop producer groups and 38 livestock groups with 65 schools (total 25,234 students). Additionally, 13 traders have been linked

to producers through the MSP process, which provide alternative markets to these FGs)

- Giving technical assistance to extend and foster spawn production technology for mushrooms
- Construction of large market facilities
- Capacity building for knowledge of marketing targeting youth, existing farmers and FGs.
- Matching grant scheme for youth
- ✓ Institutional support and policy development for strengthening agricultural institutions
 - Training for extension agents
- 3. So far, there is only one youth group (4 members) applied to the matching grant above. They are now taking the training under the corporation of Tarayana foundation in Thimphu and start their business with 50% of fund support from the government.

Objective	Activities in Gyalpozhing College of Information Technology (GCIT)		
Date	November 4, 2021 9:00-11:00 (BST)		
Venue	Mongar, GCIT conference room		
	GCIT	Mr. Lhato Jamba, President of GCIT	
Participant	MoA	Mr. Sangay Dendup, Dy Chief of APD	
	JICA Survey Team (JST)	Hajime KITA	

JST confirmed following:

- 1. GCIT is established in 2017 specialized in IT with Bachelor of Computer Applications (BCA) with 80 students, some of which are working in the Japanese IT company (Tokyo Institute of Japanese).
- 2. Now there are two programs with 304 students; BSc in Computer Science and BSc in Information Technology. Furthermore, GCIT hired the consultants from Singapore to renew the contents of courses by adding block chain technology, AI, Data Analytics with cyber security and technopreneurship as elective in BSc Computer Science. BSc in IT offers the skills in digital media development such as visualizing technology with technopreneurship.
- 3. They provide the training course of digital literacy. The course can be open anyone who has an interest in getting familiar with IT technology with small fee (3,000Nu) for 30days course. Now 9 trainees are taking the IT training course.
- 4. They also provide the IT training course for youth in private company (Agroindustry Limited) to learn IT technology. This program starts based on the request from the company to ICTD.
- 5. GCIT collaborates with MHV to give a course for development of mobile apps.
- 6. Technologies developed in GCIT is; 1) automatic watering system with a set of IoT sensors to alleviate the burden of garden watering and 2) monkey detection system by camera and AI image detection (experiment stage). 3) electric fencing system with IoT which makes management of fence easier by alarming. GCIT thinks those system should be installed in project site, and GCIT is welcoming for collaboration.
- 7. Graduates from GCIT usually works in international companies such as Amazon and Facebook because the market is quite small in Bhutan. So GCIT is looking how many students got employed outside of company but working for Bhutan.
- 8. GCIT is now preparing IT startup center for graduates technopreneur, which will take 2 to 3 years to initiate.
- 9. The concept of Gyalpozhing IT park which was suggested by JICA report "The Project for Formulation of Comprehensive Development Plan for Bhutan 2030" in June 2019, did not realize so far.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Agriculture Land Development		
Date	05/11/2021 14:00-15:30 (BTT)		
Venue	NSSC		
	Central Machinery Unit (CMU) - Bumthang	Mr. Ugyen Cheku, Head of Maintenance Section, 17971503, <u>ooogyen@gmail.com</u> , and other 6 members	
Participant	JICA Survey Team	Mr. Kazuhiro Tsuchida, Mr. Hideki Hiroshige	

Mr. Rinchen Dorji, Program Director, was not available due to an emergency, so Mr. Ugyen took over.He is also a member of the SLM New Guidelines Workshop. In addition to Mr. Ugyen, a total of 6 people attended the meeting.

- Presentation by Mr. Ugyen; PPT available; most of the information requested via AED is covered in the PPT. Also obtained Operation Record (Excel file).
- The terminology used in Bhutan for the Excavator and Backhoe is that the Excavator is a crawler type and the Backhoe is a wheeled type. (The swiveling capability of the arm is not considered.)
- In the table of achievements in the PPT document, "NFR": New farm road, "FRM": Farm road maintenance, "ALD": Agriculture land development. "Gender": the gender of the landowner.
- Project achievement: 9,903km of farm road maintenance and 3,930acres of farmland improvement (terrace construction) have been carried out so far. 861km of farm road and 2,521acres of farmland improvement have been carried out during the 12thFYP (as of 2018-2021). Especially after the 12thFYP, the focus of CMU's activities has shifted from farm road maintenance to agricultural land development.
- Construction equipment: 79 Excavators and 20 backhoes. One excavator and one backhoe each are deployed at each distirct (dzongkhag) with an operator. Dzongkhag administation operates these machines, and the CMU is responsible for the maintenance of the machines (both operating costs and maintenance costs are covered by the prefectural budget). All excavators deployed by the dzongkhag are large size (20-ton class), while the CMU owns 72 large and 7 medium (13-ton class) excavators.
- Operation of machines: CMU-operated excavators are requested by Gewog/Dzongkhag to CMU, and are prioritized and approved by DOA for implementation. District Agriculture Officer (DAO) prioritizes and approves the requests from Geog for the operation of the machines deployed in each dzongkhag within the budget of the dzongkhag. CMU is not involved in the operation of the machines in dzongkhag.
- Applicability of excavators to ALD sites: As pointed out by the NSSC and AED, the large 20-ton class excavators currently used for ALD works are not a problem in the southern regions with gentle slopes, but may cause difficulties in the central and eastern regions with steep slopes. A large excavator requires a larger terrace per level in construction, and on steep slopes, the step

hights between terraces become larger. In addition, on a steep slope, the workability and safety will be reduced by using a large size because the construction will be done in a narrow space due to "small turnaround" is not possible. Therefore, there is a strong demand for medium-sized machines in areas where there are many sites with severe slopes.

- Technical level of operators of CMU and private company: It does not seem that there is any difference in the level of machine operation between CMU and private sector, but CMU operators have higher knowledge and skills required for ALD work on agricultural land. When CMU decided to conduct ALD work, NSSC conducted a two-week training for the operators. Private operators often do not have knowledge about agricultural land and topsoil conservation. In addition, due to the cost and time involved, there have been cases where topsoil treatment has been skipped, which has become a problem.
- Supervision of ALD work: When ALD work is carried out, a contract is signed between the land owner and CMU (or private company) even if the funds are from the government budget, and a report signed by both parties is submitted to Dzongkhag administration after the work is completed. The land owner will be responsible for the supervision of the construction.
- Implementation of ALD construction work: The capacity of terraces that can be constructed with one excavator is about 50~70 acres/year. This is a figure that takes into account the reduced number of working days due to breakdowns and maintenance.
- Use of construction equipment: It was stated that most of the equipment deployed by Dzongkhag is used for farm roads and major part of ALD works are done by hiring private machines (by Mr. Ugyen). The ratio of construction equipment used in farm road maintenance is 50:50 between CMU and private sector.
- Challenges in ALD construction
 - Construction machines are getting old and breakdowns are increasing. Operating days and maintenance costs. Securing spare parts.
 - > There are no technical problems in maintaining the machines, and CMU engineers are able to do it well.
 - > Lack of machines that match the conditions of the construction site.
 - > Lack of absolute number of construction machines.

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Objective	現地視察 (Urban Agriculture and Peri-urban Agriculture)		
Date	11月8日(月)		
Venue	Thimpu Dzongkhag(県)		
	同行者	Mr. B.B. Rai, School Agriculture Program Officer (SAP), Agricultural Production Division (APD), DOA	
Participant	調査団	土田和弘	

11月8日(月)

9:00 MFA Garden (Ministry of Foreign Affairs Garden)

- 外務省パスポート部の敷地内の未利用地を農地として開発し、職員 14 名からなる公務員グループ で野菜を栽培している。FAO と RGoB の資金で DAO-MoAF が農地開発、資材提供、技術指導を 行っている。2020 年に栽培を開始して本年は2回目の作付け。
- 農地面積 3.5 エーカー、5mX21m のビニールハウス 1 棟。ハウスでは夏は苗、冬は野菜を栽培。 灌漑水源は水道水を利用している。
- 本年の収穫 野菜8トン(ジャガイモ 5,000kg、トウガラシ2,000kg、タマネギ200kg、ニンニク 50~60Kg、豆類200~300kg)
- 収穫物は全て販売(役所の中での販売、市場での販売、メンバーの買取)しており、メンバー一人 当たり 5,000Nu の販売益があった(2021年)。
- DOA からのサポート 支援総額 400,000Nu
 - ▶ 農地開発、ビニールハウス、灌漑施設(ドリップ)、遮光シェッド、等すべて DOA が支給。
 - ▶ 種子、堆肥、農薬もすべて DOA が支給(化学肥料は使用していない)
 - ▶ 耕起作業用のパワーティラーも外部機械を DOA がハイヤーして提供。(オペレーターは自前)
 - ▶ 必要なトレーニング(経営、栽培技術)も DOA が提供。
 - ▶ プロジェクト期間の3年間はこれらのサポートが継続される。
- 農地のコンディションはよく整備されており、資機材も農業機械以外は十分揃っている。プロジェクト期間中であることからすべて政府の支援の下で営農が行われている。プロジェクト期間以降は 種子と技術指導は継続する予定であるとのこと(B.B.Rai氏)。すべてにおいて手厚く支援されており、DOAとして Urban Agriculture の成功事例を作り上げたいとの意欲は感じる。また、グルー プメンバーはプロジェクト期間終了後も農業を続けたいとの意向をもっている。しかしながら、プロジェクト期間以降も現状と同レベルの資機材支援を期待しており、メンバーからは農業を続ける には支援が必須との発言もあった。プロジェクトのコンセプトが商業農家の育成ではなく、公務員の福利厚生(給与補填?)の意味合いが強いものであるため、致し方ない部分はあるが、持続的な 農業経営には不安を感じるところもある。

Bhutan Data Collection Survey for Agriculture with and post COVID-19



10:00 Babena Urban Agriculture Garden

MFA Garden と同様に FAO、RGoB の資金で DOA が開発した農地。農地面積約7エーカー。コロナ禍 で仕事を失った観光ガイドのグループ7つが参加している。土地は宗教法人の所有地。

DOA による支援は、農地開発、フェンス(電柵、ネット、鉄条網)、グリーンハウスの建設材料の提供、 マルチングの資材の提供、種子の提供、堆肥の提供(自前で 10kg 作ると 20kg 分の堆肥が追加で提供 されるシステム)、農業機械のハイヤー(機械代は DOA)、バイオ農薬の提供、経営及び栽培技術指導。 プロジェクト期間は3年間。

ユーザーグループに対しては毎年1月に営農計画を策定し、年度末にプログレスレポートを提出する義 務が課せられている。



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11:00 Tango Buddhist College Garden

2020年に FAO の資金で設置された Tango Buddhist College の学園農場。同カレッジは6年前に設立 されたブータンで最高位の仏教大学院となっている。コロナ禍で職員及び学生の食事に提供する野菜の 確保が困難となったため、自給用に学園農場を整備したもの。Pei-urban Agriculture (Protected Agriculture and Smart Irrigation Technology)プロジェクトとされている。

農地面積は1.5~2エーカーで、5mX20mのグリーンハウス5棟が設置されている。



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ハウス内での栽培風景

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Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	Collage of Natural Resources		
Date	November 8, 2021 11:00-13:00 (BST)		
Venue	CNR conference room		
Participant	CNR	Mr. Sonam Wangchuk, President of CNR Dr. Phub Dorji Dr. Karma Wangchuk Dr.Sonam Tashi、Dep. Of Agriculture Dr. Chegyel Wangmo Dr. Tengin Wangchuk	
	PPD	Ms.Sonam Euden, PPD	
	JICA Survey Team (JST)	Hideki HIROSHIGE Hajime KITA	

JST confirmed following:

1. The table below is the outline of the courses CNR provides. Graduates usually work in MoAF, but many of them got unemployed after the impact of COVID-19 has reduced employment slots available.

Degree	Course	Students	Outline and Remarks4
BSc Diploma	Agriculture	101	2 years for skill-based, and additional 2 years for development of applied science in agriculture. It was incorporated into BSc in Organic Agriculture since July 2021.
BSc	Organic Agriculture	108	Developing management skills in soil and nutrition, plant & animal health, alternative agriculture practices.
BSc	Sustainable Development	101	Developing right attitude towards nature and balanced approach to development in a holistic manner.
BSc Diploma	Forestry	173	Developing a cadre of professionals as forest extension worker, wildlife manager, environmental manager, etc.
BSc Diploma	Animal Science	137	2 years for skill-based, and additional 2 years for development of applied science in livestock farming.
BSc Diploma	Food Science & Technology	135	Developing food production, processing, food analysis, packaging, and labeling. So far, only 1 batch of students has been graduated (started in 2016)
BSc (3yrs)	Environment & Climate Studies	94	Developing analytical and critical thinking for sustainable development in a holistic manner.
MDP (2yrs)	Master in Development Practice	18	Enhancing the knowledge & skills in: Development Economics, Gender and Development, Environmental Science for Sustainable Development, and GNH, Public Policy and Development, Global Health and Organizational Management
MS in NRM (2yrs)	Master of Science in NR management	16	Enhancing the specialist knowledge and competencies in a range of subject areas pertaining to rural development in general and agriculture, animal production and forestry in particular.
	Total	1,017	Of them, 287 (28%) students are self-funding.

*Some courses were updated to a portfolio program 3 years ago to meet the market demand in terms of smart agriculture, marketing and entrepreneurship.

**Food Science & Technology provides practical methods how to deal fresh fruits and vegetables, and some post-harvest processing methods (such as vacuum, packaging, canning, pasteurization) with their limited-space lab (also CNR sends students to National Post Harvest Center and Agro-Industry Bhutan to learn for blanching method, freeze dry, and etc.).

- 2. Agro-based Entrepreneurship Development and Incubation Centre (AEDIC) was established in June 2017 (funded by Indian government, and this is the part of Startup and CSI development flagship program handled by MoEA and MoHLR) and providing school leavers and graduates with the 3months training for skills in production (such as mushroom production), 1 month for enhancing a business and financial management skills. AEDIC also links the trainees to financial institutions such as CSI development bank (interest rate:8%) and BDBL. The center needs much more improvement to help trainees start their business. CNR also provides an entrepreneurship club by students.
- 3. CNR worries that farmers' motivation in farming will be lost because the end of COVID-19 allows more and more imported cheap food whereas COVID-19 made imported food restricted which resulted in increase in domestic production. Therefore, CNR thinks one of the key to solve this challenge is crop diversification (not only rice cultivation as primary food but also use buckwheat for example by changing their eating habits) and proceed value-addition although they are not sure how to act.
- 4. CNR mentioned about importance of inputs supply. Bhutan is promoting organic production and not allow to use chemical fertilizer. So, Organic fertilizer processing facilities should be developed to supply required input for farmers.
- 5. With regards to farm machinery, current farming machines, power tiller, is big and heavy so that it is difficult to move up at terrace field. Smaller machine can move to upper terrace by one-person is required in slope terrain area.
- 6. As for fallow land treatment, CNR thinks the reason why farmers make their farmland fallow is farmers allows cattle to roam after harvesting rice so that they destroy all the bushes and crops which can make the farmland fertile.
- 7. CNR has done some case studies for HWC which is now under editing (CNR will share the report to JST). The study found the one of the reasons on HWC is big labor shortage. This is because of the big population migration from village to the city. They have not been taken any education to go back to their village after studying.
- 8. CNR also thinks protecting farmlands from wild animals only by electric fencing seems impossible and people must take some measures to control the population of wild animals. Like promotion of Game hunting. Otherwise we need to find the way to adapt the crop damage from wildlife such as establishing an insurance.

ブータン国

COVID-19下・後の農業振興情報収集・確認調査

目的	今後の調査実施方針に関する打合せ		
日時	2021年11月9日10:00-12:40 BST		
会場	Zoom		
	JICA 本部	南アジア部南アジア課 若林 康太 経済開発部:間野	
出席者	JICA ブータン事務所	田中 真理子 工藤 淳	
(现入个小甲合)	称略) 調査団	 高野 正志 弘重 秀樹 土田 和弘 北 基 矢敷 裕子 今井 美樹 	

1. 調査団からの報告内容に対し、JICAから以下のとおりコメントあり。

【若林】

- 分野ごとに優先度をつけてもらった形だと思うが、全体の優先度はどのようになっているのか。
- 各プロジェクトをやることによって、どのようなインパクトがあるのか。
- 21世紀経済ロードマップ、全総 2030 といったメインポリシーを考慮した方がよい。
- 魅力ある就業機会の提供・創出にどのように貢献できるか。
- 過去のアセットをどのように利用するかも考慮する必要があるのは、JSTの認識のとおり。(これについて、JICA工藤氏から過去の支援・成果を踏まえて、本業務の提案をお示しいただけると助かる、と付言あり。)
- バリューチェーンに関し、ブータンで本気で輸出できるかどうか、可能な限り裏取りをすべきと感じた。
- ICT の活用について、実装に加え、市民による利活用まで視野に入れた仕組みづくり(運営の仕組 みづくり)が必要と感じた。

【工藤】

- 当初は無償資金協力案件候補を避けていただくようにと説明し、それにそって検討いただいたところかと推察。ただ、事務所としては、無償資金協力、有償資金協力の可能性についても検討している。
 但し、有償協力は電力セクターのような収入を生み出す産業セクターのみブータン側で採用され、
 農業も一応含まれる。そのため、無償と技プロの組み合わせなどもあり。有償を前提とした提案も別途検討してほしい。
- ブータン政府が一番必要と感じているのは若者に仕事を作ること。各作物の産地化、農家グループの構築、この中で若者を取り組んでいくことが可能ではないか。
- ブータン側も若年雇用に取り組んでいるが、傍から見ると無責任な印象。例えば、モデル農村 PJ などで、時間軸を決めて、農業トレーニングを実施した新規就農者に期間を決めて契約栽培を行うこととして、その期間後は自立して自由にマーケットに販売できるようにするなど、支援方法が考えられる
- 学校給食プログラムの提案に関し、課題の明確化とは記載せず、本業務を通じて明確化された課題 に対する取り組みを記載すべき、またWFPとの連携・棲み分けについて整理いただきたい。
- セミナーの当日は、ブータン側に候補案件を示しつつ先方に選択権を与えるような形ではなく、日本

側としても有力候補と考える案件について先方と建設的な議論ができるようにしたい。

【間野】

- モデル農村開発に関し、ひとつの技プロの案としてはコンポーネントが多い印象。今次提案の中で 優先順位をつけることでコンポーネントを絞ってはどうか。
- セミナーに向けて、通例の技プロでは農家に対する機材供与や施設建設の一部が先方政府負担と なるケースもある。機材供与や建設が全て JICA 負担と誤解がないよう発信いただきたい。
- 今後、温帯果樹関連の支援を予定している。特定作物の輸出支援との整合性があるかもしれない。
 SHEPの枠組みでは園芸作物の全てを対象とするケースが多いが、同支援では温帯果樹に着目し、
 そのバリューチェーン構築を予定している。

【田中】

- モデル農村の目指す成果が明確になっていないので、要整理。
- School Feed Program は危うい印象を持っている。実施中の SHEPトレーニングの結果として、農家と School Feed をつなぐという提案が研修生から出てくることが多い。市場がうまく成り立っていないので 仕方ない側面あるが、SHEP の考え方とは少し異なる。
- 栄養で他の国の事例を教えてもらいたい。国内では紀ノ川町で、地産地消の成功事例があったが、 利益ではなく別の側面からやっている。
- モデル農村実施後に、ちゃんとした市場を見つけられるのかとの懸念。
- トンサのモデルファーム(FMCLが開墾して実施)では、政府の投入が多い。
- デジタル活用(ドローン)を通じた雇用促進に関する調査を実施中。(これに対し、若林より、農業分野においてお金を払ってでも受けたいサービスを確認することが、新規ビジネス発掘や雇用促進のアイデアになり得るのではないか、とコメントあり。)
- 日本では農業法人が増えてきている。農業法人を立ち上げ、就職先を増やすことができれば、ブー タン人も就職できるなら農業法人でも問題ないのではないか。
- 2. 以上の JICA コメントに対し、JST から以下のとおり応答・質問した。
- 過去とのリンクについては、整理の仕方を考えたい。
- 温帯果樹案件について可能な範囲で情報提供いただきたい。(これに対して、対象地するのは、パロ、ティンプー、ハの西部であり、果樹の苗木生産、技術普及、Value chain 構築が主な活動であり、SHEPの考え方であるマーケット需要を理解して生産するという考えを身に着けてから技術普及をすることで、より農家がやる気をもって技術を習得し、市場を見越した出荷時期の調整等を実施することを目的とする、という説明があった)
- 各支援案のインパクトについては、提案内容と並べてわかるよう整理する
- 農地改良の分野においても、若年層の農業ばなれに対する懸念が確認されており、使いやすい農 地や農機を活用したインテンシブな農業を提供・提案することの重要性を感じている。
- ドローンに関し、ブータンのような丘陵地にある農地のモニタリング手法として、ドローンの活用可能 性が認められる。ドローンによる新サービス分野として、国内空輸(輸送・宅配)、保険(インデックス 保険)があるのではないか。
- 最終報告書のまとめ方について確認させていただきたい。(これに対し、JICA 工藤氏は、各セクター で検討されたものをひとまとめにしたものが農業振興プランと想定しており、優先順位や実施時期な どを選定基準にして整理すると応答した。)

以上

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	To discuss possible support from JICA in future		
Date	November 9, 2021, 17:00-19:00 (BST)		
Venue	Meeting room, WFP		
Participants	WFP	Ms. Kencho Wangmo: School feeding and Nutrition Officer Ms. Phuntsho Wangmo: Outcome manager for nutrition unit Ms. Manashi Shukla : Food Technologist Ms. Susan Shulman: SBC Specialist Mr. Udaya Sharma: M&E and innovation officer Mr. Barnaby Peacocke: Evaluation team leader	
	JICA Survey Team	Hiroko YASHIKI	

JICA Survey Team (hereinafter JST) confirmed the following.

- In the nutrition sector, WFP is the only development partner of RGoB, and its major counterpart is MoE. However, for the School Feeding and Nutrition, WFP is working together with MoH and MoAF, too. The program should cover not only the schools but also the hospitals and the monastic institutions. However, only a few hospitals and monastic institutions have been covered.
- For the nutrition education, the information needs to be included into the textbooks at schools and WFP is supporting the broadcasting of TV shows, too.
- WFP is collaborating with the Tarayana Foundation to reach people at the grass root.
- To develop an SBC strategy, an ad-hoc task force has been established. However, WFP expects that the National Nutrition Task Force will be an apex body for the nutrition sector coordinating with other institutions and task forces.
- The Nutrition Program of the Department of Public Health is currently staffed only with 2 officers, and the capacity is limited. MoH cannot take care of everything, and the responsibilities need to be shared with other government institutions and agencies.
- The sustainability of the school feeding program cannot be assured. The supply mechanism is collapsing, and it may leave a lose-lose relationship between the schools and FGs. Up to date, FGs involved in SFP have benefitted from the Government support in kinds, such as seeds, greenhouses, etc. and without such support, how much profit FGs can get from the schools will be one of the challenges. Meanwhile, the remote schools cannot manage the School Feeding Program with the pre-fixed stipend, as the transportation costs remain very high. How to meet the end of the program, currently it depends on the skills of the mess in charge or teachers, as RAMCO cannot facilitate the negotiation between the schools and FGs due to COVID. The guidelines could be prepared based on the experience of SFP in Tashigang.
- The introduction of PLUS is a hope to the current situation. WFP wants to support FGs to facilitate the market information flow. One of the findings of the evaluation team is the price variation even within the same Dzongkhag. Schools can still get the same produce at a lower price if PLUS is well applied. Another finding of the evaluation team is an increase of the broccoli at the household level of the FG members, after having the contract agreement with the schools.
- WFP keeps investing its 50% of resources to School Feeding and the other 50% to market-oriented agriculture. Yet, for the latter, the School Feeding Program will be as entry point for farmers to develop their business. Schools and Dzongkhags are too small as markets and FGs will be encouraged to aim at the National level markets.
- The schools need rehabilitation of the cooking and storage facilities. The current facilities are already obsolete and there are problems from the point of view of the food safety & hygiene, as well as the health of cooks.

Objective	Processing and packaging agricultural products		
Date	11/10/2021 9:00-11:00 (BTT)		
Venue	NPHC Paro Conference Hall		
Dortiginant	National Post Harvest Centre (NPHC), DAMC, MOAF	 Ms. Sonam Lhamo, Food Processing Divison, NPHC Mr. Shri Ram Pradhan, Engineering Division, NPHC 	
Farticipant	JICA Survey Team	1. Mr. Hiroshige Hideki, JICA Survey Team Sub Leader	
	PPD, MOAF	Ms. Sonam Euden, PPD, MoAF	

1. Background of the Center

- Established in 1997
- Currently under Department of Agriculture, MoAF. It will be moved to under DAMC (Department of Agricultural Marketing and Cooperative)

2. The Organization structure and activities

The main activity at the Center is to develop Post production technologies which is later transferred to stakeholders.

The Headquarter is located in Paro with has three Divisions

- (1) Physiology Division
- The activities under this Division are mainly for post-harvest management of fresh produce. The Division has a 100 MT Cold store where interested stakeholders can store their produce. An SoE named Bhutan Agro Limited is the frequent user of their Cold Store.
- (2) Food Processing Division
- The activities under this Division are mostly on need basis. In order to enhance shelf life and innovate product recipes.
- (3) Engineering Division
- The major activity under this Division is for the maintenance of equipment and post-harvest technologies. The Division also comes up with new technologies for farmers to use.

4 sub-centers located in Mongar, Zhemgang, Dagana and Pema Gastehl. The HQ has three Divisions All the Sub centers usually replicate what NPHC does in the Headquarters. Integrated Food Processing Plant was the initial name of the sub-centers however after a couple of meetings it

Integrated Food Processing Plant was the initial name of the sub-centers however after a couple of meetings it was renamed to sub-centers. The equipment and technologies used at the Center are very small scale. Farmers can use the equipment in SC for processing their products. The centre in Mongor is used mainly for Bhutan Agro Industry – State Own processing company to produce Juice, etc.

The Center highlighted that they have limited fund to transfer technical know-how to the farmers. Thus, they work with other Ministries for providing trainings.

For technological assistance, with the help of Department of Cottage and Small Industries, Ministry of Economic Affairs the Center procured technologies.

3. Donor projects

(1) National Organic Flagship Program

Farmers group to produce buckwheat noodles and cookies.

Starts with group formation - training - processing and buying equipment for farmers.

(2) SDF – SAARC Development Fund

Targeted 4 farmers group – 2 in Chukkha and 2 in Samtse

Trained on Food Processing and marketing. small food processing shelves. For successful marketing of the product.

(3) AFACI (KoICA)

Similar to SDF and located in Samtse - Process mango pickle. The project piloted for just one farmers group.

4. Challenges in Processing and Storage

The constraints for Agricultural activities highlighted were Packaging and production in a large scale. Due to small scale production of processed products, the cost for package material become high. When a private company produced potato chips with aluminium-coating package, need to inoxidize oil, its price become high and lost competitiveness with imported products.

The NPHC has 100 MT cold storage. It is used mainly to store apple because of Paro location.

- Rates Apples during season and off-season is as shown below.
 Apple Season (August to September) Nu.450 to Nu.500 per box
 Off season Nu.1500 to Nu.2000 per box
- Rates for Storing apples in the cold stores

Nu.3 per box per day. Whereas, in the past it cost only Nu.1 per box. However, there is one private company to operate cold storage for apple in Paro, in order to encourage the private and not pose competition for them, the price in NPHC was increased to Nu.3 as same as them.

Challenges at the Centre

- Old cold storage and lack technical expertise to work with cold stores The cold storage in NPHC is
 need maintenance due to its age. However, in the last 2 years the Center couldn't bring technician from
 outside. Technician within the country is limited which hike the price.
- For overall Food and Nutrition Security The Center has no lab to test food for Nutrition aspects. Need for a Referral lab or upgradation of the existing lab would be an added advantage to the Center.

5. Others

- The sorting machine for potato and apples are in the Centre, but nobody use them because of no standard in the market.
- The NPHC got many cabbage under buy-back system due to good production in last season The Centre tried to make new product, like Kimuchi or Pickes, but not success and they are storing many barrels with salted cabbage now. Moreover, they tried to maintain them in cold storage, but not archived.

Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan		
Date	November 10, 2021, 9:00-10:00 (BST)		
Venue	Office of the District Education Officer, Thimphu Dzongkhag Office		
	Officiating Chief Dzongkhag Education Officer	Ms. Lham Tshering Mobile : 17129795 E-mail : <u>lhamt@thimphu.gov.bt</u>	
	Chief Dzongkhag Agriculture Officer	Mr. Sonam Zangpo Mbile: 17706913 E-mail: sonamz@thimphu.gov.bt	
Participants	Agriculture Extension Officer, Geney Gewog	Mr. Kinley Dorji Mobile: 17632974/ 77632974 E-mail: kinlzag2004@gmail.com	
	Asst. Marketing Officer, DAMC, MoAF	Mr. Tshering Penjor	
	JICA Survey Team	Hiroko YASHIKI	

JICA Survey Team (hereinafter JST) confirmed the following.

- There are 14 schools within Thimphu Dzongkhag, while there are 33 schools in Thimphu Thromde. 2 schools out of the 14 schools are small and remote. 1 private school, 1 charity school and 12 public schools.
- One of them is located at the 4,200 meter above the sea, and WHO equipped the school with a green house to produce their own vegetables for school meals.
- The School Agriculture Program has facilitated the schools to supplement ingredients of school meals and almost 30% of vegetables are produced through SAP. Some schools are selling their produce.
- With the school feeding program, the enrollment rate as well as the performance of students are improved.
- Some schools do not have nearby FGs which can supply perishable items to the schools. Thus one FG supplies to four schools in different Gewogs. For the FG, the supply to the school is their social responsibility as there is only little profit.
- The said FG supplied cheese and meat to the schools but now the schools should buy them from BLDCL. This affected the sales of the said FG.
- Chuniding Food (<u>http://chunidingfood.com/</u>) supplies egg powder and vegetable powder to the school, and the school mix them into the soup.
- The transportation cost for remote schools is expensive and they have to compromise some ingredients to make the school meals. The cold van and the deep freezers were provided to the schools by the Government.
- Farmers are encouraged to make onion, tomatoes and chili as they are prohibited to import from India.
- FGs to collaborate with SFP can be provided green houses, vans (transportation).
- To meet the costs of SFP, parents of student could assume the responsibility of cost-sharing. Not all the parents can contribute but most of them could do so.

Objective	Farmers and Traders Networking		
Date	11/9/2021 13:00-14:00 (BTT)		
Venue	Office of Horticulture Association of Bhutan (HAoB)		
Participant	Horticulture Association of Bhutan	 Ms. Sonam Lhamo, Food Processing Divison, NPHC Mr. Shri Ram Pradhan, Engineering Division, NPHC 	
	JICA Survey Team	1. Mr. Hiroshige Hideki, JICA Survey Team Sub-Leader	

1. Horticulture Association of Bhutan (HAoB)

- HAoB was established in 2019 as Non-profit organization. However, due to COVID-19, there was not able to work properly.
- 2021, HAoB started to analyse the challenges in Bhutan from experiences of two times lockdown. The issues on food security was caused various reason, and one of big issue is the gap between what farmers produce and market demands. The production should be market-demand base. And logistic is necessary.
- HAoB will active as agency to bring voice of farmer including youth and women to the Government
- HAoB is focus on Youth and women, they are vulnerable group.
- There are member, private entities, Farmers, farmers group. 3,000 farmers, 121 cooperative including farmers group are member. The member included agri-business companies.
- In future, is HAoB could collaborate with donor, financial agency, the member will be supported to access to finance.

2. Bhutan Agriculture

- Value Addition part is still big issue in Bhutan, even there is so many intervention from Government and donors.
- Bhutan have clear production season, from March to October, especially in higher part. Even green houses are promoted, there is few production adjustment. And all produced are shipped after harvest, but due to lack of good logistic, some produces are dumped in the production area.
- In Thimpu, there is no standard storage and cold storage. If there is storage, farmer can borrow to maintain the produces and selling them in off-season.
- The vulnerable group, youth and women, lack of knowledge and lack of opportunities for training. Many trainings are provided for government officials but they are not giving the knowledge to farmers. The actual beneficiaries of such trainings should be farmers.
- The issues in agriculture Bhutan are
 - Market led production
 - Market integration
 - Improving the logistics
 - People do not recognize that Horticulture production has potential in future
 - Minimum engaging private sector in the policy making by Government
 - Minimum knowledge Capacity development
- The insurance or assurance is necessary for farmers.
- Package support is necessary. The government support is mostly cover only part of production, because it was divided among groups. But only with such partial technical support, it is difficult to support proper production.

3. Future concept of HAoB

Following structure is expected to develop by initiative of HAoB

- At national level, crop ambassador will be located in HAoB.
- Crop Ambassadors will be appointed in every 20 Dzongkhag
- Gewog Distributor will be located in each Gewog
- Thick collector will be located.

4. Others

- Even if farmers produce good organic products, there is no market in Thimphu. Even, hotels and supermarkets. They are not interested to buy organic certified products. It is also difficult to export the organic products due to difficulty to prepare required documents (farmers who got EU Organic certificate)

Objective	To better understand challenges in Nutrition, the School Feeding Program and SBCC in Bhutan							
Date	November 10, 2021, 11:00-14:30 (BST)							
Venue	Wangbama Central School, Thimphu							
Participants	Principal	Ms. Deki Dema Mobile : 17600004 E-mail : dekidema tr@education.gov.bt						
	Vice Principal	Mr. Ugyen Thinley Mbile: 17661825 E-mail: uthinley25@education.gov.bt						
	Mess in Charge (Warden)	Mr. Kezang Wangchuk Mobile: 17550274 E-mail: kezangwangs1755@gmail.com						
	Head Cook	Mr. Karma Gyeltshen Mobile: 77254427						
	Mess prefect (Student)	Mr. Choki Dorji E-mail: 201.00303.11.0050@education.gov.bt						
	Mess prefect (Student)	Ms.ManishaGuninaE-mail:201.00226.11.0173@education.gov.bt						
	Farmer Group Chair person	Mr. Kencho Mobile : 17488885						
	Asst. Marketing Officer, DAMC, MoAF	Mr. Tshering Penjor						
	JICA Survey Team	Hiroko YASHIKI						

JICA Survey Team (hereinafter JST) confirmed the following.

- There are 430 students in the school and 5 cooks prepare 3 meals for 430 students every day 365 days, starting at 4:00 am in the morning. 2 cooks out of the 5 have been trained by MoE, about not only how to cook, but also about food safety and hygiene. However, the vice-principal recommends that a training in plumbing and electric works.
- The weekly menu applied at the school is as follows.

Meals	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	6 1	
Breakfast	Cabbage fried rice with Milk/Yoghurt	Mixed vegetable fried rice with boiled egg	Chana fried rice with soup	Mixed vegetable fried rice with boiled water	Mixed Carrot & Spinach fried rice with & Soup	Mixed vegetable & soya chunk fried rice & boiled water	Mixed vegetable Fried rice, boiled water	
Lunch	Rice, Mixed vegetable, & Dhal	Rice, Chicken/fish & Panner & Dhal	Rice, stir fried vegetables & Dhal	Rice ,Egg curry/ mushroom/stir fried vegetables & Dhal	Rice, Beef/Pork& Panner & Dhal	Rice, mixed vegetables, & Dhal	Rice, fried egg Mushroom/mixed vegetables, & Dhal	
Dinner	Rice, Mushroom Datse & Dhal	Rice, mixed vegetable & Dhal	Rice, Kewa/beans Datse, & Dhal	Rice, mixed Vegetables, & Dhal	Rice, mixed Vegetables, Soya chunk, & Dhal	Rice, Aludam, & Dhal	Rice ,Mixed vegetable & Dhal	
Evening Tea	Milk tea							

- The principal and the mess in charge admitted that they are doing their best but the food they can provide the students is not well diversified, as vegetables are expensive.
- The price of bananas is cheaper than that of apples, thus the school buy bananas for the students. Broccolis and Cauliflowers are expensive and rarely bought. The dairy products, such as milk or yogurt can be provided only 4 times a month.
- The Farmer Group leader said that his group is a commercial agriculture group, and therefore, it is difficult to meet the demand of the school, which requires a variety of vegetables. When his group

cannot meet the demand from the school, the leader will look for the requested crops from other FGs of various Dzongkhags. His group understand that the supply to the school is part of the social responsibility, and 50 % of the produce from his group is delivered to the 4 schools within the same Dzongkhag.

- Before the School and Hospital Feeding Program (SHFP) got started 2019, the schools bought the dairy products from his group, but in 2020, the BLDCL wrote to the schools to tell that the schools need to buy the dairy products from them. Thus, his group cannot supply the dairy products to the schools anymore.
- SHFP provided the 247 schools all over the country with 2 deep freezers each, and the Wangbama CS was also benefited. The huge electric pan was also introduced, but it caused a short circuit. To repair it, 45 coils are required. Thus, instead of fixing it, the school bought smaller rice cookers. In addition, the school bought by themselves the insulating containers to keep food ward until the last student is served (the school thinks the buffet-type equipment to keep food warm with candles would be better.), since due to the elevation, the weather in winter is too harsh.
- Other menu than rice is cooked with big pans on firewood. The firewood is bought from Department of Forests and one of the cooks chops them into smaller pieces.
- Under the School Agriculture Program, the school were trying to do the hydroponic culture, but the budget was not approved for it.
- During the lockdown, the 7 teachers and 5 support staff together with the students, they stayed at school, and the volume of meals was not often enough for all the students. But usually, the volume of meals is enough for all the students, and they are also allowed to buy snacks at canteen.
- From October 18, 2021, the schools are allowed to buy quinoa, instead of rice.
- To avoid the micronutrient deficiency, the students are given an iron tablet every week, and a tablet of vitamin A and thiamine twice a year. In 2019 there were cases of glossitis in students. The government conducted the tests of some food stuff such as dal and rice, but the causes have not been determined yet.
- In case that the quality of food supplied by FCBL, BLDCL or FMCL does not meet the standard, the school can reject to receive them.




The big rice cooker (at the right back) was broken due to short circuit and the smaller rice cooker were procured.



short circuit and the smaller rice cooker were procured.

A cook keeps chopping to make firewood.

The menu for today is Rice, Fried Egg, Kewadatsi and Dal.

Objective	Plant Protection and Human-Wildlife Conflict measures by National Plant Protection Center (NPPC)	
Date	November 10, 2021 10:00-12:00 (BST)	
Venue	Conference Room in National Plant Protection Center	
Participant	NPPC	Mr. Doe Doe, Integrated Pest Manager Specialist (ddoe_chimi@yahoo.com) Ms. Tshomo, Senior Plant Protection Supervisor Mr. Sonam Dorji, Plant Protection Supervisor
	PPD	Ms. Dechen Pem
	JICA Survey Team (JST)	Kazuhiro TSUCHIDA Hajime KITA

JST confirmed following:

- 1. NPPC distributes most PP products to extension officers who sells to farmers except for the rice herbicides which are treated by Agricultural Support Service Representative (ASSR) registered by National Seed Center. ASSRs also sells other inputs such as fertilizer and seed and are located locally depending on the demand.
- 2. NPPC doesn't monitor how much PP product based on organic agriculture has been distributed in field, but they are sure that production of organic PP product increased quire a lot.
- 3. NPPC provides Capacity Building to farmers regarding farming techniques especially for effective frequency of fertilizer and pesticide at each ARDC.
- 4. Regarding electric fencing, NPPC is responsible for making quality settings, not selling. Anyone can obtain electric fencing if he/she applies.
- 5. The reason why sometimes electric fencing is not effective is difficulty in management rather than finance. They are not eager for management when it comes to the community level management although individual level management can be possible. This is because members of community tend to think the government should take responsibility even it is broken.
- 6. They are developing the electric fencing making stronger and higher portability by changing the pole material from wooden to mild steal or plastic pipe.
- 7. NPPC is now managing e-Pest Surveillance system usually by dispatching extension officers based on the farmers' demand. Extension officers report the information about what is the damage, type of pest/wildlife, photo, location on the map, and etc which can be decision support information for right intervention to farmers. NPPC staff can support the extension officers if it is necessary. However, this system is not well functioning because extension officers cannot get information due to his/her heavy duty on the other tasks, and also because farmers simply don't ask the extension officers.

Objective	To discuss possible collaboration between WFP and JICA in future	
Date	November 11, 2021, 10:00-12:00 (BST)	
Venue	Conference Room, United Nations House	
Participants	WFP	Mr. Svante Helms, Head of WFP Bhutan Ms. Kencho Wangmo: School feeding and Nutrition Officer Ms. Phuntsho Wangmo: Outcome manager for nutrition unit Mr. Birai Lama: Agriculture Officer Mr. Udaya Sharma: M&E and innovation officer Mr. Barnaby Peacocke: Evaluation team leader
	JICA Bhutan Office	Ms. Mariko Tanaka: Representative Mr. Jun Kudo: Project Formulation Adviser
	JICA Survey Team	Mr. Hideki Hiroshige Ms. Hiroko Yashiki Mr. Sonjog Waglay

- 1. Opening remarks by WFP head, Mr. Svante.
 - From 1974 to 2018, WFP provided the School Feeding Program (SFP). Since 2019, WFP has been engaged in the transformation to shift its positioning to Advisor to RGoB. Along with the process, the number of staff increased from 6 to 22.
 - The National Pathways document was developed in collaboration with FAO and IFAD for the 2021 Food Systems Summit. RGoB selected 3 consultants for the preparation. It aims that the transformation of the current Food Systems in Bhutan driven by nutrition. At the same time, it seeks the transformation of subsistence farmers to commercial farmers driven by demand.
 - WFP has been engaged in marketing improvement and youth employment (business incubation), supply-demand linkages, improvement in farmers income, supply chain development, transportation development, promoting gender equality in agriculture.
 - In the nutrition sector, WFP focuses on Micronutrient deficiency and an increase in the NCD cases, as the stunting rate has reduced.
 - 102,000 school children are benefitting from the RGoB SFP currently, and PLUS is supposed to improve the quality of the school meals. Same crop can have about 100% price difference within the same districts. Nutrition and Agriculture development are sometimes trade-off.
 - WFP is working on behavioral change (SBC) with three ministries; MoH, MoE, MoAF, by hiring American consultants.
 - WFP is preparing for N4G Tokyo summit with MoH.
 - WFP focuses on the first 8,000 days of life. Not only the first 1,000 days but also the following 7,000 days are also important for the cognitive and physical development. To this end the provision of supplement is a cost-effective intervention.
 - WFP hopes to work closely with JICA
- 2. Ms. Tanaka explained about SHEP.
- 3. Presentation by the JICA Survey team
 - Mr. Hiroshige presented the detailed survey purposes and findings.
 - Mr. Svante appreciated the presentation and acknowleged many similarities with the findings and ideas presented by the WFP evaluation team. He informed that some of the ICT problems are being addressed and more attention to ICT might be required.
 - Mr. Barnaby inquiries if the scale of "farming village" is a gewog or much smaller administrative unit. Mr. Hiroshige clarified that the support would be concentrated to a set of several Gewogs or the entire Dzongkhag.
- 4. Presentation by Mr. Barney (WFP consultant, the Evaluation Team leader)

- The Evaluation Team recommends WFP to consider SFP as springboard for FGs and the cooperatives which supply food to schools.
- The major challenge faced by farmers and cooperatives is how to market their produces. Farmers collect market information through We Chat but not from AMIS.
- The same amount of stipend is applied over the country. An increase in the stipend in 2020 allowed the schools to have the direct contracts with FGs, and it stimulated local economy. It brought extra income and saving opportunities for women. They made their bank accounts for saving and credit.
- No linkage between stipend and the Consumer Price Index. This may endanger the sustainability of the current SFP.
- School is only one of the markets for FGs and most of the FGs are looking at bigger markets in Western region.
- The required diversification of food cannot be realized in all the schools through the year, especially in remote areas.
- Not all the cooks are trained properly.
- Proposed Actions:
 - (1) Enhanced digital market information Services and Service Contracts: By strengthening Information System and Contract Enforcement
 - (2) Cooperative Enterprise and Women's empowerment through Market, Group and Business skills development: We need to see the small markets (institutions) and wider markets. Policy environment is favorable.
 - (3) Value addition, market facilitation and business incubation higher up the Value Chain: Value chain development through capacity development
 - (4) Supply chain development through enhanced transport and market infrastructure services: Lots of investment on the infrastructure.
- 5. Presentation by Mrs. Kencho on Nutrition
 - Nutrition task force has been formed consisting of multi-sectoral representation
 - Emphasized on social behavioral change (SBC) to change into healthy eating habits, and WFP has been supporting Healthy Drukyul and some TV shows.

The SBC strategy will be developed by taking the following steps:

- o Situational Analysis
- Formative and Participatory Design Research
- Strategy and Materials Development
- Phased Implementation & Evaluation
- Schools have started PLUS, the menu optimizing application. It has contributed to 15% reduction in the costs per meal by increasing diversity (other variety of vegetable and fruits). The use of milk increased (milk, yogurt, cheese): at least once a week. The proportion of local food increased from 30 to 60%. PLUS has been introduced to the 3 Districts, and it will be introduced to Haa within this year.
- SFP requires: Infrastructure, Fortified foods (need to be continued), Tarayana Foundation (to outreach communities), PLUS, SBCC, CD to government agencies, Strengthened supply chain, M&E system (WFP Platform, MoE platform will be applied soon), Informing national policy and strategies.
- 6. Discussion

Mr. Svante: Bhutan Government focus is on agriculture and nutrition security so there are many areas to collaborate between WFP and JICA.

Mr. Kudo: JICA has long history with agriculture in Bhutan with focus on production. Now JICA wants to focus on marketing, nutrition, ICT, etc. JICA is focusing on upstream, while WFP has been focusing on downstream. We can meet in the middle.

Binai Lama: What timeline is expected to formulate new projects?

Mr. Kudo: New projects may start in 2023 as JICA needs some time to concretize details. Partner agencies would be MoAF and GNHC.

Mr. Barnaby (WFP Consultant): wanted to know if JICA publishes the finding such as the ongoing survey reports.

Kudo san: it takes time to publish but information can be shared if needed.

Mr.Binay Lama and Udayan talked about why the digital literacy amongst farmers are low due to which ICT market information systems are not working properly. All parties agreed to try to collaborate and work together in future projects.

Objective	Agriculture Land Development	
Date	12/11/2021 11:30-12:30 (BTT)	
Venue	AED	
Participant	Agricultural Engineering Division, DOA, MOAF	Mr. Namgay Thering
	JICA Survey Team	Mr. Kazuhiro Tsuchida, member

Discussion on the proposed possible Japan's support on sustainable land use was held.

- Mr. Namgay stressed again about the need for cooperation of construction machinery ; the request letter from DOA/MOAF to JICA in 2019, which was not adopted, was shared for reference.
- Discussed the need for stone picker machinery in ALD; Mr. Namgay's observations are as follows
 - Stone/gravel removal is an important issue for the introduction of farm mechanization as well as terrace construction. So far, it has been done with special emphasis for paddy fields in the flood area. Stone picker machine is not common in ALD sector at momnet, and AMC is only conducting trials. The type of machinery required for low-lying paddy fields differs from that for fields on slopes in mountainous areas.
 - In paddy fields in flood areas, gravel accumulated in the fields is still produced even after many years, so there are expectations for the introduction of stone picker.
 - Rock breaker attachment (RMC) on a medium-sized excavator is needed more than a stone picker (towed by a tractor) for fields on slopes in mountainous areas. The rock broken by the breaker is removed by excavator or manpower.
- Mr. Namgay stated his priorities regarding construction equipment for ALD are as follows
 - > No. 1: Medium-sized excavators for land development work on slopes
 - No. 2: Rock breaker attachments for excavators
 - ▶ No. 3: Stone picker as a subsequent step.

Objective	Agriculture Land Development	
Date	12/11/2021 14:00-15:00 (BTT)	
Venue	NSSC	
Participant	National Soil Service Center (NSSC), DOA, MOAF	Mr. Tashi Wangdi, Program Director, <u>twangdi@moaf.gov.bt</u>
	JICA Survey Team	Mr. Kazuhiro Tsuchida, member

The proposed project of possible Japan's support on sustainable land use and the need to introduce a stone/gravel removal machine were discussed.

- Currently, gravel removal machinery is being tested and developed by AMC and a prototype is being tested. There is no doubt scientifically about the usefulness of stone removal on sloping land, but some farmers do not want to remove stones from their fields because they believe that the presence of stones protects the soil and is better for the crop. The effectiveness of the stone picker machine is effective in flood area paddy fields, but trials are needed for its use in slope site in the mountainous areas.
- NSSC considers that the priority in the ALD project is to proceed with terrace development, and that stone removal is the next step. After terrace construction, the next priority activity is the dissemination of non-terrace SLM technologies such as stone bund. Mr. Tashi stated that it is important to promote stone bund and hedgerow on steep slopes that are not suitable for terrace construction, but these land use methods are not popular among farmers because such methods require labor intensive farming. It is essential to strengthen campaign activities to increase farmers' understanding of the necessity and usefulness of these SLM technologies.
- The individual SLM technologies have already been developed and there is no need for pilot projects. It is now at the stage where expansion through dissemination is required.
- The next important thing is to ensure the future continuous use of developed farmland and rehabilitated abandoned farmland. It is not just a matter of promoting terrace development, but also of maintaining and improving soil fertility and productivity through the application of SLM technology there. From the perspective of medium- and long-term soil management, the immediate initiation of research and studies on soil bio-diversity in Bhutan, as well as introducing dynamic soil fertility monitoring using portable soil meters and ICT. The provision of equipment for the Soil microbiology research building under construction at NSSC is also highly urgent.

Objective	Current and Future Regulation in Drone Regulation (Bhutan Civil Aviation Authority)	
Date	November 12, 2021 10:00-11:00 (BST)	
Venue	Zoom	
Participant	BCAA	Mr. Jigme Thinley, Senior Legal Officer Mrs. Dawa Yangchen, Flight Safety Officer
	JICA Survey Team (JST)	Masahiro TAKANO Miki IMAI Hajime KITA

JST confirmed following:

- 1. Latest regulation on use of UAS is the one published in May 2017, and now BCAA is revising the regulation to soften the rule to invest some more critical stakeholders to use drones. They are now amending the regulations in terms of training, setting designated areas for drone operation, registration processes, and etc.
- 2. To become a drone pilot in Bhutan, the certificate of drone pilot must be required. However, there is no authorized company for the certification in Bhutan, so the Bhutanese should obtain it from the outside of Bhutan (any time of certification is OK).
- 3. Number of the registered UAS is 20++, mostly belonging to governments. Only the exception is the Aerotech Bhutan which owns 5 DJI drones.
- 4. The government can procure the drones by applying import permit to BCAA, although private companies cannot.
- 5. There is no private company with UAS service in Bhutan. Although there is a private company, Aerotech Bhutan, which owns 5 drones and providing UAS solutions for their profit, the company is unofficial.
- 6. From the perspectives of Mr. Jigme and Mrs. Dawa, the possibility that future drone use is allowed for all the private companies does not very likely happen (like 50%-50%). This is because of the importance in National Defense, and also many stakeholders (such as army, police, all the ministries) are involved to change the current rules.
- 7. Ministry of Health used to trial project of medicine transportation by drone three to four years ago, but except for that there is no drone project for transportation.

ブータン国

COVID-19下・後の農業振興情報収集・確認調査

目的	今後の調査実施方針に関する打合せ	
日時	2021年11月15日10:00-12:40 BST	
会場	Zoom	
出席者 (敬称略)	JICA 本部	南アジア1課:加藤 経済開発部:間野
	JICA ブータン事務所	田中 真理子 工藤 淳
	調査団	高野 正志 弘重 秀樹 土田 和弘 矢敷 裕子 今井 美樹

調査団からの報告内容に対し、JICA から以下のとおりコメントあり。

- セミナーアジェンダについては特段コメントないが、フリーディスカッションの仕切り方についてはPP Dとよく相談いただきたい。
- 円借款案件を組み込んでいただきたい。輸出のみならず、国内市場改善という観点も含めて、円借款について検討しているというメッセージだけでも伝えられたらいい。
- モデル農村に関し、Market Oriented Agriculture という文言を入れ込んでいただけるとありがたい。
- "Where We Call Home"について、ブータン側に紹介することは控えたい。特に、加工技術強化という 切り口では、ブータン側の関心に依る領域(他のドナーが支援中で JICA の提案に対する関心が低い)になっており、所掌官庁は経済省である。日本で実施している農業の機械化のようなプロジェクト の方が良いかと思料。
- (間野)特定分野の加工技術強化の場合、事業実施後の評価はどのように行うのか(?)
- (田中)ゲオグセンターは農家が管理している、若者が従事しているという絵を示すのは有効と考える。
- 有事の食料輸入に備えた「農業開発」となると小さくまとまってしまうため、長期的な自給自足や食料 安全保障といった広い視野で若者の雇用促進も含めた発信になるとよい。
- 持続的土地管理のベストプラクティスに関する所感は?ゾンカの工事担当職員の設置可能性はどうか。(これに対し、土田からブータン側としてはガイドライン策定が完了し、現在実施中という姿勢。しかし、農家のニーズが上がってこないと回答。)
- WFP 実施中の支援内容は?(これに対し、矢敷から、WFPは国民の栄養・食習慣に対する変化を 促すプロジェクト(SBCC)の 2022 年?実施について、保健省と検討を進めている(但し、SBCC→S BCに縮小する可能性あり)。また、学校給食プロジェクトについては対象地域を拡大しながら今後も 継続される、と回答。)
- 労働省が若手起業家支援への取り組みをたくさんやっているが、融資をするのみで、経営に関する アドバイスの提供等はないのが実態である。

以上

Objective	To consult with PPD and DAMC on the proposal of future projects with support from JICA prior to the Seminar, which is planned for November 19, 2021	
Date	November 16, 10:00 – 12:00 (BST)	
Venue	Conference room, PPD, MoAF	
Participants	PPD	Mr. Karma Tshering, Chief Ms. Sonam Euden
	DAMC	Ms. Kinlay Tshering, Director (Online) Mr. Dawa Tshering, Chief Marketing Officer, Market Information and Research Division (Online) Mr. Leki Tenzin, Dy CMO, Marketing Development Division (Online)
	JICA Survey Team (JST)	Mr. Masashi TAKANO (Online) Mr. Hideki HIROSHIGE Mr. Kazuhiro TSUCHIDA Ms. Miki IMAI Mr. Hajime KITA (Online) Ms. Hiroko YASHIKI (Online) Mr. Dhital

- Upon the presentation made by Mr. Hiroshige, both Mr. Karma and Madam Kinlay thanked to JST for the analysis of a variety of challenges faced by MoAF as well as for the proposal of possible support from JICA.
- Ms. Kinlay expressed that she would prioritize the TCP on the market-oriented agriculture, the TCP on the master plan preparation, and the TCP on SLM, although she clarified that the final decision should be made later as MoAF. She also suggested not to propose the involvement of Desuug to complement the work of the Gewog Agriculture Extension Officers (GAEO), since Desuug already has its own TOR. She also indicated the need for the correction of the spelling of BLDCL. Regarding SBCC, she recalled that a BCC strategy was developed under FSAPP, and she expected that the new SBC strategy, which is under the preparation by MoH, MoE and MoAF would remain as an improved strategy. She also recommended to use the term of "Japanese ODA Soft Loan" instead of "Yen-Loan."
- Ms. Kinlay also reiterated the RGoB will appreciate it, if there is one or two grant projects, such as a project for the construction of market facilities, as the country economy went down significantly due to the COVID pandemic.
- Mr. Karma supported all the comments made by Ms. Kinlay. He also pointed out that the crop prioritization per district is another issue for which ICT support would be required. He expected that ICT would facilitate the tasks of the entire ministry as an enabler and proposed only one comprehensive RNR Information Management System for the entire ministry. Mr. Karma also confirmed that the fallow land is another top priority issues for MoAF, but he questioned if SLM could improve the situation.
- Mr. Karma shared with JST that TOR for GAEOs, DAOs and DLOs are under the revision, and suggested to provide them with tailor made capacity development, since the circumstances of each GAEO, DAO and DLO may vary. To this end, ICT would be also helpful.
- Mr. Karma also requested JST to explain the characteristics including the modality, the timing and the time frame of different JICA support schemes.

- Ms. Kinlay also asked the possibility for the combination of the ODA Soft Lan and Grants. Ms. Kinlay also promised to share a proposal of the construction of pack hoses with JST, as an example of concrete proposal for grant aid.
- Mr. Karma requested JST to share any recommendations and ideas formed through this survey with PPD, as MoAF is preparing the RNR strategy 2030, in line with SDGs and other policy documents. The RNR strategy 2030 will be completed in January or February 2022.
- Mr. Takano clarified that, after November 19th, the long list would be completely handed over to RGoB, so that RGoB could negotiate with JICA and others. In addition, he explained that even if JICA agrees to provide grants, this would be the last time, and RGoB should be ready for it.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	To discuss possible support from JICA in future	
Date	November 19, 2021, 16:00-17:50 (BST)	
Venue	Conference room, BAFRA	
Participants	BAFRA	 Mr. Jamyang Phuntsho, Officiating Director General, Mr. Kuhir N. Bhettaval, Officer in charge of the food fortification, 7 more officers in charge of bio-security, veterinarian, organic certification, IT, etc.
	JICA Survey Team	Hideki HIROSHIGE Hiroko YASHIKI

JICA Survey Team (hereinafter JST) confirmed the following.

- BAFRA is an authority for food safety, bio security, bio safety, gene regulations, etc.
- For the export to EU, BAFRA is already accredited by IMO to issue the certificate. Bhutan can export agricultural products to other 8 ASEAN countries, but not to Singapore.
- Mr. Sonam, officer in charge of the certificate, has studied the procedure to export agricultural products to Japan, and found that all the products need to comply the JAS requirements. BAFRA wants to be a certificate authority for JAS (or JONAN). If any Japanese can come, even for a short term, to advice how the Bhutanese products and farmers can meet the JAS requirements and how BAFRA could be accredited as the certificate authority for JAS, it would be appreciated.
- Adzuki beans will be ready for export to Japan next January and February.
- For the issuance of the organic certificate, 50% of ground work to meet the requirements for the ISO standards has been done.
- There is no premier of the organic certificate in the domestic market, and BAFRA does not have to do anything with the pricing mechanism. The awareness raising of consumers is important, and a unit in charge of the consumer education was established under the Ministry of Economic Affairs.
- All the activities of BAFRA are in line with the market access strategic plan 2021-2028 that was approved by MoAF recently.
- Mr. Hiroshige commented on the proposal submitted by BAFRA of the establishment of pack houses, recommending detailed studies on the feasibility of operation of such facilities.
- BAFRA officers admitted that the role of pack houses is not only to add value to the commodities by cleaning, grading and packing, but also to allow farmers to export their commodities to India. As impact of COVID pandemic, India gives some grace period for some Bhutanese commodities: namely, India accepts some Bhutanese produce without applying the import regulations for now. For instance, potatoes with soil can be also exported to India. However, such a grace period could be lifted up at any time, and therefore, it is important to have the pack houses to clean potatoes for the export.
- FCBL has conducted a feasibility study of some marketing infrastructure 3 to 4 years ago.
- Mr. Sonam clarified that India puts ad-hoc regulations to each crop to be imported and out of the 20 Bhutanese crops applied for the export, only 14 crops were accepted, and BAFRA certified those 14 crops.
- BAFRA regulates food fortification and it is necessary to catch up with the new technology.
- BAFRA wants to regulate commodities on e-commerce from the point of view of bio security, like it is done in Australia. Ideally, the commodities on e-commerce should be inspected before they are put on e-markets, although it has not been done yet in practice.
- There are more than 270 officers in BAFRA, but it is still difficult to do the food inspections for the School Feeding Program (SFP) at each school. Thus, Food inspections are done in warehouses

of FCBL in Phuntsholing on a quarterly basis.

- BAFRA also provide the teachers, cooks, and Gewog Agriculture Extension officers with training in the food safety.
- BAFRA has submitted a draft amendment to the Food Act to update the regulations for food inspection. However, the draft bill needs to be modified in accordance with the recent changes in the food regulations, and it may take more times to get an amendment on the Act.
- The current Food Act allows BAFRA to do the inspection only on the commercial bodies but not the government or public institutions. Officially, BAFRA cannot do the inspections in the public schools and hospitals under the current provision of laws. In addition, most of the cooks at schools are not professionals being recruited from nearby communities, and it is better to hire professionals from the point of view of food safety.
- Regarding the sustainability of SFP, it has been a big challenge for the Government, after the phaseout of WFP.

Bhutan Data Collection Survey for Agriculture with and post COVID-19

Objective	To conduct seminar on data collection survey carried out by the JICA study team
	for the Agriculture sector in Bhutan
Date	November 19, 2021
Venue	Conference Hall, Namgay Heritage, Thimphu
	(seminar deliberation and attendance by Zoom)
Participant	Find Participant List
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SUMMARY

A half day seminar on the findings of the "Data Collection Survey for Agriculture with and post COVID-19" was held on the 19th of November 2021 in the conference hall of Namgay Heritage in Thimphu. The seminar was basically aimed at sharing the various categories of data that was collected by the JICA survey team and the team's collective proposal of possible support from JICA to enhance Agriculture in Bhutan with and post COVID 19 impact.

OPENING STATEMENT BY SECRETARY, MoAF

The seminar was declared open by a brief introductory and welcome note by Dasho Thinley Namgyel, Secretary of the Ministry of Agriculture and Forests. The Hon'ble Secretary briefly touched on the personal initiatives and selfless contribution made by late Dasho Nishioka to promote agriculture in Bhutan. Further, it was mentioned that due to his efforts and personal commitment, Agriculture in Bhutan has developed considerably and much has been achieved ever since.

The secretary also highlighted that despite the crippling effect of the COVID pandemic across many sectors of business and developmental activities, the agriculture sector, in fact, has grown and done fairly well. And now, with the assistance of JICA, hopefully the agriculture sector will receive substantial technical support in the days to come.

WELCOME NOTE BY CHIEF REPRESENTATIVE, JICA BHUTAN OFFICE

The opening note by Dasho Thinley Namgyel was followed by an opening statement by Mr. Kozo Watanabe, Chief Representative of the JICA Bhutan Office. He welcomed the participants and appreciated that the agriculture sector in Bhutan has taken a forward step in such difficult times despite the hindrances and threat posed by the spread of the COVID-19 pandemic.

This survey is to see how we can improve the food security by enhancing or improving the productivity of agricultural products. It is also to assess the effect of the COVID-19 pandemic on the agriculture sector as a whole, and what changes could be introduced or brought about in order to improve agriculture methods that will increase productivity of agricultural products and eventually guarantee food security.

Therefore, in order to have a better understanding on the impacts of COVID-19 on agriculture, one component of the survey is to look at the effects of COVID-19 on agriculture and how JICA can assist or partner the Royal Government or the DOA to enhance productivity of agricultural products.

The result of the survey will also indicate how funds and assistance can be utilized effectively with the support of JICA or the cooperation and support of the Japanese Government. So, through this study and

its findings, JICA hopes to develop long term relations and cooperation with the Royal Government in this sector.

WELCOME NOTE BY FIRST SECRETARY, EMBASSY OF JAPAN, DELHI

A brief welcome note was also conveyed by Mr. Hiroyuki Yamashita, First Secretary, Embassy of Japan, Delhi by Zoom. Mr. Yamashita also highlighted the assistance and support late Dasho Nishioka provided in the field of agriculture in Bhutan. In this respect Japan has a long history of assisting many countries in this field. Similarly, it was assured that Japan will continue to extend support to Bhutan in agriculture sector development.

PRESENTATION ON DATA COLLECTION SURVEY

The presentation was deliberated by Mr. Hiroshige, the deputy team leader. After a brief introduction of the data collection team members, Mr. Hiroshige made a comprehensive power point presentation of the overall process of the data collection method and its findings. In brief, the presentation outlined the methodology of the data collection, the numerous challenges and shortcomings the farming community faces, the possible areas where JICA's assistance and expertise could be useful and conceptually what kind of support projects could be materialized.

POST PRESENTATION NOTE OF THANKS

At the end of the illustrious and detail presentation made by Mr. Hiroshige, the Secretary and Mr. Watanabe consecutively thanked Mr. Hiroshige for explaining and presenting the findings of the survey in detail with clarity.

Mr. Watanabe highlighted that the introduction of ICT has many stakeholders besides DOA. The ICT data base, once set up, will consider nationwide distribution of data and technical assistance. The implication of establishing a large and extensive ICT program will benefit the entire country and will assist all user sectors.

The seminar was suspended for a tea break after the presentation and resumed with the question answer session. The views and interactions exchanged during the general discussion session can be summarized as follows.

GENERAL DISCUSSION SESSION

Before the start of the discussion, Ms. Mariko Tanaka, Representative of JICA Bhutan Office expressed the view that the survey team suggested many approaches and activities, which will be discussed among participants today. The next step after that is to prioritize the potential new projects, based on the findings of this survey, before deciding or selecting any new projects. She also reminded the meeting that the JICA had started providing the training in the market-oriented approach called SHEP.

In addition to the comments of Ms. Tanaka, Mr. Jun Kudo and Mr. Shin Suto, Project Formulation Advisers of JICA Bhutan Office also indicated the importance of ICT and introduction of market-

oriented agriculture. In fact, there are already a few JICA assistance in the agriculture sector programs ongoing.

The JICA staff also indicated that in future, some of the projects must consider the importance of value chain as it affects all entities of agriculture. There are also opportunities for some of the project ideas to be merged or integrated into some of the ongoing JICA funded agriculture support programs.

The JICA Bhutan Office is keen to support any future agriculture related programs and will continue providing or extending required support to enhance agriculture production that will ensure food security.

COMMENT BY DAMC

The director DAMC, Ms. Kinlay Tshering, commented that DAMC already had a detailed discussion with the JICA survey team and most of the requirements that was put forth during the meeting were incorporated. She expressed her appreciation to JICA for assigning the survey team and the survey team for bringing out detailed survey data containing valuable information and numerous ideas on agriculture development.

In her following comments she touched on the subject of GAP, the certification of organic products, the introduction of ICT in agriculture, effective and appropriate mechanism for agriculture land development. She also expressed that due to the spread of COVID-19 and its effect on the country's GDP, it would not be possible for Bhutan to go ahead with the process of graduating from Grant-Aid object countries (IDA eligible countries).

Therefore, it would be highly appreciated if any of the project ideas and concept related to marketing infrastructure put forward by the survey team could be taken up as a priority grant aid project.

COMMENT BY, PPD, MOAF

Mr. Karma Tshering, Chief of PPD, made the comment on construction or establishment of proper market supply chain to improve the present marketing process or network. He also suggested that one of the projects could be aligned with the marketing strategy that the department has developed and that another project could take on board a component for fallow land development.

In fact, as there are many components that comprise the entire agriculture sector, it would be ideal and also convenient, if one main project is conceived with all the various components in it and the data base would be clubbed under one umbrella for better and efficient management.

Moreover, Mr. Karma Tshering mentioned necessity of integrated information system to cover both agricultural sector and livestock sector, as RNR information system.

COMMENT BY FCBL

The representative from FCBL, Mr. Naiten Wangchuk, commented that due to the current economic situation in the country, the implementation of the projects should be prioritized to improve food productivity. He also indicated that a study should be conducted to look into the food consumption habits of Bhutanese people and promote the importance and benefits of balanced diet.

It is also time to seriously look into cereal cultivation and advising the population to shift to consumption of cereal products which will automatically reduce consumption and import of rice. The shift towards cereal cultivation and consumption also gears towards food security.

COMMENT BY BAFRA REPRESENTATIVE

Mr. Jamyang Phuntsho of BAFRA indicated that there are some useful information BAFRA could share with the JICA survey team. Especially, BAFRA is seeking support for them to obtain organic certification by Japan Agriculture Society (JAS).

Bhutan has been trying to market the organic products to Japan but it requires the JAS certification on organic agricultural products. BAFRA may be able to act as the inspection organization to certify the products for export.

COMMENT FROM DOA

Mr. Wangda Dukpa from the Department of Agriculture indicated that the agriculture research unit, though started in the eighties, is still weak and requires support. Support would be welcome for the research program to study the value chain strengthening, implementation of ICT and introduce AI to enhance food production.

He also indicated that over the years the farming population has been decreasing due to the rural – urban migration of educated citizens. This would directly result in a reduction of agricultural food production and thereby cause food shortage. The best way to encourage the young generation to take up farming is to introduce the use of AI and smart farming methods.

He also indicated other areas such as farm mechanization and human-wild life conflict be tackled effectively and resolved so that people are encouraged to take up farming. The objective of food security should also look into the provision of Crop Insurance schemes so that farmers could be compensated for crop losses from natural calamities.

COMMENT FROM THE MINISTRY OF EDUCATION

Mr. Karma Wangchuk from the Ministry of Education commented that it is time to change the mind-set and eating habits of children, as the current trend is to eat fast food which is not healthy. In many cases farm products do not reach the schools on time or are wasted since most of the storage system in the schools are very old and dysfunctional. Therefore, support in setting up proper food storage units in schools would be helpful in providing better diet and feeding programs.

As the amount of stipend would not be increased, some schools are supplementing school meals through the school agriculture and environment program. There is need to grow more variety of products so that children can have different flavors and taste in their meals. Rice is provided in all the 3 meals a day. At present, efforts are made to diversify the food base, t served to children in the schools.

COMMENT BY THE MINISTRY OF HEALTH

Mr. Sonam Tobgay recalled the meeting that the National Nutrition Strategy and Action Plan covers all the ideas and activities to improve the nutritional status of the population. MoE and MoH have been collaborating to carry out activities together. The Collaboration between WFP and JICA would be welcome. Yet, there remain so many challenges in the nutrition sector, and detailed study may be required.

COMMENT BY ICT DIVISION, MOAF

Mr. Tenzin Dendup, ICT Officer from the ICTD indicated that most of the ideas of the ICT division were incorporated in the presentation as he had had several rounds of discussion with the JICA survey team. He indicated that one of the main themes from the ICT division was to have a list of recommendations from the user or farming groups to see how IT could be effectively used for farming. It would be worthwhile if the recommendation could take into account all the steps of farming starting from seedling inputs, cultivation, harvesting, post harvesting and marketing within which ICT could intervene positively.

DISCUSSION AND CLARIFICATION OF COMMENTS BY JICA SURVEY TEAM

In response to the various comments raised by the audience, Mr. Hiroshige responded with appropriate reasons and justification and also explained, where necessary, how the survey team would accommodate the issues or concerns raised by the participants so that the selected projects could benefit the greatest number of stakeholders.

Regarding the comments from BAFRA, the idea of export of organic agricultural products, not only to Japan, and BAFRA takes on the role of certification body is worth considering. In this case, it is necessary to develop a certification system for Bhutan and at the same time promote the production of organic agricultural products is indispensable. It is also necessary to conduct market research and clarify the export destinations for organic products. As a combination of these perspectives, Promotion of Organic Product is proposed in the project list.

Regarding consultations with other development partners, information was exchanged and discussions were held with the WFP and IFAD CARLEP project office through surveys.

It is agreed that strengthening research capacity is one of the most important key issues for Bhutanese agriculture. In the list of projects, the survey team is considering a support package for the Farming Village Development Project to help new groups of young farmers start up farming on abandoned land. The survey team believes that the introduction of new technology will be one of the keys to making agriculture more attractive to young people.

Mr. Hiroshige agreed with the need for an integrated information platform, as the RNR information system. On the other hand, MODA, currently being developed with WFP, will cover not only agriculture but also livestock, and it is expected that it works as an integrated information platform.

Mr. Hiroshige thanked for valuable comments, and he stated those comments would be examined and reflected in the final report as necessary.

COMMENT BY B.B RAI, APD-DOA

Mr. B B Rai, from the Agricultural Production Division of DOA, in his first comment indicated that the focus of the survey on production strategy seemed to be limited and it might require more attention.

In his second comment he wanted to know what the current process for fallow land conversion is. Since fallow land conversion depends on the willingness of individual land owners and the government for state owned land, such conversion may require policy inclusion as a component of the project so that implementation of the project is facilitated.

In addition, he opinioned that, if possible, a component of any of the approved projects from this survey, should involve youth people into the agriculture sector through the school agriculture program so that they are introduced to agriculture early on in life.

Ms. Mano, JICA HEAD OFFICE

Ms. Mano of JICA Head Office expressed her appreciation for giving her the opportunity to participate in the seminar and to get comments and suggestions from many sectors. JICA has continuously supported aquiculture projects in Bhutan and will continue collaboration with the RGoB and DoA in future and for future projects.

COMMENT FROM JICA BHUTAN OFFICE

Mr. Kudo from the JICA Bhutan Office indicated that there are difficulties in marketing of farm produces and needs to be overcome. The department (DAMC) and exporters have to seek for solution to overcome this hurdle or problem. Bhutan (DAMC) should consider developing strategic marketing network to market large quantity of products to India or Bangladesh and also work on developing a tentative export growth rate of products.

DIRECTOR, DAMC

In response to the suggestion and comments made on the marketing strategy and inherent difficulties, Ms. Kinlay Tshering explained that in the past the department had been trying to streamline the export process to India as almost all the products are exported to India and few items to Bangladesh.

Currently, due to formalization of trade by Government of India, export of agricultural products from Bhutan had restrictions. Now the department is working on selecting products that can be marketed to India without the restriction and farm products that are shortage in India. When the department completes the data collection and compilation exercise then further information will be shared with the Ministry, Department of Agriculture and the growers.

The department is also working on formalizing a preferential trade agreement with the government of Thailand so we can market our products in Thai market and gradually move towards free trade. The department is also working on the export of few organic products, such as turmeric, soba, adzuki beans, etc. to Japan and hopefully by the beginning of 2022 the commodities should reach Japan.

COMMENT FROM JICA BHUTAN OFFICE

Mr. Suto of the JICA Bhutan Office thanked Ms. Kinlay for the explanation and also for the efforts made by the department. He suggested that since market analysis is also an important component of the farming business, the survey or future study should include market analysis besides other market study components.

COMMENT FROM BAFRA

The representative from BFARA indicated that the exports potential to send organic products to Japan and introduce them into the Japanese markets is an excellent idea and he applauded the DAMC for the efforts put in. However, the products cannot be marketed in Japan unless the certification is received from JAS. As processing the JAS certification is very complicated, BAFRA asked if collaboration with JAS is agreed and send an expert to BAFRA to fulfill gap to obtain the certification, so that Bhutanese organic products can find market in Japan.

COMMENT FROM JICA BHUTAN OFFICE

Ms. Tanaka from the JICA Bhutan Office, asked if the product for export to Japan was identified, what process or method the DAMC would take to get the farmer to grow the product. In other words, how will DAMC select/identify the farmer and where will it be grown?

COMMENT BY DAMC DIRECTOR

In response to the query by Ms. Tanaka, Ms. Kinlay Thering indicated that the department is working with various farmers associations and groups all across the country. In the event the JAS certification is received, DAMC will identify the farming groups or cooperatives with potential growers to engage in the cultivation of products that can be marketed to Japan.

In the process, the DAMC will initially guide and advise the farmers in selecting the commodities they should grow. This support and advisory services will be based on the product market potential in Japan and production potential of the farmer or farmer groups.

COMMENT BY DOA

To select crops to cultivate, different criteria, such as nutritional value, potential for export, etc. could be applied. The survey over the country has been ongoing to define key crops for each Dzongkhag, and the report will be prepared by Dzongkhag. A strategy will be made up based on such reports.

COMMENT FROM NSSC

Mr. Tashi Wangdi from the National Soil Service Centre indicated the importance of the component on the subject of soil study and soil biodiversity. He indicated that it was first necessary to study the soil health of any prospective farm land, including the development of fallow land or other types of land.

It would also be necessary to study the soil heath by checking the inherent parameters of the soil and assessing the soil condition and thereafter deciding to a particular type of crop. Another major challenge in the agricultural land development and the sustainable land management is lack of construction machinery suitable for land condition with the right type and size of equipment. Small and mid-size excavator is requested to be provided for terrace construction in the slop area.

Mr. Tashi Wangdi also highlighted that the centre aims to focus on soil biodiversity and infrastructure for a new soil testing laboratory is under construction and would require a range of testing equipment. In the process, the centre would also require assistance and support in capacity building. Although the centre aims to produce a national soil map by 2023 but curtail soil data is not available to create the soil system data base.

Mr. Kato, JICA HEAD OFFICE

Mr. Kato from the JICA Headquarters in Japan acknowledged the personal effort and interest taken by the secretary and other members of the Ministry to promote agriculture and engage the youth in farming. He further indicated that the first step towards formulating a project proposal is to carry out a survey.

According to him, the farming population in Japan is decreasing year by year, too, and therefore, he asked the secretary's views and opinion on the possible methods or measures that Bhutan would adopt in order to attract the Bhutanese youth towards farming and agriculture.

SECRETARY, MOAF

In response to the query on youth employment by Mr. Kato, the Secretary, Dasho Thinley Namgyel, opinioned that one possible option was to make agriculture profitable by venturing into high value products. Another option would be to resort to application of ICT and mechanize farming. The farm business should be technology driven so that the youth can realize that farming is profitable in a mechanized manner and with minimal hardship.

CLOSING REMARK BY JICA BHUTAN OFFICE

The seminar was declared closed with a thanking note delivered by Ms. Tanaka of the JICA Bhutan office. In her closing deliberation she thanked the participants for sharing their views and comments and clarified that the minutes of the meeting would be circulated to all participants in a draft form for further refinement or addition/modification of views, suggestions and recommendation for JICA funded projects that may take shape as a result of this seminar.

Ms. Tanaka also observed the suggestions and comments from participants on the topics such as irrigation, mechanization and soil study to check soil fertility. She particularly, took note of the comment made by the representative from MoH on nutrition and the need for coordination between different sectors.

Last but not the least, Ms. Tanaka conveyed a thankful note to the secretary for exposing the idea/objective to attract the youth towards farming and agriculture. JICA would like to have further discussions on this matter for future cooperation and projects. (END)