

# Bhutanese Educated Youths Take Farming to a New Horizon : A Case Study of Youth in Agriculture Programme (YiAP) in Bhutan

Akinobu KAWAI, Singye NAMGYEL and Akira NAGATA

## ブータンにおける高等教育を受けた若者の営農を通じた挑戦： 若者による営農プログラム事例

河合 明 宣<sup>1)</sup>、シンゲイ・ナムギャル<sup>2)</sup>、永 田 明<sup>3)</sup>

### ABSTRACT

The purpose of the paper, “Bhutanese educated youths take farming to a new horizon : A case study of Youth in Agriculture Programme (YiAP) in Bhutan” is to record the journey and achievements of the joint project undertaken by UNU-OJCB, Japan and YiAP, Bhutan (2014-2017). It used a case study design of the qualitative research approach. The sources of data were annual reports, literature, policy documents, and the data collection tool employed was mainly document analysis.

The main findings of the study include : (1) the YiAP is going strong despite some challenges ; (2) the financial support provided by UNU-OJCB has immensely helped in kick-starting the programme, (3) the line agencies such as the Ministry of Agriculture and Forests, Ministry of Labour and Human Resources, UNDP have taken keen interest and provided some financial and technical support to the project, (4) local communities and stakeholders have become active working and marketing partners of the project. With the same zeal and drive shown by Green Hands of the YiAP there is potential for the project to be more successful and the model replicated elsewhere in the country as envisioned in its mission and objectives.

### 要 旨

ブータンでは人口の6割が農業に依存しているにもかかわらず、農村では労働力不足のために農地が放棄され、野菜の多くを輸入に頼っている。他方、都市部では高等教育を受けた若者の多くが職を得られない状況にある。このため、都市の高等教育を受けた若者（グリーンハンズ）を登録し、有機野菜などの栽培に従事させる「若者による農業プログラム」(YiAP) が考案された。このプログラムは、日本にある国連大学による若手農業研究者の人材育成を目的としたOJCBプログラム (UNU-OJCB) の支援を受けてスタートし、ブータンの農林省、労働人的資源省、国連開発計画 (UNDP) などの支援も受けながら進展した。

この論文の目的は、YiAPとUNU-OJCBの共同プロジェクト (2014-2017) の経過と成果を記録することである。研究方法としては、質的研究アプローチの事例研究デザインを用いた。データの出典は、年次報告書、文献、政策文書であり、データ収集ツールとしては主に文書分析を行った。

主な研究成果は以下のとおりである。(1) YiAPはいくつかの課題にもかかわらず大きく進展している。(2) UNU-OJCBが提供した財政的支援は、プログラムのスタートに大きく貢献した。(3) 農林省、労働人的資源省、UNDPなどが関心を示した。(4) 地域社会およびその関係者は、プロジェクトの活動的な業務およびマーケティングのパートナーとなっている。YiAPのグリーンハンズが示したような熱意と行動力により、プロジェクトはさらに成功する可能性があり、また、そのモデルは当初のミッションおよび目標で構想したように、国内の他の地域にも波及

<sup>1)</sup> 放送大学教授 (「社会と産業コース」) Akinobu Kawai, Professor, The Open University of Japan

<sup>2)</sup> タクセイ研究コンサルティング最高経営責任者 (元ブータン王立大学シェルブツェ・カレッジ学長) Singye Namgyel, CEO, Thuksey Research and Consultancy

<sup>3)</sup> 国連大学サステナビリティ高等研究所シニアプログラムアドバイザー Akira Nagata, Senior Programme Advisor, United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)

する可能性がある。

## 1. Introduction

### 1.1 Background

With the launch of First Five Year Plan in 1961, Bhutan started her socio-economic development activities in a more planned manner. More than 60% of the Bhutanese people relied on agriculture farming as their primary source of livelihood. The Ministry of Agriculture and Forests (MoAF) maintains the three basic objectives that are to i) conserve the environment, ii) enhance the rural income and iii) attain self-reliance in cereals and essential oil crops. In 2014, agriculture contributed 16.7% to the total economy i.e. as measured by the Gross Domestic Product (GDP). It was also the single largest sector that provides livelihood over 56.7 % of the population as per Labour Force Survey 2014 (NSB : 2016).

Agriculture occupies only 16.7% of GDP while 56.7 % of population depends upon agriculture, which implies the characteristics of development process of Bhutan. It is pointed out in Royal Government of Bhutan (RGOB) Economic Development Policy 2016 that the occupational structure of the economy which has however not shifted in a manner consistent with the changes in the sectoral composition of GDP is a disturbing trend reflecting jobless growth. And also UN “Millennium Development Goals Acceleration Framework : Youth Employment in Bhutan” points out the adjustment of labour market occurs in accord with the change in industrial structure. As the country develops, the importance of the secondary and tertiary sectors (manufacturing industry and services) is expected to increase, while that of agriculture is likely to diminish further. The report thus writes (UN : 26) :

… with the changing structure of the economy, growth has been relatively capital-intensive rather than labour-absorbing. That is, … the relative increase in employment (or reduction in unemployment) is less when growth is capital-intensive as compared with growth that is labour-intensive. At the same time, construction, infrastructure building and hydropower projects have tended to rely on foreign labour rather than local labour. In addition, agriculture, which is traditionally seen as labour-intensive, has witnessed both reduced growth and an overall decline in its share of total GDP. Thus, it has not absorbed labour to the extent one would have

expected.

There are few issues to be concern of during the transition phase—from relying on the primary sector of the economy to being more dependent on the secondary and tertiary sectors—that have direct implications for labour demand.

Given the development experience of East Asian economies, it generally takes the labour market longer to adjust to meet the specific demands of the changing economy ; that is, on most occasions the labour market takes time to adjust unless it anticipates the pace and sequence of the changing structure of the economy to plan accordingly. Therefore, while agriculture remains an important and a major employer, it is important that there is a continued effort and focus on skills development to meet the demand of the changing economy. This seems to be the plan pursued by the RGOB as laid out in its New Economic Development Policy (2010) ; however, to make the transition smoother, more extensive planning prioritization and coordination will be useful (UN : 26).

The report tells an alternative development process as follows :

A need exists for small investments in agriculture to make the sector more productive enterprise. Both the government and the private sector could play a role in this endeavor, including through adopting new technologies. At the same time, scope exists for improved marketing, including branding of a wider spectrum of produce for export. This will require an organized effort, including the reassessment of entire value chains … .

Although Bhutan has the potential to leverage its geographical advantage to produce off-season vegetables for the Indian market, the inefficiency across the value chain makes agriculture a low-yielding business for the farmers (UN : 27-8). Among others, organic agriculture has potential for better value chain (note1).

In 2007, New Agricultural Policy (Development of Organic Agriculture) envisioning the country to fully convert to organic by 2020 was announced. The traditional agriculture in Bhutan is organic by nature which makes it relatively easy to convert into organic. While there are policies, plans in place the following scenarios continue to persist :

- 1) Cultivable land becoming fallow across the country,
- 2) Vegetables are being imported in an alarming scale, mostly chemical infested,
- 3) Labor Workforce in village is dwindling,
- 4) A large number of educated youths are unemployed.

Attainment of self-reliance appears to be a far dream because the farmlands remain fallow and the size increases by the year in length and breadth of the country. Therefore, Youth in Agriculture Program (YiAP) was conceptualized as one of the strategies to address the scenarios listed above (note2).

## 1.2 Objectives

The YiAP has these objectives :

- Collaborate with implementing agency such as MoAF and Renewable Natural Resource (RNR) Centres to materialize the vision of Organic by 2020.
- Experiment all year round crop plantation and its affect on changing composition of soil in the identified location of Tshimasham in Chukha Dzongkhag.
- Experiment high quality organic breeds of seeds and its adaption to the local environment.
- Introduce/experiment new varieties of crop.
- Identify size of fallow arable land in the country and study the possibility to replicate the model in other regions of the country.
- Showcase YiAP as a successful business model to encourage educated youths as agro-entrepreneur.
- Opening up of Bhutan's first organized vegetable outlet by the 2nd year of business operation.

## 1.3 Model

The basis for conceptualization the model was to address the scenarios presented in 1. The Start-Up below section through the idea of pooling manpower for framing.

- (a) **Location and area of farm** : At least ten acres of land in one location that is fertile, suitable for growing vegetables, cereals, and fruits. Locations must be in different altitude of the country (north, south, central, east) to ensure agricultural activities throughout the year.
- (b) **Green Hands** : Educated and interested youths are registered and known as Green Hands. The primary objective is to employ as many educated youths as possible including high school and college graduates. Interested

young employees of government, private, corporation can also become Green Hands.

- (c) **Nature and status of employment** : There is at least a core group of Green Hands, who are permanent to manage the project. However, interested registered Green Hands can also work on permanent status. Other registered Green Hands are invited to join the farm work for 2-3 months a year especially during peak agricultural seasons.
- (d) **Incentives, compensation** : Green Hands who work on permanent status have fixed and attractive package. Other Green Hands that join the core team for 2-3 months a year are also paid attractive monthly salary, incentives and compensation for those months.
- (e) **Work, study, fun** : These Green Hands are educated people. While much of the farm works are carried out using machines and modern techniques, manual works cannot be avoided too. They carry out action research and study on the farm and keep records. They also engage in agri-business, and other studies related to agriculture. These are sources of revenues to manage and sustain the project. Keeping constant update and fun is a must part of the model. The Farm-House-cum-Office is connected to internet. Entertainment, merry making, fun are regular events of Green Hands.
- (f) **Management of the project** : The project is managed by a bigger body called, "Youth in Agriculture Programme (YiAP)". There is only one head office for YiAP when model is replicated in several locations. The YiAP registers Green Hands, prepares plans, sends Green Hands to different locations where required. In other words there is a pool of mobile Green Hands (part time man power for farming). The YiAP Head Office manages finance, maintains records of the project, liaises with relevant stakeholders, and mobilizes resources, so forth. It also has Office Bearers with terms of reference (TOR).

## 1. The Start-Up

### 2.1 Youth in Agriculture Programme-brief Background

Youth in Agriculture Programme started on 21<sup>st</sup> February 2015 with a group of enthusiastic and committed entrepreneurs. The business idea was an outcome of a research work titled "Exploring the viability of pool farming for accelerating food self-sufficiency in

Bhutan” which was funded by United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS), Japan and guided by the host scientist Dr. Singye Namgyel (the coauthor hereafter).

YiAP is a business entity dedicated towards promoting research based commercial organic farming in Bhutan. The team concerned increasing fallow arable land, huge dependency on imports and increasing unemployment among youths has offered YiAP as a sustainable solution to address those challenges. YiAP strives to develop a better avenue to encourage educated youths opt agro-farming as a recognized lucrative self-employment opportunity. YiAP is designed to serve the expectation of youths of a promising career and a remedy for an ailing economy with fresh perspective on agri-farming. The motto of the YiAP is promotion of green collar through Green Hands.

Since 2014, the company has grown out of a research finding as the Bhutan’s first youth based agriculture research and development. An area covering 5 acres of fallow arable land is pooled for the cause and has employed 5 people and few interns till date.

YiAP is supported by United Nations Development Program (UNDP) and Ministry of Labour and Human Resource in acquiring basic farm materials and equipments. YiAP is also considered as the pilot project of the supporting agencies and constant mentoring and monitoring supports provided by the mentor.

The business aims to replicate similar types of project in other regions of the nation in next 2 years with the same objective to reclaiming fallow arable land, create more employment opportunities and contribute towards food self-sufficiency. It is the hope of the promoters of YiAP to take agriculture to a new horizon.

The financing from United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS) based in Japan (2014-2015) was instrumental in kick-starting the whole project. The grant was on “On-the-Job Research Capacity Building for Food Security and Environmental Conservation in Developing Countries (OJCB).

## 2.2 Introduction of OJCB

“On-the-Job Research Capacity Building Programme for Food Security and Environmental Conservation in Developing Countries” was implemented as phase II of OJCB from August 2014 to July 2017. It was funded by the Ministry of Agriculture, Forestry and Fisheries (MAFF) of Japan and coordinated by Mr. Akira Nagata, one of the coauthors, Senior Programme Coordinator of UNU-IAS.

The purpose of OJCB (phase II) was to increase agricultural productivity through innovation,

strengthen research capacity, as well as build network for cooperation among researchers, and ultimately contribute towards solving food security and environmental conservation problems in developing countries. An OJCB project must consist of three components of 1) On-the-Job Training (OJT) for trainees under the supervision of a host scientist, 2) guidance for developing an action plan to be implemented by the trainee after the OJT, and 3) follow-up the guidance by the host scientist to the trainee on implementing Action Plan after the OJT when trainee returns to original institution. The targets of the projects were young agricultural researchers (younger than 45 years old, not student and not directly working with the host scientist) in developing countries, prioritized for APEC, ASEAN and Africa. The duration of the projects were basically 1 to 3 months and the budget for each project was in the range of \$15,000 in 2016 to \$21,200 in 2011, which is approximately \$2,200 to \$3,100 per one trainee per month.

The implementation process of OJCB is as follows : In response to the announcement of UNU-IAS, applicants (host scientists) send the application documents to UNU-IAS. UNU-IAS organizes the selection committee to select best suited projects to be supported. The host scientists implement the projects at their institutes and send reports to UNU-IAS. UNU-IAS then transfer the project funds after evaluating the reports and submits the reports to MAFF.

During the 6 years implementation of OJCB, 74 proposals from 21 countries were selected, of which Asia accounts for 49% , followed by Africa 43% , Latin America 6% , Pacific and Middle East 1% . By country, Philippines were the most selected, followed by India and Vietnam in Asia and Nigeria was the most selected followed by Kenya, Benin and Ghana in Africa. In terms of the number of trainees, 192 trainees from 31 countries were trained, of which Asia accounted for 59% , followed by Africa 35% , Latin America, Pacific and Middle East 2% . In terms of sector, projects related to agriculture sector accounts for 66% , followed by forestry sector 11% , food sector 11% , livestock sector 7% and fishery sector 5% .

Only one proposal was selected in Bhutan which was proposed by the coauthor in 2014. The OJCB Coordinator visited Bhutan in February 2015 to observe actual implementation of OJCB and found that it was one of the best example of OJCB implemented in a small country included in Least Developed Country (LDC).

## 2.3 OJCB in Bhutan

OJCB facilitated the coauthor (Host-Scientist), Mr

Loknath Sharma (Assistant Instructor) and two trainees to carry out the work. The OJCB of the project was executed with On-the-Job Training, Action Plan and Follow-Up Visits.

**Table OJCB Proposal**

S.N	Activities	Timeline	Responsible
1	Signing of contract with UNU-IAS	September 2014	Director of UNU-IAS
2	Write background to the Research	October to December 2014	Host Scientist
3	Literature review on the project topic		Scientist/ Trainees
4	Finalize research methods and data collection tools		Scientist/ Instructor/ Trainees
5	Field work-Data collection : local farmers and relevant agencies		Assistant Instructor/ Trainees
6	Analyze data, write research report and present the research findings.		Scientist/ Assistant Instructor/ Trainees
7	Develop project model and action plans for experimental research after the OJT.		Scientist/ Trainees/ Assistant Instructor
8	Present the project model to relevant agencies and get feedbacks.	January to May 2015	Scientist/ Trainees/ Assistant Instructor
9	Present the model to the Government for approval and solicit necessary support		Scientist/ Trainees
10	Visit institutions of the trainees and present the newly developed model and finalize the action plan for practical implementation study including site for the study.		Scientist/ Trainees/ Trainees Institution
11	Discuss with relevant agencies and pool necessary resources for practical study.		Scientist/ Trainees
12	Finalize the model and <b>Action Plan</b> and provide necessary advice for practical study to the trainees.	January to May 2015	Scientist/ Trainees/ Assistant Instructor

13	Trainees return to their institutions and begin implementing Action Plan.	March to June 2015	Trainees
14	Follow-up visits by the Host Scientist/Instructor		Host Scientist
15	Final Report to UNU-IAS	June 15 2015	Host Scientist

Source : OJCB Proposal, 2014

The project culminated into a workable and evidenced based model and implementation began on a 4.5 acre land in Tshimasham, Chukha Dzongkhag.

### 3. Achievements and Challenges

#### 3.1 Achievements/ Learning Milestones

Leaving aside other achievements and progress, the successful start-up of the programme and bringing YiAP into actual existence is the significant achievement. During the period, the Green Hands worked to deliver the core priorities for site development and gathering reliable information for future reference from different sources. There was a strong focus on physical works, however in-house research activities, experimental research, creating awareness on organic farming and building social relationship also went side by side.

#### 3.2 On-farm Achievements

Recall the limited initial capital investment, of the total 4.5 acres of land only 1 acre was utilized for cultivation during for the first season. Almost all types of vegetables grown by the local farmers were cultivated along with few new crops as a part of the study. In addition to 1 acre of cultivated land, almost 50% of site development activities for the remaining land were also completed. The additional capital contribution (Nu. 90,000) by the coauthor was a great ignite to the site development activities. Most of the site development activities were completed by end of 2015 and in addition an adorable farm house was also constructed (**Figure 1**) .

The remarkable outcomes which have resulted from hard work and determination of the Green Hands demonstrated their potential for a more profitable commercial farming venture. In 6 months YiAP harvested almost 1500 kg of organic vegetables sown, planted, nurtured in strict compliance to international Standard Operating Procedure (SOP) of Organic Farming (**Table 1**). While both local producers and consumers had minimal accessibility to organic food, YiAP harvested its first batch of organic produce and

**Table 1** : Details of quantity produced during first season (6 months)

Quantity Harvested (KG)				
Sl. NO	Name of Crop	Area (m* m)	Quantity (Kg)	Remarks
1	Cabbage	1.5×25 m (9 beds)	720	5 % spoilage
2	Broccoli	1.5×25 m (5 beds)	250	2 % spoilage
3	Radish	5×5 m bed	500	2 % spoilage
4	Cauliflower	1.5×25m (6 beds)	300	10 % spoilage
5	Carrot	5×5 m bed	90	5 % spoilage
6	Beans	8 decimal	-	self consumption
7	Peas	8 decimal	-	self consumption
8	Onion	1.5 by 10 m bed	-	experimental research
9	Maize	-	-	self consumption

Source : YiAP Annual Report, 2015-2016

was introduced into the market.

### 3.4 Embracing Organic Brand

One of the prominent on-farm achievements is an ability to advance the traditional culture of farming and the use of certain natural inputs for providing nutrition and protection to the crops. Following the guide book “A Guide to Organic Farming” provided by National Organic Programme of MoAF, the manures and bio-pesticides were prepared using farm waste and other biomass. Increasing the capacity in this field was crucial, as there are two primary inputs for the organic farm : cost effective and sustainable. These ensured ‘win-win’ outcomes both economically and environmentally. With theory and practice, Green Hands became much aware that there is absolutely no room for complacency in making organic farming a successful commercial business. By then the project saw clear green light for growth and expansion of organic farming with renewed accuracy of production and marketing (**Figure 2 & Figure 3**).

### 3.5 Youth Involvement and Youth Employment

Involvement of youths through social volunteerism in doing farm work was another evident achievement. Hundreds of students from Chukha Higher Secondary School and Gaeddu College of Business Studies volunteered to work on the farm during site development and preparation of beds. Moreover, the Green Hands made presentations to the students of these institutions on YiAP, principles of organic farming and entrepreneurship among youths. It was a great opportunity to encourage agro-entrepreneurship among youths (**Table 2 & 3**).

In this rapidly increasing unemployment among youths of Bhutan, YiAP not only provided employment for the promoters but also a great platform to

develop a venture which has a capacity to create huge employment opportunity for the upcoming youths. As of date the YiAP is operated by five Green Hands and volunteers.

The YiAP desires to employ additional interns (both High School and University Graduates) through support from Guaranteed Employment Scheme of Ministry of Labour and Human Resources. However, registration of more youths and creation of pool Green Hands is far from realization.

### 3.6 Creation of Database and Related Studies

One of the most significant achievements is the creation of database through close observation of selected vegetables, their growth and development. **Tables 3a-3g** show the details of timing and activities involved in cultivation of some nine common vegetables/crops. These are results of close observation of vegetables on a daily/weekly basis.

These data helped Green Hands plan their future rounds of vegetable growing with more practical and scientific approaches.

Furthermore, the Green Hands also carried out survey to determine demand/supply of certain vegetables and allied crops to help them prepare evidenced plans. Key findings are presented.

One of the crops that was consistently imported from India is onion (**Table 4**). To address the issue the Green Hands carried out a simple experimental research to find out the feasibility for production of bulb onion in Tshimasham area. Hybrid seeds were used to cultivate those crops. The variety tried was Pune red. The general characteristics of those vegetables requires less humid for proper growth and high yield which is just opposite with the climatic conditions of Tshimasham most of the time.

However, the study concluded that if right timing

**Table 2a** : Details of Promoters and permanent members (2017)

Sl. No.	Name	Education	Role and Responsibilities
1	Kezang Tshering	B.Com	Marketing
2	Tashi Tobgay	B.Com	Green Hands/ Organic farming
3	Kinzang Duba	B.Com	Green Hands/ R&D/ Marketing
4	Jangchu Dorji	XII pass	Green Hands/ Farm manager
5	Sangay Chenzom	VIII	Sales person

Source : YiAP Annual Report 2015-2016.

**Table 2b** : Student members during Vacations (2016-2017)

Sl. No.	Name	Institution
1	Dorji Tshering	Sherubtse College
2	Kumar Dhakal	Gaddue College of Business Studies
2	Dechen Dorji	Class 12 dropout
4	Tenzin Norbu	Class 12 dropout

Source : YiAP Annual Report 2015-2016.

for sowing seeds, transplantation and harvest is ensured then quite a good amount of onions can be harvested in those areas. Almost 60% of the onions planted on mid March and transplanted in late April are yet to be harvested at YiAP farm. The average diameter measures almost 8 cm.

Finding of the study also suggested another hypothesis or challenges for the following year, which is “to identify exact timing for sowing seeds and transplantation”. However as per the results of the study, nursery shall be prepared in the green house in late winter and transplanted when the temperature begins to rise (probably early spring). Normally onions are ready for harvest within 4 to 5 months after transplantation (Figure 4 • Figure 5).

#### 4. Assets and Network

The YiAP has the following assets and networks as of 2017.

##### 4.1 Farm Land

The original farm in Tshimasham has 4.5 acres and is used for vegetable cultivation (2 acres), dairy and fodder for 5 cattle (2 acres) and mushroom farm (0.05 acre). The project managed to expand to nearby village of Bunakha where an acre of wet land is used for paddy cultivation and another acre for growing vegetables.

##### 4.2 Farm Machineries and Technologies

The project has been able to acquire a power tiller, a power weeder, 4 sets of poly house. This machinery enabled the Green Hands to mechanize their work to

an extent (Figure 6).

#### 4.3 Marketing and Networking

The YiAP constructed a sales-outlet on the Thimphu-Phuntsholing Highway. It is encouraging to note a good number of passengers stop by to buy the vegetables and they are particularly tempted by its organic brand. The daily average sale generates revenue of Nu 3000 or US\$1,400 a month. The project also managed to build network with villagers (at least 23 households) as marketing partners (Figure 7 • Figure 8).

### 5. Local Stakeholders and Partners

#### 5.1 Ministry of Agriculture and Forests, Royal Government of Bhutan

MoAF duly approved the project and provided technical assistance whenever possible. Since its inception, various department and extension offices of MoAF has been very helpful and supportive in making it a successful start-up.

#### 5.2 National Organic Programme (NOP)

Youth in Agriculture programme is registered with National Organic Programme (NOP), under MoAF to gain organic brand certification. In this regards NOP facilitates the programme with various technical assistance and equipments related to organic farming. NOP also provides other related trainings to enhance the knowledge on organic farming and its principles.

**Table 3a : Cabbage**

Activities	Season, Month, Date	HR	Material cost
Nursery	1st week of March	2 men days	Hybrid seeds
Application of Manure	Before transplantation	8 men days	FYM
Transplantation	3 weeks after nursery	8 men days	
Weeding and Hoeing 1	3 weeks after transplantation	4 men days	
Application of Pesticide	Depending upon the need	1 man days	Bio pesticide
Weeding and Hoeing 2	3 weeks after 1st weeding	4 men days	
Harvest	4 to 5 months after transplant	8 men days	

**Table 3b : Broccoli**

Activities	Season, Month, Date	HR	Material cost
Nursery	1st week of March	1 man days	seeds
Application of Manure	Before transplantation	8 men days	FYM
Transplantation	3 weeks after nursery	8 men days	
Weeding and Hoeing 1	10days after transplantation	4 men days	
Application of Pesticide	Depending upon the need	1 man days	Bio pesticide
Weeding and Hoeing 2	3 weeks after 1st weeding	4 men days	
Harvest	5 months after transplant	8 men days	

**Table 3c : Radish**

Activities	Season, Month, Date	HR	Material cost
Application of Manure	last week of May	8 men days	
Sowing seeds	After application of manure	1 man days	seeds
Weeding and Hoeing 1	After one month of sowing seeds	4 men days	
Application of Pesticide	Depending upon the need		Bio pesticide
Weeding and Hoeing 2	3 weeks after 1st weeding and hoeing	4 men days	
Harvest	3 months after sowing seeds	4 men days	

Source : YiAP Annual Report 2015-2016.

**Table 3d : Cauliflower**

Activities	Season, Month, Date	HR	Material cost
Nursery	1st week of March	1 man days	seeds
Application of Manure	Before transplantation	8 men days	
Transplantation	3 weeks after nursery	8 men days	
Weeding and Hoeing 1	3 weeks after transplantation	4 men days	
Application of Pesticide	Depending upon the need	1 man days	Bio pesticide
Weeding and Hoeing 2	3 weeks after 1st weeding	4 men days	
Harvest	5 months after transplant	4 men days	

Source : YiAP Annual Report 2015-2016.

**Table 3e : Carrot**

Activates	Season, Month, Date	HR	Material cost
Application of Manure	last week of May	8 men days	
Sowing seeds	After application of manure	1 man days	seeds
Weeding and Hoeing 1	After one month of sowing seeds	4 men days	
Application of Pesticide	Depending upon the need	1 man days	Bio pesticide
Weeding and Hoeing 2	2 weeks after 1st weeding and hoeing	4 men days	
Harvest	Mature at around two and half month	2 men days	

Source : YiAP Annual Report 2015-2016.

**Table 3f : Peas**

Activities	Season, Month, Date	HR	Material cost
Application of Manure	Mid of July	4 men days	
Sowing seeds	After application of manure	1 man day	Local
Weeding and Hoeing 1	3 weeks after sowing seeds	4 men days	
Stacking	Depending upon the growth	8 men days	
Application of Pesticide	Depending upon the need	1 man days	Bio pesticide
Weeding and Hoeing 2	2 weeks after 1st weeding and hoeing	8 men days	
Harvest	Immature harvest for pods and fully developed of seeds	2 men days	

Source : YiAP Annual Report 2015-2016.

**Table 3g : Beans**

Activities	Season, Month, Date	HR	Material cost
Application of Manure	Mid of July	4 men days	
Sowing seeds	After application of manure	1 man day	Local
Weeding and Hoeing 1	3 weeks after sowing seeds	4 men days	
Stacking	Depending upon the growth	8 men days	
Application of Pesticide	Depending upon the need	1 man days	Bio pesticide
Weeding and Hoeing 2	2 weeks after 1st weeding and hoeing	8 men days	
Harvest	2 months after planting	2 men days	

Source : YiAP Annual Report 2015-2016.

**Table 4 : Demand trend/ Imports of some basic vegetables at Centenary Farmers Market (CFM) , Thimphu**

List of vegetables	Jan	Feb	Mar	Apr	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Potato	59400	57300	58300	47188	37733	6249	11856	10612	24778	37152	58544	409112
Tomato	51048	51040	48310	40077	38611	21005.5	20898	16787	22674	23758	48927	383135.5
Onion	52869	51820	48780	44270	32243	30126	28459	24198	25491	24991	52343	415590
Bitter gourd	7048	1991	2383	6379	15998	8019	10173	10591	9192	14755	14701	101230
Egg plant	18535	4504	3418	11167	11683	7793	8880	5755	9524	19497	39032	139788
Carrot	15172	18970	18100	6439	4600	0	0	0	0	0	4131	67412
Big Chilli	26439	18832	15700	5939	0	0	0	0	0	12375	32032	111317
Chilli (s)	23392	20400	15200	13701	26308	12844	13600	9193	14253	12311	25781	186983
Garlic	750	792	5180	460	1165	0	130	90	436	810	522	10335
Cucumber	7722	11874	12700	5014	5067	3561	1900	4007	5831	6237	6025	69938
Bottle gourd	526	220	237	630	2805	1653	4850	2372	1836	794	542	16465
Cauliflower	43033	50420	50900	3200	0	0	0	2993	14180	26096	234467	
Cabbage	53723	54320	53150	63700	22239	0	0	0	3610	15082	46085	311909
Beans	16441	18995	21400	38095	29703	10234	4200	0	1110	8174	23841	172193
Peas	7537	10851	11914	7290	30	0	0	0	0	0	5672	43294
Mushroom	1866	1186	1105	1060	0	0	0	0	0	1030	964	7211
Radish	8719	10368	12000	9601	0	0	0	0	0	0	980	41668
Total	394220	383883	378777	344655	231385	101485	104946	83605	121728	191146	386218	2722048

Source : Situational Analysis Report, YiAP, 2014-2015

### 5.3 Renewal Natural Resources (RNR) Dzongkhag Extension Office

RNR assisted trainees with their expertise in studying other scientific approach towards development of the farm land and crop choice. They provided basic farming amenities and training on different aspects of

farming.

### 5.4 Gaeddu College Business Studies (Volunteers)

YiAP was very fortunate to get an opportunity to present about the project to students and faculties of Gaeddu College of Business Studies (GCBS). Both the

faculty and the students were inspired by the concepts of the project. Till date four batches of volunteers have helped the business with site development activities. Further, GCBS has committed to assist the project in terms of human resources through social internship program during the summer and winter vacations. The college management also committed to purchase all types of farm products and any quantity.

### 5.5 Chhukha Higher Secondary School (Volunteers)

YiAP also received magnificent support from Chhukha Higher Secondary School. Three batches of volunteers came to lend their help during those periods. They also committed to continue such decent act of volunteerism every year and sent their students as interns during winter vacations if possible.

### 5.6 Residents of Tsimasham and Bunakha villages

In many ways the villagers of Tsimasham and Bunakha have been instrumental in making the YiAP a success so far. The locals know best about the land type of crops grown in the area. The project often sought technical assistance of local expert farmers (Figure 9 • Figure 10).

## 6. Challenges

One of the challenges the project faces is the productivity and competitiveness that are constrained by farm size, access to land and limited farm laborers and steep landscape. The nature of landscape makes it difficult to go full scale mechanization of farming. A major challenge continues to be getting educated youths to register as Green Hands. Post on the social media and personal contact asking youths to join YiAP has not been so successful. Therefore, the total realization of concept of YiAP with particular focus on “pool farming” remains to be seen. Yet on the other hand, YiAP recognizes it as an opportunity to encourage collaborative working and strategic engagement of the schools and youths which can successfully reduce cost, achieve scale at the same time encourage youths to take up farming as their life time vocation.

## 7. Conclusion

The YiAP has made modest achievements in its two and half years of establishment since the beginning of 2015. The line ministries, local partners, immediate communities have shown keen interest and extended support for win-win results. As rightly observed by media, KUENSEL, the National Newspaper on April 21, 2017 was confident YiAP is going strong. YiAP

was established with an aspiration to address some of the many paradoxical scenarios which have triggered to not only “think out of box” but “do out of box”.

It proceeds on the way to the mission. However, it made very positive and potential impact on the youth of Bhutan. Inspiration for educated youths through promotion of agriculture as a lucrative and intellectually demanding self-employment opportunity and focus on niche organic brand.

Both the faculty and the students of Gaeddu College (GCBS) were inspired by the concepts of the project. Till date four batches of volunteers had helped the business with site development activities. Further, GCBS has committed to assist the project in terms of human resources through social internship program during the summer and winter vacations. And also, Chhukha Higher Secondary School did assisted it. Three batches of volunteers came to lend their help during those periods. They also committed to continue such decent act of volunteerism every year and sent their students as interns during winter vacations if possible.

Interaction between urban and rural, that is between elder generation and the youth through agriculture is crucial to the nation state.

## Notes

1. An organized efforts done by Society Switzerland-Bhutan. Karma Yangzom writes ‘Bio Bhutan—a pioneer business case’ (Reinhard : 146).

Bio Bhutan is a pioneer enterprise specializing in product development and marketing of natural and organic certified products from Bhutan for local and international markets. With a long-term vision of making Bhutan a recognized player at national as well as regional and international organic markets the main goal of the enterprise are to : · Contribute to the sustainable use of natural resources of Bhutan ; · Improve income and employment opportunities of rural communities and private entrepreneurs ; · Create surplus value for final consumers through healthy and tasteful natural and organic produces from Bhutan ; · Promote the image of Bhutan as a supplier of pure, natural and organic products.

The origin of Bio Bhutan comes from Switzerland. The idea of bio Bhutan came into being during the Swiss Expo of 2002 where COOP displayed fine Bhutanese architecture in the expo.

2. Youth in Agriculture Programme (YiAP) : Bhutan  
Mission : Inspiration for educated youths through promotion of agriculture as a lucrative and intellectually demanding self-employment opportunity and focus on niche organic brand. Established on 21st February 2015, the first pilot project “Green Hands”—an

integrated organic farm focusing on vegetable farming, dairy and mushroom cultivation is based at Tshimasham Village under Chukha Dzongkhag.

YiAP was established with an aspiration to address some of the many paradoxical scenarios which are have triggered to not only “think out of box” but “do out of box”. These scenarios include (1) already small and cultivable agricultural land increasingly becoming fallow ; (2) country importing agricultural products especially vegetables at an alarming scale and (3) prevalence of unemployed educated youths in major towns. The magnitude of each of these scenarios need not be elaborated and if not addressed on time they have potential to becoming a threat to national peace and security.

They appear different but the cause is seen to be one and solution can be one as well. At YiAP we call it promotion of green collar through Green Hands-educated youth taking up farming in nutshell, programme has the task and responsibility to be in a position to act as a supporting agency mobilizing seed money and resources for aspiring youth enterprise.

YiAP is an avenue through which aspiring agro-entrepreneurs will be given a push in terms of management competence., technical know-how and input acquisition by mobilizing resources in collaboration with supporting agencies.

Source : <https://www.facebook.com/pg/yia@bhutan/about/> on 11/10/2017

## References

- Department of Agriculture (2006) . *National Framework for Organic Farming in Bhutan*. Thimphu : Ministry of Agriculture and Forests.
- Department of Agriculture (2012) . *National Organic Programme : Master Plan for Organic Sector Development*. Thimphu : Ministry of Agriculture and Forests.
- NSB (2016) . *Labour Force Survey 2014*. Thimphu : National Statistics Bureau.
- Reinhard, E. (2008) . *Far apart and close together Bhutan and Switzerland-Partners in Development since 1950*, Society Switzerland-Bhutan.
- RGOB (2016) *Economic Development Policy*. Thimphu : Royal Government of Bhutan.
- UN (2013) . *Millennium Development Goals Acceleration Framework : Youth Employment in Bhutan*.
- YiAP (2016) . *YiAP Annual Report-2015-2016*.
- YiAP : <https://www.facebook.com/pg/yia@bhutan/about/> accessed on 11/10/2017.

(2017年10月27日受理)



**Figure 1** : Farm House-Home, Office, Research Centre, etc



**Figure 2** : A Green Hand talks to his healthy vegetable



**Figure 3** : Broccoli and beans, sense of satisfaction



**Figure 4** : Green House, Nursery home



**Figure 5** : Transplantation, essential step



Figure 6 : A Green Hand with Power Tiller- mechanization of farming



Figure 9 : Working together with the community



Figure 7 : Outlet by the National Highway



Figure 8 : Customers have choices of vegetables



Figure 10 : Planning with the locals