
UP-COUNTRY VEGETABLE PRODUCTION AND MARKETING: CHALLENGES AND OPPORTUNITIES

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Abstract

The agriculture industry in Sri Lanka plays a vital role in socio-economic background. The share of agriculture in Sri Lanka's GDP approximately 7% in 2019. Vegetable production and marketing system face immense challenges which are causing severe damages creating long term issues. The vegetable sub-sector contributes to the national GDP. The cultivation of vegetable becomes a prominent income among the farmers in Sri Lanka. Consistent with this information, the identified area is establishing a statistically equipped market data system and therefore the comparative study is vital to identify the challenges of the vegetable cultivation within the Up-country Region. This study aims to find out challenges in vegetable production and marketing in the up-country region (Nuwara-Eliya, Badulla, Kandy & Matale) and to propose suggestions to mitigate such challenges within the study area to reinforce the socio-economy of the people. For this study, Primary data were employed with a questionnaire survey to determine socioeconomic data required for the study. Frequency distribution and percentages were used to analyze the socio-economic characteristic of respondents, patterns of marketing, the quantity of vegetable production were analyzed to identify the key variable of this study. And an explorative survey by conducting discussions with the groups and individuals of key stakeholders and informants in the up-country vegetable farming & marketing system.

Key words: Up-country region, vegetable, Production, marketing, challenges, GDP

Introduction

The vegetable (sub-sector) may be a key segment of the opposite food sector, which makes a major contribution to the country's economy in terms of saving and earning exchange and providing employment for the rural poor. During this context, Sri Lanka may be a perfect choice for Agriculture and Agro-based industry, because of its natural and manmade facilities like naturally rich soil, and zone and also well-distributed rainfall pattern and robust irrigation facilities and it produces over 800,000 metric plenty of fruits and vegetables annually and export both fresh and processed. Varieties to several destinations within the world, 90% of the fresh product is targeted to the centre East and Maldives Island and almost 75% of the processed products attend the ECU market (Shakila, 2019). The vegetable cultivation is an integral part of the smallholder sector within the up-country regions of Sri Lanka. Dispersed largely within the upper watersheds, it's characterized by year-round production of vegetables.

Sri Lanka is a tropical country with highly favourable conditions for the cultivation of crops. At the time of independence, Sri Lanka was heavily hooked into the agriculture sector in terms of output and employment (Hilal & Mubarak, 2013). However, as time went on, its importance declined compared to the service and industrial sector. The importance of the agriculture sector for employment and export earning has substantially declined.

Vegetables grown in Sri Lanka are broadly divided into two groups, like up-country types and low-country types, supported the agro-ecological adaptability. During this case, this study mainly focuses on up-country vegetable production. Although this region accounted as

70.3% of the Maha seasons and 74.1% Yala seasons which is the impact on Up-country vegetable production.

- Maha - Major season in Sri Lanka extending from mid - October to mid - March 3
- Yala - the opposite season in Sri Lanka extending from mid - June to mid –September

The upcountry vegetable cultivation is that the most popular among the farmers in Nuwara-Eliya, Badulla, Kandy, Matale districts within the central highlands of Sri Lanka. Tomato, potato, Leeks, Carrot, Beetroot, Beans, Young Jack, Cabbage, Pumpkin, and Green Chili are the main vegetable crops cultivated within the area. (Padmajani et al., 2014). Vegetable cultivation, on the average. Except for Nuwara Eliya, the foremost important Up-country district for vegetable cultivation, the opposite three mid-country districts, namely Badulla, Kandy and Matale accounted for 40% for Maha season's vegetable cultivation and 37.5% Yala season's upcountry vegetable cultivation, on the typical (Department of Census and Statistics, 2015-2019).

In vegetables, the industry should be capable of adapt to the new changes. The trends that are identified relate to the changing consumer, changing outlets for vegetables, and therefore the changing methods of selling should be highly considered (Mubarak, 2019a). Traditionally soil within the study area at an elevation over 1000m is being exploited for potato and vegetable production in Sri Lanka. The environment is very suitable for year-round cultivation of potato and high-value vegetables. Therefore, vegetables are cultivated on an intensive and commercial scale.

Vegetables are quite different from most perennial crops have they need a brief period of about 2-4 months within the field but produce high quantizes of biomass. Therefore, most farmers within the study area tend to use high quantities of pesticides and fertilizers. The cold and humid climatic conditions of the study area combined with high yielding sorts of crops and therefore the increasing use of chemical fertilizers provides a conducive environment for the event and multiplication of pests and diseases. There are three methods of cultivation identified in upcountry side: Single cropping, Mixed cropping, Multi cropping. The choice of the appropriate method varies from farmer to farmer and from location to location. Single cropping is dominating quite 50% followed by mixed cropping and multi-cropping. Farmer's preference to undertake single cropping is thanks to convenience and habits, while risk minimization and maximum use of lands are the main two factors for adoption of mixed cropping.

Seeds, fertilizers, agro-chemicals, labour and credit are the main inputs by the vegetable farmer. Input market is dominated by private sector transections are mainly done on immediate cash payment basis (Mubarak, 2019a). Within the case of labour, family labour widely used, and also most of the labours were taken from rural areas for day payment in cultivation activities. The main production problems faced by farmers are high input cost, lack of finance, water availability, quality seeds and poor extension. Additionally, farmers generally lack knowledge about proper pesticide management including safe pesticide handling and storage. While studies of pesticide productive are relatively common, few researchers have assessed the farmer's pesticide adopt on the socio-economic impacts.

The small and medium producers are not only important for the economic development but also for the social development of a nation by participating in the development of networks of the producers. Involvement of greater number of producers and entrepreneurs help to take up economic responsibilities and value their own competencies in marketing their product and services (Mubarak, 2019b). To become successful in marketing, firms/producers should focus on customers, even though, marketing costs are the major expenses for producers, marketing leads to improved business performance and benefits the economy as a whole (Ishar & Mubarak, 2017). Therefore, vegetable marketers also should have effective marketing plan to

take the product to right customers. However, the producers are facing several challenges in marketing their harvested products.

Hence, the main objective of the study is to assess the challenges in vegetable production & marketing towards identifying the suggestion and appropriate recommendations to minimize the challenges in the vegetable production and marketing of the Up-country vegetable production systems.

Study area

The study area covered the four districts of Badulla, Nuwara Eliya, Kandy and Matale. These four districts comprise 32 agro-ecological zones (AEZs) and out of which only 14 dominate concerning the production of ten selected up-country vegetables at DS (Divisional Secretariat) and ASC (Agrarian Service Centre) levels, and therefore they are within the purview of the study. The study area is a Wet zone receives a mean annual rainfall more than 2,500 mm with no distinct dry season. Further, a sub-division based on the altitude takes into account the temperature variation in these climatic regions. The elevation of the region is more than 900m.

The temperature is about 15-20 degrees Celsius. Every year, heavy wind blow from May to August. September to April is a very rainy season. The area is woven with laterite soil. Besides, humus-laterite soil and sludge with slued are also common. Most of the area is engaged in agriculture in the area, and the overwhelming majority of them engaged in the commercialization of vegetables. Farmers in this area especially produce much of the required amount of vegetables in Sri Lanka. This area is the best known for commercial farming, including potatoes and vegetables, such as carrots, beans, leeks, cabbage, green chili, tomatoes, beetroot, etc.

Material and methods

This study, Primary data were used with a questionnaire survey to determine socio-economic data required for the study. A structured questionnaire survey was distributed to collect information on several aspects of the sample of the farming community. Frequency distribution and percentages were used to analyze the socio-economic characteristic of respondents, patterns of marketing, the quantity of vegetable production were analyzed to identify the key variable of this study. With the snowball sampling method, there are 50 farmers' family were identified to obtain data through the above data collecting method. This enabled to collect data and information on current knowledge through this study and innovative ideas, it might be easier to supply appropriate information to develop production rate and marketing strategy.

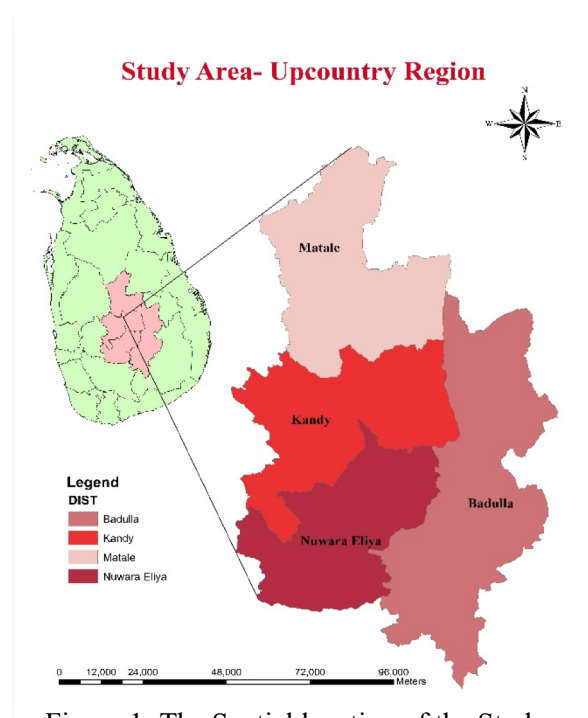


Figure 1: The Spatial location of the Study

Results and discussions

Most respondents were male (84%) and of an age where they would be able to successfully undertake activities involved in marketing. The majority of marketers involved in selling vegetables are approximately the same age, most respondents involved in the marketing of vegetables were from the Badulla and Nuwara Eliya with a good deal of marketing experience 10 to 25 years (37%). More than 40% of marketers had a secondary level of education and almost half belonged to a cooperative society. These all socio-economic information shows bellow table1:

Table 1. Socio-economic characteristics of the respondent

Socio-economic variable	Characteristics	%
Gender	Male	84
	Female	16
Age	25-45	26
	45-65	56
	>65	18
Location of Farm	Badulla	45
	Kandy	9
	Matale	7
	Nuwara Eliya	39
Marketing experience (Year)	<5	3
	5-15	31
	10-25	37
	>25	29
Education level of marketers	No formal education	16
	Primary	22
	Secondary	44
	Tertiary	18

Marketing Information System

All farmers were involved in the marketing activities for selling vegetable production. In this case, every farmer and marketer need to know about the market conditions and price. Up-country vegetable products selling commodity with a higher demand within society. Therefore, the government is more paying attention to the sub-sector of agriculture. Accordingly, Figure1. Shows through the questionnaire survey 45% of respondents get information via the government-related site and 25% of respondents able to access market information through media. Besides, 15% of respondents said they would get information from the farming community and private sector / NGOs, while 15% reported receiving information from another source. Cultivators require information about fertilizer use, new seed varieties, pest controls, composting, access to credit, crop sales etc. for successful cultivation there for the marketer gather market condition, price, demand related information through the source. Commonly, the marketing information system helps to know all information for their activity in these sectors.

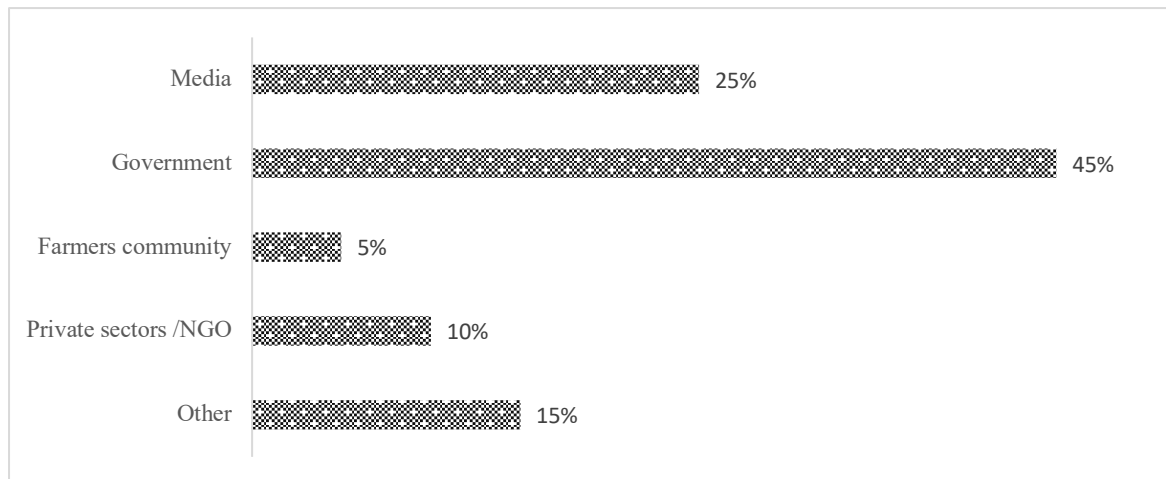


Figure 1. Percentage of information source for farmers & marketers

Financial Support

Financial support is very important for agricultural operators for their cultivation activities. The questionnaire survey respondents reported information that majority of 67% of loans were taken from government banks in Sri Lanka. Therefore, and the other number of loans taken

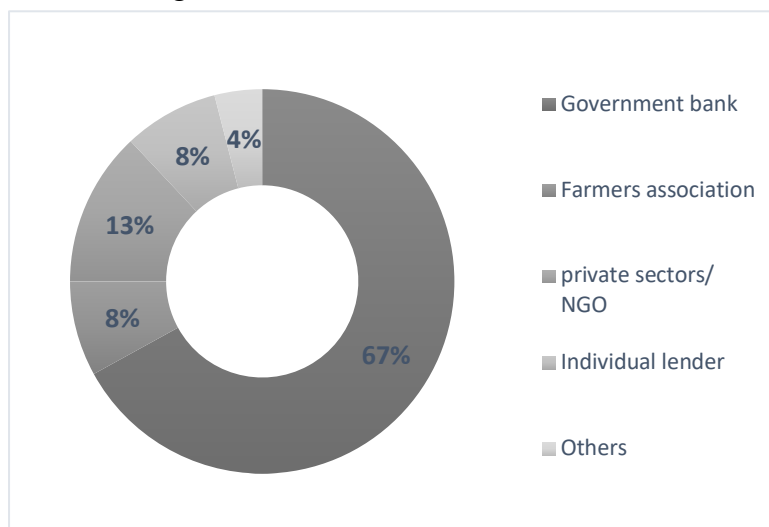


Figure 2. Percentage of Financial support

by the operators were distributed among farmers association, Private sectors / NGOs, and Individual lenders. Very few respondents 4% of were taken loans from another source. The main purpose of loans was taken to purchase seeds, fertilizers, pesticides, insecticides, and to rent agricultural equipment. Generally, This financial support is one kind of Opportunity for the farmers. In the same time people who don't

have sufficient money for the production activity, they try to get a loan and getting seeds fertilizer for their agriculture purposes. Due to over loan/ increasing of the loan amount, parents tended to migrate the Middle East countries for job opportunities for earning. This leads to separate children from parents. It causes many bad habits among children and also it creates socio-economic challenges in this area.

Challenges in vegetable production and Marketing

Due to the importance of vegetable production within the up-country region gave more food available for our country. Consumption levels, it's necessary to enhance production techniques also as processing, storage, and marketing of produce to sustain availability and affordability. An efficient production and marketing system can make sure that these commodities get to the

ultimate consumers intact. The target of this study was to look at vegetable production and marketing related challenges faced by farmers and marketers. Accordingly, bellow figure 3. Shows challenges that are identified during this study bellow:

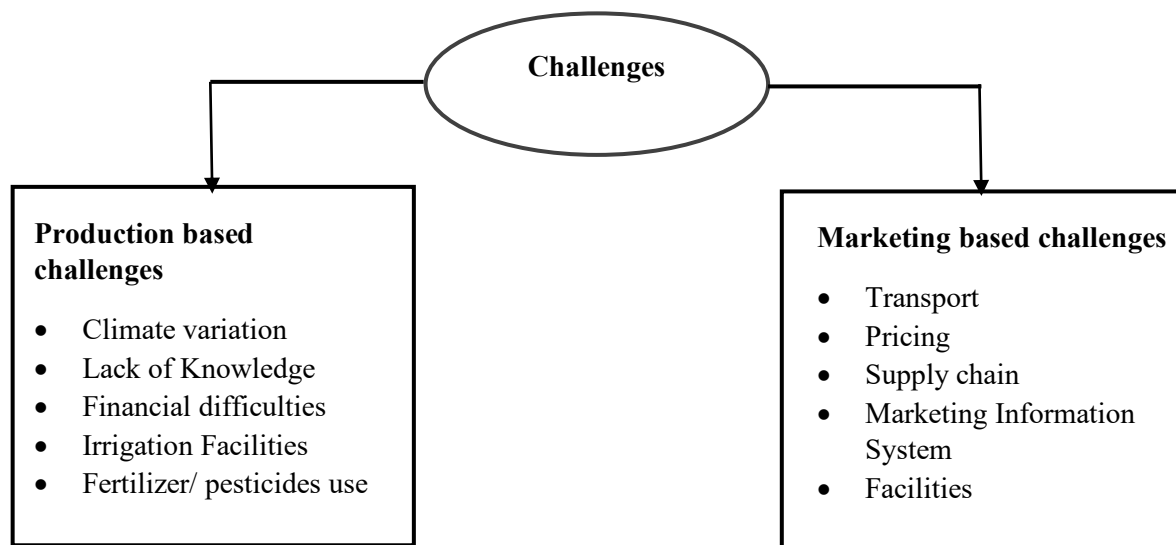


Figure 3. Challenges in vegetable production and Marketing

Challenges issues in Up-country vegetable Production

i. Climatic variation

The cultivation activities are mostly based on the climate mainly temperature and rainfall. These two factors mostly influence the production of the vegetable. In the Up-country Intermediate zone, there is a huge variation between temperature and rainfall. Therefore, in this study area, the average temperature is above 15°C-18°C. So there are so many climatic changes, seasonal changes are making challenges occur among the farmers. Seasonal changes also mainly influence in the vegetable cultivation in Up-country region. It means, in May, June, July is known as windy season. So, based on this period the cultivation of carrot mostly occurs. When we focus on these seasonal changes two years ago (May-July) couldn't receive the wind as mentioned earlier. So, in earlier due to this issue, the farmers faced so many difficulties to produce the output of this cultivation.

According to see the seasonal rainfall, this is also mainly focused on the vegetable cultivation in this particular area. But sometimes the seasonal rainfall is missed due to some climatic variability. Here is some growth of the vegetable is shown based on the seasonal rainfall. Therefore, if they haven't to get a proper rainfall pattern the production of the vegetable will be disabled. Heavy rainfall conditions tend to vegetables become rot. Increasing temperature, reduced irrigation, water availability, and landslide would be major limiting factors in sustaining and increasing vegetable productivity and unpredictable high-temperature spells will reduce the productivity of vegetable crops. In the Up-country region, the May-September is identified as the dry season, so that it mostly influences to reduce vegetable productivity.

Due to heavy rainfall pattern or temperature increasing spread many diseases in vegetables. Sometimes vegetables such as leeks, cabbage, were affecting by virus diseases. Therefore, farmers need more many strategies to overcome these challenges. They need to buy

pesticides and vitamins to protect the vegetables. Sometimes this condition decreases harvesting as well as income.

ii. Lack of new technology

According to production challenges, new technology is a major cause that influences the production of vegetable cultivation. In the Up-country region not have modern technology for tilling, cultivating and harvesting and these situations lead to time consumption. There are so many new technologies used to water the cultivation activities now a day. But here there is not a proper way to watering the plants. As well as poor knowledge of the farmers and lack of new methods are used for the growth of vegetables that most influence in the production (lack of new methods in fertilizing).

The farmers don't have a huge place for their cultivation purposes, so they unable to get high profits in particular vegetation. As well as according to our group discussion, we identified another problem that the farmers are unable to use the high machinery system on their field. Because this region is a high elevated hilly area. Therefore, they faced so many difficulties to carry the machines to the cultivation area.

iii. Financial problem

In the Up-country region, agriculture is the livelihood for most of the people. Sometimes they have a bad condition in cultivation due to the weather, fertilizer and less quality of seeds. When they affected by those kinds of problems, it leads to reduce the harvesting and also reduce the income. That's why people who are depending on this income faced many economic problems. As well as people who are studying in school (age level is above 15), getting struggle in studies. So, they are forced to do any job for their income. In this manner, it increases the child labour force.

iv. Labour force

Labour force mainly influences the production of vegetable cultivation. It is mostly based on the traditional farming system, and also, they unlike to adopt the modern farming system. It means in earlier the people who have own cultivation land the family labour is dominant on all activities, such as land preparation and harvesting watering, fertilizing and weed removing etc.

But nowadays, the new generation is to avoid family labour, they like to work in the cultivation fields, so in this manner, the owner of the land depends on the labour forces. So, they retrieved labours from outside for daily payment. Daily payment for gens Rs. 1200-1500/=, for ladies Rs. 800-900/=. This led to expenditure on more cost. And also needed more labours to manage their activities. So, the study reveals that nowadays there is a demand for labour forces. When the family labours work on their lands, the works should become very need and perfect. But if the landowner had the labour from outside the operations activities would have become imperfect. So, it leads to creating small conflict between landowners and labours.

v. Water supply

The up-country region is self-sufficient in water supply because naturally, it has so many springs. As well as some small streams are flowing through this area. This area is facing many challenges regarding the water supply.

According to the group discussion with farmers, they told that here May- September is identified as a dry season. So that in this period many springs tend to dry. As well as the capacity of tributaries also tends to very low. In this manner, farmers are facing many challenges in supplying water for the vegetable cultivation. Hence farmers are facing many

conflicts in water supplying. Avoid the conflicts among farmers, the Agrarian societies getting water from the natural river and other water bodies altogether, they tended to an agreement and they put 'turn method' among farmers. According to that, each farmer gets some hours for water supply. One of the farmers who is cultivating in 2 hectares of vegetables he will get 5-6 hours of turning time. During this time, he only has rights to get water supply. In this period, it included as an illegal activity. After finishing his period next farmer will get water supply for his cultivation. According to these actions, some farmers tend to face inequity in water supply in remote areas.

vi. Fertilizer/ Pesticides Use

The growth of the vegetable is mainly based on fertilizer usage. Both chemical and organic fertilizer is applied in vegetable farming depending on the crop and location. According to our study area, we found over 75% of the farmers applied chemical and organic fertilizer, and also through this study area the identified vegetables have varies the quantity of fertilizer for their growth such as carrot, leeks, tomato, cabbage Chilly, potato, beans Fertilizers – potato fertilizer, TDM, Urea, ammonium nitrate, ammonium sulfate, triple superphosphate, potassium nitrate Basically the vegetable cultivation has so many effects by the pest. Therefore, the vegetable cultivation occurs in the Up-country is also faced a challenge based on the impacts of pest. Although it is a preservation method to produce the plant there are so many negative impacts in using pesticides and also living organism are depleting.

Challenges in Up-country vegetable Marketing

i. Transport

The study area is a high elevated hilly area. Due to this high elevation, the street has so many bends, and also it is known as a steep slope region. There is a Badulla- Nuwara Eliya main road (A5) located in the upper part of the study area. And also, there is a 1.14-kilometre of the lengthy minor road is positioned from the borage's junction to Nuwara Eliya. Although there are many footpaths and jeeps roads are available from Up-country to parts of villages. In this manner, this region has a lack of transport facilities. Also, transport facilities should be selected according to the distance to market. Therefore, the farmer faced so many struggles in transport. By the way the vegetables are transmitted to the market by various ways. Firstly, the vegetables are packed and they transformed through the food path to the miner road or Lorries from the cultivation area/field.

Sometimes farmers tend to face major challenges in transforming their harvest. As well as some cultivation field are located in very far away from the main road. This could be considered as a major challenge in marketing process. According to discussions farmers said that, it leads to spend much money to carry the production to the market. Therefore, this causes to maintain distance between farmers and consumers. So, this is the reason for influence of commission agents in this marketing process.

ii. Price fluctuation

According to farmer's opinions the majority of farmers mentioned that increasing cost of production and increases the prices of essential items as the root course of deteriorating Terms of Trade. At the same time, they have mentioned several other reasons that affected for cultivation. Thus, cultivated the same crop and same varieties at the same season by many farmers were affected as crucial factor to decrease the vegetable prices. Cultivate the same crop and variety by majority farmers, seasonal price decline during the harvesting period and lack of proper marketing system could be recognized as causes. Over supply, low prices, no

bargaining power, low income and subsequent low living standards could be regarded as the effects.

Growth, Quality of production could be determined the price. Therefore, the well growth of the vegetable could be taken in high price because the quality of the product is great. In order to consider about the less growth of vegetable sell in low amount. According to this matter the price fluctuation of Up-country region is known as a major challenge in the vegetable cultivation.

iii. Supply chain

It was seen earlier that the difference between wholesale and retail prices vary considerably in the case of some vegetables. Here the market information could be defined as the facts and the interpretation of facts likely to help growers, traders and consumers. Focus on the marketing information relevant and helpful to improve the supply chain. According to this information the daily wholesale prices are released over the radio by the marketing department primarily to help the vegetable producers scattered all over the land. According to our study area Up-country Where considered about this matter, in Up-country region there are some major problem confronted by the farmers.

- a. The absence of suitable competitive marketing agencies result is the dominance of the private marketing channels.
- b. As well as the producer is heavily indebted to the private marketing agencies and consequently the benefit of higher prices is denied to them.

Conclusion and Recommendation

Agriculture plays a vital role in economic development in our countries. It argues that sub-sector of this vegetable production still has a significant role to play in assisting the country's economic growth. To this case, examining the challenges of the cultivating vegetable considered to be a difficult task among the farmers in the particular region. The research is known as that there are some obvious ideas to provide opportunities for this agrarian society and according to the research finding through the vegetable cultivation there are so many challenges identified. According to our case study of Up-country, this is also identified as a perfect place to produce the quality of vegetables. So these types of challenges mostly influence their peaceful life. The producers become more knowledgeable about the market and are less at the mercy of market forces. For the producers, the more availability of an additional market outlet may be an advantage, making possible greater flexibility and enabling them to spread their risk wider.

Farmer's capacity for quality production has improved. However, so far only a few farmers in the Up-country area have benefited. As the collection centres procure less quantity the farmers stay to continue to depend on other markets.

- i. Agrarian society leads to or helps to make a direct relationship with the farmers and the department of agriculture for improvement of the quantity/ quality products.
- ii. The agriculture department should be done many communities programs and awareness program among the farmers, and this organization suggest the farmers by using the proper fertilizing methods and also a range of pesticide usage.
- iii. Propose a training program for the traders and use of "pretested" literature on pest management, outdoor advertisement and use of mass media such as TV, Radio and Newspapers for improvement of communication to farmers on pesticide use.
- iv. Providing technique where group discussion, agrochemical festivals or seminars could be effectively used given the fact most farmers are literate and some educational

program could also utilize the exiting habit of seeking habitat advice from fellow farmers.

- v. As well as contact/training programs could be organized with the producer of the production and also encouraging them. To use new technological improvement in their cultivation fields and suggestions to an existing high level of education could be used to train farmers who are willing to learn to suggest to farmers that increase the usage of organic pesticide to reduce the cost and it helps to increase the quality of the cultivation field.
- vi. As well as recommended the new generation to provide information about the vegetation and encouraging them to do the cultivation activities.
- vii. Data on direct marketing of agriculture is not available in the national static system. This is a constraint to promote this particular sector hence, including direct marketing in the agricultural sensors it's needed for the future generation.
- viii. Make research investments and policy changes the emphasize development of pesticides and application technologies that pose reduced to health risks and are compatible with ecologically based pest management.

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