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# Value Chain Analysis of Onion in Dugda District, Oromia Region, Ethiopia

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***Author's contribution***

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

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## ABSTRACT

The study on onion value chain primarily aimed to identify the actors in the value chain, quantify actors costs and profit margin and identifying constraints and causes of the main problem. The data was generated by mainly desk study from a wide range of secondary sources such as books and journals, internet services using Google and Google scholar and unpublished sources.

The study finding shows that onion value chain actors include input suppliers, producers, collectors, farmer-traders, middlemen/brokers, wholesalers, retailers, consumers whereas the identified chain supporters include the Ministry of Agriculture and Natural Resources (MoANR), Small and Micro Financial Institutions (SMFI), District Irrigation Development Authority (DIDA), Awash Melkasa Agricultural Research Center (AMARC). About five channels of onion marketing were identified and out of five, two market channels (II & III) were found to be dominant in terms of volume of the transaction which accounts 74.2% and 21.2%, respectively.

The study also identified the value addition/kg of onion; where central retailers and central wholesalers had the highest share but farmer-trader had the least value. Central retailer obtained the highest profit share (31%) per kg; however, farmer-trader attained the least profit share per kg which is about 19%.

The main constraints identified include; price fluctuation, lack of credit availability, scarcity of fertilizers, less availability of inputs, high onion seed cost which is caused by the existence of an

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oligopolistic market, high involvement of brokers and less awareness of farmers about the market. Recommendation drawn from the study findings necessitate changing the oligopolistic market structure, changing the role of brokers in the market and supporting local onion markets.

*Keywords: Onion; value chain; key actors; profit share.*

## 1. INTRODUCTION

Onion, the principal alliums, ranks second in value after tomatoes on the list of cultivated vegetable crops worldwide [1]. They also reminded that all plant parts of alliums may be consumed by humans (except perhaps the seeds). Cosmetic quality is of increasing importance in competitive markets. Onion is produced for both consumption and market. According to Central Statistical Agency [2] out of a yearly production, 48.2% of onion and 66.7% of tomato are utilized for sale.

### 1.1 Vegetable Production and Onion Value Chain in Ethiopia

Agriculture has a long history in the Ethiopia's economy. Development of the agriculture sector has been hindered by a range of constraints which include low technological inputs, land degradation, weak institutions, and lack of appropriate and effective agricultural policies and strategies [3]. According to Central Statistical Agency [4], vegetable production is becoming an increasingly important activity in the agricultural sector of the country following the development of irrigation and increased emphases given by the government to small-scale commercial farmers. Currently, due to the high nutritional value of vegetable do have rising demand both in local and foreign markets, and classified among those export commodities' that generate a considerable amount of foreign currency earnings. As a matter of these facts, smallholder farms grow vegetables over a considerable land area for years. Major vegetable types produced in Dugda district are onion, tomato, and cabbage.

Ethiopian vegetable and fruits are mainly destined to the regional markets especially neighboring countries like Djibouti and Somalia. About 90% of Ethiopian vegetable and fruit are exported to Djibouti and Somalia even though the value generated from this is small [5].

The expansion of irrigation agriculture in different parts of the country has enabled smallholders to produce vegetable even in dry season. Through irrigation, farmer's per capita production and areas under vegetable coverage have been increasing [5].

The perishability nature of onion and lack of organized marketing system resulted in low producers' price during peak harvest season. Smallholders supplying onion throughout the year in Dugda district, but they could not generate as much benefit from production [6].

Market distortions are common activities of middlemen in price setting. Vegetable like onion has a low shelf life due to their perishability after post-harvest. This reduces producers bargaining power to sell their onion at a price convenient for them. Under such circumstances, analyzing value chain of onion helps to identify the key actors involved and channels of onion produce passes in the value chain.

### 1.2 Onion Production in Dugda District

In Ethiopia, the planted area for onions was 22,036 ha in 2011 and the production of onions was estimated to be 236,922 tons [7]. According to [8] the private farmers' holdings in 'meher' season 2012/2013, the total area coverage by onion crop in the country were 21,865.4 hectares, with a total production of 219,188.6 tons with an average productivity of 10.02 tons per hectare. During the 2013/2014 cropping season, the total area under onion production was estimated to be 24, 375.7 hectares with an average yield of about 9.02 tons per hectare and estimated a total production of greater than 219, 735.27 tons [9]. This is a very low yield as compared to the world average of 19.7 tons per hectare.

Meki town is located in the fertile lakes region. This area is known as the onion belt of Ethiopia. Of the 46,600 inhabitants in Meki, 11,320 are onion farmers working at a total land area of 5,650 ha [10]. The onion production is estimated to be 135,600 tons/year in Meki [11]. The onion crops have contributed to Ethiopian economy by exporting onion bulbs [12].

The red onions are culturally most accepted in Ethiopia. The emphasis of this paper lies on the onion since it is the most cultivated species.

There are two common vegetable production seasons in Dugda district. The first season runs from July to December and the second runs from January to June. The peak harvesting month is December for the first season and May and June for the second season production period [13].

### 1.3 Statement of the Problem

MoANR has been working to increase the production and productivity of horticulture sector in Ethiopia. The Growth and Transformation Plan for the agriculture sector stated that improving production and productivity of vegetable (onion) is one of the primary targets of the Ministry [14]. For this reason, the Ministry and other supporting stakeholders designed and implemented projects to support the main actors in the value chain. The Planning and Programming Directorate is in charge of organizing, planning, and preparation of programs and projects at sectoral and subsector levels through stakeholders and donor agencies engagement. Therefore, it is vital to look at the value chain aspects of onion to be able to understand the full chain map, the share of gross margin by actors and to see the role of key actors and facilitators in the chain map.

Therefore, after reviewing existing data, contextual factors surrounding onion value chain were identified. There is no market extension system or institution that helps producers to take into account the key marketing factors like who will buy their harvest, what is the quality preference, time of delivery and also the possible supply increase as other farmers will also increase their production by looking at previous year price. Often due to failure to account for these factors, many farmers have lost a significant amount value and some have even failed to break even, as has been witnessed in Dudga district [15]. This requires investigating further using existing literature to meet problems faced by producers in the selling of onion to a better and formal market at the region and country. The main problem smallholder farmers face are marketing of onion. Due to this problem farmers produce below capacity because of fear of marketing. The main causes identified for the ineffectiveness of the markets include the existence of high illegal brokers, low market awareness of farmers and oligopolistic market structure which results in lower income of the smallholder farmers in the district. Accordingly, the study revised and came up with additional challenges encountered in the chain to address problems faced by smallholder producers in the district.

### 1.4 Objectives

The objective of the paper was:

- To identify the actors in onion value chain in Dugda district, Ethiopia
- To quantify actors costs and profit margin in onion value chain
- To identify the constraints encountered in the value chain.

## 2. METHODOLOGY OF THE RESEARCH

### 2.1 Description of the Study Area

Geographically Dugda district is located in between 8º01' N to 8º10' N latitude and 38º31' E to 38º57'E longitude. Dugda district is located in the East Shoa zone of Oromia Regional State that has a total area of 959.45 $km^2$. Overall, the district has 36 rural Peasant Administrations and four urban villages. The main capital of the district is Meki town which is situated 134 km to the southeast of the capital Addis Ababa. Meki has 3 urban villages and has a population of 58,490 [16]. The boundaries of Dugda district are Arsi zone in the east, Gurage zone in the west, Bora district from north and northwest and Adami Tulu Jido Kombolcha district in the south [11].

According to Central Statistical Agency [16]. population projection for the year 2017, the population of Dugda district accounts 196,678 of whom 100,761 (51.2%) are men and 95,917 (48.8%) are women. From a total population of the district, 58,490 (29.7%) of its population are urban inhabitants and the remaining majority 138,188 (70.3%) of the population are rural dwellers. According to [17], almost 80% of Ethiopia's population is still employed in the agricultural sector, but services have surpassed agriculture as the principal source of GDP.

### 2.2 Data Collection

To address the research problem articles related to the topic of discussion were reviewed and analyzed. Accordingly, information for the analysis was gathered through a desk study from a wide range of secondary sources such as books and journals, internet services using Google and Google scholar and unpublished sources were also utilized. There was also

reliance on personal experience and observation as a player in the subsector.

Qualitative analysis tool such as chain map, PESTEC (political, economic, social, technical environmental, cultural), SWOT and stakeholder analysis was employed. Analysis of quantitative and qualitative data, information flow and quality management was done. Opportunities and constraints facing the chain were also identified and described. This process led to the identification of the main problem affecting the small holder onion producers in Ethiopia.

### 2.3 Estimation of Quantitative Analysis

To compute the value and profit share of actors along the chain and actors profit per kg in Ethiopian birr the following formula were used.

$$\text{TC} = \text{purchase price} + \text{marketing cost} \quad (1)$$

$$\text{Value added} = \text{SP} - \text{purchase price} \quad (2)$$

$$Share\ of\ VA = \frac{Actor's\ value\ added}{Total\ value\ added\ along\ the\ chain} \quad (3)$$

$$Actors\ profit = SP - (PP + Marketing\ cost) \quad (4)$$

$$Profit\ share = \frac{Actor's\ profit}{Total\ profit\ along\ the\ chain} \quad (5)$$

Where,

TC - Total cost
VA - Value added
SP - Selling price
PP - Purchase price

### 2.4 Estimation of Marketing Margin

According to [18] the term marketing margin commonly refers to the difference between a producer and consumer prices of an equivalent quantity and quality of a commodity. In short, it is a price charged for providing a mix of marketing services such as assembling, transportation, handling, packing, sorting, storage, and profit. Computing the total gross marketing margin (TGMM) is always related to the final price paid by the consumer and is expressed as a percentage [19]. Marketing margins for the onion traders were estimated using the following formulas.

$$\text{TGMM} = \frac{\text{Retailing price} - \text{Farm gate price}}{\text{Retailing (Consumer) price}} \times 100 \quad (6)$$

$$\text{GMM}_\text{B} = \frac{\text{Broker price} - \text{Farm gate price}}{\text{Retailing price}} \times 100 \quad (7)$$

$$\text{GMM}_\text{FT} = \frac{\text{Farmer trader price} - \text{Brokers price}}{\text{Retailing price}} \times 100 \quad (8)$$

$$\text{GMM}_\text{dw} = \frac{\text{DW price} - \text{Farmer trader price}}{\text{Retailing price}} \times 100 \quad (9)$$

$$\text{GMM}_\text{CW} = \frac{\text{CW price} - \text{DW price}}{\text{Retailing price}} \times 100 \quad (10)$$

$$\text{GMM}_\text{R} = \frac{\text{Retailing price} - \text{Wholesalers price}}{\text{Retailing price}} \times 100 \quad (11)$$

$$\text{GMM}_\text{P} = 100\% - \text{TGMM} \quad (12)$$

Where,

TGMM indicates total gross marketing margin
$GMM_b$ indicates total gross marketing margin received by brokers
$GMM_{ft}$ shows total gross marketing margin received by farmer-traders
$GMM_{dw}$ indicates total gross marketing margin received by district wholesalers
$GMM_{cw}$ indicates total gross marketing margin received by central wholesalers
$GMM_r$ indicates total gross marketing margin received by retailers
$GMM_p$ is the portion of the price paid by end consumer that belongs to the farmer as a producer which is 70% (100%-30%).
DW is district wholesaler price
CW is central wholesaler price

## 3. DISCUSSION AND ANALYSIS

### 3.1 Stakeholders and Their Role in the Onion Value Chain

The major value chain actors identified include input suppliers, producers, collectors, farmer- traders, middlemen/brokers, wholesalers, retailers and consumers. The supporters identified include MoANR, SMFI, DIDA and AMRC.

#### 3.1.1 Input suppliers

These are cooperative and private input dealers (agro-dealers) that sell onion seeds and fertilizers. Meki-Batu Union and private input dealers like Agro vegetable agricultural input supplier, Senbo pesticides, Adama, Rediet, and Gemo are the main input suppliers in the district. These private dealers sell inputs including seed and fertilizer. Private input dealer has a high contribution in the supply of insecticide/ fungicides in the district which accounts 97.7% [15].

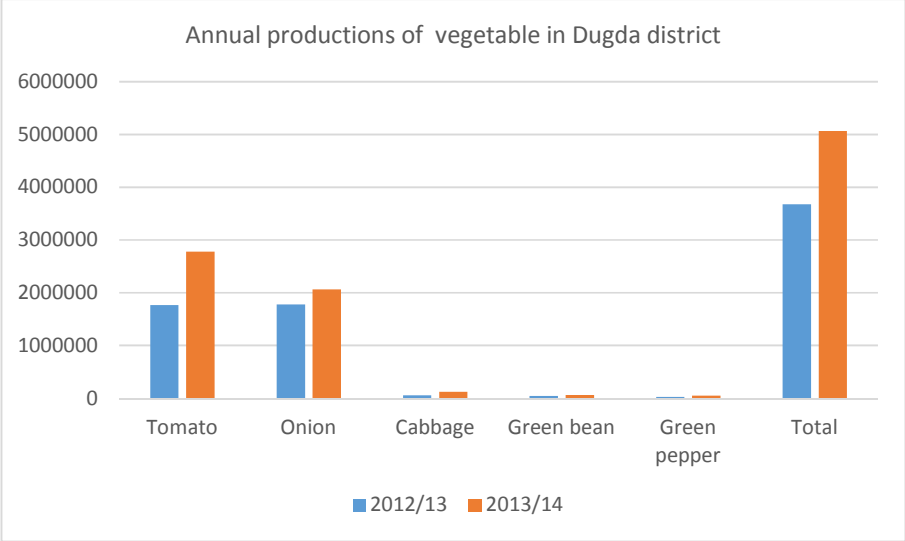


**Fig. 1. Annual production of major vegetables in Dugda District with irrigation**
*Source: Computed from DIDA*

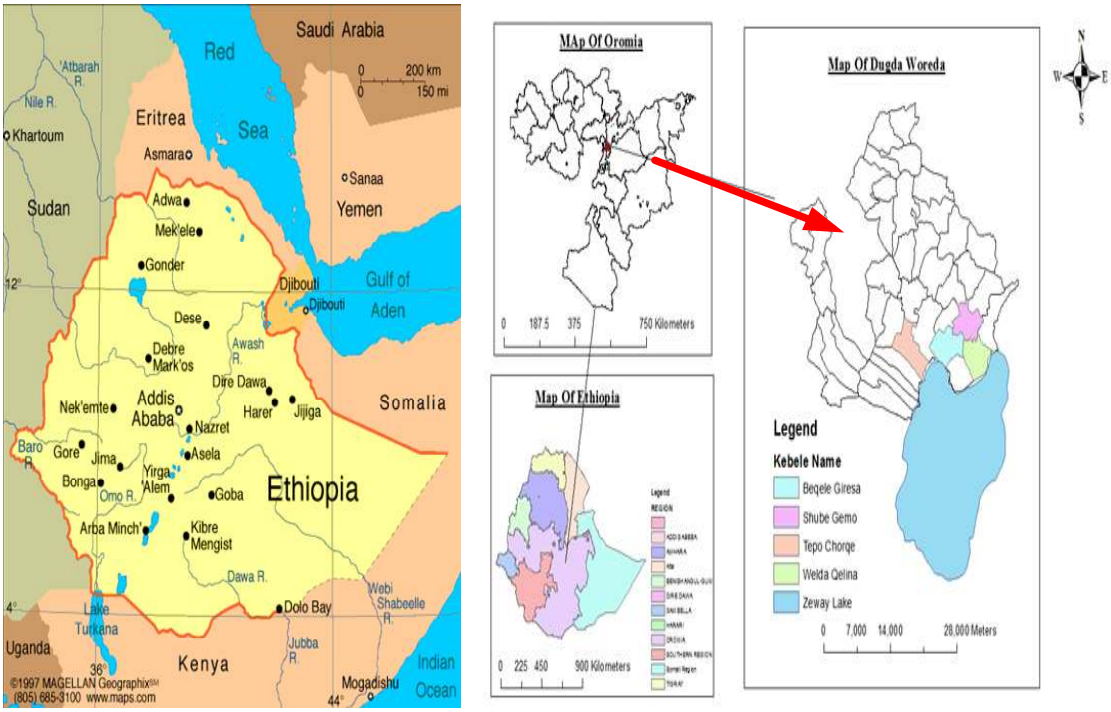


**Fig. 2. Map of Ethiopia showing boundaries and study area**
*Source: [22,23]*

### 3.1.2 District irrigation development authority

Value chain supporters are those who directly support the value chain operators. Accordingly, MoANR is supporting vegetable value chain in the rift valley. These include district offices in particular office of agriculture, the office of cooperative promotion, administration, trade, and marketing offices. Awash Melkasa Agricultural Research Center (AMARC).

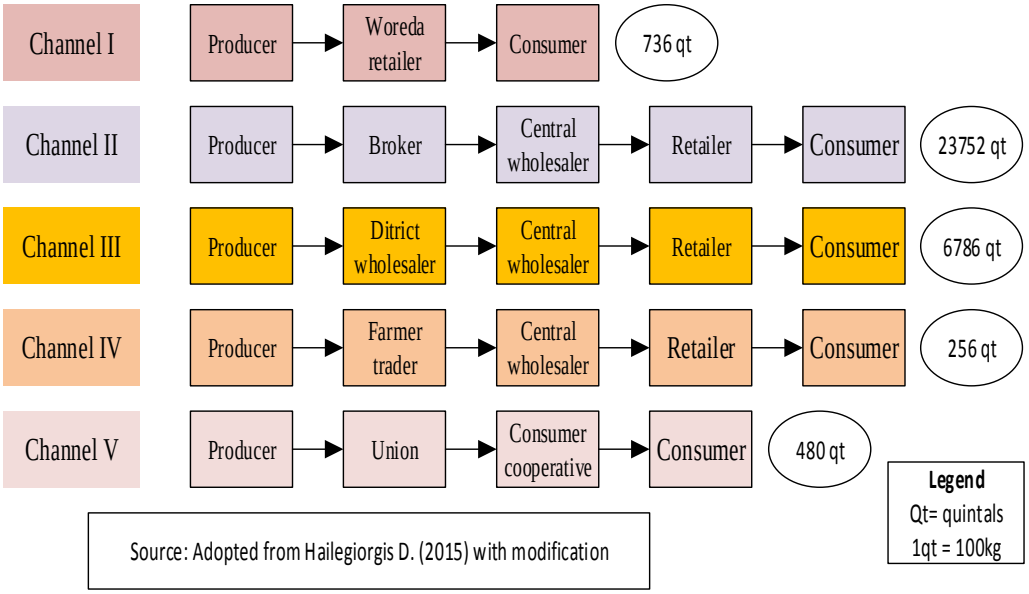


**Fig. 3. Onion marketing channel in Dugda District**

The research system in general and AMARC, in particular, supports producers by providing technical advice. AMRC has been doing research for long and some of the varieties of vegetable crops currently used in the area are released from this center. The center is active in vegetable technology extension and provides lots of backstopping facilities for smallholder farmers.

### 3.1.3 MoANR and NGOs

MoANR plays a pivotal role in synergizing Non-government Organizations (NGOs) and donors in the facilitation and support of farmers and develops value chain**.** NGOs were focusing on the production of vegetables and organizing the farmers into cooperatives. This is also done in collaboration with cooperative promotion office as well as the office of agriculture.

### 3.1.4 Micro financial institutions

The main credit institutions operating in the area are Oromia Credit and Saving Share Company (OCSSCO), Busa Gonofa, Meklit, Africa Mender and Metemamen. However, most of these credit institutions are not providing credit for vegetable growers due to high risk attached to vegetable production [15].

### 3.1.5 Producers

There are about 6082 producers of vegetable in the district. Their estimated annual production is 1.7 million quintals of onion. Though the majority of the farmers are members of cooperatives they rarely sell their products to cooperatives and institutional buyers [15].

Producers of onion predominantly participated in the selling of vegetable to wholesalers, brokers, and traders at the farm gate. The premium price offered by traders was not sustainable and mostly followed in a decrease in the price of onion due to the involvement of middlemen (brokers). Thus, smallholder producers benefited when selling to the union (which is not common in the area), or to the retailers in very small quantity or Addis Ababa market. Producers mostly sell vegetable through brokers [20].

### 3.1.6 Farmer traders

Farmer traders perform both vegetable production and selling by collecting from other farmers. They live at Meki town and carry out both production and trading simultaneously. They sell vegetable in central (Adama and Addis Ababa) and southern (Shashemene and Hawasa) markets. Their number is small. They purchase and sell vegetable without the involvement of brokers [20].

### 3.1.7 Middlemen/brokers

Brokers in the district have regular and temporary customers from major towns and cities

across the country. Their supply to the towns varies seasonally. There are different levels of brokers in the district. The brokers who deal directly with traders in other places are based in Meki town. The brokers have assistants based in the village to receive orders and deal with farmers. The share of profit that goes to brokers varies from farmer to farmer and from trader to trader. It is common for all brokers to get a commission ranging 800-1000 Birr for one truck (50-60 quintals) for onion [15].

#### 3.1.8 Wholesalers

Wholesalers are the major buyers of vegetable as they buy at least a truckload of vegetable at a time from farmers. Easy access to road and mobile phone has helped the wholesalers to know where to find product throughout the country and decide the price to buy to get maximum profit. Wholesalers buy vegetable from producers through brokers who represent them in vegetable buying activities. Thus, traders, particularly those from Addis Ababa and Adama call the brokers to send them a full truck of vegetable and they send the cash either through a bank or with truck driver brokers [20].

#### 3.1.9 Retailers

Retailers are market actors which have direct contact with consumers. They mostly obtained onion from wholesalers at the central market.

#### 3.1.10 Consumers

The consumers are found in large towns such as Addis Ababa, Hawasa, Hosana, Moyale, Jijiga, Dire Dawa, Mekele, and Bahirdar. Consumers procure onion commonly from retailers. In this study, consumers are split into two local consumers and central consumers or consumers. As indicated on chain map (Fig.4) local consumers refer to residents of Meki town (capital of the district Dugda) whereas consumers refer to large consumers where a high volume of onion purchased mostly they are located in the large city of Addis Ababa.

### 3.2 Major Channels of Onion Marketing in Dugda District

Five marketing channels were used to sell onion to the district and central markets. From the identified five channels two market channels were found to be dominant in terms of volume of transaction. Channel II was found to be the dominant one in terms of volume of onion supply. In this channel, about 23,752 quintals of onion (74.2%) of the total onion were supplied. Channel III was the second dominant one, about 6786 quintals of onion (21.2%) supplied in this channel.

### 3.3 Value Chain Map of Onion in Dugda District

As indicated and shown in the chain map the main chain function, chain actors and supporters have been identified. Accordingly, the main identified actors are input suppliers, smallholder farmers, brokers, Meki-Batu union, farmer-traders, wholesalers, retailers and local and central consumers. Moreover, as chain facilitators DIDA, financial AMARC, MoANR, and SMFI are the main bodies providing services for farmers engaged in onion subsector.

### 3.4 External Factors Influencing Onion Value Chain

#### 3.4.1 Contextual factors in the onion value chain

Farmers in the study areas procure locally produced and imported seeds of onion. The imported seeds are composed of different varieties and sometimes with poor germination capacity. Some of the onion seeds in the market where those that produce bulbs with white color while the required quality is red ones.

Brokers role in the study areas have gone beyond mediation of transaction to the determination of prices, buying on behalf of traders; control the market to the extent that no buyer can buy in their absence.

Vertical linkages refer to coordination among players engaged in different levels of the value chain. In the onion value chain, however, there is no trust and the longstanding relation between producers and buyers. On the other hand, horizontal linkage among the producers is very weak. Irrigation water users cooperatives and the unions in the study areas are established to serve creating a market linkage and providing inputs to smallholder farmers but their contribution is lower [21].

#### 3.4.2 External factor analysis (PESTEC)

In light of the qualitative analysis, PESTEC analysis executed to draw points of interventions and to address constraints by promoting the

strength of the chain. For this purpose, external analysis of opportunities and threats are analyzed under categories of PESTEC aspects.

### 3.5 Quantitative Analysis

The main five actors participating in the value chain process include smallholder farmer, farmer-trader, district wholesaler, central wholesaler and central retailer. In terms of value addition/kg of onion, central retailers and central wholesalers have the highest share i.e. 1.6 and 0.6 ETB per kg respectively, while farmer-trader has the least value addition role which is 0.3 per kg. Farmers incurred a loss of 0.62ETB per kg. However, retailers and wholesalers obtained a profit of 1.60 and 0.59 per kg respectively (Table 2).

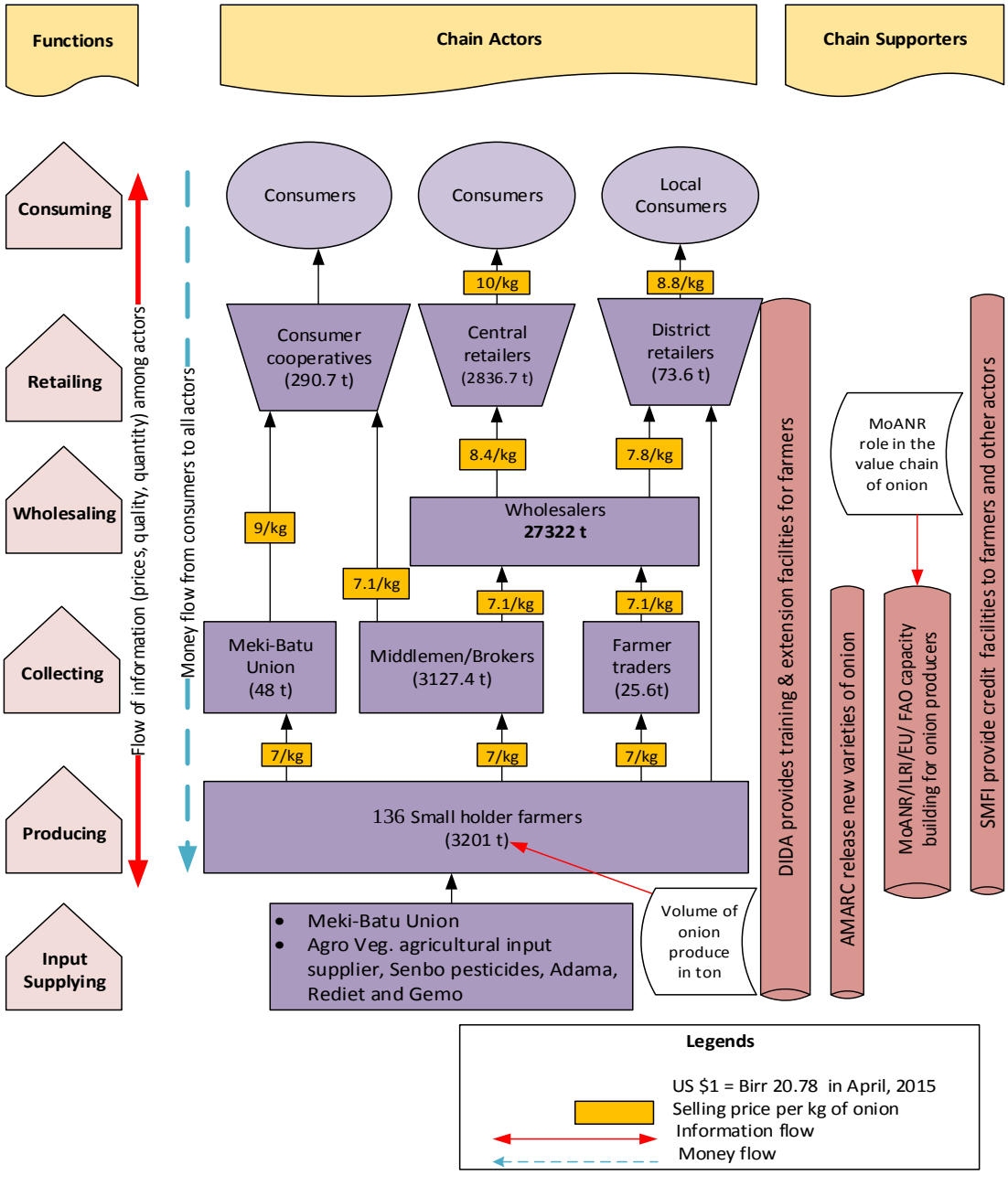


**Fig. 4. Value chain map of onion in Dugda District**

*Source: Own sketch*

As depicted above central retailer obtained the highest profit share (60%) per kg; whereas district wholesalers obtained the least profit share per kg which is about 18%.

TGMM is 30% which designates the portion of the price paid by final consumers that belong to actors/middlemen i.e. brokers, farmer-traders, wholesalers, and retailers. Therefore, the purchase price by an actor can be determined with the information on the selling price given by the actors that come first in the value chain.

## 3.6 Qualitative Analysis

### 3.6.1 Chain relations

*3.6.1.1 Actor relations*

Formation of farmers co-operatives in the district represents a major improvement in chain relations. Producers collaborate in setting up and strengthen a joint organization which is Meki-Batu Union to address their common problem.

**Table 1. PESTEC matrix**

| PESTEC Matrix | |
|---|---|
| **Tool** | **Description** |
| **Political** | • Resource and capacity constraints of local government<br>• Lack of coordination of institutions<br>• Lack of reliable statistics on production<br>• Unsupportive government policies<br>• Poor local governance<br>• Poor regulations of markets |
| **Economical** | • Potential to increase area and productivity<br>• Profit margin is high for traders<br>• Large number of traders and middlemen who lower prices for producers and wholesalers<br>• Unorganized producers leading to exploitation by traders and middlemen<br>• Insecurity of costs<br>• Delayed or non-payment of credit<br>• Cooperatives organize input supply<br>• High-value crop<br>• Farmers not satisfied with the price they receive |
| **Social** | • Good skill in own seedling production<br>• Conflicts<br>• Adversarial, with hiding of information<br>• Weak extension support service |
| **Technological** | • Prospect to provide assistance in technologyand market information<br>• Poor Technology generation & dissemination<br>• Lack of appropriate varieties<br>• Absence or poor post-harvest technology |
| **Environmental** | • Desertification and drought<br>• Prevalence of disease<br>• Transformation and development plan<br>• Soil erosion<br>• Water shortages in some areas from water-intensive farming and poor management |
| **Cultural** | • Limited women participation in the subsector |

*Source: Own analysis*

**Table 2. Value and profit share of actors in the value chain**

| Indicator | Chain actors | | | | | Total |
|---|---|---|---|---|---|---|
| | Farmer | Farmer trader | District wholesaler | Central wholesaler | Central retailer | |
| Volume of sale in kg | 3201000 | 25600 | 678600 | 2575400 | 2732200 | |
| Purchase price[1]/kg | - | 7 | 7.3 | 7.8 | 8.4 | |
| Marketing cost/kg | | 0.92 | 0.03 | 0.01 | 0.001 | |
| Total cost | | 7.92 | 7.33 | 7.81 | 8.401 | |
| Selling price/kg | 7 | 7.3 | 7.8 | 8.4 | 10 | |
| Value added/kg | | 0.3 | 0.5 | 0.6 | 1.6 | 3 |
| Share of value added (%) | | 10 | 17 | 20 | 53 | 100% |
| Profit (ETB/kg) | | -0.62 | 0.47 | 0.59 | 1.60 | 2.66 |
| Profit share (%) | | - | 17.68 | 22.19 | 60.14 | 100% |

*Source: Own computation*

**Table 3. Gross marketing margins for key actors**

| Market chain actors | Selling price (Birr/kg) | Gross marketing margins |
|---|---|---|
| Average farm-gate price | 7 | |
| Average brokers price | 7.10 | |
| Average farmer-trader price | 7.30 | |
| Average district wholesalers price | 7.80 | |
| Average central wholesalers price | 8.40 | |
| Average retailing price | 10 | |
| TGMM | | 30% |
| $GMM_b$ | | 1% |
| $GMM_{ft}$ | | 2% |
| $GMM_{dw}$ | | 5% |
| $GMM_{cw}$ | | 6% |
| $GMM_r$ | | 16% |
| $GMM_p$ | | 70% |

*Source: Hailegiorgis, 2015*

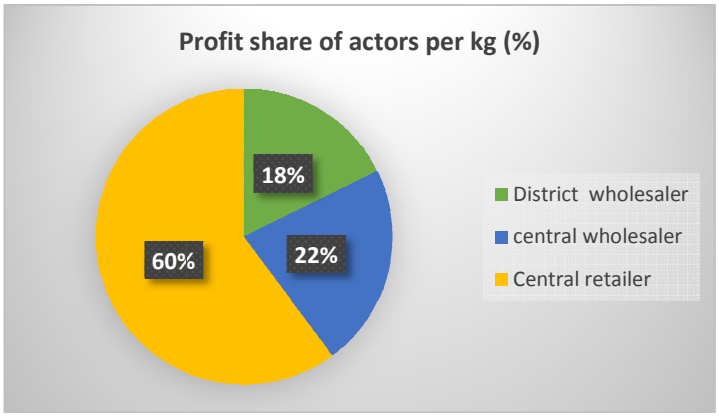


**Fig. 5. Profit share of actors in Dugda District**
*Source: own computation*

[1]*The price is calculated in Ethiopian Birr abbreviated as (ETB). The official exchange rate at the time of study was 1 € = 23.7 ETB.*

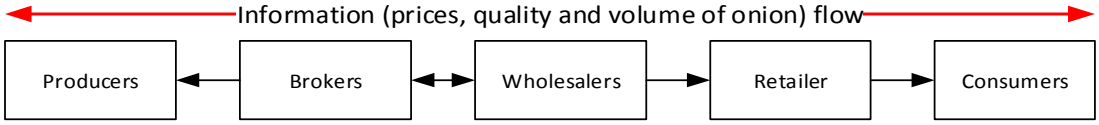


**Fig. 6. Information flow between actors in onion value chain**
*Source: Own sketch*

**Table 4. SWOT summary analysis matrix**

| SWOT summary analysis matrix | |
|---|---|
| **Strengths** | **Weaknesses** |
| • Willingness and passion for producing onion<br>• Onion is profitable<br>• Input supplier selling seeds and other inputs at farmstead<br>• Farmers skill in preparation of own seedlings | • Weak participation of women in the value chain development<br>• Capital constraints<br>• Low producer and market prices<br>• Poor packaging materials & services<br>• Poor seed quality<br>• Weak collaboration among actors |
| **Opportunities** | **Threats** |
| • Creation of farmer cooperatives associations<br>• Training in production and marketing of produce<br>• Availability of infrastructure<br>• Geographical location<br>• Potentials for irrigation | • Changing weather patterns – climate change<br>• Decrease in soil fertility due to improper use of fertilizer and chemicals |

*Source: Own analysis*

*3.6.1.2 Chain co-ordination*

The middlemen or brokers are the chain co-coordinators in the value chain. They have access to market information with regard to prices which smallholder farmers lack. Brokers obtained a commission for the service they provide for traders in a large city like Addis Ababa.

*3.6.1.3 Power relations*

The middlemen/brokers also control the largest part of onion value chain as they have involved in the collection of onion the markets and closely work with wholesaler by neglecting farmers. Wholesalers have actually the power to transport onion as a result of their high margins obtained from onion transaction in the district. However, they prefer to use brokers to buyonion from farmers.

*3.6.1.4 Vulnerable relations*

Onion producers are the most vulnerable actors in the chain. They lack information concerning prices and therefore the middlemen/broker dictate the market price. Farmers are also disadvantaged as a result of the market price fluctuation. Lack of control of the market by the local government also makes producers more vulnerable to exploitation by middlemen. Producers also incur a lot of costs from planting seedling to harvest and finally to primary markets. This makes them even more vulnerable as they also lack market information. Sometimes they are forced to sell their onion at very low prices. Lack of organization or ineffective co-operatives also makes farmers more vulnerable as they lack bargaining power in the market.

**3.6.2 Gender aspects**

Women in some onion producing communities are only involved in the planting of seedling and up to harvest stage of production. They are involved in directselling of onion along with the roadside for consumers. They hardly participated in the marketing of onion as like that of men. Their role is in the production process of onion.

### 3.6.3 Sustainability profile

*3.6.3.1 People standards*

**Basic needs:** In most parts of the district, basic facilities such as good health care and education services are inadequate. Infrastructural facilities outside of the main road are poor. This creates difficulty for selling their outlets during the rainy season.

*3.6.3.2 Planet standards*

**Access to water:** Sometimes there is disagreement between water user association of farmers due to a shortage of irrigation water and this raises conflict of interest among farmers in the community. This comes as a result of the absence of schedule or calendar for using water among producers.

**Natural resources:** Irrigated areas are heavily degraded and over dosage of chemicals utilized per hectare of land.

*3.6.3.3 Profit standards*

**Fair and clear agreements:** Producers do not make a formal or informalagreement with the market forces and thus they are prone to exploitation by middlemen.

**Market infrastructure:** Markets are not well organized and as a result, brokers emerged as a dominant actor in the value chain of onion. In the district of Dugda, all brokers have no license and the market is an informal one. Traders are not paying taxes to the local authority which creates a loop hole for them to manipulate producers in the district.

**Market power:** Producers lack market power as it is in the hands of traders who control the markets. This makes producers vulnerable actors.

## 3.7 Information Flows

- Price information here is poor and uneven access to market information
- Producers obtain price information from brokers and other producers
- They arrive at markets with information of variable accuracy, and with no exact knowledge of the existing rate on the day.
- Depending on the severity and urgency of household needs, producers may decide not to sell if the price offered is too low and does not meet their expectations.

➢ **Market institutions**

- Formation of farmers cooperatives and Meki-Batu Union may help to ameliorate exploitation by passing many actors to farmers.

### 3.7.1 Information flow within the chain

Farmers obtain market information from brokers who have ultimate power in setting the price. Usually, in the morning brokers meet and discuss to set price independently by communicating to traders in major towns. Brokers consider price difference across towns and prefer to supply with higher prices [20].

## 3.8 Quality Management

Due to perishability, onion starts to lose quality right after harvest and continued throughout the process until consumed. For this purpose quality management via elaborate and extensive transportation system, marketing facilities and equipment are vital.

Based on the extended quality triangle approach quality considered from physical product aspects and performance of the organization.

### 3.8.1 From product aspect

*3.8.1.1 Quality attributes*

**(a) Intrinsic attributes**

- Safety – perishable product and onion require careful handling.
- Health – onion texture is good and unpeeled.
- Shelf life – the shelf life of onion is reduced due to lack of proper handling, packing, and loading/ unloading.
- Convenience – onion, in this case, is suitable and can be used for home consumption without further processing.

**(b) Extrinsic attributes**

- Price– fluctuating price in the market.
- Production system characteristics- overutilization of inputs per hectare.

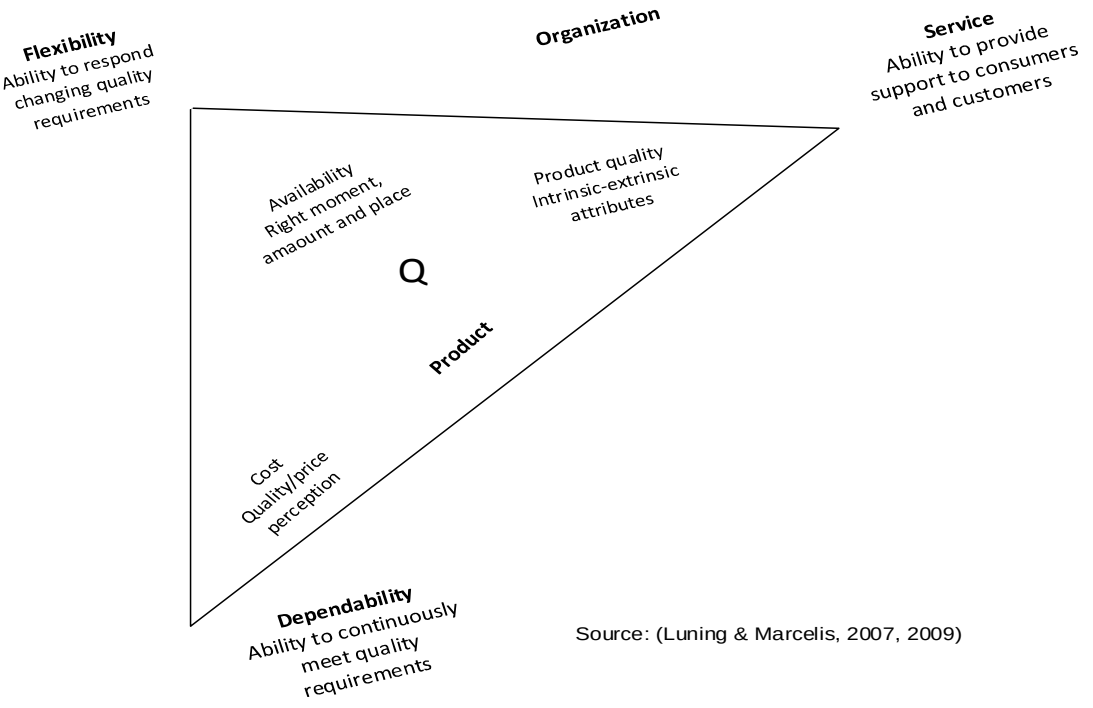


**Fig. 7. Extended quality triangle**
*Source: [24,25]*

### 3.8.2 Production system characteristics

Farmers in the study areas purchase both locally produced and imported seeds of onion. Meki-Batu union have started producing onion seeds on farmers' fields and distribute it to their surrounding farmers. However, these seed is again not certified and there is no guarantee forits quality. The quality problem is, for both imported and locally produced seeds [21].

The marketability of the product and its price is mostly influenced by product quality relative to what consumers demand. Farmers need to understand quality requirements and applyit in their production process. The poor seed quality has partly contributed to the poor quality of the products and its heterogeneity quality [21].

### 3.8.3 Quality management systems

Apart from the heterogeneity of the product, the unwise chemical application has big negative impact on the product quality and export market. The Meki-Batu Union, trying to export vegetables to Europe and Middle East markets. However, these countries have their own Sanitary and Phytosanitary (SPS) requirements. The type and amount of chemical residues available in the products to be exported have very big impact on the future vegetable trade of Ethiopia to the world [21].

### 3.8.4 Factors affecting quality

- Poor seed quality
- Packaging materials
- Lower shelf life
- Outbreak of diseases
- Availability of storage facilities

## 3.9 SWOT Summary Analysis Matrix

The SWOT analysis was conducted to capture internal and external factors that affect the business environment and to design strategies and forward applied recommendation to address the internal and external challenges and constraintsencountered producers in the onion value chain at Dugda district.

Internal strengths and weaknesses as well as external opportunities and threats were identified and analyzed based on SWOT findings. Internal

weaknesses include willingness and passion for producing onion and farmers skills in thepreparation of own seedlings while as weakness weak collaboration among actors and weak participation of women in the value chain development. From external opportunities, identified factors are like farmers' cooperatives, infrastructure availability and geographical location while the threats identified are changing weather and decrease in soil fertility.

## 3.10 Problem Related to Onion Value Chain in Ethiopia

### 3.10.1 Constraints and opportunities

Opportunities in onion value chain include the existence of Lake Ziway, groundwater and rivers and suitable agro-ecology, availability of infrastructure and it is ideal for agro-processing industries are the main one for onion production.

The key constraints identified include; the existence of an oligopolistic market structure, price fluctuation, lack of credit availability, scarcity of fertilizers, high involvement of brokers, less availability of inputs, lack of know-how on marketing condition, the high cost of onion seedand supply homogeneous products to the market.

### 3.10.2 Causal diagram

Smallholder farmers were facing inefficient market caused by presence of illegal brokers, low market awarness and oligopoly market structure which resulted in a lower income and poor livelihood status of producers as indicated in Fig. 8.

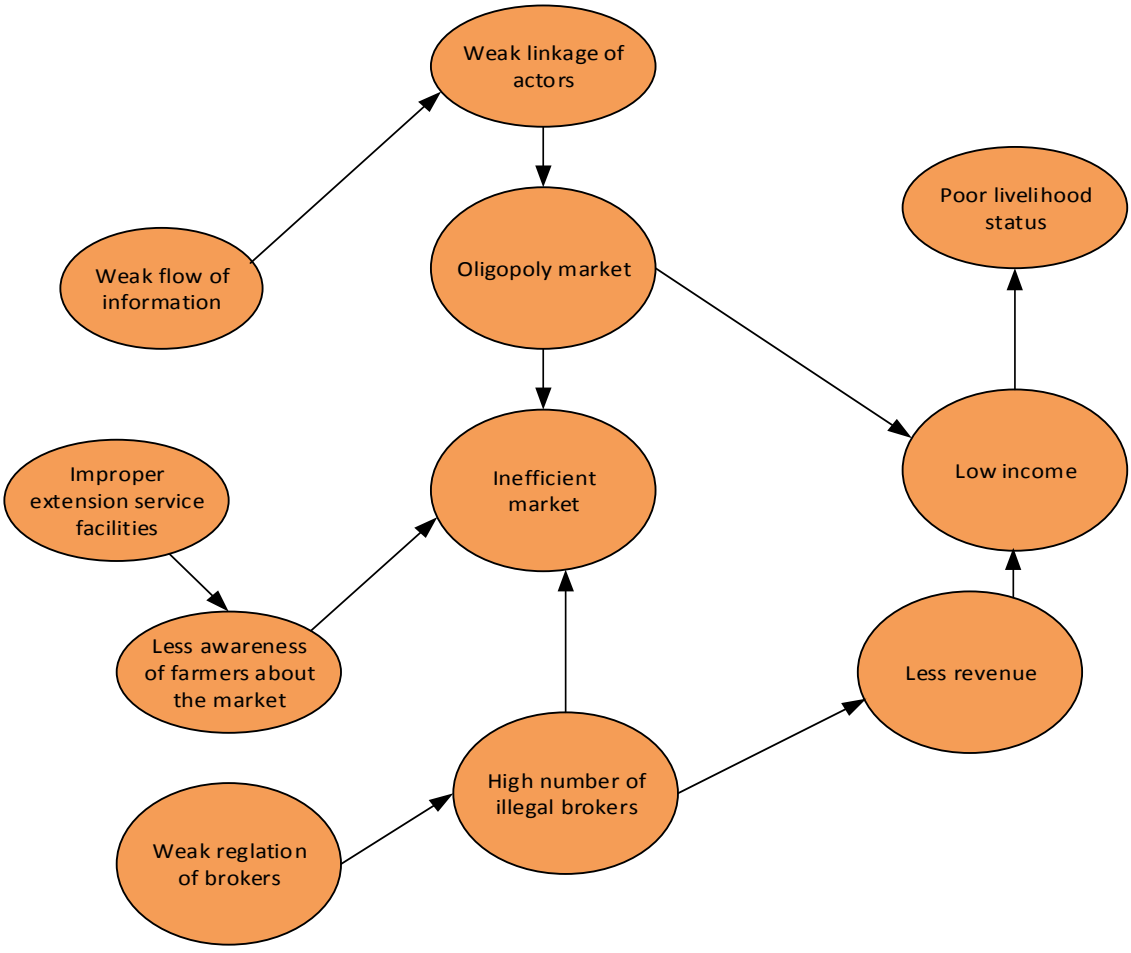


**Fig. 8. Causal diagram of onion value chain in Dugda District**
*Source: Own sketch*

## 4. CONCLUSION AND RECOMMENDATIONS

### 4.1 Conclusion

The main actors involved in onion value chain include ; input suppliers, producers, collectors, farmer-traders, middlemen/brokers, wholesalers, retailers and consumers whereas the chain facilitators identified are MoANR, SMFI, DIDA and AMRC.

In terms of value, addition/kg of onion central retailers and central wholesalers have the highest share while farmer-trader has the least value addition in the value chain of onion. Central retailer obtained the highest profit share/kg (31%) followed by central wholesalers (26%); whereas farmer-trader obtained the least profit share per kg which is 19%.

The key constraints identified include ; price fluctuation, lack of credit availability, scarcity of fertilizers, high involvement and role of middlemen (brokers), less availability of inputs, the high cost of onion seed and supply of homogeneous products to the market. The main causes identified for the inefficient markets are high involvement of brokers, the existence of the oligopolistic market and lack of market awareness; which results in lower income and lower livelihood status of producers.

### 4.2 Recommendations

- **Changing oligopolistic market structure:** Provision of tax holidays and tax cuts for licensed traders as an incentive to encourage legal trade and brokerage services is required. The government has to find the means to control illegal actors (unlicensed traders and brokers).
- **Changing the role of brokers in the market:** The District Trade Office and concerned partners need to work in closer partnership to regulate brokers to play a constructive role in the efficient transaction.
- **Supporting and legalizing local onion markets:** Thus, to address oligopolistic tendency, it requires changing the existing imperfect market structure to be competitive, through engaging all actors.

## 5. FUTURE RESEARCH

Most farmers prefer selling vegetable to traders such as wholesalers due to failure to trust in brokers. Thus, most farmers are hardly able to access wholesalers directly and trade with them. As a result, brokers easily intervene and facilitate the transaction of vegetable. Therefore, analyzing factors affecting channel choice decision of smallholders of vegetable marketing appears as a topic for further research.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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