



## Research Article

# An Analysis of Marketing Costs and Margins of Potato in District Peshawar Pakistan

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**Abstract** | Vegetables are perishable in nature, and it requires a well-established market to facilitate the farmers for selling their produce at a reasonable price and make it accessible for ultimate consumers in preferred shape and location in the required duration. This research is carried out to analyze the existing marketing channels, marketing costs and margins of different market functionaries of potato crop in the selected villages of district Peshawar, Khyber Pakhtunkhwa Pakistan in 2019. For this purpose, a total of seventy producers, twenty wholesalers and twenty retailers are randomly selected and interviewed for data collection. From the current research it can be revealed that majority of potato growers followed the same marketing channel i.e. Producer → Wholesaler → Retailer → Consumer. The analysis shows that marketing-margins of potato growers, wholesalers and retailers is estimated as 31.8 percent, 24.1 percent, and 42 percent respectively. Similarly, the share of producer in consumer rupee is obtained as 31.3 percent, respectively. Marketing margin and cost indicated that by reducing the huge margin of retailers the share of growers and wholesalers can be raised in the prevailing marketing channels. The research findings recommended that government must focus on establishing markets at village level, by minimizing the role of intermediaries which will help farmers to generate more profit.

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## Introduction

Vegetables play a very significant role in human nutrition. It provides a lot of health benefits and it is recommended that more and more vegetables should be consumed as it contains energy, minerals, vitamins and fiber etc. (Bazzano *et al.*, 2003). Vegetables include fruits, flowers, seeds, leaves, stem and roots that are consumed by humans. The risk of

many chronic diseases is reduced for those people who consume fruits and vegetables as a part of their daily diet. Plenty of vegetables consumption resulted in increased demand of vegetables and efforts are made to increase the production of vegetables in order to feed the burgeoning population of the world. Vegetables are cultivated throughout the world. Efforts has been made worldwide to increase the production of vegetables which enabled the consumers to purchase

those agricultural products in other parts of the world.

Potato (*Solanum tuberosum* L.) belongs to the family Solanaceae is a major crop having a lot of importance in our daily diet. It is a starchy, tuberous crop which refers to edible and to the plant itself (Muthoni *et al.*, 2013). Around 5000 varieties of potatoes are present worldwide. Potatoes importance as a food source varies by region and it is still changing. It remains an essential crop worldwide. Potato plays a significant role in human health because it is a fine source of starch, dietary fibers, vitamins and minerals etc. (Andrew *et al.*, 2012). The consumption of potatoes with skin is a good source of antioxidant-vitamins. Potatoes also contains many essential minerals which include magnesium, potassium, iron, copper and phosphorous etc. France exported the highest Canadian Dollar value worth of potatoes in 2017 which was recorded CD 655.34 million (FAO, 2018). Due to a lot of important nutrients and increasing demand its production is given importance worldwide. Pakistan ranked 19<sup>th</sup> in annual potatoes production in 2016 (FAO, 2018). The total production of potato in Pakistan is recorded as 3831.70 thousand tons in the year 2017-18. In this overall production, Punjab contributes 3660.30 thousand tons, followed by Khyber Pakhtunkhwa 143.40 thousand tons, Baluchistan 22.40 thousand tons and Sindh 5.60 thousand tons respectively (GoKP, 2018). The area under potato cultivation is recorded as 102 hectares and the production of potato is recorded as 1137 tons in district Peshawar (GoKP, 2018). The production of potato is shown in **Table 1**.

**Table 1:** Province wise potato production, 2017-18 (Production in '000' tons).

No.	Province	Production
1.	Punjab	3660.30
2.	Khyber Pakhtunkhwa	143.40
3.	Baluchistan	22.40
4.	Sindh	5.60
5.	Pakistan	3831.70

**Source:** Government of Khyber Pakhtunkhwa, 2018.

Vegetables production plays an important role to fulfill the increasing demand of vegetable throughout the world hence its marketing is necessary in order to make it available to the ultimate consumer and timely marketing plays a significant role to keep the vegetables safe from being damaged hence provides maximum profit to growers. Agricultural development

relies on efficient marketing system as it affects both i.e. producers share (prices received by producer in consumers rupee) as well as consumers welfare (prices paid by consumer for consuming agricultural products). Marketing is the performance which is involved in all business actions by which products are transferred from production point till received by the end consumer (Kotler and Keller, 2010). Farmers lacks the basic facilities and less marketing knowledge makes it difficult for farmers to find a well-established market hence forcing them to develop marketing system for their unique situations. Various channels are used to perform the marketing process known as marketing channels. It is a set of interdependent organization which makes the product available for final consumption by end users (Irwin, 2000). Market intermediaries can be elaborated as Middleman, Agent or Broker, Distributer, Dealer, Wholesaler and Retailer (Kang, 2011). All the cost of the services provided by the middleman/intermediaries which helps the commodity been transferred from farm to final consumer is referred as marketing margin (Kohls and Uhls, 1985).

An efficient marketing system acts as a mechanism for the both the exchange function and the proper coordination of exchange through price signals that reflects and shape consumers and producers incentives in demand and supply interaction in vibrant economies (Aidoo *et al.*, 2012). A well-developed marketing system is expected to complement the farm production efforts towards the realization of its desirable goals through the provision of time, place, possession and farm utilities (Oteh and Njoku, 2014). An efficient marketing system not only brings buyers and sellers together but it also enables entrepreneurs to take advantages of the opportunities to innovate and improve in response to demand and price directions (Fakayaode *et al.*, 2010). An efficient marketing system is considered to be a pre-requisite for prompt delivery of goods and services. Prompt delivery at reasonable prices of goods and services is possible through the effective competition between the markets (Oteh and Njoku, 2014). The degree of efficiency is one of the criteria by which marketing systems are measured.

Vegetables are perishable in nature, and it requires a well-established market to facilitate the farmers for selling their produce at a reasonable price and make it accessible for ultimate consumers in preferred shape

and location in the required duration. According to relevant studies it has been found that most of the vegetable growers lacks the essential facilities and are forced to sell their produce at cheap cost due to the perishability nature of the vegetables and the major benefit is gained by the intermediaries involved in the marketing channels. Researchers' attention is found necessary on important factors such as appropriate time and methods of crop harvesting, its packaging, storage as well as processing. The current research was designed to investigate the marketing of potato crop and will attempt to inspect each intermediaries shares involved in the marketing system of potato crop. The reason for the selection of potato crop was because of the nearly inelastic demand and are mostly consumed by majority of the segments of the society.

## Materials and Methods

### *Sample design and data collection*

District Peshawar is blessed with fertile soil and natural ecology, and a vast number of vegetables are grown in this province in each season. The villages named as Kachore, Mulazai, Sufaid Sung, Pakha Ghulam, Watpagho and Surizai etc. are well known for producing good quality vegetables. The area for this research study was district Peshawar. Apart from this Peshawar Market was chosen to examine the marketing channels adopted for potato crop.

The number of potato crop growers are vast in the district where research was carried out. In this regard, we followed the data collection procedure followed by (Abid *et al.*, 2006; Sonile *et al.*, 2012; Nwaigwe *et al.*, 2019) and seventy producers, twenty wholesalers and twenty retailers were purposively selected under the umbrella of non-probability sampling technique for the collection of primary data for the research in hand. Agriculture Extension Department, Peshawar was also contacted to get the list of registered farmers of potato crop with complete information and their addresses. The collection of secondary data was done from various government offices, published reports, and journals. Efforts were made to explain all the questions to the respondents to get accurate and reliable information/data about the potato crop.

### *Analytical framework*

**Total cost of marketing:** The total cost is correlated with transporting final products to end users. The cost of marketing includes cost linked with delivering

products to customers, reserving goods in storages, awaiting deliveries, or the delivery of commodities to sale points. Following equation was used to calculate the total cost of marketing (Singh, 2004).

$$C = C_F + Cm_1 + Cm_2 + \dots \dots \dots Cm_{mi}$$

Where;

C= total cost of marketing,  $C_F$ = marketing cost sustained by farmer,  $C_{mmi}$ = marketing cost sustained by  $i^{th}$  middleman.

### *Producer's price*

It consists of the price of selected vegetable or situation determined by the aggregate of the production worth including land, labors, capitals, marketing, and taxation. Asmat (2016) calculated the producer's price by using the following equation:

$$P_G = P_W - C_G$$

Where;

PG= producer's price; PW= wholesale price in the primary assembling market; CG= marketing cost sustained by farmers.

### *Price spread*

It can be determined as the difference between the sale price and purchase price (Sangeetha *et al.*, 2011). A higher producer shares in consumer rupee and a narrow price spread results in the preferable attention of both i.e. producer and consumer (Kumar and Srivastava, 1993). It can be deliberated by below equation:

$$P_s = S_p - P_p$$

Where,

PS= price spread; SP= sale price and PP= purchase price

### *Marketing margin analysis*

Marketing can be described as the operations involved in all business actions which helps the transfer of goods from initial production point till it reaches to the hands of the end consumers (Kohls and Uhl, 1985).

Marketing Margin can be specified as all the cost of the services provided by the middlemen/intermediaries through which the product flows from

farmland to end user. The amount of the dollar spent by the end user on food that reaches to the firms involved in the marketing of the product is referred as the marketing margin (Kassana and Nilsen, 2003). The variation among the rupee spent by the end user and the portion of that rupee gained by the grower is also referred as the marketing margins (Kohls and Uhls, 1985).

Marketing margins were estimated based on the data collected on prices of the marketing chain at different stages. Marketing margins were calculated as the percentage of the ratio of price spread to sale price (Ahmad, 2008).

$$MM = \frac{\text{Price Spread}}{\text{Sale Price}} \times 100$$

#### Gross margin

Gross margin can be defined as the difference between the sale price and purchase price. Gross Margin was calculated by using the following equation (Hussain et al., 2013).

$$G_M = S_P - P_P$$

#### Net margin

Net margin can be specified as the difference between the gross margin and total marketing cost. Following equation was used to calculate the net margin (Ahmad, 2008).

$$N_M = G_M - C$$

Where;

MM= marketing margin; GM= gross margin; NM= net margin; PS= price spread; SP= sale price; PP= purchase price; C= total marketing cost.

#### Producer's share in consumer price

The share of growers involved in the marketing of a product in the rupee which is paid by the end user is referred as the share of producer in consumer price. Asmat (2016) calculated the share of producer in consumer rupee by using the following equation:

$$PS = \frac{RP - C}{RP} \times 100$$

Where,

PS= producer's share in the consumer rupee; RP= retail price; C= total marketing cost.

#### Marketing channels

Following are the general channels used in the marketing of vegetables. In the present research we selected that channel which was followed by majority of the respondents.

**Channel I:** Producer→ Pre-Harvest Contractor→ Commission Agent→ Wholesaler→ Retailer→ Consumer

**Channel II:** Producer→ Commission Agent→ Wholesaler→ Retailer→ Consumer

**Channel III:** Producer→ Wholesaler→ Retailer→ Consumer

**Channel IV:** Producer→ Retailer→ Consumer

**Channel V:** Producer→ Consumer

## Results and Discussion

#### Total cost of potato production

Total cost is the aggregate of the entire practices and inputs used in per acre of potato cultivation. It comprises of the tractor hours used for land preparation, seed, irrigation, fertilizer, pesticide, weedicide, and labor hours used for different practices. Table 2 shows all the per acre pre-harvest cost of potato production.

**Table 2:** Cost of production of potato per acre.

No.	Inputs	Units	Qty/Acre	Unit cost (Rs)	Total cost (Rs)	%age
1.	Land Rent (Cropping Season)	6 Months		5699.8	5699.8	9.5
2.	Land Preparation (Ploughing)	Tractor Hours	3.5	1000	3500.0	5.8
3.	Seed (20 kg)	No. of Bags	3.3	4150	13695.0	22.8
4.	Irrigation (Cropping Season)	6 Months	4	250	1000.0	1.6
5.	Urea (50 kg)	No. of Bags	2	1990	3980.0	6.6
6.	DAP (50 kg)	No. of Bags	1.6	3750	6000.0	10.0
7.	Pesticide (100 ml)	No. of Bottles	1.3	700	910.0	1.5
8.	Weedicide (100 ml)	No. of Bottles	1.7	900	1530.0	2.5
9.	Labor (No.)	Man Days	29.6	800	23680.0	39.4
	Total				59994.8/-	100.0

The results of the current research revealed that in the study area cost incurred on land rent was about Rs. 5699.8/- which was about 9.5 percent of the total cost. Cost incurred on land preparation was about Rs. 3500.0/- which was about 5.8 percent of overall cost of potato production. The results of the current research revealed that cost incurred on seed was about Rs. 13695.0/- which was about 22.8 percent of overall cost. Fertilizers are synthetic nutrients which is used to fertile the soil immediately. It makes the soil healthy and helps in enhancing the production. It was revealed that most of the farmers used Urea and DAP (Di-Ammonium Phosphate) to increase the nitrogenous component of field and to get maximum production. The results of the current research revealed that cost incurred on fertilizer was about Rs. 9980.0/- which was about 16.6 percent of overall cost. The quantity of labor is calculated in man days which starts from land preparation till harvesting of crop. For different practices, these labors are used. The results of the current research revealed that the major portion of total cost incurred on labor was about Rs. 23680.0/- which was about 39.4 percent of overall cost.

#### Marketing cost

Hassanpour *et al.* (2013), stated that marketing cost is incurred after the harvesting of the crop. Marketing costs consist of packing charges, transportation cost, loading/unloading and market entry fee. Table 3 presents all the costs incurred on the marketing of potato.

**Table 3:** *Marketing cost of potato.*

No.	Practices	Growers			Wholesalers			Retailers		
		Qty/Acre	Unit cost (Rs)	Total cost	Qty/Acre	Unit cost (Rs)	Total cost	Qty/Acre	Unit cost (Rs)	Total cost
1.	Packing charges (50 kg)	44 bags	100	4400	---	---	---	---	---	---
2.	Tpt. Cost per bag	44 bags	34	1500	44 bags	15	660	1 bag	15	15
3.	Loading/ unloading per bag	---	---	---	44 bags	35	1540	1 bag	20	20
4.	Market entry fee per trip		100	100	---	---	---	---	---	---
	Total			6000			2200			35

**Table 4:** *Price spread and marketing margin of potato marketing actors.*

No.	Marketing actors	Growers	Wholesalers	Retailers
1.	Total cost/ purchase price (per Kg)	Rs. 10.7/-	Rs. 15.7/-	Rs. 20.7/-
2.	Sale price (per Kg)	Rs. 15.7/-	Rs. 20.7/-	Rs. 35.7/-
3.	Price spread (PS)	Rs. 5/-	Rs. 5/-	Rs. 15/-
4.	Marketing margin (MM)	31.8%	24.1%	42%
5.	Gross margin (GM)	---	Rs. 5/-	Rs. 15/-
6.	Net margin (NM)	---	Rs. 4.6/-	Rs. 14.8/-

Source: Field survey, 2019.

The results of the current research revealed that on average the potato growers used 44 bags and each bag's cost was Rs. 100/- resulted in overall cost of Rs. 4400/-. Transportation cost is the cost of produce transferred from one place to another. It is the cost of produce transferred from the field to the market in the case of growers, from market to specific warehouse or shop in the case of wholesaler and retailer. The outcomes of the current research showed that in the research district growers used Datsun or Pick Up for the transportation of potato bags which costs them Rs. 1500/-. The cost incurred by the wholesalers was Rs. 660/-, while for Retailers the cost incurred was Rs. 15/-. In the current research growers do not pay the loading and unloading charges as the labors they hire do it for them. The wholesaler pays Rs. 20/- for loading and Rs. 15/- for unloading and the overall cost calculated was Rs. 1540/-. Retailers paid the loading price of Rs. 20/- and the unloading was done by the retailer himself without any charges. Growers pay the market entry fee of Rs. 100/- per visit while wholesalers and retailers do not have to pay this cost as this cost is to be paid by those who enter the market to sell their produce.

#### Marketing margin of growers

The results revealed that in the study area potato growers sustained a total cost on one kg of potato of Rs. 10.7/- which was sold at Rs. 15.7/- to wholesalers. The marketing margin's percentage ratio indicated

**Table 5:** Profit function of potato growers.

Total revenue	Quantity (kgs) * Price (Rs)	5,322.9 * 15.7	83,569.5
Total cost	Production cost + Marketing cost	59,994.8 + 6000	65,994.8
Profit	Profit = Total revenue – Total cost	83,569.5 – 65,994.8	17,574.7

**Source:** Author's own estimation.

that potato growers procured about (31.8%) margin in the marketing chain.

#### Marketing margin of wholesalers

The results revealed that in the research region wholesalers bought one kg of potato at Rs. 15.7/- which was further sold at Rs. 20.7/- to retailers. The marketing margin's percentage ratio indicated that wholesalers in the study area procured about (24.1%) margin in the marketing chain. The gross margin of wholesalers was about Rs. 5/- out of which wholesalers paid about Rs. 0.4/- per kg for the marketing cost of potato hence the net margin received by wholesalers for per kg of potato was about Rs. 4.6/-. These result was found in line with the findings of the previous study conducted by Rehman, 2014.

#### Marketing margin of retailers

The results revealed that in the study area retailers bought one kg of potato at Rs. 20.7/- which was further sold at Rs. 35.7/- to consumers. The marketing margin's percentage ratio indicated that retailers in the study area procured about (42%) margin in the marketing chain. The gross margin of retailers was about Rs. 15/- out of which retailers paid about Rs. 0.2/- per kg for the marketing cost of potato hence the net margin received by retailers for per kg of potato was about Rs. 14.8/-. The calculated result was found supportive with the previous study of (Rehman, 2014).

#### Producer's share in consumer price

Retail Price of Potato per kg = Rs. 35.7/-

Total Marketing Cost per kg = Rs. 1.54/-

Producer's Share (PS) = ???

$$PS = \frac{\text{Retail Price} - \text{Total Marketing Cost}}{\text{Retail Price}} \times 100$$

Putting Values,

$$PS = \frac{35.7 - 1.54}{35.7} \times 100$$

$$PS = 31.3\%$$

The result revealed that potato producers obtained (31.3%) share in consumer price. The higher the share obtained by growers will lead in the better interest of producer and it shows the efficiency of the marketing chain.

#### Profit analysis

Profit analysis was carried out to estimate the profit generated from the potato crop in the study area.

The results revealed that potato growers generated a total revenue of Rs. 83,569.5/- per acre which was obtained by multiplying the average per acre yield (kgs) with the prevailing market price (Rs) while the total cost experienced by growers were Rs. 65,994.8/- which was obtained by adding the production cost and marketing cost of potato resulting in an average profit of Rs. 17,574.7/- per acre.

## Conclusions and Recommendations

The results revealed that most of the farmers sold their produce using the same marketing channel i.e. Producer → Wholesaler → Retailer → Consumer. It was observed that most of the growers obtained less marketing margin due to lack of storage facilities and less market knowledge forced growers to sell their produce at cheap prices. Retailers fetched the huge percentage of marketing margin as they bought the produce at cheap prices while they sold it further at almost double price. Marketing margin and cost indicated that the share of grower can be increased by decreasing the huge margins of retailers in the existing marketing channels. Based on the findings of this research it is recommended that government must focus on establishing markets at village level, by minimizing the role of intermediaries which will help farmers to generate more profit. Market prices must be stabilized by implementing such rules and regulations by Government, so that the exploitation of farmers and consumers should be reduced. The wholesale market must be monitored regularly by the Government officials, which will protect the farmer from exploitation and fraudulent practices.

## Novelty Statement

The current research was designed to investigate the marketing of potato crop and attempt to inspect each intermediaries shares involved in the marketing system of potato crop.

## Author's Contribution

**Auzair Javaid Butt:** Conducted the study, reviewed literature, wrote introduction and methodology.

**Irfan Ullah:** Developed main theme of the research and guidance in model development.

**Shahid Ali:** Wrote abstract, conclusions and recommendations, provided technical input at every step.

**Khurram Nawaz Saddozai:** Helped in analyzing data.

**Jahangir Khan:** Performed proof reading of the Draft and corrected references.

## Conflict of interest

The authors have declared no conflict of interest.

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