



ONION PRODUCTION AND MARKETING SYSTEM IN BALOCHISTAN PROVINCE

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ABSTRACT

In Pakistan, onion is one of the most grown commercial crops in the various parts of the country. The study was carried out through a primary data collection from various stakeholders to examine the status of onion production in Balochistan province. The average per acre cost of production, productivity, profitability, input output ratio were analyzed. Furthermore, find out the issues and constraints faced by onion growers and recommend policy guidelines for sustainable onion production and marketing in the study area. Costs have been broken down in a variable, fixed and opportunity costs (depreciation and opportunity) costs for production factors that are owned by the onion growers. While the variable cost was high from other costs, among them seed rate cost was high in the variable cost and in the lowest costs was recorded in chemical weedicide from other variable costs and fixed cost was nil due to relief from Balochistan government, whereas total cost of production and net income was Rs.82737 and Rs.75665 per acre respectively found in the study area. Majority 67% seed dealers were reported that due to high ratio of population, more consumable, good seed quality, more benefit, short duration of time and more production of onion as the principal reason for increase seed suppliers over the past 5 years. Onion farmers must follow best methods in management and strive to adopt scientific guidance from local and other available sources, for example research stations, progressive producers and extension workers.

Keywords: gross revenue, marketing, net income, onion, production

INTRODUCTION

Onion is one of the most common regular dietary vegetables. Onions are commonly used for seasoning foods, soups, salads, and sauces. Onions as part of diet can help reduce cardiovascular and other diseases. It is one of the important source of phosphorus, calcium and carbohydrates. It also contains proteins and vitamin C (Cope, 2005). The green leaves and mature or immature bulbs are consumed raw as well as used in cooking of daily foods. The small bulbs are also used in pickled in vinegar. Onions, in contrast with other fresh vegetables, are tremendously excessive in food value, intermediate in protein content and are rich in calcium and riboflavin (Purseglove, 2000).

Onion is no longer recognized as a wild plant. It originates from a region like Iran, Western Pakistan and the mountains in the

north (Purseglove, 2000). At least 175 countries grow onions. Onion is one of the major commercial crops widely grown indifferent parts of Pakistan. According to global statistics, Pakistan is the seventh largest producer of onions in the world while China is ranked as top country followed by India (FAO, 2012). Onion from Pakistan and India is recognized for its pungency and accessible all year round. The value of dry onion produced in the world was projected to be around US \$ 29490 million. Approximately over 90% of onion production is used in the countries of production. But for some countries the crop is a big contributor to exports (FAO, 2012). Approximately 1.6 million tones, representing 2.5% of global production are produced in Pakistan annually. Exports of onion peaked with the global shipment of 173,152 tons in 2011, rendering the country among the top exporters of onion. The volume of vegetables for the foreign market dropped significantly in the following years. Though, based on the latest

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records, Pakistan exported onion worth at least \$220 million in 2015.

Ogunjobi, (1999) stated that the measurement of productivity is significant, since it is an indication of performance and a metric for tracking and testing production units. It can only analyses hypothesis about the origins of marketing difference by calculating efficiency and distinguishing its impact from the environmental influence. The trend of economic growth is shifting to increase the internal demand and increase the relative weight of farm operations in this process (Amaza, 2010). Thus, any developed technology or enhanced productivity in agriculture leads not only to overall economic development but also offers immediate microeconomic benefits for a significant number of rural households. The Reason for lower onion productivity may be traced, for example, restricted supply of seeds of consistency and related processing technologies. Plant nutrition plays a crucial role in improving onion seed production and quality (Maity and Basu, 2017).

Horticultural crops with vegetables have an important place in agriculture sector. These not only contribute to the agriculture sector of the national economy, but they also provide a huge opportunity and competitive edge in the open economy. Vegetables not only play an important role in health and disease prevention, but they are also a source of livelihood for small-scale farmers and foreign exchanges for the national economy. Vegetables are essential to Pakistan people's food security (Lohano *et al.*, 2005). It was suggested that famers should not avoid applying potassium in onion crop in Sindh province, particularly when quality seed is required for future onion crop production (Majeedano *et al.*, 2019). Balochistan is covering onion crop area and production was 35.7 thousand hectares (23.96%), 680.3 thousand tones (32.16%) respectively and yield is below the potential during 2017-18 (GoP, 2018).

Therefore, this task was assigned by the Pakistan Agricultural Research Council and carried out through a primary as well as secondary data collection from various stakeholders to investigate the average status of onion production, average per acre cost of production, physical productivity, input output ratio, profitability, problems and constraints, faced by onion growers and to recommend policy measures for onion production and marketing in study area on sustainable basis.

MATERIALS AND METHODS

In order to investigate the status of onion production in Balochistan province, primary as well as secondary data was collected from various stakeholders. Although many research designs exist in the field of social sciences, a survey research design was used for this study to collect primary data. Through this approach a wide variety of problems can be investigated (Gall *et al.*, 1996). Relevant secondary information collected from the archives of various departments and organizations. For primary data, a representative sample of Onion growers, market intermediaries and other stakeholders was selected for interviews. The selected growers and other market intermediaries were personally interviewed with the help of a detailed and comprehensive questionnaire. Data analyses were performed by employing the descriptive statistics as well as standard economic techniques. A combination of qualitative and quantitative analytical techniques such as cost of production, market margins, regression analysis, cross tabulation analysis were carried out.

The study was undertaken in Nasirabad, Loralai, Mastung and Khuzdar districts in Balochistan. The data were collected from 109 onion producers randomly selected from 20 villages and 10 seed dealers. The growers were chosen randomly during the survey. The sample farmers were categorized as into small (≤ 12.5 acres), medium (>12.5 to 25 acres) and large (> 25 acres) based on their operational land holding for analytical purposes. The primary data of onion production was collected during rabi 2017-18. Before leading the formal survey, a detailed questionnaire was developed and pretested. The questionnaire contained the socio-economic characteristics of respondents, such as land ownership, farm scale, irrigation sources and related variables. Questions about to total area of onion, input, crop management practices and physical productivity also included. In addition, the reasons for increase/ decrease onion production in 2017-18 was also questioned to respondents. The researchers clarified the purpose of the study before beginning the interview and informed the respondents that all data would be confidential and only used research purpose.

Data analysis

After finishing the survey work, the data were edited and transferred into worksheet as a database file in SPSS software. To measure the

status of onion production and marketing in the province carried through profitability analysis of the onion production. The onion profitability is explained below.

Farm costs analysis

The total costs of production of onions were explained by variable, fixed and opportunity costs for agricultural factors. The calculation of this cost of opportunity was carefully considered, because it is difficult to calculate the potential income from farm output factors in alternative usage. In brief, using own production factors on a family farm will offer stability if the family decides to forgive its profits if its returns are low. However, opportunity costs in the long run were considered because, in most cases, the prospective successor farmers will decide an alternative use of their own production factors, and especially their own labor input, before they take over the farm. We must separate the opportunity cost from the other cost to determine the effects of opportunities. The following procedure is adopted for the assessment and calculation of onion performance in Balochistan.

Total revenue

Total revenue is the total income generated from the sale of any output amount. Total revenue is dependent on the price of the sales times of the sold quantity. (Total revenue=price x quantity) (Kampf *et al.*, 2016).

Total costs

The average cost for a given output level is the estimate of the fixed cost and the total variable costs, i.e., fixed cost plus total variable cost. The expense of agriculture is also categorized into different groups. The following are some of the most important cost concepts.

Total fixed costs

The total fixed costs are costs which with the output volume do not change. For instance, the cost of operating a building depends on whether it is vacant, partially used or overflowing.

Total variable costs

Variable costs are the costs that are directly changed by volume output. By not producing, it is possible to prevent variable costs. For example, Feed costs are variable costs for feeding livestock. If the cow is not bought it would pay no food expenses, but there are also fixed costs to the cattle house.

Opportunity costs

Opportunity costs are the cost that the use of a resource on the basis of the profits whether the next best option had been chosen. For example, the expense of developing your own land by selling to someone else is the price that you should have got. (Hofstrand, 2005).

Profit

Profit computes by gross income, subtract expenses.

Accounting profit

Accounting profit is the remaining amount after gross sales has subtracted all costs rather than the cost of opportunity. It is the similar as "net farm income".

Economic profit

Economic profit is the amount that exists after all expenses have been subtracted from total sales, including the opportunity costs for labour and resources of the operator. It is as alike as "return to management" (Hofstrand, 2005).

Gross margin

A gross margin is estimated by excluding variable costs from a farm's gross income. Gross margins are usually reported per rupee for farming companies.

Gross margin = returns-variable costs

RESULTS AND DISCUSSION

Farm size

How resources are handled and how they affect growth and sustainable development is necessary to be examined. The literature indicates that, in the field of labor supervision over big farmers, small farmers have an advantage. The amount of labor production in small farms is also expected to be higher. Secondly, small-scale farmers may have limited access to modern inputs, which may maintain productivity and can change in their risk-and-uncertainty behavior. The big farmers will have greater willingness and risk. Data presented in (Table 1) indicates that 39.11% of respondents had over 25 acres; 33.89% had between 12.5-25 acres; 27% had over 12.5 acres.

Yield and price

The performance is called physical efficiency when expressed in terms of physical weight. The unit weight of the output obtained is usually expressed. That is, onion farm physical output is

the same as other farmers' overall production. In Pakistan the yield of onion is much lower than in other countries. Poor yield capacity for established cultivars may be one of the causes. There will undoubtedly be a rise in crop yield by enhanced farming practices but genotypic genotypes play a major role in improving crop yield. While high yields are achieved by using scientific technologies, such as the use of certified seed, the use of recommended nutrient doses etc as reported by Khushk, *et al.* (2001). The same type study conducted the selected onion growers in Awaran Balochistan area reported that growers obtained per acre 144 mounds on an average (Rameez, *et al.*, 2014). During the survey onion growers received yield was 157.5 mds per acre yield through transplanting and 72.5 mds per acre obtained through direct seedling was found in the selected area. The onion growers obtained average yield was 115 mds per acre from all study districts.

Table 1. Operational land holding of selected growers

Farm size groups	Districts				All average
	Loralai	Nasirabad	Mastung	Khuzdar	
Small (< 12.5 acre)	32	17.65	25	33.33	27.00
Medium (>12.5-25 acre)	44	38.24	30	23.33	33.89
Large (>25 acre)	24	44.12	45	43.33	39.11
All	25	34	20	30	109

Source: Survey data, 2017-18

The wide variation was found in onion prices during the season. There are a many reasons, supply and demand is one of the major factor. Early harvest prices were higher than mid- and late-harvest. Table 2 indicates that the average maximum was Rs.31.12/kg of sale price in Loralai district and overall highest yield of onion growers were received from Nasirabad district followed by other districts in the study area. The Loralai district of onion growers' sale our product the Punjab markets and some farmers' sale in local markets. Information regarding the overall 5421 kg/acre yield and Rs.29.22/kg of onion growers received in the study area.

Table 2. Yield and price of onion crop

Districts				All average
Loralai	Nasirabad	Mastung	Khuzdar	
Yield in kgs per acre				
5800	6800	4421	4663	5421
Average Sale Prices (Rs/kg)				
31.12	28.5	28.09	29.15	29.22

Source: Survey data, 2017-18

Marketing of onion

The changes to the functioning and efficiency of product markets in the field of agricultural and economic growth are now widely accepted as significant. Marketing transition has been increased particularly in the last decade because of strict structural changes of many developed countries. In most developed nations, government strategies and agricultural marketing programs, instead of realistic facts and economic analyze, are focused more on pre-conceived assumptions about the essence of the new marketing mechanism. It is usually useful to use a term which sums up as briefly as possible in the subject matter. Davies, (2019) reported that, marketing is the presentation of trade activities that direct the movement of goods and services from producers to users. Agricultural marketing is characterized as the execution of all the activities involved in the flow of food stuffs from the initial agricultural production unit in the hands of consumers (Hingley and Lindgreen, 2002).

The marketing systems in the Balochistan have no proper vegetable marketing system except Quetta and Nasirabad districts. It is estimated that there is no wholesale markets in the study area except Nasirabad. Some onion farmers have reported to take their production to Dera Ghazi Khan, Punjab and Sindh provinces wholesale markets and they fetch better price. Some producers sale their product in local basis in cheap price as compared wholesale markets. In the Nasirabad wholesale market, where only some commission agents working, Retailer procured the onion bulbs by open auction in the wholesale market. Prices are generally relied based on season and supply and demand. The prices were very high in the early season and higher in the later season.

Marketing channels

Marketing channels are concern with the idea of "marketable" and "marketed" surplus of farm products that come into the mechanism of circulation and exchange. The reason for trade of products for cash and the other way around is to courses through which wares pass to arrive at a definitive purchaser. The leaving promoting channels of onion are presented in Figure 1.

Onion producer

Generally, a wide number of farmers produce onion at different sites in the study area. Most of onion farmers sold out their output to the local city in cheap price. Only some onion farmers

sold out their output in wholesale markets of Quetta/other provinces.

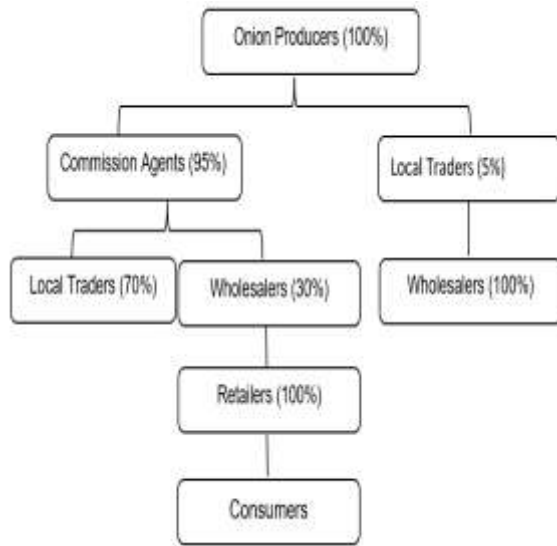


Figure 1. Marketing channels of onion

Commission agent

It was determined that new entrants in the market as a commission agent needed a permit, space, amount of capital and trade experience. Permission, where he will room, capital original and company experience, is the first prerequisite. Permit is the leading requirement, which he can obtain from "market committee". When a new Commission Agent is authorized, they must register with the "Commission Agent's Association" in order to comply and provide access for smooth running of the company to marketing details. The initial capital is also a basic requirement for new commission agents in the market. Commission agents also provide housing facilities for contractors and farmers who supply their goods from big distance. In case of onion marketing system in Quetta/other provinces, commission agent auctioned the onion in the presence of grower or their representative and deducted 10% commission from total sale price.

Beopari

Beopari is the trader who was not a wholesaler or dealer, but an investor who bought the commodity from the farmer's farm gate at low prices and in wholesale markets. He served mostly as a freelancer and doesn't have a suitable shop or place in a market. Data reveals that less than 10% of growers have sold their goods to Beopari.

Wholesaler

A wholesaler also needed a license, space, experience and contacts to inter in the market. Permission for a wholesaler is the 1st requirement for entrance into the wholesale trade. Permissions may be received at reasonably low cost and with little effort, but payment to business committee officials will be needed. According to the survey of the onion marketing system, about 10 wholesalers were functioning in Nasirabad wholesale market.

Retailer

There is no need for nay permission for retailer, but experience is a key point to come in this business. There are many retailers present in market, so each faces heavy competition in the marketing of goods. Retailer does not require much capital to start the business. There were two categories of retailer i.e. shopkeepers and mobile retailers who sale the product from place to place on Rehri (wheel cart).

Cost of production of onion crop

The right regulated and regular water for the development of onions is important. The word managed is emphasized more because it has a direct influence on the flower, as if irrigated could slow the development of the bulb. The irrigation statistic, obvious from the results and its approximate value of 0.76, seems overused. The producers of the study area should therefore be allocatively productive with proper and regulated watering. The consequences of the under-use of inputs (tractor hours, labour days, FYM, fertilizers and weedicides/pesticides) as reported by Rameez, *et al.* (2014); Naveed, *et al.* (2017) reported that, production costs of every crop include all kinds of costs, i.e. fixed costs, variable costs and selling costs, etc. The cost of onion production was calculated as the amount of the costs incurred for the preparing of land, the procurement of seedlings, manure from the farm yard (FYM), urea, pesticide and diammonium phosphate (DAP), irrigation and other labor charges. The Centre for Sustainable Agriculture Research and Education (SARE) noted that "In established organic systems, production costs tend to be lower due to reduced input costs. Perhaps one exception to this is labor. Due to increased time spent controlling weeds and tracking rodents, organic farming systems are also more labor intensive." With the study compiled by SARE is reliable, and supporting that organic farming is less costly. Rameez, *et al.* (2014) reported that, a

total cost of production of Rs. 75050.00 was spent per acre by the selected onion farmers in the Awaran Balochistan province. It included Rs.18840.00, Rs.18100, Rs.9600.00, and Rs.28510 on capital inputs, fixed costs, labour costs and marketing costs respectively. According to Shah, *et al.* (2019), the outcome of the analysis suggests the importance of each input. Major inputs such as tractor hrs, labor days, FYM, fertilizers, pesticide/ weedicide and irrigation were significant with coefficients values of 923.237, 20.100, 1.98262, 13.7402, 3.61377 and 15.9940 respectively. These findings suggested that a 1% rise in tractor time will increase the yield of onion by 923,237 kg, same increase in the others descriptive variables as well. Table 3 presents the outcomes of the production cost analysis of onion crops. Costs

were divided into variable, fixed and opportunity costs. Although the variable costs were high because of other costs, including variable seed cost, the chemical weedicide from additional variable and fixed costs were reported at the lowest cost due to the relief from the Balochistan government and the total production costs were Rs. 82737 per acre identified in the study area.

Revenue productivity of onion crop

The value of the output of the farm's gross profit is the cash income produced by farmers when they sell their production. It is measured by multiplying the output (yield) obtained by the sell price, it is sold. Survey results shown that the total revenue of onion crop was Rs. 158402 per acre was found in the study area in Table 4.

Table 3. Cost of production of onion crop

S. #	Operation	Units	Quantity	Cost per unit	Total value (Rs)
A) Variable costs	Land Preparation			Tractor hour	
	a) Deep ploughing	Hr.	2.5	@1200/ hour	3000
	b) Cultivator	Hr.	4	@900/ hour	3600
	c) Tractor ridge making	Hr.	1	@900/ hour	900
	Seed	Kg	4.33	2738 / kg	11856
	Ridge making	M-Days	4	350	1400
	Sowing charges	M-Days	6	350	2100
	Irrigation	Numbers	16	618	9888
	Application charges	M-Days	8	400	3200
	Fertilizer				
	Urea	Kg	100	2000	4000
	DAP	Kg	50	4000	4000
	NP	Kg	25	2800	1400
	FYM	Hand trolley	19	103	1957
	Plant Protection	# Spray	2.5	642	1605
	Application charges	M-Days	1	500	500
	Manual weeding	M-Days	4	350	1400
	Chemical weedicide	# Spray	1.5	433	649
	Application charges	M-Days	1	500	500
	Harvesting/Picking	M-Days	15	350	5250
Mark up on investment for 6 months @ 11% per annum	Rs.			6261	6261
Transportation, packing and marketing charges	Kg	4600	2.45		11270
Total cost					74737
B) Fixed cost	Rent of land, Land tax and Usher	Acre	1	Nil	0
C) Opportunity cost	Rent of own land for 6 month	Acre	1	8000	8000
Total cost of production	A+B+C				82737

Source: Survey data, 2017-18

Table 4. Revenue productivity of onion crop

Particulars	Amount (Rs) acre ⁻¹
Average yield (kgs)	5421
Prices per kg	29.22
Gross income	158402

Source: Survey data, 2017-18

Economic profit/net return of onion crop

The net profit is the gross return remains money operational expenses and depreciation cost of all resources could be subtracting the gross income from cash operating costs. Averages production or total profits after all farm costs have been subtracted. The average profit/net income of onion growers received was Rs. 75665 per acre in the study area in Table 5.

Table 5. Profit/net return of onion crop

Particulars	Amount (Rs) acre ⁻¹
Gross income	158402
Total cost	82737
Net income	75665

Source: Survey data, 2017-18

Input-output ratio

Input-output ratio is determined by dividing overall sales by overall production expense. Table 6 displays that the onion farmers on an economic profit per acre earned Rs. 75665 and total cost expenditure Rs. 82737 and thus, input output ratio was found 1:0.92 from onion farming in the study area.

Table 6. Input-output ratio of onion crop in per acre

Particulars	Amount (Rs)
Net income per acre	75665
Total cost	82737
Input-Output Ratio	1:0.92

Source: Survey data, 2017-18

CONCLUSION AND RECOMMENDATIONS

It was found that onion growers using traditional production practices resulting in low output as compared to the potential yield. Main factors involved in low production of onion crops included lack of knowledge about improved seed, improper uses of fertilizers and weedicide. The price of onions during the season varies greatly due supply and demand in the market and harvesting seasons. The onion prices were higher in the early harvest as compared in the mid to late harvest session. It was found that due to high seed prices the variable cost was higher as compared to other costs. The mostly onion growers were unaware about the relationship of improved varieties and yield per acre. Survey result shows that total revenue of

onion crop was Rs. 158402 per acre and average profit/net income of onion growers received was Rs. 75665 per acre in the study area. Disputes between seed dealer and Seed Company like low seed germination and registration of seed varieties. This type of dispute usually solved by sharing the losses on 50% between seed dealers and Seed Company. Majority of seed dealers reported they face to transferring money from buyer and seller on credit based. Vegetable growers purchase seed on credit when season off they did not pay on due date and presented excuses about low yield or losses.

On the basis of above findings and observations it was suggested that, onion farmers should follow best managerial practices and strive to adopt scientific guidance from available local sources, for example research stations, progressive producers and extension workers. In specific, onion planting needs to be timely and the proper use of fertilizer and weedicide. Improved diseased free and certified seed of high-yield onion varieties are the major requirements for large-scale onion production in Balochistan. Public private partnership is strongly recommended to provide better certified onion seeds to farmers.

ACKNOWLEDGMENTS

This research was carried out by the Social Sciences Research Institute, Pakistan Agricultural Research Council at ARI Sariat Quetta and funded by the Pakistan Agricultural Research Council Islamabad, Pakistan for the research purpose from the main current budget.

AUTHOR'S CONTRIBUTION

J. Khan: Data collection, review of literature, analysis and write up

S. Pasand: Data collection, review of literature and data entry

S. P. Tunio: Data analysis and review

M. A. Gadehi: Data analysis and review

M. A. Shahwani: Data collection, review of literature, data entry and analysis

REFERENCES

- Amaza, P. S. and L. K. Olayemi. 2010. Technical efficiency in food crop production in Gombe State Nigeria. *Nigeria Agricultural Journal*, 32 (1): 140-151.
- Cope, 2005. *Allium* species poisoning in dogs and cats. *Veterinary Medicine*, 100 (8): 562-566.

- Davies, R. W. 2019. Economic Planning in the USSR. *In: The Soviet Economy*. Routledge, pp. 7-38.
- FAO, 2012. Major food and agricultural commodities and producers-countries by commodity. Food and Agriculture Organization of the United Nations.
- Gall, M. D., W. R. Borg and J. P. Gall. 2003. Education research, an introduction. New York: Longman Publishers, 7th edition.
- GoP. 2018. Agricultural Statistics of Pakistan 2017-18. Ministry of National Food Security and Research, Islamabad.
- Hingley, M. and A. Lindgreen. 2002. Marketing of agricultural products: case findings. *British Food Journal*, 104 (10): 806-827.
- Hofstrand, D. 2005. Farm Analysis Terms. USA: Iowa State University, <http://www.freshplaza.com/article/157408/Worlds-top-8-onion-producing-countries>.
- Kampf, R., P. Majerčák and P. Švagr. 2016. Application of break-even point analysis. *NAŠE MORE: Znanstveni časopis za more i pomorstvo*, 63 (3): 126-128.
- Khushk, A. M, I. Lashari, J. A. Lund, M. A. Memon and U. Shar. 2001. Factor responsible for higher wheat yield in Sindh. Research Report of AERU, Agriculture Research Institute, Tandojam.
- Lohano, H. D. and F. M. Mari. 2005. Spatial price linkages in regional onion markets of Pakistan. *Journal of Agriculture and Social Sciences*, 31 (8): 1813-1826.
- Maity, T. K. and A. K. Basu. 2017. Response of quality seed production of onion (*Allium cepa* L.) to different levels of nitrogen and potassium application debashis manna. *Research Journal of Chemical and Environmental Sciences*, 5 (2): 38-45.
- Majeedano S. D, H. I. Majeedano, M. H. Leghari, N. A. Wahocho and A. R. Mahar. 2019. Effect of potassium application rates and varieties on growth and seed yield of onion. *Pakistan Journal of Agriculture Agricultural Engineering and Veterinary Sciences*, 35 (1): 13-16.
- Naveed. M., S. A. Shah, A. U. Jan, I. Ullah, M. Ibrahim and S. Khan. 2017. Allocative Efficiency analysis of tomato growers in Mohmand agency, Pakistan. *Sarhad Journal of Agriculture*, 33 (3): 366-370.
- Ogunjobi, O. P. 1999. Efficiency of small holder cocoa farmer in Ondo State. *Journal of Social Science*, 17 (2): 62-68.
- Purseglove, J. W. 2000. Tropical crop monocotyledons. Longman Group Limited, pp. 407.
- Rameez, B. A., B. Sanullah, B. S. Khan, B. H. Noor, B. S. Ahmed, B. Waseem, B. A. Bakhsh and B. Jahangeer. 2014. Economic analysis of onion (*Allium cepa* L.) production and marketing in district Awaran, Balochistan. *Journal of Economics and Sustainable Development*, 5 (24): 192-205.
- Shah, W. S., I. Ullah, A. Ali, M. Iqbal and S. Khan. 2019. An analysis of allocative efficiency of growing onion in district Swat Khyber Pakhtunkhwa. *Sarhad Journal of Agriculture*, 35 (4): 1191.

(Received: December 09, 2020; Accepted: June 25, 2021)