

Scanning of Organic Agricultural Products From Production and Market Side

Sri Wahyuni^{1*}, Reni Kustiari¹, Juni Hestina¹, Handewi P. Saliem¹, Sahat Pasaribu¹

¹Indonesian Center for Agricultural Socioeconomic and Policy Studies - Bogor 16111

*Corresponding author: maloleyayuk@yahoo.com

Abstract. Realization of Indonesia's shallot exports is targeted to be achieved in 2025, therefore a strategy is needed to realize the shallot as an export market. The following paper presents 1) Export market opportunities; (2) Market structure and performance; and (3) Factors affecting export market access. The methodology: Research was conducted through a survey, interviewed 28 respondents in the provinces of West and Central Java in 2017. Data analysis for Objective 1) Identifying and mapping market opportunities; Objective 2) Refers to Structure Conduct Performance (SCP); Objective 3) Qualitative analysis which is presented descriptively. Results: 1) Shallots have a chance to be exported to Malaysia, Russia, and the United States. 2) The international market structure of shallots is an oligopoly. 3) Technical influential factors were no adequate Good Farming Practices technology and product quality have not reached the export standard, economically producers have no adequate capital, and socially were marketing networks that are still limited to village-level traders. Strategies to penetrate shallot in the export market are: take advantage of market opportunities, implement GAP, assist certification, subsidize capital, and shorten the marketing chain

1. Introduction

Shallots are one of the strategic agricultural commodities that are prioritized in their development related to continuity of production, distribution, and competitiveness in gaining international market access. In the roadmap for developing strategic agricultural commodities towards Indonesia as a world food store in 2045, shallots are targeted to reach stable supply and prices by 2019. In 2020 - 2024 it is targeted that self-sufficiency and competitiveness can be achieved while exports are targeted to be achieved in 2025 - 2034. In 2035 - 2045, it is hoped that Indonesia will become the main exporter of shallots in the ASEAN region (Ministry of Agriculture, 2017).

To realize an increase in shallot production, a People's Business Credit (KUR) has been allocated for the development of the shallot area of IDR 165.4 billion (Prihasto, 2020) accompanied by guidance on implementing Good Agricultural Practices (GAP). Sari (2018) reported that the benefits of KUR funds were able to increase the income of shallot farmers by 43 to 94 percent of their income before receiving KUR. The application of GAP increases shallot production and the total profit of 29.5% and 79.1%, respectively, and reduces the cost of chemical fertilizers by about 69.5%, and ensures environmental fertility (Mahfudz et al. 2019). Similar findings were reported by Baswarsiati and Tafakresnanto (2019) that implementing shallot GAP increased production by 8-10% compared to the existing cultivation method with B / C 2.55. However, it is unfortunate that the majority of farmers have not implemented GAP (Suharni et al, 20190).

The study of competitiveness and factors affecting the volume of Indonesian vegetable exports to the main destination countries was reported by Kusuma and Firdaus (2015) that one of the indicators used to measure the country's economic progress is the competitiveness of commodity exports, by looking at comparative and competitive advantages and factors that affect it. On the other hand, Asmara and

Ardhiani (2010) states the importance of market integration information both vertically and horizontally and it is also supported by an analysis of the market structure of shallots to obtain a picture of the efficiency of the shallot marketing system.

Referring to the above research results, to realize shallots as an export commodity, the following paper provides information on 1) Export market opportunities; (2) Market structure and performance; (3) Factors that affect the access of shallots to the export market. The results of this study are important as the basis for a strategy to realize shallot agribusiness to support shallot agribusiness as an export commodity that can increase farmers' income.

2. Methods

The research was conducted in shallot production centers (Gebang Village, Gebang District, Brebes District, West Java Province and Jaga Lempeni Village, Wanasari District, Kendal District, Central Java Province). Information was obtained through a survey in 2017, data was extracted through interviews with 28 respondents consisting of (20 farmers, 4 traders, 2 exporters, and 2 agencies) equipped with secondary data from related agencies.

Data analysis for objective 1 through identification and mapping of market opportunities based on secondary and primary data, presented descriptively. Objective 2 is carried out by using Structure Conduct Performance (SCP) analysis, using the Herfindahl Index and Concentration Ratio (concentration ratio) of buyers at a certain market level. Herfindahl Index to calculate market share and the Concentration Ratio are used to measure the percentage of the market share held by the four largest producing countries in the international market. 3) The analysis of influencing factors was carried out through qualitative methods based on the results of the interviews, presented descriptively.

3. Results and Discussion

Export Market Opportunities. On the world market, there are ten main exporters of shallots (Table 1), with the value and volume of exports being India's main position (39%) of total exports.

Table 1. Value and Export Volume of Shallots by Exporting Country Main, 2016

No.	Exporter Country	Export Value (US \$)	Export Volume (Kg)	Implicit Price (US \$/Kg) ^{*)}
1	India	382 440 956	1 837 249 202	0,21
2	China	465 455 849	711 049 611	0,64
3	Egypt	197 822 234	457 327 809	0,43
4	Mexico	419 675 631	412 924 997	1,02
5	Spain	152 680 948	356 693 503	0,43
6	USA	229 373 705	324 311 259	0,71
7	Peru	70 027 981	208 976 209	0,34
8	New Zealand	81 674 596	190 119 396	0,43
9	France	91 571 626	128 366 506	0,71
10	Turkey	12 546 575	105 932 029	0,12

Source: UNComtrade (processed); Code HS 070310

*) Implicit Price = Export Value/Export Volume

The performance of Indonesia's shallot exports (HS 070310) to the world market in 2010 - 2016 (Table 2), shows that in 2010 - 2016 the export of Indonesian shallots to the world market experienced a decline in export value and volume with a decline rate of 0.06% / year and 0.15% /year.

Shallots in world trade occupy an important position in terms of the number of countries involved in the export and import of shallots. Of the ten importing countries, the share of import volume from the five largest importing countries reaches around 70%. Of these, Malaysia had the highest share of imports at around 19%, the USA at 17%, and England at 13% (Table 3).

Table 2. Value and Export Volume of Indonesian Shallots in the World Market, 2010 – 2016

Year	Export Value (US \$)	Export Volume (Kg)	Implicit Price (US \$/Kg)*)
2010	1 850 153	3 260 526	0,567
2011	6 626 941	13 826 675	0,479
2012	8 824 966	19 126 475	0,461
2013	2 991 143	4 992 822	0,599
2014	3 037 029	4 569 968	0,665
2015	7 866 048	8 441 289	0,932
2016	410 037	748 781	0,548
Laju (%/th)	-0,060	-0,149	0,062

Source: UNComtrade (processed); Code HS 070310

*) Implicite Price = Export Value/Export Volume

Table 3. The number of countries involved in the export and import of shallots

No.	Exporter Country	Export Value (US \$)	Export Volume (Kg)	Implicit Price (US \$/Kg)*)
1	Malaysia	166 369 923	577 692 238	0,288
2	USA	465 087 869	521 160 270	0,875
3	United Kingdong	212 942 458	395 360 327	0,539
4	United Arab Emirates	88 588 500	358 367 936	0,247
5	Japan	141 541 726	279 499 062	0,506
6	Germany	161 095 995	251 060 836	0,642
7	Canada	152 636 204	196 953 157	0,775
8	Brazil	60 036 938	178 078 551	0,337
9	Senegal	20 709 299	155 118 493	0,134
10	France	90 0009 660	149 800 295	0,601

Source: UNComtrade (processed); Code HS 070310

*) Implicite Price = Export Value/Export Volume

Indonesia also still imports shallots from the world market. The development of the value and volume of imports of Indonesian shallots in 2010 - 2016 (Table 4) illustrates that the import of Indonesian shallots on the world market during the period 2010 - 2016 experienced a decline in both the value and volume of imports. The rate of decline in the import value of Indonesian shallots on the world market decreased by 0.013% / year, while the rate of decline in import volume was 0.012% / year. The decline in imports of shallots shows a good signal for the development of domestic shallot production. The adoption of the technology of planting shallots with seeds by some Indonesian farmers (originally using seeds) is expected to accelerate the increase in shallot production in Indonesia. The development of shallots at the border of East Nusa Tenggara since 2016 is expected to be able to fill the Indonesian export market, especially to meet the imports of shallots by Timor Leste.

Table 4. Value and Volume of Indonesian Shallots Imports in the World Market, 2010 – 2016

Year	Export Value (US \$)	Export Volume (Kg)	Implicit Price (US \$/Kg)*)
2010	56 337 194	125 815 765	0,448
2011	109 507 970	235 118 830	0,466
2012	67 232 449	155 361 490	0,433
2013	67 953 555	124 544 250	0,546
2014	64 488 411	144 884 999	0,445
2015	26 032 003	58 785 888	0,443
2016	46 842 075	104 951 225	0,446
Laju (%/th)	-0,113	-0,112	-0,003

Source: UNComtrade (processed); Code HS 070310

*) Implicite Price = Export Value/Export Volume

If Indonesia targets to become an onion exporter in the world market, a bilateral approach is needed in the economic and trade sectors with the main shallot importer countries in the world market. The price level for the types of shallot products required (type, variety, quality, and other product attributes) by the world's shallot importing countries is important information and needs to be responded to well by Indonesia.

Structure and Performance of the Red Onion Market. During the 2006-2015 period, the average production growth of shallots was 5.1% per year, with a constant growth trend. The growth component of the harvested area (3%) contributed more to the growth of shallot production compared to the 1.43% productivity component (Table 5). Shallots are a potential commodity that can be developed in Indonesia, however, shallot production is seasonal and uneven throughout the year, so that at certain times there is a production vacuum that occurs to meet domestic needs and demands.

Table 5. Land area, productivity, and production of shallots, 2006-2015

Year	Land Area (Ha)	Productivity (Ku)	Production (Ton)
2006	89.188	89,13	794.939
2007	93.694	85,69	802.827
2008	91.339	93,46	853.622
2009	104.009	92,80	965.167
2010	109.634	95,68	1.048.934
2011	93.667	95,35	893.124
2012	99.519	96,89	964.221
2013	98.957	102,14	1.010.773
2014	120.704	102,23	1.233.989
2015	122.126	100,65	1.229.189
Trend(%/year)	3,00	1,43	5,41

Source: BPS (2015)

The characteristics of shallots produced by Indonesia generally do not meet the GAP and SNI requirements, post-harvest handling which is still traditional makes the water content still high by 90 percent, and in terms of size is not uniform and grading is still not good, but the taste quality of Indonesian shallots is quite sharp and much liked by the country other. According to the Indonesian National Standard (SNI 01-3159-1992), the quality requirements of shallots are as shown in Table 6.

Table 6. Characteristics of Red Onion Production

Characteristic	Testing Terms		Information
	Quality 1	Quality 2	
Similarity of varieties	Even	Even	Organoleptic
Age	Old	Old enough	Organoleptic
Harshness	Hard	Hard enough	Organoleptic
Minimum diameter (cm)	1,7	1,3	SP-SMP-309-1981
Drought	Dry Store	Dry Store	Organoleptic
Maximum Damage (%) (weight / weight)	5	8	SP-SMP-310-1981
Maximum Rot (%) (weight / weight)	1	2	SP-SMP-311-1981
Maximum Dirt (%) (weight / weight)	None	None	SP-SMP-313-1981
Water content (%)	80-85	75-80	SP-SMP-313-1981

Source: Standard Nasional Indonesia (SNI) No. 01-3159-1992

The Herfindahl Index value for the world shallot market in 2010 and 2016 ranged from 750- 900, respectively, the number of exporting countries was 127 and 109 countries, CR4 values of 51.37% and 58.53% with Herfindahl Index values of 756.39 and 888, 72. This fact shows that the shallot commodity in the international market tends to be in the form of a perfectly competitive market or at least monopolistic competition with a moderate market concentration, between 51-59 percent. According to Asmara (2010), the structure of the shallot market in Indonesia is imperfect (oligopsony), due to the relationship between farmers and village traders who are ready to buy crops from rice fields.

The number of countries acting as shallot exporters tends to decrease from 127 countries to 109 countries. This indicates that the competition in the shallot trade in the international market is getting looser as fewer countries are involved in the shallot trade. Based on the analysis of market concentration (Concentration Ratio), in 2010 the producing countries that had a large market share were Netherlands, India, the USA, and Mexico. In 2016, the order of the main exporting and producing countries of shallot in the world was the Netherlands, China, Mexico, and India.

Driving and Inhibiting Factors of Shallot Opportunities. The existence of farming in terms of technical, economic, and social aspects (Table 7), shows the obstacles that need to be overcome and a driving force that can be used to make shallots penetrate the export market. This obstacle is land ownership (0.45 Ha/farmer) which demands business consolidation business solutions or making business in an agribusiness area to achieve maximum results and the majority land ownership status (50%) tenants, 42% owners, and 15%, cultivators. The status of land ownership affects farmers in deciding the application of GAP by only 25% of farmers, 25% only partially implemented it and 50% did not implement GAP at all.

Table 7. Driving and inhibiting factors of shallot farming at the research location towards the export market

No.	Aspect	Booster	Resistance
1	Technical	Get access to information (100%) Get access to transportation (100%) Get access to government support (100%)	Narrow land (0.4-0.5 Ha / farmer). Land prices are expensive The majority are tenants (50%), GAP implementation (25%),
2	Economy	The farm is commercially oriented and as the main livelihood (100%) No sales tax expense (100%) No transportation costs (100%)	Low personal capital (30-50%). Production quality does not meet export standards. The price is twice as high as the international price (IDR 18,000 vs IDR 9,000).
3	Social	No illegal fees (100%) age of farmers in the productive classification (100%). 100% of farmers receive training from the Agriculture Service, Industry Service, and Cooperative Office	The majority of education is an only elementary school (45%). All farmers market their products on the farm at harvest time to the village traders

Source: Primary Data

External technical factors in the form of access to land were declared difficult by all farmers because the selling price of paddy fields was very expensive (IDR 800 million / hectare). Access to information, transportation, and program support from the government was declared easy by all farmers, as well as means of transportation because the distance to the nearest market was only 1.5 km to 2.0 km. The ease of transportation aspects is supported by the fact that generally, farmers sell their crops slashed in rice fields and only take home a small portion of the harvest to be used as seeds and 100% of farmers own motorbikes and even 27% own 4-wheeled vehicles. The main source of

electronic information obtained by farmers comes from television, while the means of communication for the majority of farmers (90% in West Java and 100% in Central Java) are mobile phones, with a small proportion accessing the internet network.

Economically, all farmers have a commercial business orientation and onion farming is the main source of livelihood. This fact is the most important capital in encouraging farmers to maximize their agricultural output and will greatly assist in achieving self-sufficiency towards achieving export targets. All farmers are free from transportation costs, taxes, transactions, and illegal fees and receive support from the government in obtaining business capital loans in the form of the People's Business Credit (KUR) program with 9% interest, KKPE with 6% interest/year, borrowing from input production kiosks with interest around 10%, pawned the BPKB for motorbikes and owed loans to the cooperative.

There were product constraints, where the price of shallots in the world market was cheaper than the price in the domestic market. In 2016, the average price of shallots on the world market was only around Rp. 9,000 / kg, while the average price of shallots at the Indonesian farmer level was around Rp. 18,000 / kg. The high price of shallots in Indonesia is due to the high cost of farming, the production cost of shallots can reach Rp130 - 140 million / ha. If the production reaches 12 tons, then the cost to produce 1 kg of shallots will reach IDR 12,000 / Kg. However, red onions from Indonesia are preferred because they have a more fragrant aroma.

Indonesia experienced a heyday in 1987/1988 where the export of shallots from Indonesia was able to dominate the world market, this fact can be used as learning and motivating farmers to regain that position. Currently, there are still several shallot exporters that still export frequently, namely CV. ATAS, Toko Surabaya, PT. Indoagrolestasi, Alion, and cheap shops. Also, there are shallot buyers from Thailand who use tourist passports but directly buy shallots from farmers, rent warehouses in Brebes Regency, and make their shipments.

Only grade A and B shallots can be exported with a diameter specification > 30mm for grade A, 27-29 mm grade B with a total of about 60 eggs/kg. Grade C shallots with a diameter of <26mm, with an amount of 100 items/kg are usually purchased for fried onions, while those for grade D (even smaller) are purchased by Indofood for seasoning. The Indonesian National Standard (SNI 01-3159-1992) is a requirement for the quality of shallots that can be exported.

In 2017, the export volume of shallots increased by around 92%, which came from Eastern Indonesia, namely Bima, Sape, and Sumbawa. The main export destination countries are Thailand and the Philippines (50%), the rest is exported to Vietnam 50%. Only about 35% of the exportable shallot from Brebes. The shallot variety from Brebes is the Bale Kare variety originating from India which is not favored by Malaysians and Singaporeans. Bima Brebes red onion comes from Ampenan which is resistant to water, therefore it can be planted in the rainy season with good yields. However, now Indonesia often imports shallots from the Philippines and Vietnam, because the harvest is not successful.

Bima's shallot comes from the Philippines (Tantuyung) which was brought to Indonesia about 10 years ago and was grown in Sape Regency (known as Super Philip) and is now called Bima. Currently, shallots from Indonesia are exported to Malaysia (15%), China (10%), Vietnam 60%, and Thailand (15%). If the supply of shallots from Vietnam and Thailand to the world market decreases, the demand for Indonesian shallots will increase.

Social factors show that most of the farmers are at a productive age (43 to 63 years), but their education is relatively low, the majority of education has not yet completed primary school. Partnership relationships that are established by farmers with various institutions are carried out primarily to fulfill agricultural business capital and farmers make maximum use of partner institutions' facilities related to credit. When the research was conducted in September 2017, the price of shallots at the farmer level was only IDR 8,000 / kg, therefore farmers would be at a loss. This is one of the reasons why farmers establish relationships with various sources to carry out their next farming business. The chairman of the Indonesian Shallots Association has tried to help farmers by providing a storage warehouse with a minimum capacity of 6,000 tons to accommodate farmers' production during the main harvest. The storage fee is around Rp. 1000 / kg which is paid when the farmer sells his crop. This storage service has been running since September and many shallot farmers have left their

harvest. The initiative of the chairperson of APBMI is because Bulog does not yet have an adequate storage warehouse for shallots. Before being stored in the warehouse, the shallots must be dried in the sun for 10 days. Rogol red onions will shrink by about 20-25% if the harvest is taken in the rice fields, the results of the scales are cut 10% with details of 7% soil manure and 3% shrinkage. In general, the number of shallots stored in the warehouse will experience shrinkage of 15% / month during the rainy season harvest and 11% / month during the dry season. Storage time refers to the targeted market price. The price of IDR 15,000 / kg is the reference price stated in MOT 27/2017 concerning the determination of the purchase reference price at the farm level and the selling reference price at the consumer level (Ministry of Trade, 2017). The reference price for the conde onion (wet at the farmer level) is IDR 15,000 / kg, for the conde for insurance is IDR 18,300 / kg and the reference price for onion is IDR 22,500 / kg, while the reference price for shallots at the consumer level is IDR 32,000 / kg. For the salary of the warehouse keeper who takes care of weighing, labeling, administration, and services, the farmer's sales will be deducted by IDR 1,000 / kg.

4. Conclusions

Indonesian shallots have an opportunity as an export commodity in certain countries. To realize these opportunities, the strategy that needs to be taken is to take advantage of existing market opportunities, namely Malaysia, Russia, and the United States; The structure of the shallot market is an oligopoly where marketing is controlled by certain companies so that the roots can penetrate the export market, it is necessary to make partnerships with companies that are experienced and have networks in exporting shallots; The quality of the majority of shallots has not met the standard export requirements, so there is socialization, promotion, and advocacy (SPA) about the prospect of shallot as an export commodity and its requirements, including the implementation of GAP; and Farmers still experience limited capital and marketing networks so that capital support and policies are needed to shorten the market chain and farmer economic institutions independently and facilitation of certification.

References

- [1] Asmara R, Ardiani R. 2010. Market Integration In The Onion Marketing System. *AGRISE* 10 (3): 164176.
- [2] Central Bureau of Statistics. 2016. Indonesian Statistics. www.bps.go.id. (2 August 2017).
- [3] Vegetable Crops Research Agency. 2014. Standardization of Shallots Commodities in Efforts to Increase Competitiveness in the ASEAN Market Era. October 27th.
- [4] Baswarsiati and Chendy Tafakresnanto. 2019. Study Of The Implementation Of Good Agricultural Practices (Gap). Shallots In Nganjuk And Probolinggo. *Agrika: Journal of Agricultural Sciences*, Volume 13, Number 2, November .pp 147-161.
- [5] Ministry of Trade. 2017. Recapitulation of Approval Letter / Export Permit for Agricultural Products. Dit. Tanhut Exports.
- [6] Kusuma, RL. and Firdaus, M. 2015. Competitiveness and Factors Affecting the Volume of Indonesian Vegetable Exports to Main Destination Countries. <http://journal.ipb.ac.id/index.php/jmagr>. DOI Number: 10.17358 / JMA.12.3.226
- [7] Mahfudz, M., S. Saleh., M. Antara., A. Anshary., S. Bachri., U. Made., U. Hasanah and Rauf. 2019. Adoption And Advantages Of Eco-Friendly Technology Application At The Shallot Farming System In Indonesia. *Agronomy Research* 17 (4), 1679–1687, 2019. <https://doi.org/10.15159/AR.19.188>
- [8] Prihasto, S. 2020. Ministry of Agriculture Targets Red Onion-Chili Production to Increase 7 Percent. *CNN Indonesia*, CNN Indonesia [cited on Tuesday, 11/02/2020 17:02 WIB. <https://www.cnnindonesia.com/ekonomi/20200211141353-92-473592/kementan-targetkanproduksi-bawang-merah-cabai-naik-7-persen>.
- [9] Sari KI. 2018. The Effect of Providing People's Business Credit (KUR) PT. Bank Rakyat Indonesia(Persero) Tbk Unit Baraka Against The Income of Onion Farmers in Baraka District,

- Enrekang Regency. [Essay]. URI: <https://eprints.unm.ac.id/eprint/11161>. [Downloaded July 19, 2020].
- [10] Suharni., Waluyati L R and Jamhari. 2017. Good Agriculture Practices (GAP) Application of Red Onion in Bantul Regency. *Agro Economics* Vol. 28 / No. 1, pp 48-63.
- [11] UN COMTRADE. 2017. World Integrated Trade Solution. February 27. World Integrated Trade Solution UNCOMTRADE.datacatalog.worldbank.org.
<https://www.google.com/search?q=UNCOMTRADE+2017&oq=UNCOMTRADE+2017&aqs=chrome..69i57j0l3.6335j0j7&sourceid=chrome&ie=UTF-8>.