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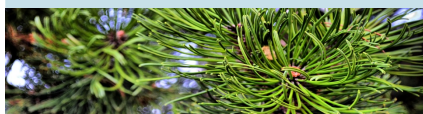
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EDITOR'S CHOICE

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The study of agribusiness wetland rice farming system in an attempt to synergize subak with ecotourism: a case in subak Sembung, Bali province of Indonesia

- by [Arisena Gede Mekse Korri](#) and [Dewi Ni Luh Prima Kemala](#) (Udayana University, Bali, Indonesia)
- Issue 9(69), September 2017, pp. 47-53
- Language of article: English
- Full-text paper: [download](#)



The rapid development of tourism in the Bali Province led to the conversion of agricultural land into a settlement and tourism support facilities are growing rapidly occurred in Denpasar City. This causes the decline in the area of rice fields and increasingly threatened the existence of subak (Balinese cultural base irrigation system for paddy fields) in Denpasar City. By making the paddy field become a tourism object based on the principles of ecotourism, is expected to maintain the existence of subak in Denpasar City. This study examines the benefits and feasibility of wetland paddy farming, economic efficiency of the use of production factors of wetland paddy farming, environmentally friendly production pattern of wetland paddy farming, the potential of subak sembung area as the attraction of ecotourism, performance of agribusiness system of wetland paddy farming and create a synergy model between subak and ecotourism based on agribusiness. The results obtained can be concluded that the commodity rice paddy worth to be used as farming in Subak Sembung, rice farmers in Subak Sembung classified as efficient in using production factors but has not achieved optimal efficiency, production patterns in Subak Sembung still using chemicals (not yet environmentally friendly) and Subak Sembung has a very noble agrarian cultural value that can be used as tourism assets.

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Life of the riverine fishermen: present status of livelihood strategies and economic conditions at Payra River, Bangladesh

- by [Rahman Md. Hafijur](#), [Haque Md. Mahfuzul](#), [Mithun Paul](#), [Hossain Md. Moazzem](#) and [Hasan Md. Rakib](#)
- Issue 12(72), December 2017, pp. 299-306
- Language of article: English
- Full-text paper: [download](#)



A study was conducted to find out the livelihood condition of Payra River, located at the Angaria union of Dumki upazila under the district of Patuakhali for twelve months from July, 2012 to June, 2013. In the present study, it was found that highest percentage (40%) of the fishermen is young (21 to 31 years) where about 92% of the fishermen used boat for fishing. By religion, 46% fishermen are Muslims and majority (54%) fishermen are Hindus. In terms of education, 50% had education up to primary level, 12% of fishermen in secondary level, 4% fishermen had education up to SSC level and 6% had no education. About 54% of the fishermen are dependent on upazila health complex for health facilities. Maximum housing condition of the fishermen are Earthen made (52%), 44% are Tin shed building and only 4% are fully furnished cemented building. Service and labor are the main occupation of 4% fishermen. Majority (80%) of fishermen main income source is fishing and among them 54% of the fishermen had 1 to 10 decimal homestead lands and majority (72%) of the fishermen had no agricultural land. In case of other occupation 28% fishermen are involved in agriculture as other occupation, 40% fishermen in day laborer,

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8% fishermen in business and 2% fishermen in service. The average monthly income was found to be Tk. 15000 when agriculture is the main occupation. When fishing is the main occupation the monthly income is Tk. 10410. It has been observed that 54% fishermen have training on one or more than one related matter, 46% have no training. So from this study, we can conclude that the livelihood statuses of the riverine fishermen of Payra River were not satisfactory and the fishermen were deprived of many amenities.

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The viewpoint of stakeholders on the causes of forest and land fires in Riau province, Indonesia

- by [Badri M.](#), [Lubis D.P.](#), [Susanto D.](#), [Suharjito D.](#)
- Issue 2(74), February 2018, pp. 4-10
- Language of article: English
- Full-text paper: [download](#)



Riau Province is one of the prone areas of forest and land fires in Indonesia. Fires began to grow since the 1980s as deforestation and the clearing of palm oil plantations occurred. The peak of a major fire was happened before the study was taken from 2014 to 2015 and caused a smoke haze for months. This study aims to determine the factors causing forest and land fires in Riau in the viewpoint of stakeholders. The research is conducted by using qualitative methods by exploring stakeholder viewpoint through semi-structured interviews on actors representing government, companies, research institutions, NGOs, mass media and community groups. The results show that all stakeholders have the same viewpoint regarding the cause of human-fire perpetrators. Burning is largely done intentionally in open access areas, disputes, concessions, corporate land, and community lands. Fires continue to occur due to lack of oversight by authorities, massive peatland clearance, deforestation, increased permission for forest or land management for political costs, land disputes, human negligence and weak law enforcement.

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Impact of agricultural exports on economic growth of Peru: the case of avocado and grapes

- by [Urriola Nadia Nora](#), [Aquino Carlos Alberto](#), [Baral Pradeep](#)
- Issue 3(75), March 2018, pp. 3-11
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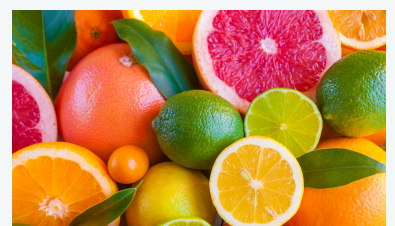


Agricultural sector in Peru contributes to 7.7% of Gross Domestic Product (GDP), accounts for 15% of the total export earnings and employs 25% of the labor force. Agriculture products such as grapes and avocados have seen notable export successes in the recent years compared to the country's traditional exports, such as sugar and coffee. Research of the connection between agriculture exports and economic growth wasn't given serious attention until recently. This study seeks to analyze and quantify the impact of the selected agricultural products' exports on the Peruvian economic growth using an annual time series data from 1998 to 2016 obtained from Central Bank of Peru and International Trade Centre. Grape exports, avocado exports, agriculture growth rate, real exchange rate and price consumer index for each year of the stipulated period were used as determinant factors of the economic growth. Ordinary Least Square regression, Augmented Dickey Fuller test, Phillip Perron test and Granger Causality tests were used for data analysis. The findings revealed that while agriculture growth rate and the avocado exports have a positive impact on the real GDP, the grape exports and price consumer index have a negative impact. Tests showed that, with the exception of the real exchange rate, all determinants achieved stationary at level I(0). Moreover, there was a unidirectional causality in the relation between the agriculture growth rate and the real GDP, and between grape and avocado exports and agriculture growth. The study recommends policy options including value addition, the incentive for private investment, and improvement of the traditional agricultural production techniques for a proper diversification of Peruvian economy in the future.

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Phylogenetic relationship of Phytophthora sp. infected citrus in East Java of Indonesia using polymerase chain reaction

- by [Widyarningsih Sri](#), [Dwiastuti Mutia Erti](#)
- issue 5(77), May 2018, pp. 297-303
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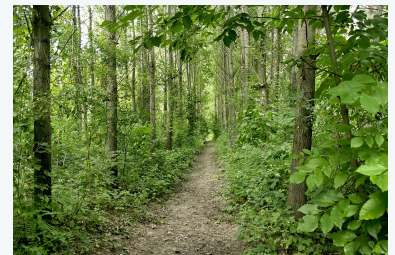


Soilborne *Phytophthora* species are the pathogen that causes several diseases on citrus in Indonesia. The objective of this research was to know phylogenetic relationship of *Phytophthora* sp. causing citrus crown rot disease in East Java Indonesia using Polymerase Chain Reaction. The research was carried out at Phytopathology Laboratory, Indonesian Citrus and Subtropical Fruits Research Institute (ICSFRI). The phylogenetic relationship analysis was based on PCR using ITS (Internal Transcribed Spacer) primer. In the research, 21 cultures of *Phytophthora* were isolated from infected citrus rootstock at citrus center production (Banyuwangi, Jember, Ponorogo, Blitar, and Tulungagung), 2 culture isolates from non citrus center production (Kraton-Pasuruan and Tlekung-Batu) and 1 culture isolate from apple rootstock infected by *Phytophthora*. The result showed that several isolates from Banyuwangi, Jember, Ponorogo, Blitar and Tulungagung have 100% similarity coefficient, while Banyuwangi-2 isolate have 82% similarity. Ponorogo isolates number 3, 4, and 5 have 100% similarity coefficient. That isolates with other 21 isolates have smallest similarity, i.e. 28%. These data suggest that frequent outbreaks of *Phytophthora* crown rot in various citrus growing centers might be resulted from other factors rather than from different genetic structure, such as climatic condition which is conducive for the disease epidemic, resistance of citrus rootstock, and plant maintenance.

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Hungarian forest management tendencies at the beginning of the XXI century

- by [Komarek Levente](#)
- issue 6(78), June 2018, pp. 5-11
- Language of article: English
- Full-text paper: [download](#)



Today, the forest is a key element of natural resources, the most complex natural (ecological) system in the continent. Because of its environmental impact, it is also a vital condition for healthy human life. In addition to its dominant role in regulating the quantity and quality of waters, the forest defines the nature of the landscape, preserves the richness of wildlife species and, being a renewable natural resource, continuously improves the state of the environment, while producing raw materials, energy sources and food. The present area and condition of forests have evolved over centuries of human activity. Due to their territorial fragmentation and the environmental damage forests are exposed to, we can only count on the indispensable survival, protective effect and products (yields) of forest communities if we treat them professionally and protect them from damaging effects, excessive use and stress, ensuring the diversity and appropriate harmony of their flora and fauna. The forest area of Hungary has grown dynamically over the last decades, however, in the European Union, we are one of the countries with less favourable indicators in this field. This study deals with the current issues of forest management in Hungary (forest area, forest land proportion, forest-tree supply, afforestation, forest health, logging) focusing on the direction and extent of positive and negative changes in this field.

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Abbreviation of scales on apple plant in Junggo (Tulungrejo village of Batu City, Indonesia)

- by [Tito Sama' Iradat](#), Mudjiono Gatot, Abadi Abdul Latief, Himawan Toto
- issue 6(78), June 2018, pp. 457-467
- Language of article: English
- Full-text paper: [download](#)



Scales have attacked 9 hectares of apple land spread in 8 villages of Bumiaji sub-district such as Giripurno village, Tulungrejo village, Pandanrejo village, Sumbergondo village, Bulukerto village, Punten village, Gunungsari village, and Bumiaji village. This pest is a perennial pest on apple crops and difficult to control. The current way of control has not been able to overcome this pest problem. This research was conducted to find out abbreviation of scales on apple plant at Junggo, Tulungrejo Village, Bumiaji Sub-district, Batu City. Number of duct tape observed as many as 18 units of experiment and trap color as much as 30 unit experiment. The results showed that the total population of scales that can occur in one year is 1322 individu with a generation of 7.20 months and the rate of breeding speeds of 3.21 in one parent. Decrease of scales occurs in March to May and September to November. In March to May it is suspected to be caused more by natural enemies, whereas in September to November it is caused more by rainfall factor.

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DEVELOPING THE ADDED VALUE OF CORN CHIPS AS WAY OF IMPROVING THE COMMUNITY ECONOMY IN GORONTALO PROVINCE OF INDONESIA

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ABSTRACT

The objective of this study is to create the model for the development of corn-based products. The ultimate objectives of this study is: 1) the availability of development and utilization of appropriate technology for corn processing products to be adopted by industry; 2) the increase of added value for each actor within the value chain and community as the economic multiplier effect in Gorontalo province. The method used in this study is quantitative descriptive method which encompasses desk study, secondary data analysis, workshop and meeting with related stakeholders, develop the design of the study for each value chain actor, field visit and in-depth interview, focus group discussion, presentation and findings discussion to formulate the master plan and the model for the development of corn commodity. The conclusion of this study is 1) benefit of chips very dependant on the type of packaging; 2) the advantages of chips are increasingly improved; 3) based on the results of the organoleptic test seen from the aroma, taste, texture and the most preferred color is Balado.

KEY WORDS

Corn chips, economic value, community, public service.

Gorontalo Province is known as the maize province that optimistically has the program of one-million-ton maize product achievement in a year to support the national food security. In 2011 there was an extension of maize farmland by 3.500 hectares, and this then had increased the production of maize around 245.000 ton, and that time the product of maize could reach 600.000 tonnes. Besides, as an attempt to increase the maize production, the Government of Gorontalo Province also has attempted various ways including through the improvement of the capacity of the elucidator, the use of the qualified high yield seed and the provision of fertilizer. As stated by Isa (2012), the maize production in Gorontalo from time to time has been increasing in which it is predicted that each maize crop could reach around 65%, and 35% is in the form of wastes such as stalk, leaves, husk, and stem of maize ear.

In addition, to fulfill the daily needs of society in Gorontalo, maize also can be processed for a variety of products such as maize steak, maize oil, maize meal, livestock feed, fish feed, and many more. Moreover, the maize grains can be processed into various products, and the waste of maize is also used to be various products such as the ruminant feed and organic fertilizer. The stem of maize ear, furthermore, can be processed to be the charcoal briquette and the husk of maize can be processed to be a flower, toffee wrapping, and starting product of clothes, tablecloth, and many more unique products.

As revealed by a survey, the maize grains in Gorontalo are commonly used as daily food and sold in other neighbor countries or provinces. Usually, the maize grains have not been processed to be other processed products that can improve the economic values from the products. As an illustration, the ratio of the price of one kilogram of maize grains is Rp. 2.800 and when it has been processed to be the livestock feed, then the price can be five times higher than the initial price. By processing the maize grains to be basic livestock feed, it is potential to improve the economical values of the product.

Economic welfare growth depends on the capacity to innovate, to produce sustainably high value-added products which cannot be easily imitated by others. This should be supported by the progressing target, implementation of appropriate technology, developing better quality products and better production process as the foundation for the regional, even international economy in this modern era.

Agriculture sector plays a significant role in the country's economic development, as Indonesia is an agricultural country. Economic development heavily relied on agricultural and agricultural-based industry or agroindustry. Within the agribusiness system, agroindustry is one of the sub-systems which together with other sub-systems shaped the agribusiness. One of the efforts to develop the product from the agricultural sector is by increasing the added value of its products. This can be done by linking the agriculture with industry/processing industry or services in the economic sector [3][4].

Gorontalo province is currently trying to boost its maize commodity, from cultivation to development of its processed products. The maize production in Gorontalo province increases by 7.58% in 2014 compared to the previous year which was only 719, 787 tons [4]. As the featured product from Gorontalo, the added value of maize into various processed products is needed through the involvement of small and medium scale industries. Processing industries of agricultural production will increase the economic value of the products.

One of the popular agricultural product processing industries is corn-based processing industry. There are quite several small-scale corn-based processing industries, such as corn chips, corn flour, popcorn, corn crackers, and fried corn. This corn processing industry process locally produced corn with limited market coverage. In addition, there are also several large companies which produce the maize flour, corn-based noodle, and corn-based snacks such as corn flakes, tortilla chips, and popcorn [6][7].

The objective of this study is to create a model for the development of corn-based products. The ultimate objectives of this study are: 1) the availability of development and utilization of appropriate technology for corn processing products to be adopted by industry; 2) the increase of added value for each actor within the value chain and community as the economic multiplier effect in Gorontalo province.

LITERATURE REVIEW

Corn Commodity. Corn is the second food source of carbohydrates after rice, essential for food security. Corn also plays an important role in the animal feed industry and the food industry. In Anonim (2012) it was explained that in the past five years, the need for national maize for feed, food and beverage industry materials increased $\pm 10\%$ -15% / year. Based on the order of staple food in the world, corn is the third after wheat and rice (Directorate General of Food Crops, 2012). Corn plants have many uses. Almost all parts of the plant can be utilized, for example, 1) Young leaves: cake wrappers (sticky dodol, corn leaf flowers, fabric fibers); 2) Young stems and leaves: animal feed; 3) Old stems and leaves; green

manure or compost; 4) Dry stems and leaves for firewood. According to Anggraeny et al. (2006) corn waste from stems ranged from 55.4-62.3%, from leaves 22.6-27.4% and from klobot between 11.9-16.4%; 5) Corn stalks; pulp (paper material); 6) Young corn fruits: cakes, vegetables, bakwan; and 7) Old corn kernels; substitute for rice, marning, pastries, animal feed, flour, rice noodles, mixtures of ground coffee, biscuits, corn bread, popcorn, animal feed, raw materials for beer industry, pharmaceutical industry, dextrin, adhesives, textile industry.

Corn Farmers Society. The community of corn farmers is a community that has a basic business and livelihood as a corn farmer. Farmers' lives are synonymous with the lives of people in rural areas so that the corn farming community is also called a farmer or peasant. Corn farmers are human resources that need to be considered because part of agricultural producers in a region. Commodities produced by corn farmers are corn (*Zea mays*) which can grow normally in altitude areas 0-1300 above sea level (Mindalan 2007). This infographic characteristic is characteristic of the Indonesian region, including in Gorontalo Province, especially in Boalemo District, so it can be concluded that corn is a plant that is very suitable in developing productive commodities through various community empowerments, especially corn farming communities.

Corn Chips. Corn is one of the important types of food with complete nutritional content such as rice. According to EIRI (Engineers India Research Institute), the composition of nutrients contained in each corn seed is carbohydrates 8-10%, Proteins 9 - 7%, starch 50 - 60%, Fat 10-15%, water in small amounts, sugar 10% and ash \pm 3%. This chemical composition makes corn as the second food source after rice.

In Indonesia, corn is not only consumed in the form of whole corn seeds which are processed by boiling, burning or added to vegetables but as technology advances, processed corn products are also increasingly diverse. One of them is corn chips.

Corn chips are one of the corn processing industries which are very potential to be developed in rural areas because the manufacturing process is very simple, high yield and products in the form of raw chips have a long shelf life because of the low moisture content and fat content. Therefore, corn chips is one of the processed products that has been widely known by the community, especially in Java, this is evidenced by the many agro-industries there that make corn chips as one of the starting products, among others, as mentioned by Hadi (2010) in his study stated that for the case study in the Pandan Wangi sub-district, Blimbing District, Malang Municipality, the average agro-industry for corn chips earned a profit of Rp 1,990,000 for one production process.

The data from the Development Studies Association (2008) obtained from statistical data in 2006 that 12.2 million people living in Ethiopian urban areas with an average of 5 family members represented around 2.5 million families; only 2.5 percent of these families can meet the need for chips with the potential demand for 62,500 families. With a conservative assumption that of 1 kilogram of corn chips consumed per family per week at a lower price, the annual demand will increase to 3000 tons. Analysis of this demand increased when the public and requests from hotels, restaurants and international cafes were added to the calculation.

METHODS OF RESEARCH

The method used in this study is quantitative descriptive method which encompasses desk study, secondary data analysis, workshop and meeting with related stakeholders, develop the design of the study for each value chain actor, field visit and in-depth interview, focus group discussion, presentation and findings discussion to formulate the master plan and the model for the development of corn commodity.

Activities: 1) identification of potentially applicable corn processing technology for the industry, 2) engineering of the appropriate technology and economic analysis and technical analysis for the utilization of appropriate technology engine, 3) business feasibility analysis, added value analysis and projection of multiplier effect, 4) stakeholder and institutional mapping, SWOT analysis, strategy formulation for the strengthening of value chain strategy

for various corn processing products, 5) formulation of intervention activities to increase production, 6) socialization and evaluation toward the implementation of value chain result/formulation of strategy for intervention activities, increasing the production of various corn-processing products, replication of various corn processing-based industries to other areas in Gorontalo, 7) research roadmap initiated by previous study.

RESULTS AND DISCUSSION

Total Production Cost and the Sales Volume of Corn chips Product for 2015-2017. The data on the production cost of corn chips fluctuated monthly and annually. This production cost fluctuation is largely influenced by a number of produced products. The average fluctuation in each year consecutively is 15% in 2015, 7% in 2016, and 3% in 2017. The production cost steadily increased annually along with the increase in sales volume. The average increase of production cost on the period of 2015-2017 is 79%; whereas the average increase of sales volume of corn chips annually for a similar period is 85%.

The average range of monthly production cost is from Rp. 900.000 to Rp. 1.500.000 from 2015 to 2017. The average sales also increase from Rp. 1.500.000 to Rp. 2.700.000 during a similar period. The comparison of production cost against the sales volume for each month ranges from 67.75% to 77.9%. The sales volume value is higher than the production cost. Thus, the income for this corn chips production stays positive over the years.

Table 1 – Total production cost and the sales volume of corn chips product for 2015-2017

Month	Year					
	2015		2016		2017	
	Production cost	Sales	Production cost	Sales	Production cost	Sales
January	2.914.972	4.403.800	8.462.849	14.817.400	12.800.850	23.695.900
February	3.461.676	5.551.000	8.883.372	15.501.800	11.873.569	20.982.100
March	2.856.185	4.358.000	8.412.812	14.607.400	14.790.457	28.270.800
April	4.168.967	6.698.200	11.353.687	20.486.700	10.749.833	19.042.700
May	2.438.936	3.891.600	8.910.574	18.585.800	15.197.112	30.696.800
June	5.120.296	9.031.600	10.452.950	20.004.500	8.272.321	12.894.500
July	5.833.965	10.607.200	4.203.190	8.078.800	10.134.201	16.996.900
August	3.844.406	6.575.600	8.297.840	13.731.000	14.258.374	26.322.700
September	5.019.945	8.191.000	9.536.060	16.407.300	13.669.801	24.178.900
October	3.633.890	5.809.800	8.785.913	15.244.700	12.461.701	19.778.500
November	3.613.152	5.812.600	8.207.503	13.540.800	13.901.187	25.195.900
December	6.001.766	11.113.400	8.848.623	12.223.500	11.931.132	18.883.500
Total	48.908.157	82.043.800	104.355.373	183.229.700	150.040.538	266.939.200

Source: processed secondary data, 2018.

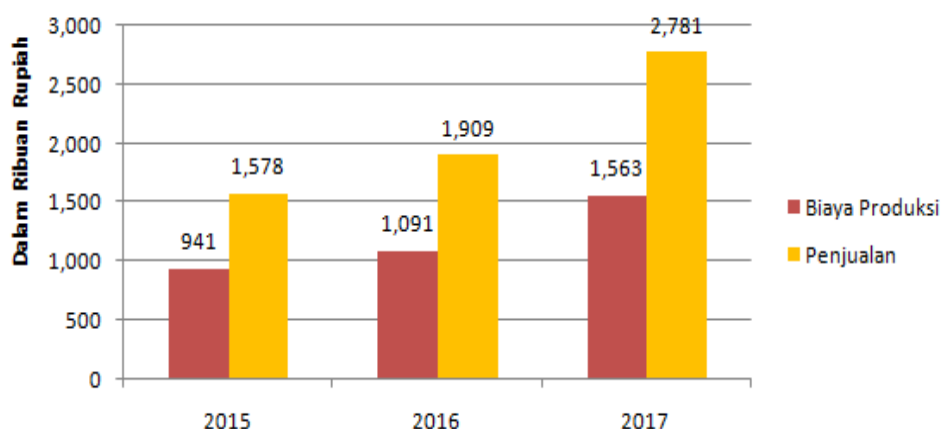


Figure 1 – Comparison graphic of average production cost and sales volume for the period of 2015-2017 (Source: processed secondary data source, 2018)

The income value for corn chips production for the period of 2015-2017. As seen in Table 2, it shows that the monthly income from corn chips production stays positive over the years. The monthly income is influenced by production cost and total sales of the product. The lowest income per month on average is Rp. 1.500.000; and the highest income per month is Rp. 11.000.000. The highest average increase of income per month for the period of 2015-2017 is 27.7%; whereas the lowest average income per month from this product for a similar period is 12.4%.

Table 2 – The income value for corn chips production for the period of 2015-2017

Month	Income/year (in Rupiah)		
	2015	2016	2017
January	1.488.828	6.354.551	10.895.050
February	2.089.324	6.618.428	9.108.531
March	1.501.815	6.194.588	13.480.343
April	2.529.233	9.133.013	8.292.867
May	1.452.664	9.675.226	15.499.688
June	3.911.304	9.551.550	4.622.179
July	4.773.235	3.875.610	6.862.699
August	2.731.194	5.433.160	12.064.326
September	3.171.055	6.871.240	10.509.099
October	2.175.910	6.458.787	7.316.799
November	2.199.448	5.333.297	11.294.713
December	5.111.634	3.374.877	6.952.368
Total	33.135.600	78.874.300	116.898.650

Source: processed secondary data, 2018.

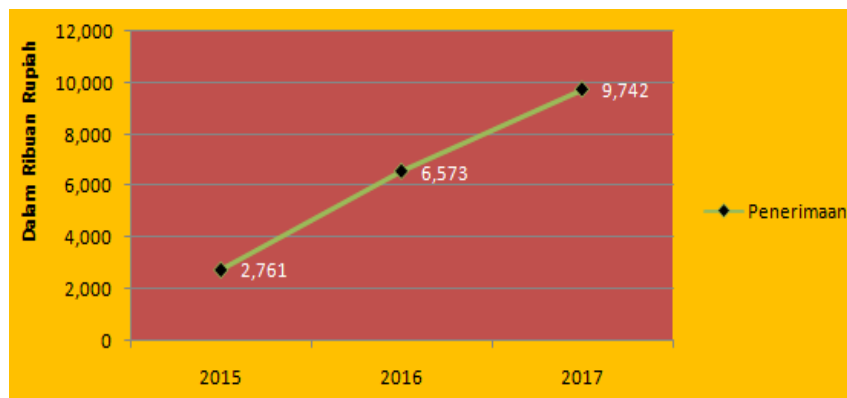


Figure 2 – The trend of the average increase in income in the period of 2015-2017 (Source: processed secondary data, 2018)

For each month, the average income is about Rp. 2.700.000 to Rp. 9.700.000 from 2015 to 2017. In 2016, the average income increases by 138% compared to the previous year; meanwhile, in 2017, the increase is 48% compared to 2016. The average income increases by 93% during the period of 2015-2017. This steady positive increase of income indicates that the corn chips product is favored by the consumers and can increase the welfare of the small-scale industry that works in producing these corn chips.

As seen in Figure 3 below, the total production cost, total sales volume, and income from these corn chips during the period of 2015-2017, the total production cost annually increases with linear pattern toward the sales and income. This brings the positive influence for the improvement of welfare level through improvement of performance of the small-scale industries which produce these corn chips.

The level of sales of these small-scale industries which produce these corn chips is very profitable and promising as the economic locomotive for the products in Gorontalo. The value of sales is above all the cost components, which in turn yields positive returns.

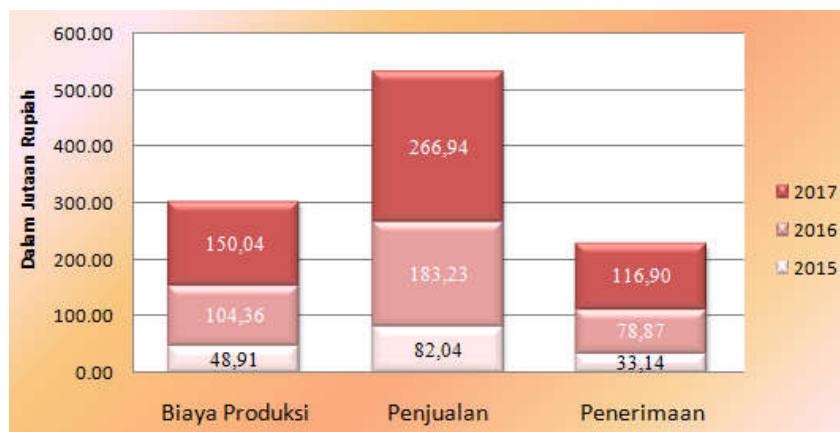
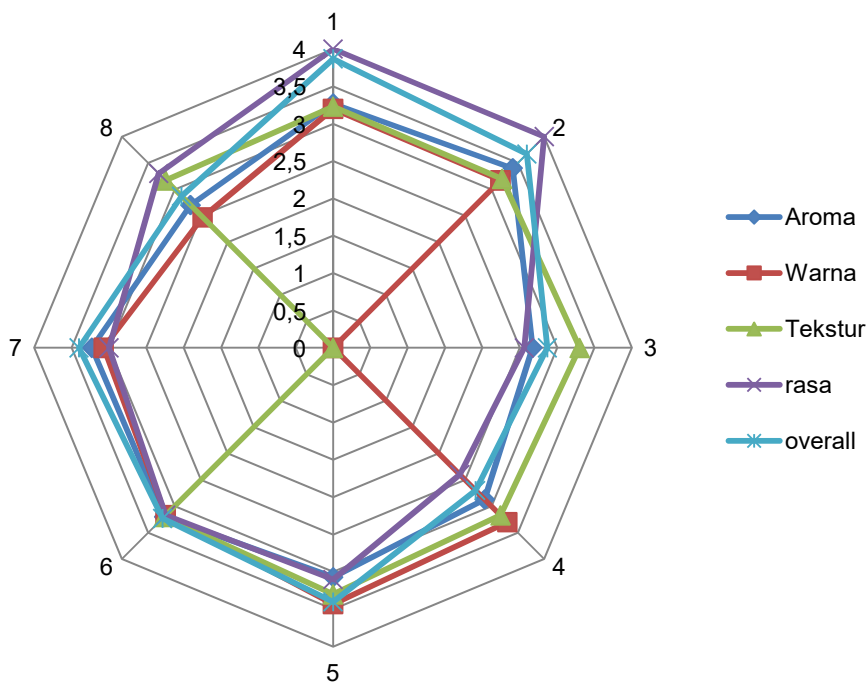


Figure 3 – Graphic of total value development for the period of 2015-2017 (Source: processed secondary data, 2018)

Organoleptic Analysis. The organoleptic analysis is one of the analyses used to determine whether a product is suitable or not, especially food products are preferred or not liked. The results of this assessment will be used as a basis for the chips industry to be developed or not because the organoleptic aspect has been accepted by consumers. The results of the organoleptic analysis of corn chips were carried out with 5 testing scales, namely: 5 = very like, 4 = like, 3 = Rather like, 2 = less like it, 1 = Don't like the picture below



Note: 1 = Balado Taste, 2 = Spicy Sweet Balado Flavored Chips, 3 = Sweet Cheese Flavor, 4 = Salted Cheese Flavor, 5 = Empty Flavored Corn Flavor, 6 = Roasted Chicken Flavored Chips, 7 = Roast Cow Flavor, 8 = Taste Flavored Chips

Figure 4 – Spider diagram for organoleptic corn chips with 8 flavor variants

Organoleptic testing showed that corn chips for flavor parameters (purple) with Balado flavored corn chips and sweet spicy balado occupied the outermost point on scale 4 on the spider diagram above. Likewise, for the overall organoleptic parameters, it shows values in the scale range above 3 for the two variants. This value can be interpreted that the average consumer "likes" the aroma, taste, texture, color and taste of corn chips with this flavor

variant. Unlike the chips with sweet cheese flavors, salted cheese and balado flavor, the results of the average rating for the overall parameters are in the range of 2 and above. This value can be interpreted that consumers give a "rather like" rating, as well as the color, taste, aroma, and texture of corn chips for the three formulas. When observed, the panelist's assessment of all corn chips is in the scale of 3 (rather like) on all test parameters except for the salted cheese flavor, sweet cheese flavor and barbeque flavor with overall parameters. Nevertheless, the results of testing of corn chips with different flavor variants organoleptically did not show a significant difference for all test parameters.

Analysis of Production Cost Correlation with the Sales of Corn Chips Product. The correlational analysis is carried out to investigate whether there is a correlation between the production test and the level of sales of these corn chips product. This test is administered using the Pearson *product moment* correlation test, where different annual financial data are used. This test is to ensure the significant correlation between production cost and sales of the corn chips product. The result of this test is presented in Table 3 below.

Table 3 – Average value and Deviation Standard

Variables	Total	Average	Std. deviation
Production cost	36	8425112,97	3856708,430
Sales	36	7,1399	0,32043

Source: processed secondary data, 2018.

The average value of production cost for corn chips product is compared against the standard deviation value. As seen in Table 3 above, the average value 8425112,97; whereas the standard deviation value is 3856708,430. This average value is higher than the standard deviation value. Hence, it can be said that the data is appropriate to be analyzed. Similarly, the average value of sales variable is 7,1399 with the standard deviation value of 0,32043. The average value is larger than the deviation standard value, thus, worthy of analysis.

Table 4 – Summary of the Correlational test result

	r-count ($t_{table} = \pm 1,975$)	Sig. (p-value)	notes
Production cost* sales	0,775	0,000	Significant

Source: processed secondary data, 2018.

The result of the correlation test of the production cost and the sales yields the r-count of 0,775 with the significance level of 0,000. The r-count 0,775 describes that there is a strong and positive correlation between the production cost and sales of corn chips product. This increase in corn chips production is also followed by the positive increase in sales. This is statistically proven that there is a significant correlation between production cost and sales, where the *p-value* 0,000 is smaller than alpha 0,05. Therefore, it also indicates that the production cost of corn chips also influences the increase of sales of the product and impacts on the increase in income. This result indicates that production cost and the sales of the corn chips are promising for the community to utilize this corn commodity and turn it into corn chips. The corn commodity as the leading commodity in Gorontalo can be utilized into corn chips, which have been done by these small-scale industries to increase their economic welfare.

Normality data test of the production cost and sales variables of corn chips. Normality test is to test whether data or the investigated variables or the developed model has normal or abnormal distribution. In linear correlation, the data distribution is expected to have to have a normal distribution. The normality test is conducted using the *Kolmogorov-Smirnov* test, where the test is carried out and proven with the *asymptotic significance*. *Asymptotic significance* value which larger than 0.05, shows that the variables or observed data have a normal distribution, and vice versa. The *Kolmogorov-Smirnov* test result is presented in Table 5 below.

Table 5 – The result of data normality test

Variables	Asymptotic Sig.	Alpha (α)	Notes
Production cost	0.200	0.05	Normal
Sales	0.200		Normal

Source: Processed data, 2018.

Table 5 above shows that the *asymptotic significance* value of production cost and marketing is more than alpha 0.05 (> 5%). Therefore, it can be said that the variables used in the correlation model meet the normal assumption and appropriate to be used.

Linearity Test of Production Test Variable and Sales price of Corn Chips Product. The linearity test is conducted to see whether there is a linear correlation pattern between the variable or insignificant. The test is carried out using the *Test for Linearity* with the significance level of 0.05. Two variables can be said to have a linear correlation when the significance level is less than 0.05. The linearity test of the variable is shown in Table 6 below.

Table 6 – Linearity test of the variable

	Linearity	Alpha (α)	notes
Production cost * sales price	0.000 < 0.05		Linier

Source: processed data, 2018.

From Table 6 above on the linearity test result above, it is known that the significance value on the linearity is 0.000. The significance value of the test for linearity is smaller than the alpha value (0.000 < 0.05). Therefore, it can be concluded that there is a linearity correlation between the production cost and sales price.

Table 7 – Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Production cost	.116	36	.200	.944	36	.066
Log_ Sales price	.112	36	.200*	.906	36	.005

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction.

Table 8 – ANOVA Table

		Sum of Squares	Df	
Production cost	*Between Groups	(Combined)	32.563	202
Log_ sales price	Linearity		29.638	1
	Deviation from Linearity		2.925	201
	Within Groups		.132	35
	Total		32.695	237

Table 9 – ANOVA Table

		Mean Square	F
Between Groups	(Combined)	.161	42.624
	Linearity	29.638	7836.628
	Deviation from Linearity	.015	3.847
Within Groups		.004	
Total			

Table 10 – ANOVA Table

		Sig.
Between Groups	(Combined)	.000
	Linearity	.000
	Deviation from Linearity	.000
Within Groups		
Total		

CONCLUSION

The conclusion of this study is 1) benefit of chips very depending on the type of packaging; 2) the advantages of chips are increasingly increasing; 3) based on the results of the organoleptic test seen from the aroma, taste, texture and the most preferred color is Balado.

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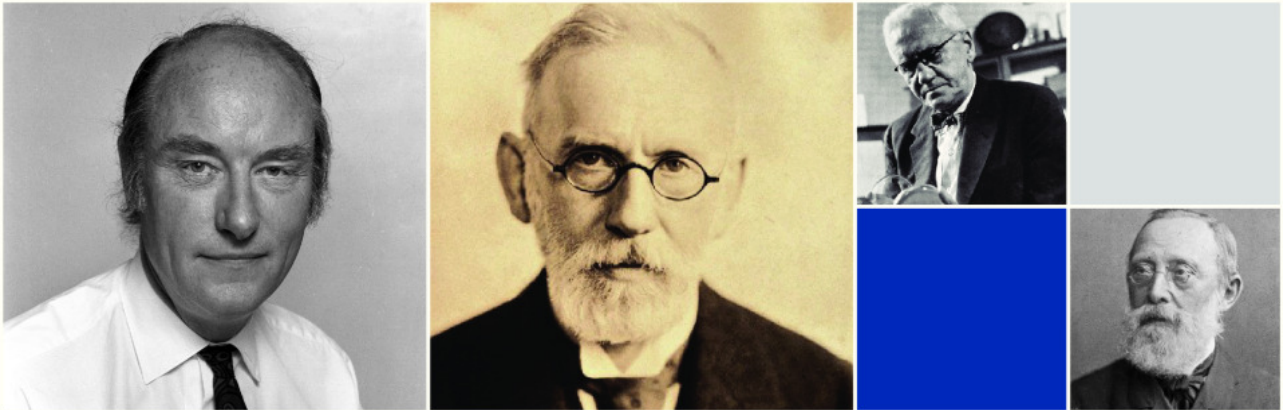
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