

## ANALYSIS OF GINGER PRODUCTION FOR EMPLOYMENT CREATION

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### **Abstract:-**

*Ginger is a biopharma plant with the largest number of production in Toba Regency while turmeric is in the second position, and the third is galanga, where the types of ginger planted, are empirical ginger and elephant white ginger. This research was conducted in Toba Regency in February 2019 with consideration of the selection of areas where the ginger is the biopharma plant with the highest number of production and the area is in the second position with the most ginger production in North Sumatera Province. The purpose of this study is to find out that ginger farming is one of the business alternatives that can create jobs and find out the problems faced by farmers in conducting ginger cultivation with the research method used is descriptive method with in-depth interview techniques to agricultural service staff, government agricultural extension workers, and farmers in collecting the required data.*

*The research results show that ginger farming is one of the business facilities that must be developed so that it can provide jobs and improve the economy in Toba Regency with the consideration that there is still new land that has not been used, ginger is a biopharma plant with the largest production amount, ginger which is produced has been exports to another country, and agricultural products are the driving force of the economy in Toba Regency.*

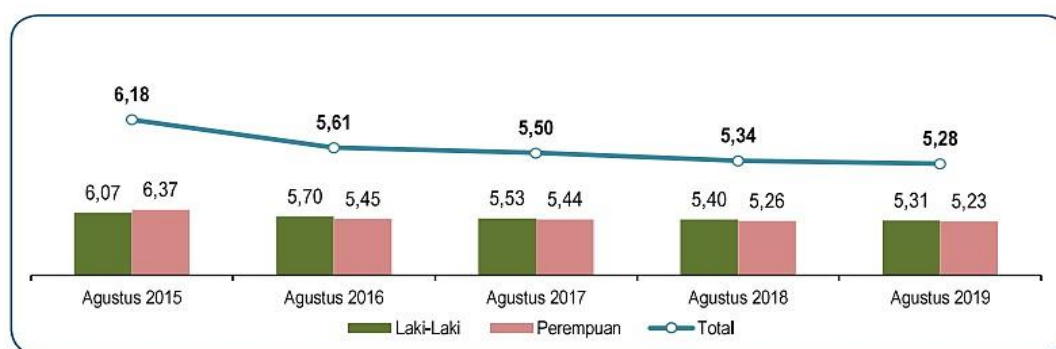
**Keywords:** - *Ginger cultivation, unused land, Unemployment, Ginger Price, and Toba Regency*

## INTRODUCTION

Based on the Indonesian Central Bureau of Statistics (BPS), Indonesian labor conditions based on the National Labor Force Survey, where the open unemployment rate/Tingkat Pengangguran Terbuka (TPT) in February 2019 reached 6.82 million inhabitants or 5.01% whereas in August 2019 it reached 7.05 million people or 5.28%, which increased from August 2018 but the percentage decreased 5.34%. BPS-Statistics Indonesia added that the unemployment rate in February 2020 calculated before the Coronavirus disease (COVID19) broke out in Indonesia increased to 6.88 million people where this figure rose by 60,000 people or 0.06 million people when compared with February 2019.

The highest open unemployment rate (TPT) in Indonesia came from high school (SMA/SMK) graduates while Figure 1 shows that the open unemployment rate from 2016– 2019 wherein 2019 the TPT rate was dominated by men were 5.31 percent and women were 5.23 percent. Based on the BPS-Statistics Indonesia, Banten Province was the largest open unemployment rate in 2019 at 8.11% while Bali was the smallest percentage at 1.52% from the 34 provinces in Indonesia. On the other hand, North Sumatra Province was ranked eleventh with an open unemployment rate (TPT) in 2019 of 5.41 percent which decreased from 5.56 percent in 2018 where the population in that two years was unchanged at 265 million, an increase from 261.9 million in 2017.

**Tren Tingkat Pengangguran Terbuka (TPT) Menurut Jenis Kelamin (persen), Agustus 2015–2019**



**Figure 1. The Open Unemployment Rate (TPT) trends from August 2015 to 2019 Source: BPS-Statistics Indonesia**

In 2018, Indonesia was the second-largest country that has biodiversity, including biopharma, which is beneficial in medical aspects after Brazil which has the Amazon Forest as the largest tropical forest in the world (Listyana, 2018). She found that in Indonesia and the world there was a tendency for people to consume traditional medicines because lifestyle changes are returning to nature and the high cost of medicines makes the demand for medicinal plants higher. Hence, in Indonesia, there are 9 types of biopharma plants grown by farmers, namely ginger, galanga (lengkuas), east Indian galangal (kencur), turmeric, zingiber aromaticum (lemmpuyang), java turmeric (temulawak), black turmeric (temuireng), Chinese keys (temukunci), and sweet root (dringo) with the largest amount of production came from ginger for 2 consecutive years, in 2017 was 216,586,662 kg which decreased in 2018 to 207,411,867 kg while turmeric came in second place with the amount of production in 2017 was 128,338,949 kg and increased in 2018 to be 203,457,526 kg (BPS-Statistics Indonesia).

Setiawan and Pujimulyani (2019) stated that ginger (*Zingiber Afficanate*) is one type of spice which is widely used as a beverage ingredient, food seasoning, herbal medicine, and others that have several relatives included in the Zingiberaceae family, such as Wangi Lempuyang Wangi, Bengle, Benglai Ghost, Lempuyang And Galangal. On the other hand, ginger is used as a mixture of seasoning of food or drinks, medicines, perfumes, cosmetics, stimulates the digestive glands, both to arouse appetite, can reduce cholesterol levels, prevent of blood clots, prevent nausea, and help neutralize damaging effects caused by radicals in the body (Dewi, 2020).

In 2018, North Sumatra Province was in the 7th position with the highest number of ginger production in Indonesia which was 5,452,774 kg, where the number of production decreased from 2016 was 8,400,336 kg, and in 2017 was 7,263,534 kg. The ginger in North Sumatra Province is produced by the cities/regencies contained therein, including Toba Samosir Regency with the second-highest amount of ginger production after Simalungun Regency in 2015 and 2016 while North Tapanuli ranks third. The Toba Samosir Central Bureau of Statistics argued that the number of job seekers registered at the Office of Manpower and Transmigration in Toba Regency in 2019 was 665 participants were coming from 11.58% graduate or 77 participants, 4.51% bachelor or 30 participants, and high school (SMA/SMK) 83.91% or 558 participants and that the number was an increase from 377 job seekers in Toba Samosir Regency in 2018.

## RESEARCH METHODS

The purpose of this research is to see and know that the ginger farming business is an alternative that can create jobs in Toba Regency while the problems faced by farmers in conducting ginger cultivation will also be discussed by the author.

The author uses a primary collection method in the form of in-depth interviews directly with farmers and agricultural extension workers as well as secondary data obtained from the Central Statistics Agency documentation. In-depth interviews were conducted in Toba District on February 13-16, 2019 with resource persons from the Ministry of Agriculture staff (1 staff), agricultural instructors from the Ministry of Agriculture (3 staff), and farmers (14 farmers). "In-depth interviews are a process of exploring information in depth, openly, and free with problems and research focus and directed at the research center. In this case the method of indepth interviews is carried out with a list of questions prepared previously" (Moleong, 2005: 186). The questions and summary of the results of the respondents are as follows:

**Table 1. List of Questions and Answers from Respondents**

<b>Questionnaire to the Agriculture Instructor</b>	
<b>Questions</b>	<b>Answers</b>
Are there any suppliers that sell ginger seeds in the area here?	Until now, there are no suppliers that sell ginger seeds. In this area, farmers buy ginger seeds from other farmers who have excess ginger seeds or they supply their own ginger seeds from the newly harvested ginger plants for re-cultivation.
What problems do farmers face when conducting ginger cultivation?	There are two main problems faced by farmers when cultivating ginger, namely pest and disease, and uncertain prices from distributors. The absence of socialization from the government related to the cultivation of ginger is good and right, especially to the handling of pest disease, making farmers cultivate ginger with the knowledge and abilities they have. On the other hand, the ginger price is determined by the distributor, the government has not yet followed up because the program and the government's main focus is the provision of food availability, namely rice and corn.
What role does the government play in dealing with the low price of ginger given by the distributor?	
What assistance does the government provide regarding ginger Cultivation?	There is some assistance provided by the government to farmers such as assistance in the form of leasing agricultural equipment (tractors, harvesting machines, etc.) so that farmers can easily cultivate and do not need to buy agricultural equipment which is very expensive. As for the assistance in the supply of ginger seeds and marketing of ginger, the government has not focused on this.

<b>Questionnaire to Farmers</b>	
<b>Questions</b>	<b>Answers</b>
How much agricultural land do you have? Is more than 1 Ha?	Yes, it is more than 1 Ha, but the land is divided into several parts which are spread to several regions. The land is paddy fields, dry land, and land in the mountain hills.
Is the area of land that you have, all planted with ginger?	To save costs and minimize losses due to falling prices at harvest time, the farmers do some crop cultivation on a number of parcels of land owned. For example, an area of 3 rante planted ginger, 1 rante planted turmeric, and the other rice and corn. Farmers think that equity is IDR.40 million, they will be more comfortable doing some crop cultivation compared to all the capital allocated only for one type of crop cultivation. Difficult to get equity from banks due to the administration that cannot be fulfilled by farmers and farmers' unwillingness to pay the interest of creditors, making them must immediately set aside the profits obtained to be used as capital.
What problems do you have encountered in ginger cultivation?	Before conducting cultivation, the difficulty of getting quality ginger seeds is one of the problems faced by farmers so they tend to set aside ginger that has been harvested to be used as seeds and recultivated. If the plants are 4 – 5 months old, the farmers will do the spraying the ginger so it will not be attacked by pests. This age tends to make farmers pay extra attention because the ginger plant is still very easy to contract the disease so that if the ginger has been exposed to pests, farmers will do a young harvest at the age of 5 – 6 months.
What assistance do you know and get from the local government?	Currently the government is providing assistance in the form of fertilizers and liquid spray so that the

	Plant is not attacked by pests. However, to receive this assistance, the farmer must first register with the agricultural extension agent as the recipient of the assistance, then when assistance is available, the farmer will be informed through the agricultural extension agent to be taken. In addition, the government also has agricultural machines that can be rented by farmers at low prices. This machine is then used in turn/alternately by each farmer so it must be booked in advance.
Besides the obstacles during cultivation, are there still problems encountered related to ginger?	The biggest problem faced and difficult to predict is the price of ginger. Lack of marketing of ginger sales makes farmers only sell ginger to distributors, so the price is determining by the distributors are very influential in ginger farming. We will do cultivation if the price of ginger is good, but this does not last long when the harvest comes, which is likely to decrease prices.
How many family members do you have?	There are at least 5 children owned in one family plus parents and grandparents who also live together.
Do you have good farming skills such as dealing with plants that have been attacked by pests?	From small farmers have been trained to farm so that their farming skills are good enough. But there are some skills that are not possessed because parents have never taught them before such as pest management in certain types of plants including ginger.

### TOBA REGENCY

Based on consideration of historical factors, customs and aspirations of the people and the Regional Government of Toba Samosi Regency, on February 24, 2020, President Joko Widodo has signed Government Regulation/Peraturan Pemerintah (PP) No. 14 of 2020 concerning Changing the Name of Toba Samosir Regency to Toba Regency in North Sumatra Province. The name of the Toba Samosir Regency as an autonomous region within the territory of North Sumatra Province, according to Article 1 of the PP, was changed to Toba Regency which Balige is the capital of Toba Regency with a total of 16 sub-districts.

Toba Regency with an area of 202,180 Ha has population of 184,493 people where 91,724 people were males and females were 92,769 people, with a total number of households (RT) 44,732 RT; 182,673 inhabitants in 2018; 181,790 inhabitants in 2017; and 180,694 inhabitants in 2016. The growth rate of the population in Toba Regency continues to increase from 2016 – 2019 where there are more women than men with a sex ratio of 98.87% in 2019 (BPS of Toba Regency, 2020).

In the Toba Regency Gross Regional Domestic Product (GRDP) report by the 20152019 Business Field released by the BPS, there are 5 main sources of economic growth in Toba Regency namely trade is the largest 1.13%, construction 1.06%, agriculture 0.96%, administration 0.63%, industry 0.23%, and others 0.87%. Over the past 5 years, the economic structure of Toba has shifted from the fields of agriculture, forestry, and fisheries to other economic fields. This was evident from the magnitude of the role of each of these business fields in the formation of the Toba GRDP.

Figure 2. Below shows the biggest contribution in the formation of the Toba GRDP in 2019 was generated by the agriculture, forestry, and fisheries business fields, reaching 30.85 percent, followed by the large and retail trade, car, and motorcycle repair business at 18.16 percent. Furthermore, the construction business sector was 13.89 percent and the manufacturing industry was 10.83 percent whereas the role of other business fields respectively below 10 percent. But of the four business fields, there were only two categories that have increased roles, namely wholesale and retail trade, car and motorcycle repair; and construction. On the other hand, the fields of agriculture, forestry, and fisheries; and the processing industry its role has gradually declined.



**Figure 2. Toba Regency Gross Regional Domestic Product (GRDP) 2015 – 2019**

Source: Badan Pusat Statistik of Toba Regency

Minister of Home Affairs Regulation No. 72 of 2019 dated October 25, 2019 stated that based on the location and natural conditions, North Sumatra is divided into three regional groups, namely the West Coast, the Highlands, and the East Coast where there are 78 districts spread over the area. Toba Samosir Regency with an area of more than 2 million km<sup>2</sup> is one of the regencies in North Sumatra province that produces the most ginger from 2018 amounting to 2,361,443 kg which decreased to 1,055,625 kg in 2019. On the other hand, the percentage of the open unemployment rate (TPT) in 2017 was 2.18% which decreased in 2018 to 2.15% and in 2019 amounted to 1.26% (BPS-Statistics, 2020).

## GINGER PRODUCTION

Most of the population in the Toba Regency depends on their lives in the agricultural sector so that the distribution of the agricultural sector in the Gross Regional Domestic Product of Toba Regency in 2019 was 30.85% (BPS-Statistics Toba Regency, 2020). Hence, one of the development areas of the Toba Regency is the creation of "advanced agriculture". Mr. Sitohang as agricultural extension staff from the Toba Regency Agriculture Department stated that the ginger produced by farmers is a type of empirical ginger/jahe empirit and elephant white ginger /jahe putih besar.

Based on the BPS-Statistics of Toba Regency, ginger was a biopharma plant with the largest amount of production in Toba Regency in 2019 when compared with 3 other biopharma plants namely turmeric was in the second position, east Indian galangal/kencur in the third position, and the fourth position was galanga/laos where Figure 3. below shows that the number of ginger production in 2019 was very much different from the other 3 biopharma plants.



Figure 3. Harvested Area and Production of Biopharma in Toba Regency, 2019

Source: Badan Pusat Statistik of Toba Regency

Table 2. Ginger Production by Sub-District 2016 to 2018 (kg)

No	Sub-District	2016				2017				2018			
		TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV
1	Balige	4,800	-	-	47,302	66,248	34,827	4,921	24,795	-	30,284	9,464	28,350
2	Tampahan	-	-	-	-	-	-	-	-	-	-	-	-
3	Laguboti	28,000	297,836	127,712	170,000	208,208	208,208	283,922	227,136	264,992	198,743	152,370	105,450
4	Habinsaran	-	-	-	150,712	113,577	75,712	151,424	-	132,496	189,280	113,568	-
5	Borbor	-	-	71,128	-	56,784	-	-	56,784	-	-	7,571	-
6	Nassau	-	96,000	34,128	56,756	-	75,711	-	94,640	-	37,856	-	37,000
7	Silaen	82	-	4,533	5,488	5,110	5,901	4,637	8,044	10,712	12,795	7,921	4,892
8	Sigumpar	430	-	3,786	1,892	3,786	15,142	9,464	9,464	9,464	17,035	1,892	900
9	Porsea	-	189,000	18,928	38,000	-	-	-	75,712	37,856	-	18,928	-
10	Pintu Pohan Meranti	13,600	-	7,571	5,678	30,286	-	15,142	9,464	18,928	9,464	28,392	-
11	Siantar Narumonda	-	4,850	946	1,893	1,893	1,893	5,678	4,732	18,927	-	4,732	24,100
12	Parmaksian	-	113,504	9,464	-	9,464	37,856	37,856	7,571	-	17,035	37,856	37,800
13	Lumban Julu	-	150,560	75,712	37,856	-	36,857	68,656	-	-	132,496	56,778	48,000
14	Uluan	25,000	28,000	56,784	37,856	102,211	75,433	47,320	94,640	75,712	94,640	132,496	57,000
15	Ajibata	-	-	9,464	-	-	-	5,678	-	-	-	3,785	1,200
16	Bonatua Lunasi	25,800	-	151,424	5,678	13,250	-	-	45,427	41,641	41,642	-	15,000
Total		97,712	879,750	571,580	559,111	610,817	567,540	634,698	658,409	610,728	781,270	575,753	359,692

Source: BPS-Statistics Toba Regency

Table 2. above shows the amount of ginger production by quarter in each district in Toba Regency from 2016 to 2018 where the largest amount of ginger production, 721,555 kg, came from Laguboti sub-district while the second position was Habinsaran sub-district at 435,344 kg, and Uluan District was in third position with the number of production of 359,848 kg. A significant increase of ginger production occurred in the Siantar Narumonda sub-district from 2017 to 2018 by 336 percent or 47,759 kg where the second position was from Lumban Julu sub-district by 225 percent or obtained the amount of ginger production 237,274 kg and in the 3rd position came from Bonatua sub-district. Pay off with an increase of 167 percent or 98,283 kg. There are several sub-districts that do not produce ginger every quarter, such as the Habinsaran, Borbor, and Nassau sub-districts while Tampahan sub-district does not produce ginger from 2016 to 2018. Significant decreases in the number of ginger production from 2017 to 2018 came from the sub-districts of Borbor, Nassau, and Balige. The decrease in the amount of ginger production was caused by the harvest area of the ginger plant

which also experienced a decline (Table 3). Misgiantoro *et al.* (2017), found that the harvested area, seeds, manure, NPK fertilizer/chemical fertilizer, and labor affected the amount of ginger production planted by farmers where an increase in a land area of one percent would increase production by 0.38 percent.

Table 3. Shows the harvested area of ginger in 2016 was 1.26 million m<sup>2</sup> could produce ginger of 2,108,153 kg, in 2017 there was an expansion of the harvest area of 1.32 million m<sup>2</sup> which affected the increase in the amount of ginger production to 2,471,464 kg. On the other hand, it was found that with a harvest area of 1.20 million m<sup>2</sup> in 2018 which was smaller than in 2016 was able to produce more ginger which is 2,327,443 kg.

**Table 3. Harvested Area of Ginger by Sub-District 2016 to 2018 (m<sup>2</sup>)**

No	Sub-District	2016				2017				2018			
		TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV
1	Balige	20,000	-	-	25,028	35,000	18,400	2,600	13,100	-	16,000	5,000	15,000
2	Tampahan	-	-	-	-	-	-	-	-	-	-	-	-
3	Laguboti	70,000	160,127	70,171	89,947	110,000	110,000	150,000	120,000	140,000	105,000	80,500	55,500
4	Habinsaran	-	-	-	80,166	60,000	40,000	80,000	-	70,000	80,000	60,000	-
5	Borbor	-	-	39,960	-	30,000	-	-	30,000	-	-	3,000	-
6	Nassau	-	50,000	19,958	30,030	-	40,000	-	50,000	-	20,000	-	20,000
7	Silaen	200	-	2,398	2,800	2,700	3,150	2,450	4,250	5,660	6,760	4,185	2,575
8	Sigumpar	1,000	-	2,003	1,001	2,000	8,000	5,000	5,000	5,000	9,000	1,000	500
9	Porsea	-	100,000	10,015	29,921	-	-	-	40,000	20,000	-	10,000	-
10	Pintu Pohan Meranti	14,945	-	4,006	3,004	16,000	-	8,000	5,000	10,000	5,000	15,000	-
11	Siantar Narumonda	-	2,566	501	1,002	1,000	1,000	3,000	2,500	10,000	-	2,500	12,000
12	Parmaksian	-	60,055	5,007	-	5,000	20,000	20,000	4,000	-	9,000	20,000	20,000
13	Lumban Julu	-	80,085	40,059	20,030	-	30,000	40,000	-	-	70,000	30,000	20,000
14	Uluan	20,000	14,973	30,044	20,030	54,000	40,000	25,000	50,000	40,000	50,000	70,000	30,000
15	Ajibata	-	-	5,007	-	-	-	3,000	-	-	-	2,000	1,000
16	Bonatua Lunasi	60,000	-	80,119	3,004	7,000	-	-	24,000	22,000	22,000	-	8,000
<b>Total</b>		<b>186,145</b>	<b>467,806</b>	<b>309,249</b>	<b>305,962</b>	<b>322,700</b>	<b>310,550</b>	<b>339,050</b>	<b>347,850</b>	<b>322,660</b>	<b>392,760</b>	<b>303,185</b>	<b>184,575</b>

Source: BPS-Statistics Toba Regency

The difference in the number of ginger production to the area of the ginger harvest because of the use of ginger seed rhizomes, cultivation techniques, the use of compost/chemical fertilizers, and continuous land use. Saputra *et al.* (2018) found that continuous land use resulted in reduced soil fertility so that production yields declined where the disease that attacks the ginger rhizome is generally still left on the ground along with the remnants of the ginger rhizome when processing land after harvesting so that it will result in the attack of ginger plants in subsequent cultivation. On the other hand, the increase in ginger production and quality can be achieved by the use of quality seed rhizomes obtained through the determination of growth patterns, hormonal balance regulation, both naturally through microclimate regulation, as well as by administering growth regulators (ZPT) during the production process in the field and storage (Rusmin *et al.*, 2020).

### FLUCTUATING OF GINGER PRICE

Prinanda (2019), stated that fluctuations are changes in the rise or fall of a variable that occurs as a result of market mechanisms which can be interpreted as a change in value. The definition of fluctuation is a spike or inconsistency of everything that can be described in a graph. Price instability is also felt by ginger farmers in Toba Regency, where Table 4. is the price of ginger determined by the distributor to farmers. Based on the results of the interview, the price of ginger is much determined by the distributor so that farmers tend to cultivate ginger when the price of the ginger is high but it is not a guarantee for farmers to benefit when the harvest comes.

**Table 4. Ginger Pricing in Toba Regency Determined by Distributor (IDR/Kg)**

No	Sub-District	2016				2017				2018			
		TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV
1	Balige	12,000	-	-	3,500	4,000	5,000	4,500	6,000	-	10,000	15,000	8,000
2	Tampahan	-	-	-	-	-	-	-	-	-	-	-	-
3	Laguboti	6,000	4,500	7,000	3,500	3,000	6,000	4,000	4,000	7,000	10,000	15,000	8,000
4	Habinsaran	-	-	-	2,000	5,000	4,000	3,500	-	6,000	8,000	14,000	-
5	Borbor	-	-	3,000	-	5,000	-	-	4,500	-	-	14,000	-
6	Nassau	-	15,000	6,000	3,500	-	4,000	-	4,000	-	9,000	-	10,000
7	Silaen	10,000	-	7,500	3,500	5,000	4,000	4,000	4,300	7,000	10,000	14,000	10,000
8	Sigumpar	6,000	-	4,500	3,500	2,500	3,500	4,000	3,500	7,000	9,000	14,000	8,000
9	Porsea	-	10,000	10,000	5,000	-	-	-	8,000	7,500	-	14,500	-
10	Pintu Pohan Meranti	5,000	-	4,500	3,500	3,000	-	4,500	4,600	7,500	9,000	13,500	-
11	Siantar Narumonda	-	10,000	7,500	3,000	5,000	3,500	5,500	5,500	7,000	-	13,500	10,000
12	Parmaksian	-	10,000	7,500	-	4,000	3,500	4,500	5,000	-	9,000	13,500	10,000
13	Lumban Julu	-	6,000	3,000	3,000	-	3,500	5,000	-	-	8,000	14,000	16,000
14	Uluan	5,000	6,000	4,000	3,500	3,000	3,000	3,500	6,000	6,000	8,000	13,500	16,000
15	Ajibata	-	-	5,000	-	-	-	5,000	-	-	-	13,500	11,000
16	Bonatua Lunasi	6,000	-	5,000	3,000	5,000	-	-	7,000	7,000	9,500	-	15,000

Source: Toba Regency Agriculture Department

Table 4. above shows the lowest price of ginger received by farmers was IDR. 2,500 – IDR. 3,500 which lasted for 8 months in 2017 and the highest price for the year was only IDR. 7,000 which was different from the previous year 2016 with the highest price of IDR. 12,000 and the lowest price of IDR. 3,000. Lack of farmers' ability to market ginger to other markets makes farmers can only sell their agricultural products directly to distributors. On the other hand, the limited capital to process ginger into ready-made products such as ginger candy, ginger powder, dried ginger, ginger oil, etc. is a major factor in producing wet ginger. Hence, price fluctuations tend to have a negative impact on the low price of ginger given by distributors so that it harms farmers, especially until now there has been no role of local governments to overcome the low prices given by distributors.

One way that farmers do to avoid the cheap price from distributors is doing a young harvest with the plant age of 4 – 6 months. Farmers tend to do harvest when the price of ginger is good or it can produce profits for farmers whereas some farmers are forced to do a young harvest because of the inability of farmers to care for ginger plants that have been attacked by pests. According to Ermia (2017), if ginger plants are attacked by pests and diseases, farmers use chemical pesticides with a frequency of spraying two to five times while there is no choice for farmers, except to directly dismantle or harvest all the existing ginger plants.

Pests, diseases, and bacteria that often attack the ginger plant are *Ralstonia Solanacearum* which causes the leaves to dry and tear where the initial symptoms are white spots on the leaves and stems of ginger. Lack of knowledge of farmers in handling ginger plants that have been attacked by pests is the main reason for farmers to immediately harvest young. *Ralstonia Solanacearum* is a disease that does not yet have adequate control methods, only limited to implementing measures to prevent the entry of disease germs, such as the use of healthy land, healthy seeds, treatment of healthy seeds (antibiotics), avoiding injury caused by the use of ash husk, crop rotation, cleaning crop residues and weeds, making irrigation channels so that no stagnant water can flow properly, and routine garden inspections (Rostianan *et al.*, 2009).

## PRODUCTION COST

Production costs are objects that are recorded, classified, summarized and presented by cost accounting, while costs in the broad sense are the sacrifice of economic resources, measured in units of money, which have occurred or are likely to occur for a particular purpose (Ginting & Sagala, 2019). Information from Mr. Sitohang as agricultural extension staff said that a farmer tends to have an area of agricultural land that is divided into several regions or sub-districts in Toba District with an area of 400 m<sup>2</sup> each so the equity that is needed by farmers to ginger cultivation with an area of 20 m x 20 m in 2019 in Table 4. are as follows:

**Table 5. Costs of Elephant White Ginger Cultivation in 2019 (20 m × 20 m)**

No	Uraian	Volume	Harga (Rp)	Jumlah (Rp)
A	SAPRODI			
1	Bibit Jahe	120 kg	25,000	3,000,000
2	Pupuk Kompos	150 Kg	2,000	300,000
3	Pupuk Organik	50 Kg	1,300	65,000
4	Herbisida	1 Ltr	150,000	150,000
5	Kurater	1 Kg	45,000	45,000
6	Pupuk NPK Mutiara	20 Kg	9,000	180,000
	<b>Jumlah</b>			<b>3,740,000</b>
B	TENAGA KERJA			
1	Pengolahan Lahan	2 HOK	80,000	160,000
2	Penaburan Kurater	0.5 HOK	80,000	40,000
3	Membuat Larikan	1 HOK	80,000	80,000
4	Menabur Kompos dan Menanam	2 HOK	80,000	160,000
5	Penyemprotan Herbisida	1 HOK	80,000	80,000
6	Pemupukan ke I dan II	2 HOK	80,000	160,000
7	Panen	1 HOK	80,000	80,000
	<b>Jumlah</b>			<b>760,000</b>
	<b>Total</b>			<b>4,500,000</b>

Source: Toba District Agriculture Office

The cultivation of ginger with an area of 400 m<sup>2</sup> farmers can produce 1 – 2 tons of ginger with a cultivation period of 8 – 12 months. Widyastuti (2015), Ermia (2017), Hamda *et al.* (2018) all stated that ginger with good quality can be harvested at the age of 8 – 12 months, with the characteristic the color of the leaves from green to yellow and the stem becomes dry where with this type of ginger, is used as medicine or herbal drinks whereas ginger with harvest age 4, 5, 6 months (young harvest) is used as a spice of the problem and depends on the urgent needs of farmers.

The results of research conducted by Misgiantoro *et al.* (2017) found that the total cost incurred in ginger cultivation with an area of 1 Ha is IDR. 42,082,785.37 Where the average reception rate of farmers at the time the ginger was harvested and sold was IDR. 63,487,855.63 thus obtained a profit of IDR. 21,405,070.26 for one season. However, if the author does the calculation against the costs incurred by farmers in Toba District IDR. 4.5 million Who have an area of 400m<sup>2</sup>

of agricultural land assuming the price of ginger IDR. 15,000/kg, it will be obtained an income of IDR. 15 million with a profit of IDR 10,500,000 for one growing season.

## NEW PLANTING AREA

Based on the results of a survey conducted by the author, that farming techniques carried out by farmers are still relatively simple where the cultivation of ginger is done on open land that gets enough sunlight and uses simple farming tools such as hoes, shovels, etc. There is still a lot of lands that have not been used by residents so that farmers in the Toba Regency have not cultivated a crop on poly bags or carried out farming with a hydroponics system. Hence, Toba Regency is located on high land with an altitude of 900 – 2,000 m above sea level and various contours of land such as flat, flat, sloping, steep, so that more than 54 percent of 202,180 Ha area of Toba Regency is a forest which is 109,626 Ha in 2019 (BPS, 2020).

The development of ginger cultivation carried out by farmers in Toba Regency can be seen from the new land uses that are attached in Table 6. Agricultural extension officers state that the use of new land used by farmers is to produce ginger with export quality because the new land has good soil nutrients and has not been exposed to chemicals due to the previous planting. Table 4. shows new land clearing data used by farmers to carry out ginger cultivation in each sub-district where the opening of new land use in 2016 is 764,600 m<sup>2</sup>, in 2017 it is 642,800 m<sup>2</sup>, and in 2018 it is 559,240 m<sup>2</sup>.

**Tabel 6. New Planting Area for Ginger from 2016 – 2018 (m<sup>2</sup>)**

No	Sub-District	2016				2017				2018			
		TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV	TW I	TW II	TW III	TW IV
1	Balige	15,000	10,000	15,000	20,000	9,000	-	100	-	12,900	4,000	5,000	5,000
2	Tampahan	-	-	-	-	-	-	-	-	-	-	-	-
3	Leguboti	110,000	30,000	60,000	20,000	40,000	80,000	40,000	50,000	5,000	-	-	-
4	Habinsaran	-	-	25,000	20,000	20,000	50,000	20,000	-	40,000	-	60,000	-
5	Borbor	10,000	10,000	-	30,000	-	-	-	2,000	1,000	-	4,000	-
6	Nasazu	-	-	20,000	20,000	10,000	800	10,700	-	-	10,000	-	-
7	Silaen	400	-	1,500	700	1,500	800	3,300	3,600	3,250	1,650	1,030	910
8	Sigumpar	-	1,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	-	500	-
9	Porsea	-	-	-	5,000	20,000	20,000	15,000	20,000	30,000	-	10,000	30,000
10	Pintu Pohan Meranti	2,000	10,000	5,000	1,000	-	8,000	5,000	5,000	5,000	10,000	8,000	-
11	Siantar Narumonda	-	1,500	1,000	2,500	3,000	1,000	2,000	5,000	2,500	500	4,000	-
12	Parmaksian	-	5,000	20,000	10,000	2,000	5,000	3,000	5,000	20,000	20,000	30,000	10,000
13	Lumban Julu	-	40,000	-	30,000	20,000	20,000	30,000	-	20,000	10,000	20,000	-
14	Uluan	30,000	20,000	35,000	10,000	21,000	15,000	50,000	-	30,000	60,000	-	60,000
15	Ajibata	-	6,000	-	2,000	-	-	-	-	2,000	-	1,000	-
16	Bonatzua Lumsasi	80,000	-	-	20,000	-	-	4,000	2,000	-	8,000	5,000	4,000
Total		247,400	133,500	187,500	196,200	151,500	205,600	188,100	97,600	176,650	124,150	148,530	109,910

Source: Toba Regency Agriculture Department

## LABOR

Based on data of Toba Regency Manpower and Transmigration Office, the number of job openings registered in 2019 was 3,653 vacancies but only 100 vacancies were fulfilled. On the other hand, the percentage of registered job seekers is dominated by high school/vocational school graduates at 83.91 percent, undergraduate 4.51 percent, and graduated 11.58 percent. This happens because in the world of work the educational background is very important as a requirement to be accepted to work in a company (Arnawan, 2017) while Rusli (2010), argues that the public values people who study in higher education or those who have a bachelor's degree.

Several things lay behind the community with SMA/SMK graduates deciding not to continue their education to the tertiary level such as working to help parents continue their business, social factors that friends invite to work immediately, and inadequate economic factors (Nurhidayah, 2018). Hence, farmers in Toba Regency employ workers from high school graduates to assist them in cultivating a crop where later the high school graduates will receive a daily wage or called Daily Workers (HOK). The daily wage given by farmers to laborers in Toba Regency is IDR. 80,000 – IDR. 100,000 or depending on the negotiation of farmers and labor recipients but the wages do not include the cost of cigarettes, food, and drinking so if a worker works from Monday – Saturday then the number of wages received for a month is IDR. 2,400,000.

## DISCUSSION

To find out exactly the problems faced by farmers in producing ginger, the author conducted in-depth interviews with agricultural extension workers and farmers who had been carried out on February 13, 2019, for 3 days with questions, list of participants' names, and evidence of visit attached in the attachment in point 1 – 3. As for the results of the group discussion together with agricultural extension workers from the Department of Agriculture and farmer groups, there are several problems faced by farmers in conducting ginger cultivation in Toba Regency including equity; fertilizer supply on the market; cultivation techniques related to disease and pest management; availability of superior ginger seeds; and the low price of selling ginger to distributors is the main problem faced by farmers. The discussion of these problems is as follows:

1. Equity. Table 7. shows the calculation of the amount of income obtained by farmers from ginger cultivation. In general, farmers have more than 1 hectare of agricultural land which is divided into several different areas, from which farmers carry out 3 types of agricultural cultivation such as ginger, shallot, and rice. As for the agricultural land area



of 1 Ha of ginger, farmers will benefit IDR. 87.5000.000 where if divided by the ginger cultivation period for 10 months, every month farmers can only use IDR. 8,750,000 for living expenses needed by the family. The funds are felt to be insufficient considering the number of family members from farmers is more than 6 people, but housewives must be able to use the available funds to meet every need.

**Tabel 7. Calculation of Ginger Sales Revenue**

Area	Equity	Production (kg)	Price (8.000/kg)	Profit	Living Cost Divided in 10 months
400 m2	4,500,000	1,000	8,000,000	3,500,000	350,000
1 Ha	112,500,000	25,000	200,000,000	87,500,000	8,750,000

Source: Author Analysis

2. Availability of good quality ginger seeds. The availability of good quality ginger seedlings in the market is very difficult, so they produce their own ginger seed and then re-cultivate it.
3. Cultivation technique. Farmers will harvest young with the age of 5-6 months because the ginger has been attacked by pests and diseases. That is because farmers do not understand how to treat ginger plants that have been attacked by pests and diseases and also the local Agriculture Service has not done in-depth research related to these plants.
4. Price fluctuations. The instability of ginger prices from distributors is very influential in the desire of farmers to cultivate these plants. Farmers tend to cultivate ginger when the crop has the best price from distributors, but they also cannot deny that fear of falling ginger prices at harvest often occurs. Farmers do not have the instinct to determine the price of ginger at the time of the harvest, because distributors tend to buy the ginger when the harvest arrives compared to do price agreement before the cultivation is carried out.

## CONCLUSIONS

Based on the results, the author can conclude that ginger farming in Toba Regency is an agricultural business that can create jobs where this can be seen as follows:

1. Based on the Central Statistics Agency that agriculture is the mainstay sector for Toba Regency in moving the economy where the largest contribution in the formation of Toba GRDP in 2019 was generated by the fields of agriculture, forestry, and fisheries which reached 30.85 percent.
2. Ginger is a biopharma plant with the largest amount of production in Toba Regency in 2019 when compared to 3 other plants namely turmeric in the second position, kaempferol galanga/kencur third position, and galangal/laos fourth position.
3. Ginger produced from Toba Regency is of good quality that is well known and is exported to Malaysia and Singapore. On the other hand, based on interviews with agricultural extension workers, information was obtained that investors from India had conducted surveys and offered to collaborate to produce ginger from Toba District in large quantities. However, this cannot happen because the price quote cannot be agreed upon.
4. There is a lot of lands that have not been used by farmers in Toba District so that to increase the amount of production the expansion of land is very easy to do by farmers.

## SUGGESTION

1. The role of the Toba Regency government in terms of providing "price stability" of ginger so that distributors do not have more power in terms of suppressing the price of ginger to farmers.
2. At present, the government has assisted in the form of agricultural extension staff so that farmers groups are formed, therefore it is hoped that through farmer group discussions can have a positive impact in the form of solutions related to good and correct ginger cultivation techniques; pest and disease management, and further development to increase ginger production in Toba Regency.
3. The role of the government in cooperating with cooperatives in the Toba Regency can be maximized so that the utilization by farmers for the need for capital in crop cultivation can be fulfilled.

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## APPENDIX

### 1. Interview Questions

The information obtained by direct discussion so that the ginger farmers listed are not determined by name, but based on ginger cultivation that is being carried out at the time of the interview.

- 1) Discussion related to farmers' biodata and the size of land owned.
- 2) The area of ginger farming land and the obstacles experienced by farmers.
- 3) Discussion on cultivation techniques, amount of production, marketing of ginger/sale, and price of ginger.
- 4) Discussion of the type of assistance provided by the Toba District Agriculture Office and its use by farmers.

## 2. List of Farmers and Agricultural Extension

No	Name	Profession
1	Welvin Sitohang	Agricultural Extension
2	Wiston Sinaga	Agricultural Extension
3	Siregar	Agricultural Extension
4	Rut Melisa	The staff of the Agricultural Department
5	Amg. Pangaribuan/br.Siregar	Ginger Farmer
6	Amg. Linda Sitorus	Ginger Farmer
7	Amg. Angel Sitorus	Ginger Farmer
8	Amg. Adelia Pardosi	Ginger Farmer
9	Amg. Theresia Sitorus	Ginger Farmer
10	Amg. Robertus Sitorus	Ginger Farmer
11	Amg. Rosma Manurung	Ginger Farmer
12	Amg. Erlita Sitorus	Ginger Farmer
13	Amg. Gabe Manurung	Ginger Farmer
14	Op. Kembar Sitorus	Ginger Farmer
15	Amg. Mula Sitorus	Ginger Farmer
16	Amg. Mikael Simatupang	Ginger Farmer
17	Amg. Siagian/br.Pangaribuan	Ginger Farmer

## 3. Photos



The building used by agricultural extension workers

