Prospects of Chrysanthemum Development in North Sulawesi

Conny N Manoppo*, *Ibrahim* E. Malia, *August* Polakitan dan *Louise* Matindas

North Sulawesi Assessment Institute of Agricultural Technology, Kalasey-Manado Agricultural Campus

Abstract. Tomohon City is the largest producer of chrysanthemum in the North Sulawesi. The aim of the research: to analyze the prospect of chrysanthemum development. The study was conducted in five sub-districts in Tomohon City, in May – October 2021. The samples are 50 chrysanthemum farmers, and 7 ornamental plant traders. Data analysis uses descriptive analysis, SWOT analysis, and financial feasibility analysis. The results showed that: The prospect of developing Chrysanthemum in Tomohon City has good prospects, where the potential is in the many events or local celebrations that always require cut flowers. These regular moments include Thanksgiving, Christmas and New Year. There are also National and International events such as TIFF, Bunaken Festival, Lembeh Festival, Tondano Festival, Manado Fiesta, Export opportunities are mainly supported by direct flights to several countries, such as: Singapore, Malaysia, Philippines, China (7 cities), and Japan. Financial feasibility of chrysanthemum farming in Tomohon City with an R/C Ratio indicator of 2.30; BEP for production volume: = 4558,952 stalks. This means that the turning point is reached if Chrysanthemum is produced: 4558,952 stalks/screen house. BEP for production price; IDR. 1,477. That is, the turning point is reached if the selling price of Chrysanthemum is IDR. 1,477.

1 Introduction

Chrysanthemum (*Chrysanthemum* sp.) is a horticultural commodity that has high economic value and bright agribusiness prospects. Apart from being one of the most liked of cut flowers, chrysanthemums are universal, meaning they are in demand by all people. The varieties also vary, both in terms of shape and color. In addition to its wide utilization, it can be used as the main flower in flower arrangements, another advantage is that it lasts longer. [1] stated, the increasing need for ornamental plants is in line with the increasing standard of living and welfare of the community, thus providing opportunities for chrysanthemum farming to farmers, namely by expanding the chrysanthemum cultivation business.

Chrysanthemum continues to be a commodity ornamental plants that have strategic potential in developing the national economy. In the last five years, chrysanthemum has become an ornamental plant commodity in Indonesia which has a high level of highest production among other types of ornamental plants [2]. Chrysanthemum of harvested area of

* Corresponding author: connybptpsulut17@gmail.com

1,110.52 hectares in first place by beating second place with harvested area of up to 411.10 hectares and a pleasant night with a harvested area of 309.67 hectares in order third [3]. During domestic chrysanthemum production, year period 2015 to 2019 chrysanthemum even leads as a type of cut flower that has volume the highest export in the sub-category of ornamental plant horticulture [4]. Japan's demand for chrysanthemums exceeds the demand for other types of flowers. Current suppliers of chrysanthemum for overseas markets are not only Indonesia, but also from other developing countries such as Columbia, Zimbabwe, and South Africa [5; 6]. Planting flowers that are in high demand has a high selling value, because of the very competitive market potential and bright prospects [7].

North Sulawesi is one of the flowers producing areas including chrysanthemum in Eastern Indonesia. Tomohon City is the largest producer of chrysanthemum in the province. The geographical condition of Tomohon City which has Mount Lokon which is still active, located 600-800 m above sea level, makes this plant fertile and quickly adapts to an environment that supports the development of its cultivation. According to [8], chrysanthemum cultivation will be successful if 95% of the environmental conditions meet the cultivation criteria. Furthermore, it is said that chrysanthemum flowers can grow well, at an altitude of about 600-1200 m above sea level. Locations for planting chrysanthemums spread throughout Indonesia from 700 – 1,200 m above sea level [1].

One of the criteria for determining commodity priority products is market-oriented and based on local resources. The research objectives were to analyze the prospect of chrysanthemum development [9].

2 Research methodology

The research was conducted from July to August 2021. The research location is in Tomohon City, North Sulawesi Province. The selection of the research location was done deliberately with the consideration that the location was a chrysanthemum planting center area. The number of respondents was 57 people, consisting of 50 flower farmers (chrysanthemum farmers and other flower farmers who have the potential to develop chrysanthemum farming), 7 flower shops, flower traders in traditional markets and the Tomohon Indonesian Flower Association (ASBINDO). Other key informants are from the technical side, the private sector and other chrysanthemum agribusiness actors who are familiar with chrysanthemum cultivation and marketing in production centers.

Secondary data comes from reports and publications at the Horticulture Research and Development Center, Director General of Horticultural Crops, AIAT, Technical Service, and other related institutions. Primary data sourced from farmers, florists in the city of Tomohon, includes the identity of respondents, data on Socio-Economic identification and Chrysanthemum Farming System at the producer-florist level, data on various program assistances that have been received and their benefits at the chrysanthemum farmer-florist level as well as data on system problems. farming in the context of developing chrysanthemum exports.

Data analysis was carried out by qualitative descriptive and quantitative analysis. The quantitative analysis used is an analysis to see the economic feasibility of farming using the Input-output analysis method [10]. The method includes the net income of chrysanthemum farming and its feasibility by using B and C ratios. Meanwhile, to analyze the constraints of chrysanthemum farming which includes aspects of production and marketing in several chrysanthemum production centers, a Likert scale was used [6].

In more detail, the variables analyzed were chrysanthemum planting pattern, variety used, quantity, type, seed and price, organic fertilizer and price, inorganic fertilizer and price, quantity and price of pesticide, labor and labor wages, infrastructure (shade house). , irrigation) and equipment, production quantities and production prices, harvest and post-

harvest, marketing, dissemination of chrysanthemum technology from Horticulture Research and Development Center, reasons for farmers to engage in chrysanthemum farming activities, constraints in farming and marketing of chrysanthemums.

Net income of chrysanthemum farming is calculated using the following formula [11]:

$$\pi = Y.Py - \sum_{i=1}^{n} Xi.Pxi - BL \quad (1)$$

Where:
π = net income of farming (IDR/ha/year)
Y = Total chrysanthemum production (kg/ha/year)
Py = selling price of chrysanthemum (IDR/kg)
Xi = Level of use of the ith farm input (IDR/ha/year)
Pxi = Price of the i-th farm input (IDR/unit)
BL = Other costs (IDR/ha/year)

Meanwhile, the feasibility of chrysanthemum farming is calculated using the formula [11]:

$$R/C = \frac{(Y \times P)}{TVC} \quad (2)$$

Where:
R/C = Ratio of revenues and expenses
Y = Total chrysanthemum production (kg/ha/MT)
P = selling price of chrysanthemum (IDR/kg)
TVC = Total cost value (IDR/ha/MT)

By decision:
R / C > 1, farming is economically profitable
R / C = 1, farming is economically at the break-even point (BEP)
R / C < 1, farming is economically unprofitable (loss)

In order to improve chrysanthemum farming and formulate a strategy for developing chrysanthemum plants, a SWOT (Strength, Weakness, Opportunities and Threats) analysis was used. namely a systematic framework/guide in discussions to discuss basic alternative conditions that might be considered for agribusiness. [12] SWOT analysis is used to identify various internal factors and external factors to formulate strategies.

3 Results and Discussion

3.1 Characteristics of Ornamental Plants Farmer Groups in Tomohon City

The number of chrysanthemum-based ornamental plant farmer groups in Tomohon City is 49 groups. From the observations of the enumerators, the Ornamental Plant Farmers Group in Tomohon City is specific. Most of them are formed on a greenhouse basis, where the group leader is the owner of the green house while the group members are generally day laborers. The satisfaction level of these members is quite high because the daily salary is quite high compared to other workers such as construction and plantation workers. There are group members who double as daily workers who do their own cultivation using the green house of their leader on a rental system.

The number of members in a farmer group varies from 10-15 people. At the beginning of formation, the number of members in a farmer group was 15-25 people, which were formed as required by the local government. In addition to using screen houses, there are also group

members who use pots, but the number is decreasing and is currently less than 10%. In planning for farmers who still use pots, they will switch to using greenhouses if they have sufficient capital.

3.2 Characteristics of Chrysanthemum Cultivation in Tomohon City

The cropping pattern of cut flower chrysanthemums in Tomohon City is cultivated in monoculture, the business scale is relatively small, and most of the application of technology from the production process to post-harvest is still simple. Chrysanthemum flower plant requires adequate water but is not resistant to rainwater [13]. Therefore, for areas with heavy rainfall, planting is done in a greenhouse. This change occurred after the implementation of Tomohon International Flowers Festival (TIFF). Currently, the cultivation of chrysanthemums in greenhouses is still using conventional methods so that it is difficult to regulate the watering process and light, which causes delays in the flowering of chrysanthemums. [8] The purpose of making protected houses is to obtain suitable microclimate conditions and protect plants from pests and direct environmental stresses to obtain optimal results in the environment where they grow. In the preparation of a protected house that needs to be considered are the design, shape, materials protected by the house, height, roof, and walls of the protected house. The results of data analysis show that more than 90% of chrysanthemum farmers in Tomohon City use green houses. The average greenhouse area is 10 x 25 = 250 M^2.

Based on the flower buds, the characters of the chrysanthemum planted were standard and spray types. The type of seed used is mostly cuttings. The length of the cuttings varies by 5-10 cm. The cuttings used are grounded first to grow roots. Once rooted, ready to be transferred to the field. Chrysanthemum seeds obtained from seed breeders who are currently active 5 people. The stock of seeds that can be supplied by breeders is not sufficient for the needs of farmers in Tomohon City, so they have to order from the island of Java. Initially they ordered via UPBS Balithi from West Java, but during the Covid 19 pandemic, they were constrained by the length of the delivery process (about 5 days), so they ordered from East Java via Cargo.

The fertilizers used, both types and dosages, generally follow the instructions obtained from training, whether organized by the North Sulawesi AIAT, the Ornamental Crops Research Institute and by the Agriculture Service of the City of Tomohon. The use of fertilizer per season per green house (250 m^2) were manure (chicken) 30 sacks, SP36 50 kg, NPK plus 15 kg (Ponska plus, Mutiara etc.), and urea (observe leaf growth).

The types of pests that attack farmers' chrysanthemums are trips, lice, and leaf borers. While the diseases that usually attack are leaf rust, wilt, and stem rot. Farmers generally feel that they can overcome these pest and disease problems through preventive measures such as sanitation and mechanics or using pesticides. The types of insecticides used are Decis, Cannon, Curacon, Dursban. While the types of fungicides used were Dithane 45, Antracol and Amistar Top.

The production obtained in stalk units varies between farmers, this is in accordance with the area of land (green house) owned by each farmer. For a land area of 250 m^2, the average production per season is 20,000 flower stalks. The green house area is 200 m^2 producing 16,000 stalks, the land area is 140 m^2 producing 9,000-11,000 stalks. Production Age 95-115 days.

Stem chrysanthemum products are marketed to florists, flower markets, and decorators. Routinely sales are made to florists, while sales to flower markets and decorators are only incidental, especially if there are religious events or festivals. Some farmers also have subscriptions to certain churches (especially the Catholic Church) which indeed use flowers every week in their worship processions. The price obtained by farmers when sold to florists

is around IDR 3,000-3,500 per stalk. Meanwhile, if you sell it yourself to an incidental flower market, the price will reach IDR 4,000-5,000. The maximum price set for religious events is the same as the selling price to the florist. The marketing area is the local market of Tomohon City, Manado City, and Cities in North Sulawesi, Gorontalo Province, Central Sulawesi, East Kalimantan, North Maluku and Papua. However, there is no definite data on deliveries to other provinces because they are incidental.

3.3 Potential of Floriculture Land in Tomohon City

The City of Tomohon, dubbed the City of Flowers, has been identified by the local government, both the Tomohon City Government and the North Sulawesi Provincial Government. The potential land for floriculture is presented in Table 1. Although in general the potential is described in 5 sub-districts in Tomohon City, currently the existing ones are concentrated in one sub-district, namely North Tomohon District with a potential area of 100 ha. The land potential does not include the potential for conversion from other uses, such as plantations and food crops, if in the future the development of floriculture provides prospects for benefits that have comparative and competitive advantages.

Table 1. Potential land for Floriculture in Tomohon City.

No	Subdistrict	Potency (Ha)
1.	West Tomohon	10
2.	North Tomohon	100
3.	South Tomohon	25
4.	East Tomohon	10
5.	Central Tomohon	30
Total		175

3.4 Prospects of Chrysanthemum Plant Development

The prospect of chrysanthemum development in Tomohon City is quite promising. However, the production of chrysanthemum flowers in Tomohon has not been able to meet market needs because of the limited area of land cultivated by farmers, and inadequate control of farming management. The increasing production must be increased through extensification and intensification [8]. Research results [14] showed that chrysanthemum production was significantly affected by land cultivation, planting, maintenance and prevention of pests and diseases. Furthermore, it is said that farmers' income is significantly influenced by the price of chrysanthemum flowers, chrysanthemum production, seed prices, fertilizer prices, labor wages, pesticide prices, and other interest prices.

Realizing sustainable agricultural development requires a development strategy, both in the short and long term. The medium-term strategy is a strategy to develop the sub-sector to develop into a potential sub-sector, one of the long-term strategies, namely the determination of the region as a producer of superior commodities [15]. SWOT analysis stands for Strengths (strengths), Weaknesses, Opportunities, and Threats which can be used as a simple analysis to describe strengths, weaknesses, development opportunities and external threats if we cannot optimize existing opportunities. According to [16], the function of SWOT analysis is to obtain information from situation analysis and separate it into internal issues (strengths and weaknesses) and external issues (opportunities and threats). can be a managerial reference for its development.

The results of the analysis of the strengths, weaknesses, opportunities, and threats of chrysanthemum development in Tomohon City, a grid of strengths, weaknesses, opportunities and threats are presented as follows:

3.4.1 Strength

(1) Support from City Government, Provincial Government and Central Government. Government support is very real for the development of chrysanthemums and other ornamental plants in the City of Tomohon, among others, the designation of Tomohon as a "City of Flowers" and facilitated by various National and International events such as TIFF (Tomohon International Flowers Festival), assistance to farmers in the form of funds, technical facilities as well as assistance to farmers and extension workers
(2) Agroecological Potential of Tomohon City. Floriculture which is the main commodity of Tomohon City is considered relevant to the conditions of the agroecosystem in the area. Located at an average altitude of about 600m – 1000 m above the sea level, Tomohon City is the main center for the development of horticultural crops, especially ornamental plants and vegetables. The results of the identification of land potential in the City of Tomohon (Table 1) and the total development area of 175 ha [17].
(3) Farmer groups that have been formed and adequate florists. There are 49 chrysanthemum-based ornamental plant farmer groups in Tomohon City and 16 Florist units which are the main reservoirs for chrysanthemum products from farmer groups.
(4) There are 43 green houses, most of which are associated with total or partial government assistance and assistance.
(5) Socio-culture of the people of North Sulawesi who always come into contact with ornamental plants. There are social, cultural, and religious celebrations. Thanksgiving, Easter, Christmas, New Year, Ketupat Day, Chinese New Year, mourning, marriage, birthdays, both birth and wedding anniversaries, even at the weekly worship services of several Church denominations in North Sulawesi always use flowers.

3.4.2 Weaknesses

(1) The area of land controlled by farmers is still narrow, 140-250m^2.
(2) Most of the farmers do not have adequate land and green house facilities.
(3) The control of farming management by farmers is not sufficient.
(4) Most of the farmers are still grand minded (depending on government assistance or other parties).
(5) The main problem faced by chrysanthemum farmers is the lack of representative seed producers. There are only 5 seed producers in Tomohon City with an average production of 20,000-30,000 cuttings / 2 weeks. Furthermore, farmers order seeds from Java, but apart from being more expensive at IDR. 1,000 compared to locally produced seeds, they are often in danger of being damaged due to the late arrival of the expedition to Tomohon City.

3.4.3 Opportunities

Based on the existing components of excellence as mentioned above, the development of cut flowers in Tomohon City is very promising. The development of productive technological innovations can be carried out by utilizing support from research institutions such as the ornamental plant research center, the Agricultural Technology Study Center, and universities. Support can be in the form of providing technology, or direct assistance (technical guidance) in the field. Likewise, in trainings to improve the professionalism of farmers and business

actors of chrysanthemums and other ornamental plants in Tomohon City, there is a chance to improve immediately.

By fixing the problem of the readiness of farmers and agribusiness actors in Tomohon City, the pattern of developing chrysanthemum cut flowers and other ornamental plants has the opportunity to take advantage of the comparative and competitive advantages available in Tomohon City and North Sulawesi. Several important social, cultural, and religious events in North Sulawesi that can be associated with the development of chrysanthemums include:

(1) Thanksgiving. In North Sulawesi, every year a Thanksgiving Festival is held which is similar to the Thanksgiving Party in the United States and the Philippines. However, it is different from Thanksgiving in the United States which is held simultaneously on every 4th Sunday of November or in the Philippines which is associated with the Proclamation of Independence Day on September 21. In North Sulawesi, thanksgiving is not carried out simultaneously from one district to another. Even between sub-districts in one district or between villages in one sub-district, the implementation time can be different. Usually the "Thanksgiving season is around June to September every year. At the Thanksgiving event, relatives and tourist visitors will head to the village where the Thanksgiving event is being held, so the village will be very crowded on that day. Consumption of interest at the event is quite significant (there is no definite quantity data yet). Furthermore, in certain areas where there are quite a number of Muslims, this Thanksgiving is held in conjunction with Ketupat Day.

(2) Easter. Easter celebrations are a routine agenda for Christians, the majority in North Sulawesi. Usually, each church will use interest that is double that used for weekly services. Recently, the trend of using chrysanthemum has increased at these religious events. Easter is usually held around March-April. Although the main event of Easter is 3 days, from Good Friday to Sunday, but usually there are competitions for 1 week. In the Easter ornaments contest, the fee is a lot of flowers.

(3) Christmas and New Year. Christmas Day falls on December 25 every year. However, the implementation of Pre-Christmas services which are popularly known as the Tree of Light is carried out for 1 month, starting from December 1st until it is connected with the New Year's Day January 1st. The tree of light is carried out by smaller groups. One church usually consists of 2-40 small groups, which in Protestant denominations are called Columns. They take turns doing Pre-Christmas worship every day.

(4) Tuludes. The annual Tulude traditional ceremony is carried out mainly by the people of North Nusa (Sangihe, Talaud and Sitaro islands). Tulude has been carried out for generations and is a sacred and religious traditional ceremony carried out by ethnic communities

3.4.4 Threats

The potential strengths and opportunities for chrysanthemum development in Tomohon City are very dynamic and can increase at any time if all agribusiness actors and their supporting facilities can be improved in terms of quality, capacity, and capability. If we are not able to cultivate the existing potential, then there is a threat of competition both competitively and comparatively. Currently, in North Sulawesi and Indonesia in general, many preserved flower products are circulating, especially from China, including immortal roses, eternal flowers which are fresh flowers, especially preserved roses.

Chrysanthemum farming in Tomohon City often experiences a shortage of seeds, so that the continuity of supply to consumers is inadequate, this can affect consumer perceptions of flowers, and have the potential to shift their choice to alternative flowers, such as immoral roses and even synthetic flowers.

3.4.5 Chrysanthemum development strategy in the city of Tomohon

Based on the results of the SWOT analysis, the strategy for developing chrysanthemum farming in Tomohon can be done through: (1) increasing technical and managerial capacity through technical guidance and training for farmer groups in a sustainable manner, (2). Increasing the chrysanthemum seed meter, (3) Optimizing farmers' land, (4). Optimizing existing greenhouses through setting a planting schedule, (5) marketing network.

Agricultural problems and the powerlessness of farmers in developing their farms are one of the causes of weak capacity building and farmer institutions [29]. This is also explained by [30; 29], the low welfare of farmers in Indonesia is caused by the low capacity of farmers (managerial, technical, and social capacities). The importance of developing the capacity of farmers and institutions in carrying out agricultural business in order to be able to compete and be resilient in the face of global competition. Propagation of chrysanthemum seeds in Tomohon through vegetative propagation, namely shoot cuttings and tillers. The shortage of chrysanthemum seeds experienced by chrysanthemum farmers can be overcome by multiplying chrysanthemums through tissue culture technology. Propagation of chrysanthemum by tissue culture can save time and can obtain a large number of chrysanthemum seeds. According to [23] chrysanthemum plants can be developed with tissue culture through meristem culture techniques, namely tissue culture techniques using young plant tissue parts or meristems. In addition, the advantage of meristem culture is that it is able to produce identical plant seeds with the parent. Rice et al. (1992) said that meristem culture was able to increase the rate of shoot induction and multiplication, was able to improve the quality of the seeds produced and was able to maintain positive morphological characteristics.

Currently, the cultivation of chrysanthemum plants in the greenhouse still uses conventional methods so that it is difficult to regulate the watering process and light, [25] The standard temperature in the greenhouse is between 17^0C-30^0C. For the process of planting and flowering it takes a temperature of 16^0C – 18^0C. [31] In the vegetative phase, the chrysanthemum plant requires an optimal temperature of 22 -28°C, while for the generative phase the optimal room temperature is 16 -18°C with a relative humidity of 90 - 95%. The standard humidity in a greenhouse is 70%-80%. [28] Chrysanthemum is a plant that is affected by the availability of light, both in the growth and flowering phases and allows it to be cultivated throughout the year by controlling the length of the day. Greenhouse conditions affect the state of chrysanthemum flowers in the production process [27]. Many greenhouse buildings are starting to break down, so they need a process to repair. Chrysanthemum plant growth was given a plastic shade and showed good plant growth [26]. [25] The strategy must do for PT Alam Indah Bunga Nusantara for improve the risk is repair the greenhouse to be more optimized than previous, adding a thermostat in the greenhouse.

3.5 Financial Analysis of Chrysanthemum Farming in Tomohon City

[11] That farming costs can be classified into two, namely fixed costs and variable costs. Fixed costs include all agricultural equipment, while variable costs include the costs of production facilities. The cost of production facilities is the cost incurred by the respondent in the production process until it becomes a product such as the cost of seeds, fertilizers, medicines, and labor. Furthermore, it is said that the production cost is influenced by soil structure factors, soil topography, greenhouse area and plant varieties as well as the technology applied by the respondents.

Production is chrysanthemum flowers that have been harvested by farmers in the form of cut flowers. In this study, the calculated production is the yield in one growing season in stalk units. Production costs are costs incurred by farmers in the cultivation of chrysanthemums.

Production costs consist of fixed costs and variable costs. Variable costs include, purchase of seeds, fertilizers, pesticides, payment of labor and operational costs. Fixed costs are costs or expenses of farming that do not depend on changes in the number of goods or services produced, so they will not change even though there is a change in the number of goods and services produced within a certain range. Fixed costs for chrysanthemum farming consist of green house, electrical installation, scissors, plant sprinkler, flower net, hand sprayer, timer, water hose, and water pump.

In this study, farm analysis (production costs and revenue) of cut chrysanthemum was carried out on chrysanthemum farming with production age of 95-115 days, green house area of 140m^2. The results of the analysis of cut chrysanthemum farming are presented in Table 3.

Table 2. Analysis of Production Costs for Chrysanthemum Farming in Tomohon City.

No.	Description	Unit	Volume	Unit price (IDR)	Amount(IDR)
Production cost (Output)					
I.	**Variable cost (Variable):**				
a.	**Production Facility Cost:**				
1.	Chrysanthemum Seeds	Tree	12,000	600	7,200,000
2.	Manure	Bag	30	15,000	450,000
3.	SP36 fertilizer	Kg	20	3,000	60,000
4.	Phonska NPK Fertilizer	Kg	20	3,000	60,000
5.	NPK Mutiara Fertilizer	Kg	10	20,000	200,000
6.	Akarisida (Furadan)	Kg	7	17,500	122,500
7.	KNO3 Fertilizer	Kg	2	50,000	100,000
8.	Pestisida				
	a. Confidor	Ml	200	750	150,000
	b. Cabrio	Ml	200	750	150,000
	c. Agrimex	Ml	200	750	150,000
	d. Anttracol 70 WP / Dithane M45	Kg	1	60,000	60,000
Total					**8,642,000**
b.	**Labor costs:**				
1.	Land Clearing	Men's Power (MP)	1.5	110,000	165,000
2.	Land Processing	MP	2	110,000	220,000
3.	Mound making	MP	2	110,000	220,000
4.	Basic Fertilization and Mixing	MP	2	110,000	220,000
5.	Flower Net Installation	MP	1	110,000	110,000
6.	Lamp Installation	MP	1	110,000	110,000
7.	Sprinkling	Women Power (WP)	3	110,000	330,000
8.	Planting	WP	2	110,000	220,000
9.	Weeding	WP	2	110,000	220,000
10.	Disbunding	WP	2	110,000	220,000
11.	Disposal of old leaves	WP	2	110,000	220,000
12.	Pest and Disease Control	MP	2	110,000	220,000
13.	Harvest and Post-Harvest	WP	2	110,000	220,000
Total					**2,695,000**
c.	**Operating costs:**				
1.	Land Rent (IDR. 600,000: 3 MT)	MT	1	200,000	200,000
2.	Electricity	Month	2	150,000	300,000
				Total	**500,000**

No.	Description	Unit	Volume	Unit price (IDR)	Amount (IDR)
II.	**Fixed cost:**				
1.	Green House (Wood Construction)	M^2	1	140,000	35,000,000
2.	Electrical Installation (cables, Veteng / Hood, Balloon Lights, etc.).	Package	1	3,000,000	3,000,000
3.	Scissors	Pcs	3	50,000	150,000
4.	Watering can	Pcs	2	70,000	140,000
5.	Flower Net	Meter	140	10,000	1,400,000
6.	Hand Sprayer (Swan)	Pcs	1	600,000	600,000
7.	Timer	Pcs	1	120,000	120,000
8.	Water tube	Pcs	50	6,000	300,000
9.	Water pump (Dap)	Pcs	1	750,000	750,000
Total					**41,460,000**
Remarks: Use of Green House and Production Infrastructure for at least 3 (three) years. Paint: Fixed Cost IDR. 41,460,000: 9 MT = IDR. 4,606.667 Fixed Cost Expenditure per 1 (one) Planting Season					
The Fixed Cost per 1 Planting Season					**4,606,667**
Total Cost per Planting Season (I + II)					**16,443,667**
Reception					
Chrysanthemum Flower Production 140 M^2 =		Petiole	10,800	3,500	**37,800,000**
Income					
Input - Output = IDR. 37,800,000 - IDR. 16,443,667)					**21,356,333**

Revenue is the difference between revenue and all production costs (capital). Income shows the amount received by farmers as a result of business. Revenue is the product of the product obtained by the selling price. Total or capital costs are the total costs incurred for all fixed and variable costs. In this study, the costs referred to are seeds, fertilizers, pesticides and labor. Meanwhile, revenue is income that has not been reduced by production costs incurred by farmers in producing chrysanthemum flowers. This revenue is the production produced per growing season multiplied by the selling price. Revenue equals production value. Farming income is the difference between farm income and costs incurred by the farm. Based on the results of the analysis, the farmers' income per planting season is IDR 21,356,333.

From the farming calculations, it can be seen that the chrysanthemum cultivation business is financially very profitable. In one planting season can generate a profit of 70% of the funds invested [24].

3.6 Business Feasibility

The measurement of the feasibility of chrysanthemum farmers in Tomohon City was measured using the BEP and R/C ratio parameters. Feasibility analysis of chrysanthemum cultivation with a land area of 140 m^2 in one growing season.

3.6.1 Break Even Point (BEP)

The breakeven point is the point where total revenue is equal to total costs, the point where profit is equal to zero (17; 18; 19). [20], Said that the Break-Event Point (BEP) analysis is a balance point between total costs and total sales or activity points (production volume) and sales where neither gain nor loss is obtained because total revenue is equal to total expenditure.

The BEP in this chrysanthemum research is the break-even point, which is a point when the chrysanthemum production business does not experience profits and losses.

a. BEP for production volume: = 4,558.952 stalks. That is, the turning point is reached if Chrysanthemum is produced: 4,558.952 stalks/green house
b. BEP for production price; = IDR 1,477. That is, the turning point is reached if the selling price of Chrysanthemum = IDR 1,477. -

From the results of chrysanthemum cultivation, farmers feel the benefits in the form of increased income. This is in line with research [21, 22] that the production of ornamental plants can improve the living standards of the poor who previously did not have a steady income.

3.6.2 Return Cost Ratio R/C

The return cost ratio is the ratio between the income from the sale of chrysanthemums and the costs incurred during the management of the chrysanthemum garden. Based on the formula: R/C ratio = Total Revenues Total Costs Criteria: - R/C□ 1 then the business is feasible to carry out - R/C = 1 then the break-even business - R/C 1 then the business is not feasible to carry out.

Chrysanthemum farming is said to be profitable if the R/C value > 1. The greater the R/C value, the greater the level of profit that will be obtained from the business.
Based on the research results, the R/C ratio of chrysanthemum farming is 2.30

R/C (Amount of Receipt: Expenditure)
R/C = IDR 37,800,000: IDR 16,443,667 = 2.30

Note: Each additional fee of IDR 1, will receive a receipt of IDR 2.30
Feasibility of the Chrysanthemum Farming business: Profitable.

4 Conclusion and suggestion

4.1 Conclusion

1. The development of chrysanthemums in Tomohon City has good prospects, where the potential is in the many local events or celebrations that always require flowers. These regular moments include Thanksgiving, Easter, Tree of Light, Christmas and New Year. There are also National and International events such as TIFF, Bunaken Festival, Lembeh Festival, Tondano Festival, Manado Fiesta, Tomini Festival. Export opportunities are mainly supported by direct flights to several countries, such as: Singapore, Malaysia, Philippines, China (7 cities), and Japan.
2. Financial feasibility of chrysanthemum farming in Tomohon City with indicator R/C Ratio 2.30; BEP for production volume: = 4,558.952 stalks. This means that the turning point is reached if Chrysanthemum is produced: 4,558.952 stalks/screen house. BEP for production price; = IDR 1,477. That is, the turning point is reached if the selling price of Chrysanthemum = IDR 1,477. -

4.2 Suggestion

1. Chrysanthemum cut flower farmers in Tomohon City should maintain chrysanthemum farming because this farming is very profitable, it can be seen from the high market demand, production will definitely be sold. The advancement of marketing technology

for chrysanthemum cut flowers has become easier so that farmers do not have to worry about farming chrysanthemum cut flowers.

2. Expansion of the chrysanthemum planting area by taking into account the characteristics or growing conditions of the chrysanthemum plant is very necessary.
3. The limited number of seeds/seedlings in the field can be overcome by increasing the number of parent plants that can be used as sources of seeds/seedlings
4. Support from the government is needed in the form of the construction of a tissue culture laboratory, in order to meet the needs of seeds/seedlings.

References

1. A.Wasito dan B. Marwoto. Daya Hasil dan Adaptasi Klon-klon Harapan Krisan di tiga zona Elevasi. Direktorat Jenderal Hortikultura. Departemen Pertanian. Jakarta (2004)
2. L.D. Sukmayanti, Mukson, W. Roessal, A. Kusumawardani dan M.I. Alamsyah. Analisis Perhitungan BEP (Break Even Point) dan Margin of Safety dalam Penentuan Harga Jual pada Usaha Kecil Menengah. Jurnal Ilmu Keuangan dan Perbankan. Vol. 9. No. 2. P. 118-132. (2020)
3. BPS. 2018. Statistik Tanaman Hias Indonesia Tahun 2018. Badan Pusat Statistik, Jakarta.
4. BPS. 2020. Analisis Komoditas Ekspor 2012 – 2019. Badan Pusat Statistik, Jakarta.
5. Auni, H. N., M.N. Latifah, and M.A. Khairol. 2002. The Prospect of Japaneses Flower Market and The Potential of Exporting Malaysian Cut Chrysanthemums by Sea Shipment. International Symposium on Greenhouses, Environmental Controls and In-house Mechanization for Crop Production in the Tropics and Sub-Tropics. ISHS Acta Horticulturae 710. (2002).
6. Riduwan dan Sunarto, 2007. Pengantar Statistika untuk penelitian Pendidikan, Sosial, Ekonomi, Komunikasi dan Bisnis. Alfabeta, Bandung. p. 19-36. (2007)
7. R. Kumar dan P. Baiswar. Production Of Chrysanthemum Under Greenhouse Condition. 36.ProductionofChrysanthemumundergreenhousecondition.pdf (2020)
8. I.G.M. Arjana, Yohanes Parlindungan Situmeang and I Nengah Suaria. Study of Development Potential Chrysanthemum in Buleleng Regency. International Kournal on Advanced Science Engineering Information Technology. Vol.5 (2015) No. 5 p. 350-354 (2015)
9. I. Wardani, T.R. Dewi, L. Widiastuti. Perencanaan Strategi Pengembangan Agribisnis Tanaman Perkebunan Unggulan di Kabupaten Sukoharjo. Agric Jurnal Ilmu Pertanian. Vol. 33, No. 1, Juli 2021: 67-80 (2021)
10. P. Gitinger. Journal economic analysis of agricultural project. The economic development institute, Interbational Bank for reconstruction and development. The John Hopkins University Press, Baltimore and London. 221 p. (1972)
11. Soekartawi. Agribisnis Teori dan Aplikasi. Rajawali Press. Jakarta. (2006)
12. Rangkuti. Analisis SWOT. Jakarta: PT Gramedia Pustaka Utama. (2017)
13. S.Sawidin, O.E. Melo, T. Marsela. Monitoring Kontrol Greenhouse untuk Budidaya Tanaman Bunga Krisan dengan Lab View. JNTETI, Vol. 4, No. 4, November 2015
14. K. Swasti, Karno dan Titik Ekowati. Strategi Pengembangan Agribisnis Bunga Krisan di Kecamatan Bandungan Kabupaten Semarang. Agromeda. Vol. 32. No.2. p. 16-23. (2014)
15. O.C. Ferrell, M.D. Hartline. Marketing Strategy. Text and Cases. South Western : Thomson Corporation (2005).

16. Pusat Penelitian dan Pengembangan Hortikultura. Agro Inovasi Melaju di Tomohon Internasional Flower Festival (TIFF) 2021. *Website.* (2021)
17. A. Kusumawardani, M. I Alamsyah. Analisis Perhitungan BEP (Break-Even Point) dan Margin of Safety dalam Penentuan Harga Jual pada Usaha Kecil Menengah. Jurnal Ilmu Keuangan dan Perbankan (JIKA). Vol.9 No. 2. (2020)
18. H. Maruta. Analisis Break Event Point (BEP) sebagai Dasar Perencanaan Laba Bagi Manajemen. JAS (Jurnal Akuntansi Syariah). Vol 2. No. 1. (2018)
19. B. Riyanto. Dasar-Dasar Pembelanjaan Perusahaan. Ed. 4. Yogyakarta. Penerbit: BPFE. Yogyakarta. (2010)
20. K. Mollah. 2016. Analisa Break-even Point Dan Net Present Value Berdasarkan Input Tarif Yang Berlaku Di Klinik Kesehatan Al-Jadid Surabaya. Jurnal IPTEK. Vol 20, No 2 (2016).
21. B. Swapna. Cultivation and Marketing of Tuberose (Lily) Flowers by the Rural Poor: An Approach of SWOT (2018).
22. Helmiatin, E. Susanty. The SWOT Analysis for Chrysanthemum Farmers Business Development Strategies for Fresh Chrysanthemum Farmers. Journal of Business and Economics Review. Vol. 4 (3) 139 – 148 (2019).
23. Nugroho, A dan Sugito. 2000. Pedoman Pelaksanaan Kultur Jaringan. Penebar Swadaya. Jakarta (2000)
24. A.G Pratomo, K.B. Andri. Aspek Sosial Ekonomi dan Potensi Agribisnis Bunga Krisan di Kabupaten Pasuruan JawaTimur. J. Hort. Indonesia 4(2):70-76. Agustus 2013. (2013)
25. J.A. Astaningrum, E. Djuwendah. Analisis Risiko Usahatani Bunga Krisan Potong (Chrysanthenum indicum L) (Studi kasus di PT Alam Indah Bunga Nusantara). PASPALUM Vol. III Maret 2015 (2015).
26. M.F. Masyhudi, Suhardi. Adaptasi Agronomis dan Kelayakan Finansial Usahatani Krisan di Daerah Yogyakarta. J. Hort. 19(2):228-236, 2009.
27. N.Q. Hayati, Nurmalinda, B.Marwoto. Inovasi Teknologi Tanaman Krisan yang Dibutuhkan Pelaku Usaha (Technology Innovation of Chrysanthemum Needed by Stakeholders). J. Hort. Vol. 28 No. 1, Juni 2018 : 147-162 (2018).
28. L. Mufarrikha, N. Herlina, E. Widaryanto. Respon dua kultivar tanaman krisan (Chrysanthemum morifolium) pada berbagai lama penambahan cahaya buatan, Jurnal Produksi Tanaman, vol. 2, no. 1, pp. 10–16 (2014).
29. Aminah S. 2015. Pengembangan kapasitas petani kecil lahan kering untuk mewujudkan ketahanan pangan. Jurnal Bina Praja. Vol 7 (3): 197 – 210
30. Anantanyu S. 2011. Kelembagaan petani: peran dan strategi pengembangan kapasitasnya. Jurnal SEPA, Vol. 7 (2): 102-109
31. N.P.Yuliasih, Sumiyati, Y. Setiyo. Analisis Profil Suhu pada Greenhouse Tipe Arch untuk Budidaya Bunga Krisan (Chrysanthemum morifolium). Jurnal Beta (Biosistem dan Teknik Pertanian) 4(1). (2015)