Abstract. Eighteen years ago, the application of innovative Chrysanthemum cultivation technology was implemented in the Hargobinanung Village area, Pakem District, Sleman Regency and was the location for PRIMA TANI activities, which has an altitude of 600 to 1325 meters above sea level. Chrysanthemum cultivation was first applied to farmers in 2005 by BPPT Yogyakarta in collaboration with BALITHI Cipanas. Although it requires more complicated handling, chrysanthemum cultivation in a controlled environment can provide relatively high additional income in rural areas. Based on data on narrow land ownership in North Sleman Regency, it is necessary to look for alternative commodities with high economic value to make it easier to increase the welfare of farmers. The basic method in this research is descriptive analysis, based on solving actual problems that exist in the present. The research was carried out to conduct an assessment and collect data from several studies on cooperator farmers since 2005 until now. From the results of this study it can be seen that commodity diversification has been created; additional income/income that indirectly increases the welfare of farmers; creating attractive job opportunities for young people (millennials) in rural areas; a higher sense of self-confidence for millennial farmers in rural areas so as to create a mindset worthy of living as farmers in rural areas; as well as the initiation of agro-industry in rural areas through various other farming activities as a multiplier effect from chrysanthemum cut flower farming activities.

1 Introduction

Ornamental plants are one of the potential commodities that can be developed both on a small and large scale, as evidenced by the increasing public interest in the agribusiness of various ornamental plants [1]. This has encouraged an increase in the number of ornamental plant business actors, products, and new development areas for ornamental plants. This interest does not only belong to centres of ornamental plant production, but also to urban communities. The development of the ornamental plant business is in line with the increase in consumer income, demands for environmental beauty, development of the tourism industry, and construction of housing complexes, hotels, and offices. The high demand for ornamental plants makes businesses in the field of procurement of ornamental plants promise big profits, one of the popular ornamental plants is the chrysanthemum [2]. In Indonesia, the demand for chrysanthemum flowers increased by 25% per year, even before 2003 the market demand incurably seed 31.62%. Chrysanthemum ornamental plants are among the most popular flowers because they have advantages, namely the advantages of
rich colors and long lasting. Chrysanthemum is one of the cut flowers with high economic value [3 - 5].

In Indonesia, there are many chrysanthemum gardens in the areas of Lembang, Sukabumi, Cianjur [6], Bogor, Bandungan [5], Batu – Malang, Yogyakarta, and Brastagi Tomohon. However, even on medium plains, chrysanthemum plants can adapt to an altitude of 400 meters above sea level with a temperature of 24 - 260 C. According to Hano Hanafi et al. [7], chrysanthemum cultivation was first introduced by the Yogyakarta Special Region Agricultural Technology Study Center in collaboration with the Cipanas Ornamental Plant Research Institute. Initially, in 2005, a study was carried out on the cultivation of ornamental plants Roses, Chrysanthemums, and Orchids at the Udi Makmur Farmers Group, Wonokerso Hamlet, Hargobinangun, Pakem, Sleman, Yogyakarta. Until 2010, chrysanthemums developed in the Samigaluh District, Kulon Progo Regency, but for almost four years (2019-2022) it experienced a decline in chrysanthemum farming, even stopping completely because of the Covid-19 disaster which hit nationally and even the world. Chrysanthemum cultivation, specially cut chrysanthemums during the coronavirus pandemic (COVID-19) experienced a significant decline because many areas receiving flower supplies were implementing Large-Scale Social Restrictions (PSBB). Alhamdulillah, since 2022 the two locations of Sleman and Kulon Progo Regencies, Special Region of Yogyakarta, have started to revive with relatively limited capital.

Chrysanthemum has a beautiful appeal that can captivate everyone who sees it. Chrysanthemums are rich in color and long lasting [8 – 10]. Yogyakarta is a tourist city so the demand for cut chrysanthemums is very high, which is used for hotel decorations and ceremonies [11,12]. However, the demand for chrysanthemums in Yogyakarta is not proportional to the products produced. About 20% of the need for chrysanthemums in Yogyakarta is met, 80% of which comes from other cities. The Asta Bunda Association is the institution that manages the development of chrysanthemum plants in the Pakem District. The Asta Bunda Association is a group of Udi Makmur farmers formed by a group of farmers in Kaliurang, Sleman Regency, Yogyakarta. The Asta Bunda Association initially accepted an offer from the Yogyakarta Agricultural Technology Study Center (BPTP) in collaboration with the Ornamental Plant Research Institute in 2005 for chrysanthemum cultivation. This farmer group consists of 14 farmers groups who cultivate Chrysanthemum plants. Institutional Asta Bunda Association received capital assistance from the DIY Agricultural Technology Study Center (BPTP) in the form of a UV plastic house covering an area of 240 m² and trials for chrysanthemum flower cultivation of as many as 4000 chrysanthemum cuttings and 800 rose seedlings, but chrysanthemum plants are more suitable for planting on the plains of Kaliurang than rose flowers.

The first planting yielded a harvest of 90 bunches (900 sticks) of chrysanthemum flowers during a growing season of about 3 months [13]. Therefore, they consider chrysanthemum cultivation to be more promising, so they choose chrysanthemum as the superior commodity of the farmer group. Various varieties of flowers are often planted, such as the jaguar, shamrock, regen, white fiji, yellow fiji, jaguar red, jaguar purple, puspita, puma, Bakardi, lineker, and pasopati. The profit obtained by the chrysanthemum flower is very satisfying so it can improve the welfare of the farmer group.

1.1 Group constraints in chrysanthemum farming

In every business there must be obstacles, even in chrysanthemum farming there are also obstacles in terms of production, and relatively large farming costs, especially for buying seeds, using labor, maintenance costs. Farming planning can be done on farming as a single unit (integrated) or just part of it (partial) [14]. A farmer group is an institution that has a function to facilitate farmers in carrying out agribusiness activities from upstream to
downstream. Hence, the function of farmer groups has not been fully realized. Meanwhile, the obstacles experienced by farmer groups were the lack of motivation of farmers, lack of awareness of the role of farmer groups, business of farmers, and lack of extension workers [15]. Common obstacles which are faced in empowering farmer groups are structural obstacles (including policies that are not pro-smallholders), cultural barriers (the attitude of farmers who tend to be apathetic and static towards the times), and natural obstacles (occurring due to natural disasters, plant pests, lack of fertility of the land, and the outbreak of the Covid-19 pandemic).

Gross income in one growing season of chrysanthemum farming has an average income of IDR 9,090,000.00 per 200 m² according to the Association SOP, production costs of chrysanthemum farming in one growing season have an average of IDR 3,260,000.00 per 200 m² and an average net income of IDR 3,900,000.00.

2 Methodology

The research was carried out to assess and collect data from a number of studies and studies that have been carried out by the research team on cooperator farmers who have become government partners in supporting the successful dissemination of technological innovations from the Agricultural Research and Development Agency since eighteen years ago (2005) until now (2023). The writing of the paper was carried out by reviewing and adding the latest data on the results of the development of chrysanthemums after the Covid-19 pandemic. The location determination was carried out purposively with the consideration that Hargobinangun Village was the location for PRIMA TANI activities in Sleman Regency. Research on clusters of ornamental plants, especially chrysanthemum cut flowers, began in 2005 and continues to this day in the PRIMATANI and PUAP programs in Hargobinangun Village, Pakem District, Sleman Regency, Yogyakarta Province. Determining the location using a purposive method with the consideration that the area is used as a place for PRIMA TANI activities. The basic method in this research is descriptive analysis, namely research based on solving actual problems that exist in the present. The data collected was compiled, explained and then analyzed [16].

3 Results and Discussion

Hargobinangun Village is included in the administrative area of Pakem district, Sleman Regency, located at an altitude ranging from 500 to 1,325 mdpl, or included in the medium to high altitude category and has an average temperature of 26°C.

Fig. 1. Commodity Regional Map Based on Agroecological Zones of Hargobinangun Village, Pakem, Sleman.
Regosol soil type is with flat topography up to 40% slope and moderate fertility. The area of Hargobinangun Village is 1,430 ha, consisting of 40,500 ha of paddy fields, and 623.9455 ha of dry land (including yards and fields) [17].

Tabel 1. Hargobinangun Village land use.

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Paddy land</td>
<td></td>
</tr>
<tr>
<td>Technical irrigation</td>
<td>30,60</td>
</tr>
<tr>
<td>Semi-technical irrigation</td>
<td>163,96</td>
</tr>
<tr>
<td>Simple irrigation</td>
<td>92,72</td>
</tr>
<tr>
<td>2. Dry soil</td>
<td></td>
</tr>
<tr>
<td>Yard</td>
<td>361,441</td>
</tr>
<tr>
<td>Farming</td>
<td>246,532</td>
</tr>
<tr>
<td>Moor</td>
<td>137,204</td>
</tr>
<tr>
<td>3. Recreation areas</td>
<td>125,300</td>
</tr>
<tr>
<td>4. etc</td>
<td>204,639</td>
</tr>
<tr>
<td><strong>Jumlah</strong></td>
<td><strong>1,339,998</strong></td>
</tr>
</tbody>
</table>

Source: Hargobinangun Village Monograph, 2011

The residents of Hargobinangun Village, according to their altitude zoning, can be divided into three groups. The first group is residents in the highest locations, namely the Kaliurang and Boyong areas. The average population in this location relies on the bustling visitors to Kaliurang for a living, namely by providing lodging, food stalls, processed products, souvenirs, and ornamental plants. Some of them run a dairy cattle business. So that the land and fields in this location are mostly residential and lodging buildings, while the sloping land is planted with forage plants for animal feed. The second zoning includes the hamlets of Ngipiksari, Banteng, Sidorejo, Purworejo, Panggeran, Tanen, Wonorejo, Sawungan, Wonokerso, and Randu. Residents in this location mostly rely on plantation crops and horticultural crops, including mushrooms, various vegetable crops, flowers, and cut leaves. Some still prioritize food crops. The third zoning includes Pandanpuro, Gondanglegi, and Jetisan hamlets. Most of the residents in this location run farming, the main of which is food crops, however, during the dry season, due to limited water availability, many also cultivate chilies.

Hargobinangun Village has a rain pattern that is influenced by the monsoon system which is characterized by one peak of rain, namely in November - April, while June - September are the dry months with rainfall less than 100 mm. The peak of the rainy season is in January-March and the peak of the dry season is in July-September. With this monsoonal rain pattern, this area is classified as vulnerable to the effects of El Nino, so it is necessary to adjust the cropping pattern in the year that is predicted to occur with an El Nino climate deviation.

Water for household consumption and agriculture comes from springs on the slopes of Mount Merapi. The water is channeled into reservoirs near residential areas, then distributed to people's homes and plastic pools. Buildings or irrigation facilities in Hargobinangun Village include 8 check dams (capable of irrigating 3 ha of land), 7,000 m of irrigation canals, and 56 culverts. At this time the condition of the water system in Hargobinangun Village has decreased compared to previous years. The condition of the irrigation channel has been damaged so that it does not function optimally. In the last year, farmers in Hargobinangun Village (southern part) have experienced water shortages for farming during the dry season. Hargobinangun Village has several water sources (umbul lanang, umbul wadon, tlogo putri, tlogo nirmolo) and a conservation area (forest), which is a water buffer area for the Special Region of Yogyakarta. Because the discharge of water...
from the existing springs is partly used to meet the needs of water both in Hargobinangun Village and outside Hargobinangun, this affects more or less the availability of agricultural irrigation water.

![Monsoonal rain pattern in Hargobinangun Village](image_url)

**Fig. 2.** Monsoonal rain pattern in Hargobinangun Village

In Hargobinangun Village, which is located on the southern slopes of Merapi, with part of the land being a sloping location, the community has implemented a good land conservation system with bench terraces and planting forage crops on the edge of the terrace which functions as an erosion barrier. Meanwhile paddy fields and dry fields are planted with food crops and vegetable crops.

Types of ornamental plants cultivated in Hargobinangun Village are leaf ornamental plants, pots and cut flowers (anthuriums, chrysanthemums, philodendrons, sansevieria). In general, anthurium and chrysanthemum are grown in monoculture under plastic houses in paddy fields. While sansevieria was planted in paddy fields and yards, philodendrons are currently being planted in paddy fields by members of the chrysanthemum farmer group in Wonokerso Hamlet. In addition, several ornamental plant farmer groups in the Kaliurang area have begun to develop ornamental plants in pots and place them in flower stalls and in yards.

### 3.1 Chrysanthemum Business Prospects

Since the introduction of chrysanthemum cut flower farming by BPTP DIY and BALITHI in Hargobinangun Village in May 2005, this farming business has developed quite rapidly. Data can be seen in the table below:

**Table 2.** Data on the Development of Chrysanthemum Cultivation in Hargobinangun Village

<table>
<thead>
<tr>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Poktan</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Number of active Farmers</td>
<td>-</td>
<td>6</td>
<td>10</td>
<td>37</td>
<td>40</td>
</tr>
<tr>
<td>Year</td>
<td>2005</td>
<td>2006</td>
<td>2007</td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>Flower Land Area (m²)</td>
<td>220</td>
<td>550</td>
<td>1,996</td>
<td>4,196</td>
<td>7,200</td>
</tr>
<tr>
<td>Production capacity/season</td>
<td>11,000</td>
<td>27,500</td>
<td>182,000</td>
<td>263,000</td>
<td>369,000</td>
</tr>
</tbody>
</table>
Although the chrysanthemum cultivation technique requires special expertise and high investment input, namely by conditioning a controlled environment in a plastic house, looking at the data in table 2, from year to year more and more farming communities in Hargobinangun Village are interested in running a farming business. chrysanthemum flower. Here we present the results of a feasibility study of chrysanthemum cut flower business as of June 2009.

I. Farming data
1. Area of arable land : 200 m²
2. Rent land : Rp 120,000/ year or Rp 4,000/ season
3. Cost of farming / season:
   o Seed production : 10,000 btg x Rp 175 =Rp1,750,000
   o Organic fertilizers : 300 kg x Rp 500 =Rp 150,000
   o Urea fertilizer : 15 kg x Rp 2000 =Rp 30,000
   o SP36 fertilizer : 15 kg x Rp 4000 =Rp 60,000
   o Kcl fertilizer : 5 kg x Rp 7500 =Rp 37,500
   o Foliar fertilizer : 1 lt =Rp 20,000
   o Insectisida : 10 klgx Rp12,500 =Rp 125,000
   o Fungisida : 10 ktg x Rp 750 =Rp 75,000
   TOTAL =Rp2,247,500
4. Labor
   o Cultivate the land : 2 HOK, @ Rp 20,000 =Rp 40,000
   o Plant : 2 HOK, @ Rp 20,000 =Rp 40,000
   o Treatment : 20 HOK @Rp 20,000 =Rp 400,000
   TOTAL =Rp 480,000
5. Other
   o Harvest : 5 HOK, @ Rp 20,000- =Rp 10,000
   o Packing and post harvest =Rp 125,000
   o electricity : 1 season =Rp 50,000
   o Depreciation of the house : 1 season =Rp 600,000
   TOTAL =Rp 875,000
OVERALL AMOUNT OF CHARGES =Rp3,642,500

II. Production result
1. Average success : 75 % x 10,000 btg = 7500 btg
2. Average price/ stem = Rp 800- [18]
3. Gross yield = Rp 800- x 7500 btg =Rp6,000,000

III. Profit
Gross yield – Total cost = Rp6,000,000 - Rp3,642,500= Rp2,357,500

3.2 Feasibility Study of Chrysanthemum Seed Business
The feasibility study of Chrysanthemum seed business is presented below.
1. Fixed costs :
2. Variable costs :
- Main plant 8000 stem x 2 : Rp 24,000,000
- Organic fertilizers 4 ton : Rp 4,000,000
- NPK fertilizer 1000 kg : Rp 1,750,000
- Liquid organic fertilizer 100 ltr : Rp 1,000,000
- Insectisida : Rp 1,500,000
- Fungisida : Rp 1,800,000
- Bacterisida : Rp 1,000,000
- ZPT : Rp 1,080,000
- Electricity : Rp 1,200,000
- Charcoal husk : Rp 1,000,000
3. Other costs
- 2 land workers : Rp 300,000
- 2 daily care person : Rp 12,000,000
- Harvesting facilities : Rp 500,000

The total of costs of Chrysanthemum seed is Rp 55,080,000.

On average, 1 mother plant produces 60 stem cuttings per season (6 months). Therefore, in 1 year the yield cuttings will be : 60 x 2 x 8000 = 960,000 stems. Hence, the sale of stem cuttings is : Rp 175 x 960,000 stems = Rp 168,000,000. Then, the benefits of seeding with a mother plant capacity of 8000 stems in a year will be : Rp 168,000,000 - Rp 55,080,000 = Rp 112,920,000.

Around the world, flower production is widespread and generates a substantial amount of money [19]. The prospects for chrysanthemum farming are indeed quite good, plus the cultivation location is very close to the center of Yogyakarta city which has quite a high market potential. The Special Region of Yogyakarta, with its special features, is a province with a royal nuance and is a tourism city that is never separated from the need for interest [20]. The need for flowers and ornamental plants in Yogyakarta is relatively high, especially at certain times such as New Year, Christmas, Eid, and others. Then, it makes the price double than the usual day. Even flower growers in DIY and Central Java often cannot meet market demand, so they have to be brought in from West Java. Meanwhile, West Java's production, at certain times the flower production is absorbed to meet market needs in West Java and DKI Jakarta.

From the results of a market survey conducted by the Ministry of Education of Sleman and the Yogyakarta National Development University, the demand for the flower market in the Special Region of Yogyakarta is quite high according to the following table.

**Table 2. Data on the Development of Chrysanthemum Cultivation in Hargobinangun Village**

<table>
<thead>
<tr>
<th>Florist Name</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toko Puspa 3</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>30</td>
<td>50</td>
<td>100</td>
<td>30</td>
</tr>
<tr>
<td>Toko Asri</td>
<td>30</td>
<td>50</td>
<td>30</td>
<td>20</td>
<td>50</td>
<td>150</td>
<td>20</td>
</tr>
<tr>
<td>Toko Vloneta</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>50</td>
<td>50</td>
<td>20</td>
</tr>
<tr>
<td>Toko Dewi 1</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Toko Taman Sari 1</td>
<td>10</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>10</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>Toko Mawar</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>30</td>
<td>20</td>
</tr>
<tr>
<td>Toko Taman Sari 2</td>
<td>20</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>30</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Toko Dahlia</td>
<td>10</td>
<td>30</td>
<td>20</td>
<td>20</td>
<td>40</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Toko Purwo 1</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>10</td>
</tr>
<tr>
<td>Toko Sakura</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>
3.3 Hargobinangun Village Chrysanthemum Business Development Plan

In planning the development of chrysanthemum commodity farming in Hargobinangun Village, of course, various aspects must be considered, both social, economic, cultural, and technical aspects. Hargobinangun Village has a fairly heterogeneous population. For residents in the Kaliurang tourist area, most of the population relies on the tourism sector for their livelihood. So, in this location, most of the residents do the lodging business.

With Kaliurang as a tourist destination for both domestic and foreign tourists, of course, it will provide considerable benefits for the agricultural sector. The development of the agricultural sector in Hargobinangun Village, especially the chrysanthemum commodity, will realize a program to improve farmers' welfare more quickly by taking advantage of the high number of tourists visiting Kaliurang. In addition, existing hotels and inns will be even more beautiful and will give special nuances and memories to guests who stay if every room is decorated with the beauty of fresh chrysanthemum flowers. Taking this into account, the development of chrysanthemum farming in Hargobinangun Village still has bright prospects.

To minimize obstacles in the cultivation of chrysanthemum plants, the direction of developing this commodity farming business must pay attention to the growing conditions needed by chrysanthemum plants [21]. By choosing a location that has a climate that suits the needs of chrysanthemums, it will be easier for farmers to do chrysanthemum farming to get quality flower products and reduce the level of pest and disease attacks, which will further reduce the risk of production failure. Nevertheless, the adjustment of human resources as a chrysanthemum business actor is the most decisive in the success of this farming business. Work patterns, mindsets, insights, and knowledge of cultivation technology must be prepared in advance so that the development of chrysanthemum farming can be sustainable. Training can be given to farmers to increase their knowledge of chrysanthemum cultivation, including: (1) Training on how to cultivate land, (2) Training on fertilization, (3) Training on how to plant and care for chrysanthemum plants, and (4) Training on marketing chrysanthemums [22].

The development of the chrysanthemum area in Hargobinangun Village cannot be separated from the need for chrysanthemum seeds. The chrysanthemum farmer group in Wonokerso Hamlet, which was the first farmer group in the chrysanthemum business, initially needed a lot of seed propagators from other areas such as West Java and Ambarawa. However, this dependence turns out to be more or less hampering the business.

The planting schedule that has been made for each week often cannot be on time due to the unavailability of sown seeds. This of course raises other problems in the future. The planting schedule is of delayed, it eventually causes problems in the marketing of chrysanthemums that have been pioneered. Consumers or florists who have established
partnerships with groups are often disappointed due to crop failures due to delays in seed availability.

By looking at this experience, it can be seen that the availability of dispersed seeds for farmers must be guaranteed so that the established market is not lost. Because of this, the Udi Makmur (Klantum) Farmer Group in Wonokerso Hamlet has started an intensive chrysanthemum seedling business. Moreover, after the declaration of Yogyakarta as the "Seed Center City", this farmer group is increasingly active and innovative to participate in the success of the program.

Seed is the basis for determining the success of agribusiness, therefore the selection of types, varieties, quality, time, quality, availability, and suitability of seeds for the location and agro-ecosystem is very decisive at the level of production. The role of seeds in horticultural agribusiness is very important, in addition to supplying the needs of the horticultural production itself, determining the added value that will be obtained, is also related to various other development programs.

Business development and horticultural production require strong support from the aspect of providing quality seeds of superior varieties. Until now, seed producers have not been able to keep up with this demand, so that some of the seeds have to be imported from abroad (imported), and more use of seeds of origin. Awareness and concern for some farmers in using superior seeds are still low, so it does not stimulate the development of the national seed industry.

In the current development of horticultural agribusiness, the seed business is no longer seen as a supporting aspect in the agribusiness system, like other production facilities, but it has developed into a business that is parallel to the production of horticultural commodities. The seed industry (nursery and seed industry) has become a profitable business choice, and has added value, prospects, and opportunities that are not inferior to the cultivation business [23]. In capturing and taking advantage of these economic opportunities, special efforts are needed to develop the seed business, so that the commercial seed business can be fully handled by the private sector, starting from the aspects of production, procurement, distribution, and marketing. Seed development activities are carried out based on consideration of needs, availability, institutional capabilities, and seed growers.

The development target is farmers who are members of farmer groups who do not yet have superior commodities. Especially farmers with narrow land ownership and of course with attention to the conditions for growing chrysanthemum plants. The Hargobinangun Village area which is located at an altitude between 500 – 1325 meters above sea level is very supportive of developing chrysanthemum farming. Chrysanthemum ornamental plants require high humidity for the initial formation of seed roots, cuttings need 90-95%. Young to mature plants need humidity between 70-80%, balanced with adequate air circulation. The CO2 level in the natural surroundings is 3000 ppm, while the ideal CO2 level to stimulate photosynthesis is between 600-900 ppm. In cultivating chrysanthemum plants in closed buildings such as greenhouses, CO2 can be added to reach the recommended levels. Chrysanthemum ornamental plants require adequate water, but are not resistant to exposure to rain water. Therefore, for areas with high rainfall, planting is done in a greenhouse [24].

By looking at the average farmer's land ownership in Hargobinangun Village which is no more than 2000 m², the introduction of alternative commodities with high economic value such as chrysanthemums can be said to be quite urgent so that an increase in farmers' welfare can soon be realized. Chrysanthemum farming in Hargobinangun Village is very likely to be developed in several hamlets and farmer groups as shown in the following table.
Table 2. Chrysanthemum Development Location Plan Based on Agroecological Zones

<table>
<thead>
<tr>
<th>Hamlet name</th>
<th>Number of Farmer/Livestock Groups</th>
<th>Number of Farmers</th>
<th>Area of Development (ha)</th>
<th>Location Altitude (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wonorejo</td>
<td>2</td>
<td>40</td>
<td>3</td>
<td>700</td>
</tr>
<tr>
<td>Sidorejo</td>
<td>1</td>
<td>20</td>
<td>3</td>
<td>700</td>
</tr>
<tr>
<td>Ngipiksari</td>
<td>1</td>
<td>15</td>
<td>1</td>
<td>800</td>
</tr>
<tr>
<td>Boyong</td>
<td>2</td>
<td>40</td>
<td>2</td>
<td>850</td>
</tr>
<tr>
<td>Kaliurang Timur</td>
<td>2</td>
<td>30</td>
<td>0.5</td>
<td>900</td>
</tr>
<tr>
<td>Kaliurang Barat</td>
<td>1</td>
<td>15</td>
<td>0.5</td>
<td>900</td>
</tr>
</tbody>
</table>

Based on data from BPP Pakem, the planting area and production of several ornamental plant commodities and the number of ornamental plant farmer groups in Hargobinangun Village are increasing. In May 2007, a group of the ornamental plant (chrysanthemum) farmers in Wonokerso (Randu) Hamlet, Hargobinangun Village, received a visit from the Minister of Agriculture and several officials from the Ministry of Agriculture for a working visit to Sleman Regency. The very positive response and appreciation for the farmer groups further strengthened the confidence of the farmer groups and local PPL to realize the Hargobinangun Village area as a mountainous agro-tourism area such as in Cipanas, Batu Malang, Kopeng, Bandungan, and others. Currently, the formation of the Yogyakarta Chrysanthemum Farmers Association ("Aprista") has begun to be initiated, which was established by a combination of 6 farmer groups in Hargobinangun Village plus several individual chrysanthemum agribusiness actors outside Hargobinangun. Apart from cutting chrysanthemum flowers, Aprista members have also started cultivating various cut leaves as supporting products for chrysanthemum flowers. By embracing youth organizations around the cultivation site as partners in conducting cut leaf farming, in Hargobinangun village more and more people are involved and benefiting from the chrysanthemum farming business. Especially now that the association (Aprista) is starting to pioneer the existence of flower agro-tourism which is located in Wonokerso Hamlet. It is hoped that the existence of a flower agro-tourism location will have a more real impact on the surrounding community, especially for dasawisma and PKK women who have a processing business, it will be easier for them to market their products.

Chrysanthemum commodity is something new for Hargobinangun Village farmers. The development plan for the chrysanthemum area that will be carried out must be thoroughly prepared from all aspects so that the farming community that is the target of the development will be able to accept and quickly understand the transfer of technology. Chrysanthemum farming is very different from the farming that is usually run by farmers in Hargobinangun Village. In a business that has a fairly high risk and requires production costs that are considered quite large by farmers, the preparation and improvement of the quality of human resources must be thoroughly mature to minimize the risks involved. Considering that agricultural business demands the fulfillment of various technical operational requirements, to obtain high production efficiency, good product quality, optimal profits, and sustainable products and sustainable natural resources, efforts to develop chrysanthemum farming with an agribusiness perspective need to be carried out through a comprehensive approach, integrated and site-specific based on the potential of land resources and regional socio-economic, problems and needs of farmers.
4 Conclusion

Through research and study of ornamental plants, especially chrysanthemum cut flowers, it can be seen that there are:
1. Commodity diversification in Hargobinangun Village, Pakem, Sleman.
2. Additional income / income, which indirectly increases the welfare of farmers.
3. Attractive job opportunities for young people in rural areas.
4. A higher sense of self-confidence for young people in rural areas so as to create a mindset worthy of living as farmers in rural areas.
5. Agro-industry in rural areas and other farming activities as a multiplier effect of chrysanthemum cut flower farming activities.

References