

## **THE SENSITIVITY ANALYSIS OF DRAGON FRUIT BUSINESS IN RANOMEETO DISTRICT SOUTH KONAWA REGENCY**

**Mutmainnah<sup>1)</sup>, Abdi<sup>1)</sup>, Muhammad Aswar Limi<sup>1\*)</sup>**

<sup>1</sup>Department of Agribusinesses Faculty of Agriculture, Halu Oleo University Kendari 93232

\*Corresponding author: [aswar\\_agribusiness@yahoo.com](mailto:aswar_agribusiness@yahoo.com)

### **To cite this article:**

Mutmainnah, M., Abdi, A., & Limi, M. (2022). The Sensitivity Analysis of Dragon Fruit Business in Ranomeeto District South Konawe Regency. *Buletin Penelitian Sosial Ekonomi Pertanian Fakultas Pertanian Universitas Haluoleo*, 24(1), 24 - 29. doi:<http://dx.doi.org/10.37149/bpsosek.v24i1.24064>

**Received:** February 02, 2022; **Accepted:** April 19, 2022; **Published:** April 25, 2022

### **ABSTRACT**

This research aims to find out the sensitivity of financial viability of dragon fruit farming in Ranomeeto Village, Ranomeeto District of South Konawe Regency. This research was conducted in Ranomeeto District, Ranomeeto South Konawe Regency of Southeast Sulawesi Province. The study took place from April 2021 to March 2022. The object of this study is the farming of the dragon fruit Abu Wafiq. This study uses case study methods with quantitative data analysis. This research aims to determine the feasibility of dragon fruit farming in terms of financial aspects. Financial aspects are analyzed by the Present Net method Value.Net B/C Ratio. Internal Rate of Return. Payback Period, as well as Sensitivity Analysis. The data used in this study are primary data and secondary data. The data retrieval techniques used are interviews and recording. From the study results obtained, the value of NPV = IDR13.731.275. Net B/C = 1.36. IRR = 61% and PP = 1.55 or 1 year 5 months. This effort is worth working on financially. In addition, based on the calculation of sensitivity analysis. Abu Wafiq dragon fruit farming is worth running when there is a 13% decrease in production and an increase in operating costs by 63%. If the change exceeds the tolerance limit determined, the business becomes unfit to run because the resulting NPV is smaller than 0 or negative.

**Keywords:** dragon fruit; financial eligibility; sensitivity

### **INTRODUCTION**

Horticultural plants in Indonesia can be grouped into four, namely vegetables, fruits, ornamental plants, and biopharmaceutical plants. Fruits are one of the horticultural products that have the potential to be developed in Indonesia, one of which is dragon fruit (Tiyas et al., 2015). Dragon fruit is one of Indonesia's newly cultivated horticultural plants with bright red fruit colours and green scales. Until now, the need for dragon fruit in Indonesia is quite large. Dragon fruit began to be known around the middle of 2000, but it was not cultivated in its own country but imported from Thailand. In 2001 dragon fruit plants began to be cultivated in Indonesia, in the East Java area (Elisa, 2016).

Ranomeeto District is one of the sub-districts in South Konawe Regency, Southeast Sulawesi province, which is the object of dragon fruit farming development. Based on the results of direct interviews in the field, there were several dragon fruit farmers in Ranomeeto District, but over time, dragon fruit farming continued to decrease or decrease. It has decreased due to the inability of dragon fruit farmers to fulfil their farming production facilities. Hence, a farm that can survive by using its capital to meet its production facilities is the Abu Wafiq dragon fruit farm, established in 2015 and still surviving today, with a land area of 3,000 m<sup>2</sup>. In the 6-year process of farming Abu Wafiq's dragon fruit with a land area like this, it produces fluctuating production due to fluctuating weather factors. Even production costs may increase from previous costs, affecting the income of dragon fruit farming.

Given that future conditions are filled with uncertainty, certain considerations are needed in starting a business, where the basis of these considerations can be obtained through a study of various aspects regarding the feasibility of a business to be run so that the results of the study used to decide whether a project or business should be feasible or postponed or even cancelled, therefore it is important to carry out a sensitivity analysis (Sulastris, 2016). According to Dewi & Ustriyana (2018),

in the face of uncertainty due to the changes that occur, it is necessary to do a re-analysis of a project to see the effects of these changes. Therefore, it is necessary to see how much influence these changes have on the sustainability of the dragon fruit business by evaluating the sensitivity of the business.

Referring to the phenomena in the field, it shows the opportunities and potentials in developing Abu Wafiq dragon fruit farming amid ignorance of the financial aspects in the form of profits obtained and the threats they face and their product production to examine the sensitivity analysis of dragon fruit farming in Ranomeeto Village, Ranomeeto District, Konawe Regency. South.

## MATERIALS AND METHODS

This research was conducted in Ranomeeto Village, Ranomeeto District, South Konawe Regency, Southeast Sulawesi Province. The location is determined *purposively*, considering that Abu Wafiq dragon fruit farming is a business that meets the criteria for researching its feasibility in terms of length of farming. This research was carried out for 11 months, from April 2021 to January 2022. Data analysis in this study is quantitative, which is the analysis used to analyze the financial feasibility criteria of farming, and sensitivity analysis is also carried out. To review the research objectives, the method of NPV, *Net B/C*, IRR, *Payback Period* according to Padangaran (2008); Rianse & Abdi (2009) and Sensitivity Analysis according to (Nurmalina et al., 2020).

## RESULTS AND DISCUSSION

### Characteristics of Respondents

Abu Wafiq's dragon fruit farming is a farm that cultivates dragon fruit which Mr Igo Kale Wahyutino pioneered. Based on the results of the study showed that the age of Igo's father was 28 years. This shows that the research respondents fall into productive age in doing dragon fruit farming. This is in line with the opinion of Gatningsih & Sutrisno (2017) that the composition of the population if targeted towards productive age and unproductive age, is divided into three compositions, namely 0-14 years old (unproductive age), 15-64 years old (productive age). And age >64 years (unproductive age). This dragon fruit farm was founded in 2015 and is located in Jalan Jica, Ranomeeto Village, Ranomeeto District, South Konawe Regency, Southeast Sulawesi Province. Mr Igo's initial goal in developing this farm was to help increase family income. According to Hanum (2018), the more respondents have children and dependents, the more effective the time provided by respondents to work. The effectiveness of this time is useful for increasing the respondent's income. Based on the interviews with respondents, his main job is as a pharmacist assistant. Nurkholis (2013) argues that education is a necessary process to get balance and perfection in the development of individuals and communities. The level of education is closely related to the mindset and can affect technology adoption. In 2015 Mr Igo founded a dragon fruit farm with a source of capital from private property with an initial capital of approximately IDR25.000.000, which was used as investment capital to purchase support poles, purchase of equipment and land clearing of 3.000 m<sup>2</sup>.

### Analysis Cost

Overall costs are grouped into investment costs and operational costs. The investment cost is the initial cost used in the initial stage of Abu Wafiq's dragon fruit farming. At the same time, the operational costs are the costs used in running the Abu Wafiq dragon fruit farming from the first year to the sixth year consisting of fixed costs and variable costs. The value of investment costs, operational costs, and total costs can be seen in the following table.

Table 1. Total cost of Abu Wafiq dragon fruit farming in 2015-2016

| No | Cost Component  | Cost (IDR)  |
|----|-----------------|-------------|
| 1  | Investment Fee  | 24.813.000  |
| 2  | Operating costs | 79.600.000  |
|    | Total cost      | 104.413.000 |

Source: Primary Data processed, 2022

The investment costs incurred at the beginning of carrying out Abu Wafiq's dragon fruit farming include support poles, seeds, land clearing and various equipment used in IDR24.413.000. In the analysis of the financial aspect, all of the required investment costs are charged at the beginning of the farming year and all costs incurred in cash at the beginning of dragon fruit farming activities are carried out. The tools invested in Abu Wafiq's dragon fruit farming have different economic lifespans.

After passing the service life, each item will experience damage or non-optimal performance, which can hamper the running of the business. Investment tools that can no longer be used must be replaced with new ones and will require additional reinvestment costs that have an economic life.

Replacing investment goods whose economic life has expired is a reinvestment activity. According to, investment costs are not the same from year to year. This is because the economic time of the equipment is not the same, so the reinvestment time is different. The cost of reinvesting or buying back tools that are no longer suitable for use will be carried out according to the equipment's economic life, such as spray bottles and fruit baskets purchased every three years. Based on Table 1, the total investment cost incurred by Abu Wafiq's dragon fruit farming is IDR24.813.000. This can be a guideline for farmers who want to cultivate or develop similar businesses.

The total fixed costs incurred by Wafiq's dragon fruit farming are IDR49.900.000. The costs incurred include labour costs consisting of three freelance employees or on-call employees. While the variable costs are the costs incurred by Abu Wafiq dragon fruit farming, the amount varies, which is influenced by the amount of production. The higher the amount of output desired, the greater the number of variable costs incurred. The variable costs incurred include seeds, fertilizer, maintenance costs including irrigation, grass poison, pest and disease poison and other costs such as transportation costs. The variable costs incurred are IDR29.700.000. So, the total cost incurred by Abu Wafiq's dragon fruit farming is IDR104.413.000.

### Revenue and Revenue

Table 2. Total Revenue and Income of Abu Wafiq dragon fruit farming in 2015-2016

| Year  | Revenue (IDR) | Income (IDR) |
|-------|---------------|--------------|
| 0     | -             | -37.263.000  |
| 1     | 20.000.000    | 6.650.000    |
| 2     | 30.000.000    | 16.650.000   |
| 3     | 40.000.000    | 26.250.000   |
| 4     | 30.000.000    | 16.650.000   |
| 5     | 30.000.000    | 16.650.000   |
| Total | 150.000.000   | 45.587.000   |

Source: Primary Data processed, 2022

Table 2 shows that acceptance has not been obtained at the age of the 0th plant because the dragon fruit plant has not yet been produced at that age. This is in line with Khaina's (2012) opinion, which states that dragon fruit is an annual plant that can bear fruit from 1 year to 1.5 years after planting. The highest dragon fruit revenue was in the third year of IDR40.000.000, and this was due to the increase in dragon fruit production. While the revenue of dragon fruit in the first year was IDR20.000.000, the revenue obtained was relatively low because the dragon fruit plant was still learning to produce, so its productivity level was still low.

The highest income from Abu Wafiq's dragon fruit farming was in the third year, which was IDR26.250.000, while the lowest farming income was in the first year, which was IDR6.650.000 because, in the first year, the dragon fruit plant had just started producing so that the total income earned for six years of dragon fruit farming is IDR45.587.000. When compared with income in the study of Yunanda et al. (2017) , amounting to IDR19.563.034 for one planting season with 30 farmers with an average land area of 0.5 hectares.

### Financial Feasibility Analysis

The investment criteria used to measure the feasibility of dragon fruit farming include NPV, Net B/C, IRR, and PP. The results of the analysis can be seen in the following table.

Table 3. Calculation results of NPV, Net B/C, IRR and PP.

| No | Investment Criteria | Score      | Indicator | Information |
|----|---------------------|------------|-----------|-------------|
| 1  | NPV                 | 13.731.275 | > 0       | Worthy      |
| 2  | Net BC              | 1.36       | > 1       | Worthy      |
| 3  | IRR                 | 61         | > 15%     | Worthy      |
| 4  | PP                  | 1.55       | < 5 Years | Worthy      |

Source: Primary Data processed, 2022

Based on the results of the NPV calculations presented in Table 3. It can be seen that the results of the NPV calculations on the Abu Wafiq dragon fruit farming for a period of 6 years (2015-2020) have a value of IDR13.731.275. Because the NPV obtained is positive or larger than 0, the NPV result suggests that Abu Wafiq dragon fruit cultivation is possible. Compared with the NPV found by Khaina (2012) of IDR550.462.878, this value is much greater because the number of supporting poles used is 1,877 poles (2.5 hectares) with 7,700 seedlings. Meanwhile, in the Abu Wafiq dragon fruit plantation, there are only 500 support posts with 1,500 seedlings. This is in line with research conducted by Ratnawati et al. (2019) that if the NVP obtained is greater than 0, then the farming carried out is feasible because it is profitable. Furthermore, Kusmiati & Wati (2020) said that farming is feasible if the NVP is more positive because the NPV is greater than 0. It can be interpreted that the value obtained will provide benefits in the future, and the benefits obtained are greater than the issued costs.

Based on the Net B/C value obtained is 1.36. This value indicates that Abu Wafiq dragon fruit farming is feasible because it has met the requirements for a value greater than 1, which means that a business is said to be feasible if the Net B/C value is greater than 1. The Net B/C value is 1.36. It can be interpreted that every IDR1 of the costs incurred in dragon fruit farming will generate an income of IDR1.36. This value shows that Abu Wafiq's dragon fruit farming can still benefit from the costs incurred. This is in line with research conducted by Gusnawati et al. (2014) that if the Net B/C obtained is greater than 1 (one), then the farming carried out is feasible to cultivate.

Further, Hasan et al. (2019) stated that a business is said to be feasible or has many benefits if the obtained Net B/C value is greater than one. If the obtained Net B/C value is less than one, the business is rejected or not feasible. The greater the net B/C value, the more profitable a business (Maulidah & Pratiwi, 2013).

Based on Table 3. The IRR value obtained by Abu Wafiq's dragon fruit farming is 61%. Because the IRR number produced is more than the current interest rate of 15%, this result implies that dragon fruit cultivation is still viable or possible. This value proves that based on the IRR calculation of dragon fruit farming, Abu Wafiq can return the investment costs incurred at the beginning of dragon fruit farming at an interest rate of 61% per year. This is in line with the research conducted by Kusmiati & Wati (2020), where the IRR value obtained is 23.24%. Because the interest rate obtained is larger than the current interest rate, this figure suggests that the agricultural operation is still lucrative (7 percent). Furthermore, Khairunnas & Tety (2012), The IRR number is more than the interest rate, which is the acceptability limit according to the bank's interest rate, as seen in the IRR calculation. Dragon fruit farming is feasible to be developed.

The payback period is an investment feasibility study by measuring the period of capital development for Abu Wafiq dragon fruit farming. The payback period value of Abu Wafiq's dragon fruit farming based on Table 3 is 1.55. This value shows how long the investment capital will return, expressed in years. The value of 1.55 in this payback period indicates that Abu Wafiq's dragon fruit farming is feasible, considering that the farm can recover its investment capital within one year and five months. This is in line with Kusuma & Mayasti (2014) and (Marhawati, 2019) research. Further, Sa'id et al. (2020) said that the business is declared feasible to operate or run for those who can return capital before the project life ends.

Based on the assessment using four investment eligibility criteria, namely NPV of IDR13.731.275; net B/C of 1.36; IRR is 61% and PP is 1.55 years. The analysis results can be concluded that Abu Wafiq's dragon fruit farming is feasible.

### Sensitivity Analysis

Table 4. Calculation of Sensitivity Analysis of Abu Wafiq Dragon Fruit Farming in 2015-2020

| No | Investment appraisal criteria   | Investment Criteria | Score   | Indicator | Information |
|----|---------------------------------|---------------------|---------|-----------|-------------|
| 1  | 13% decrease in production      | NPV                 | 933,534 | > 0       | Worthy      |
|    |                                 | Net BC              | 1.02    | > 1       | Worthy      |
|    |                                 | IRR                 | 19%     | > 15%     | Worthy      |
| 2  | 63% increase in operating costs | NPV                 | 159,079 | > 0       | Worthy      |
|    |                                 | Net BC              | 1.00    | > 1       | Worthy      |
|    |                                 | IRR                 | 16%     | > 15%     | Worthy      |

Based on Table 4. in the sensitivity analysis, where if there is a decrease in dragon fruit production by 13% with fixed operational costs, dragon fruit farming is still feasible even though the

value is low because the value obtained is positive, namely IDR933.534; Net B/C > 1, which is 1.02 and an IRR of 19%, shows that the acquired rate of return on capital is higher than the current interest rate of 15%. This means that if a change exceeds the 13% limit, the business becomes unfeasible because the resulting NPV is less than 0 or negative.

Based on Table 4. on the sensitivity analysis in increasing dragon fruit operational costs by 63% with constant production, Even if the value is low, Abu Wafiq's dragon fruit cultivation is still viable since the NPV achieved is positive IDR159.079; the Net B/C of 1.00 is declared feasible because the result is equal to 1 and the IRR value of 16% implies that the rate of return on capital is higher than the current 15 percent interest rate. However, if there is an increase in operational costs that exceed the limit of 63%, the fruit farming dragon is not feasible to run because the resulting NPV is less than 0 or negative.

## CONCLUSION

Based on the sensitivity analysis results, with a change in the form of a decrease in the amount of dragon fruit production by 13% with the results of the calculation of NPV of 15%, which is IDR933.534 Net B/C, the value is 1.02. The IRR figure of 19% is feasible even though the NPV value obtained is very low. While the increase in operational costs by 63% with the results of the calculation of NPV of 15%, which is IDR159.079. Then the result of the calculation of the Net B/C value is 1.00. The IRR figure of 16% makes Abu Wafiq's dragon fruit farming feasible. However, if the change condition exceeds the predetermined tolerance limit, the business becomes unable to run because the resulting NPV is smaller than 0 or negative.

## REFERENCE

- Dewi, I., & Ustriyana, I. (2018). Kelayakan Finansial Usahatani Buah Naga Di Daerah Perkotaan Sebagai Alternatif Tambahan Pendapatan Petani. *Jurnal Agribisnis dan Agrowisata*, 7(1), 172-181.
- Elisa, R. (2016). *Panen Rupiah dengan Budidaya Buah Naga* Akar Publishing.
- Gatiningsih, & Sutrisno, E. (2017). *Kependudukan dan Ketenagakerjaan*. Fakultas Manajemen Pemerintahan IPDN.
- Gusnawati, Laapo, A., & Howara, D. (2014). Analisis kelayakan finansial usahatani cengkeh di desa boukecamatan sojol kabupaten donggala provinsi sulawesi tengah. *Jurnal Agrotekbis*, 2(3), 325-331.
- Hanum, N. (2018). Pengaruh Pendapatan, Jumlah Tanggungan Keluarga Dan Pendidikan Terhadap Pola Konsumsi Rumah Tangga Nelayan Di Desa Seuneubok Rambong Aceh Timur. *Jurnal Samudra Ekonomika*, 2(1), 75-84.
- Hasan, W., Maula, B., & Chaniago, R. (2019). Analisis Kelayakan Bisnis dan Sensitifitas Usaha Budidaya Buah Naga (*Hylocereus sp.*) di Desa Lenyek Kecamatan Luwuk Utara Kabupaten Banggai Sulawesi Tengah. *Journal Tabaro Agriculture Science*, 2(2), 227-238.
- Khaina, F. (2012). Kelayakan Usaha Tani Buah Naga di UD, Sabila Farm Kecamatan Pakem. . *Jurnal Agribisnis*, 1-27.
- Khairunnas, & Tety, E. (2012). Analisis Kelayakan Usahatani Buah Naga (*Hylocereus Costaricensis*) Di Pekanbaru (Studi Di Kelurahan Sail Tenayan Raya Pekanbaru). *Jurnal PEKBIS*, 3(03), 579-585.
- Kusmiati, A., & Wati, N. (2020). Kelayakan Finansial dan Sensitivitas Usahatani Kopi Robusta di Desa Kalibaru Manis Kecamatan Kalibaru Kabupaten Banyuwangi. *Mimbar Agribisnis: Jurnal Pemikiran Masyarakat Ilmiah Berwawasan Agribisnis* 6(1), 460-473.
- Kusuma, P., & Mayasti, N. (2014). Analisa kelayakan finansial pengembangan usaha produksi komoditas lokal: mie berbasis jagung. *Agritech: Jurnal Fakultas Teknologi Pertanian UGM*, 34(2), 194-202.
- Marhawati. (2019). Analisis Kelayakan Finansial Usahatani Jeruk Pamelu di Kelurahan Attangsalo Kecamatan Ma'rang Kabupaten Pangkep. *Seminar Nasional LP2M UNM*, 4-11.
- Maulidah, S., & Pratiwi, D. (2013). Analisis kelayakan finansial usahatani anggur Prabu Bestari. *Agricultural Socio-Economics Journal*, 10(3), 213.
- Nurkholis, N. (2013). Pendidikan dalam upaya memajukan teknologi. *Jurnal Kependidikan*, 1(1), 24-44.
- Nurmalina, R., Sarianti, T., & Karyadi, A. (2020). *Studi Kelayakan Bisnis*
- Padangaran, A. (2008). *Manajemen Proyek Pertanian*. PPS Unhalu.

- Ratnawati, I., Noor, T., & Hakim, D. (2019). Analisis Kelayakan Usahatani Cabai Merah (Studi Kasus pada Kelompok Tani Mekar Subur Desa Meparah Kecamatan Panjalu Kabupaten Ciamis). *Jurnal Ilmiah Mahasiswa AGROINFO GALUH*, 6(2), 422-429.
- Rianse, U., & Abdi. (2009). *Metodologi Penelitian Sosial dan Ekonomi Teori dan Aplikasi* (2 ed.). Alfabeta.
- Sa'id, N., Ma'ruf, A., & Delfitriani, D. (2020). Analisis Kelayakan Usaha Produksi Tahu Sumedang (Studi Kasus Di Pabrik Tahu XY Kecamatan Congeang). *Jurnal Agroindustri Halal*, 6(1), 105-113.
- Sulastri, L. (2016). *Studi Kelayakan Bisnis Untuk Wirausaha*. LA Goods Publishing.
- Tiyas, A., Putra, I., & Dewi, I. (2015). Analisis finansial usahatani buah naga super merah (*Hylocereus costaricensis*)(studi kasus di kelompok tani berkah naga Desa Sambirejo Kecamatan Bangorejo Kabupaten Banyuwangi). *Journal of Agribusiness Agritourism*, 4(5), 402-411.
- Yunanda, Pranoto, Y., & Bidayani, E. (2017). Analisis Usaha Tani Buah Naga (*Hylocerius SP.*)(Studi Kasus: di Kelurahan Sinar Baru Kabupaten Bangka). *Jurnal Penelitian dan Aplikasi Sistem dan Teknik Industri*, 12(3), 360-371.