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Research Article

The Effect of Sustainable Livelihoods on the COVID-19 Disaster Recovery in Agrotourism

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Abstract

Kebun Belimbing Ngringinrejo is the leading agrotourism in Bojonegoro Regency. COVID-19 pandemic has decreased a numeral of tourist visits which caused agrotourism income to decline, business actors, to lose their jobs, and the livelihoods of starfruit farmers to be threatened. After the COVID-19 vaccination, the re-opening of agrotourism began with the application of health protocols. Agrotourism must carry out a recovery process to return to normality. The study aims to determine the condition of sustainable livelihoods for star fruit farmers and business actors and the effect of livelihood assets on disaster recovery. This research was conducted so that agrotourism can recover immediately by optimizing high assets and improving low assets. This study used the descriptive statistic and analysis of SEM-PLS. The outcome indicated that the condition of sustainable livelihoods for starfruit farmers and business actors has a high natural, social, and physical assets. At the same time, low assets are human and financial assets. Four sustainable livelihood assets are human, natural, social, and physical, significantly influencing disaster recovery. In contrast, financial assets have no significant impact on disaster recovery. The most significant indicators for the disaster recovery process in agrotourism are developing digital solutions, and the lowest indicator is designing risk communication.

Keywords: Agrotourism; COVID-19; disaster recovery; sustainable livelihood

1. Introduction

The World Health Organization (WHO) declared the Corona Virus Disease (COVID-19), which spreads rapidly to several countries, as a worldwide pandemic on March 11, 2020. (WHO, 2020). According to Presidential Decree No. 12 of 2020, non-natural disasters that spread COVID-19 are declared national disasters. The effects of the pandemic calamity are multifaceted, widespread across practically all provinces, and restricted to the health industry and other fields, especially the economy and socio-culture (Hadi, 2020). One industry that is dependent on the movement of tourists is tourism. The World Travel and Tourism Council predicted in 2020. Due to ongoing mobility restrictions, the industry will lose between USD 4.5 trillion and USD 4.7 trillion (WTTC, 2020). The spread of COVID-19 is a severe threat to health, and the lockdown has created a risk to people's livelihoods (Sharma & Mahendru, 2020). Sixty-two million jobs have been lost since 2020, with 272 million remainings if we compare to 2019, which was 332 (WTTC, 2020). Based on the Regent of Bojonegoro No.

188/183A/KEP/412.12/2008 regarding the determination of the Agropolitan area, there is a superior tourist village in Bojonegoro Regency which has been affected by Corona Virus disease was Kebun Belimbing Agrotourism located in Ngringinrejo Village, Kalitidu District.

The Ngringinrejo area is a group of low-lying areas prone to flooding. With soil conditions that tend to be wet and muddy, this area experiences obstacles in the agricultural sector. Not all plants can thrive in Ngringinrejo Village, especially fruits, so one of the currently considered suitable and suitable, both with climatic conditions and the soil, is the star fruit tree. Starfruit trees began to be planted in 1984, which five farmers pioneered then, followed by farmers as a whole in 1989. In 2010, deliberation facilitated by the Ngringinrejo Village Government reached an agreement that the Ngringinrejo Starfruit Garden be designated as a new tourist spot. However, new agro-tourism is ready to operate starting in 2015. Located on the banks of Bengawan Solo with a total land area of approximately 20.4 ha, which is planted with ±10,250 star fruit trees. With a harvest period of about three months, the garden is estimated to produce around 855,000 kg of star fruit annually. Over the past five years, the number of tourist visits has fluctuated.

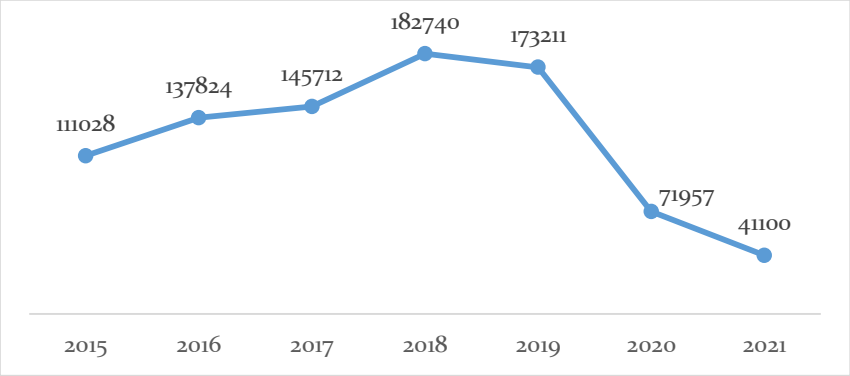

Figure 1. Tourist visit 2015 – 2021

According to the Tourism Awareness Group (Pokdarwis) analysis, in addition to the COVID-19 pandemic, several factors cause the decline in the number of visitors from 2019 to 2021, including an increase in competitiveness with the number of new tours in Bojonegoro, the need for tour package innovation, the lack of tourism promotion, and the lack of involvement of the younger generation for the agro-tourism development. The most significant decline throughout 2021 occurred in July when Indonesia experienced the COVID-19 pandemic in the second wave due to the entry of the Delta variant. When the Community Activities Restrictions Enforcement level 4 was implemented, agrotourism only served to purchase star fruit. As a result, agro-tourism income decreases, business actors lose their jobs, and the livelihoods of star fruit farmers are threatened. The ability of rural communities to find new sources of income during the COVID-19 pandemic is still low (Hermanto, 2020). As a result, people become dependent on outside assistance, such as the government and other institutions.

After the vaccination program was implemented, agro-tourism re-opening began with strict health protocols based on the CHSE guide. Agrotourism must carry out a recovery process to return to normality. Disaster recovery is a component of emergency preparedness where nations, communities, families, and individuals restore or recover what has been lost due to a disaster and, ideally, lessen the likelihood of repeat occurrences (Coppola, 2015). According to Jones and Comfort (2020), in achieving more holistic and comprehensive development in the future, it is necessary to carry out sustainable recovery in the tourism industry and integrate all stakeholders, including employees, tourists, and the whole society. Based on research by Joakim (2013), a resilient disaster recovery process must combine the sustainable livelihoods concepts, vulnerability, and resilience described in the Resilience Disaster Recovery Assessment Framework. Sustainable livelihood concepts were proposed as the significant

concepts to be included in the restoration process (Cannon et al., 2003; Regnier et al., 2008). In the development context, sustainable livelihood comprises the capabilities, assets/assets, and activities necessary for life. There are five kinds of assets: nature, human, social, financial, and physical. Life is considered sustainable if it recovers from stress, can withstand shocks, and can maintain or improve the capabilities and assets nowadays or in the future without destroying the natural resource base. (DFID, 1999). Suppose the current level of livelihood achieved is obtained from the exploitation of natural resources alone, without regard to the impacts they cause. In case it is ascertained that it will not be sustainable. In time, a certain amount of damage and loss on a larger scale will occur, such as natural disasters and other disasters that will destroy all that has been achieved. Likewise, suppose a society only relies on its energy without developing efficient technology, then in time. In that case, the results they can achieve will continue to decline because, physically, humans are limited in their productive period (Parmawati et al., 2021). Vulnerability is a characteristic and condition of a community, system, or assets that make it prone to be adversely affected by a hazard (UNISDR, 2009). Vulnerability is closely related to asset control.

The more vulnerable a household is the more assets it has, and vice versa. Resilience, on the other hand, is the capacity of a system, group, or civilization exposed to dangers to endure, absorb, adjust, and recover quickly from the effects of hazards (UNISDR, 2009). COVID-19 sustainable recovery framework in India to recreate the tourism sector in the pasta pandemic era includes restarting travel, establishing protocols, stimulating demand, promoting coordination, operationalizing the new normal, nurturing new options, and developing digital solutions (Pandey et al., 2021). People will be bewildered in the wake of a new pandemic. Therefore both parties need to earn each other's trust. Lack of communication and information may result from recent, difficult-to-understand events and developments. Effective rehabilitation requires improved communication between the public health system and the community (Fakhruddin et al., 2020). In the modern world, communication is crucial to helping visitors overcome their fears and concerns (Orîndaru et al., 2021).

One of the challenges of post-pandemic agro-tourism must be able to regain public trust in travel and ensure that these tourist attractions are safe from the spread of COVID-19. Disaster recovery during the pandemic of COVID-19 is complex, and the literature on the pandemic recovery process in the tourism sector is still rare. The Sendai Framework for Disaster Risk Reduction's systematic risk management strategy for 2015–2030 does not distinguish between the effects of biological hazards (Fakhruddin et al., 2020). Effective disaster management, according to Mair et al. (2016), entails three step: (1) Preparation and planning before the disaster; (2) Managing the crisis while it unfolds; (3) Transitioning to a new and improved state of affairs after the disaster. By concentrating on steps (2) and (3) and combining numerous COVID-19 catastrophe recovery frameworks from the research of Joakim (2013), Pandey et al. (2021), and Orîndaru et al. (2021), the authors hope to assist Indonesia's tourism sector is recovering and thriving following the COVID-19 pandemic. The trend of agribreaks, i.e. a short vacation to the countryside to relax in nature, away from the crowds, for example, weekends on agrotourism farms, will be very popular (Wojcieszak-Zbierska et al., 2020). The pandemic of COVID-19 may be the opportunity for the tourism industry to be more sustainable and a once-in opportunity of a lifetime(Muller, 2020). Opportunities maximized to make a recovery in agrotourism. This study aims to determine the condition of sustainable livelihoods for star fruit farmers and business actors during the COVID-19 pandemic. Sustainable livelihood analysis needs to determine the existing conditions in agro-tourism, including the ability, livelihood assets, and activities carried out by star fruit farmers and business actors when facing the pandemic of COVID-19. From the analysis of sustainable livelihoods, star fruit farmers and business actors can determine the condition of existing assets in agrotourism. High assets optimized, and low assets improved. Livelihood assets that significantly influence disaster recovery indicators can be used as a strategy to recover from the COVID-19 pandemic.

2. Methods

This research survey was conducted at Kebun Belimbing Ngringinrejo Agrotourism, Bojonegoro Regency, East Java Province, Indonesia, using a questionnaire instrument in September 2021. Data collection aims to determine the general description of the research location and the livelihood conditions of star fruit farmers and business actors in agro-tourism. The samples were found from the Slovin formula. Based on the calculation, with a population of 104 people, the sample size was 83, consisting of 47-star fruit farmers, 16 business actors, 20-star fruit farmers and business actors. Sustainable livelihood guidance sheets published by The Department for International Development (DFID) in 1999 used in this study consisted of five variables: natural, human, social, financial, and physical. Several indicators were added to adjust the conditions at the research site.

The sustainable livelihood analysis technique is a descriptive statistic to produce a frequency value from each indicator asked. Indriantoro (2009) elaborates that descriptive statistics are statistics used to analyze data by describing the data that has been collected as it is without intending to make generally accepted conclusions or generalizations. The descriptive statistical analysis aims to describe and interpret data in statistical data to explain each research data (Gitleman et al., 2019). Furthermore, sustainable livelihood analysis using the Likert scale. The score categories are very low (1.00-1.75), low (1.76-2.50), high (2.51-3.25), and very high (3.26-4.00). At the same time, SEM-PLS analysis uses SmartPLS software to determine the effect of sustainable livelihood variables on disaster recovery. SEM-PLS is used on small sample sizes and complex models and does not require assumptions from the data distribution (Hair et al., 2017).

Table 1. Research variable and indicator

Variable	Indicators	Source
Human assets (X_1)	$X_{1.1.}$ Work ability	(DFID, 1999)
	$X_{1.2.}$ Hazard knowledge	(Joakim, 2013)
	$X_{1.3.}$ Disaster preparedness	
	$X_{1.4.}$ Health	
Natural assets (X_2)	$X_{2.1.}$ Water availability	(DFID, 1999)
	$X_{2.2.}$ Climate	(Baiquni, 2006)
	$X_{2.3.}$ Land ownership	
	$X_{2.4.}$ Number of star fruit trees	
Social assets (X_3)	$X_{3.1.}$ Belief / tradition	(DFID, 1999)
	$X_{3.2.}$ Society participation	
	$X_{3.3.}$ Information access	
	$X_{3.4.}$ Coordination with government	
Physical assets (X_4)	$X_{4.1.}$ Road infrastructure	(DFID, 1999)
	$X_{4.2.}$ Tourist attraction	(Kemenparekraf,
	$X_{4.3.}$ Availability of CHSE facilities	2020)
	$X_{4.4.}$ Agricultural equipment and trade	
Financial assets (X_5)	$X_{5.1.}$ Source of income	(DFID, 1999)
	$X_{5.2.}$ Farm	
	$X_{5.3.}$ Total income	
	$X_{5.4.}$ Help others	
Disaster Recovery (Y)	$Y_{1.}$ Promoting coordination	(Joakim, 2013)
	$Y_{2.}$ Stimulating demand	(Pandey et al, 2021)
	$Y_{3.}$ Establishing health protocol	(Orindaru et al,
	$Y_{4.}$ Risk communication	2021)
	$Y_{5.}$ Increase resilience	
	$Y_{6.}$ Reduce vulnerability	
	$Y_{7.}$ Developing digital solutions	
	$Y_{8.}$ Restarting agrotourism	

3. Result and Discussion

This research was held at Kebun Belimbing Ngringinrejo Agrotourism, Kalitidu District, Bojonegoro Regency. The Agro Jaya Tourism Awareness Group (Pokdarwis) manages at the Kebun Belimbing Ngringinrejo Agrotourism. The characteristics of respondents in this study were observed based on several aspects, namely gender, age, and education level. The grouping is in accordance with the research result conducted by Prista (2017), which states that respondents' characteristics regarding age and level of education can describe the level of knowledge and innovation ability of star fruit farmers and business actors in agrotourism Ngringinrejo Star fruit plantations. 64 respondents, or 77 percent of the total, were men, making up the majority of respondents. The respondents' predominance as men suggested that men are typically needed for the construction of tourist communities. Men are more likely than women to rely on their physical strength for more demanding tasks at work (Amanah & Fatchiya, 2018). In workers with a male sex, the level of productivity is generally higher compared to that of women. This is in line with the level of male work participation is always higher than the level of female work participation because men are considered the main breadwinners for the family, so male workers are usually more selective in choosing jobs that suit their aspirations both in terms of income and position than female workers (Hasanah and Widowati, 2011). Meanwhile, 19 female respondents, or 23% of the total respondents. Most female respondents work as business actors such as star fruit sellers, star fruit processed products, souvenirs, food, and beverages. Most of the respondents were found at the age of 51 years, namely 49% with a total of 40 people. This shows the lack of interest of the younger generation in the field of agrotourism and starfruit farming at this time. The age aspect affects the ability of the activities carried out and the determination of decision making. The physical strength possessed will affect the ability to work and decrease at a certain age limit (Prista, 2017). There is an influence of the age of labor on labor productivity. Young age reflects a strong physique so that it is able to work quickly so that the output produced also increases, and vice versa. Age greatly affects the physical ability of the workforce. Young age, the resulting production is large. Old age productivity decreases (Hasanah and Widowati, 2011). The high level of graduates who did not finish primary school was 55%, with 45 people. Junior high school became the second position by 30% with 25 people. The aspect of education is the factors that are very important that can persuade farmers in managing to farm and develop agrotourism. The better the quality of human resources is created by the higher of the level of education. The educational aspect is also related to decision making and acceptance of innovation (Tino and Balkis, 2016).

3.1. Sustainable Livelihood Conditions in Kebun Belimbing Ngringinrejo Agrotourism

Initially, sustainable livelihoods were an approach used to reduce vulnerability, maintain existing livelihoods, and seek new opportunities for a better life. This study's vulnerability occurs due to the shocks of the COVID-19 pandemic. These vulnerabilities affect livelihood assets owned by individuals and groups. The explanation of every asset in Kebun Belimbing Ngringinrejo Agrotourism is as follows:

Table 2. Livelihood assets in agrotourism

No	Indicators	Score	Categories
1	The assests of human		
	The ability of work	2.22	Low
	Hazard knowledge	2.40	Low
	Health Disaster preparedness	2.31	Low
	Health	2.65	High
	Average	2.40	Low
2	Natural assets		
	Water availability	3.69	Very high
	Climate	3.00	High

	Land ownership	3.08	High
	Number of starfruit trees	3.04	High
	Average	3.20	High
3	Social assets		
	Belief / tradition	3.50	Very high
	Society participation	2.71	High
	Information access	2.80	High
	Coordination with government	2.35	Low
	Average	2.84	High
4	Physical assets		
	Road infrastructure	3.06	High
	Tourist attraction	2.63	High
	Availability of CHSE facilities	3.01	High
	Agricultural equipment and trade	3.08	High
	Average	2.95	High
5	Financial assets		
	Source of income	2.47	Low
	Farm	2.45	Very Low
	Total income	1.65	Low
	Help others	3.10	High
	Average	2.42	Low

The Kebun Belimbing Ngringinrejo Agrotourism's human assets have a score of 2.40 (low), natural assets have a score of 3.20 (high), social assets have a score of 2.84 (high), physical assets have a score of 2.95 (high), and financial assets have a score of 2.42 (low). These factors affect the farmers' and business actors' ability to maintain sustainable livelihoods (low). The high natural assets can be seen in water availability for irrigating starfruit gardens, and daily needs are very high because water is abundant during the rainy and dry seasons. Currently, climate change is also having a wide impact on the life of society. Earth's temperature rises and causes the current erratic weather. Two obstacles that most often occur: the rainy season, which causes a lot of star fruit to rot because rainwater can get into the plastic wrapper for star fruit, and strong winds can knock star fruit flowers. Climatic factors largely determine the growth and production of crops. When the rainfall is too high, it causes flowers and fruit to fall so that production is low.

Similarly, drought causes a decrease in the rate of photosynthesis which negatively affects plant growth in both the vegetative phase and generative phase (Surdianto et al., 2012). Ownership of land for growing starfruit is the majority of their rights because many have owned this land for generations. The number of starfruit trees is around 100 - 150 trees owned by each respondent. Regarding human assets, most respondents have one to three skills, including farming, selling star fruit, and making star fruit processed products. Respondent's knowledge of the dangers of prevention efforts so as not to contract COVID-19 is still low because most respondents only wear masks and wash their hands. That contradicts government advice to wear masks, wash your hands, keep your distance, avoid crowds, and limit mobility. COVID-19 disaster preparedness in agrotourism is still in the low category because most respondents continue to work wearing masks when they are confirmed positive for COVID-19. Most respondents were in good health, and none were symptomatic of COVID-19. However, some symptoms include runny nose, allergies, pain and dizziness. The majority of respondents consider that the symptoms are a common cold disease, so it will resolve itself. Therefore, they continue to work as usual. The perception and action of people in rural areas in the face of the COVID-19 pandemic show a low level of awareness, compliance, and consistency. Various factors and perceptions that influence people's perceptions and actions during the pandemic include a lack of understanding of COVID-19, low community participation to participate in efforts to prevent COVID-19, community economic conditions and the absence of binding rules (Apriyanti and Widoyoko, 2021). Overall, the conditions that cause low human assets are because the level of formal education is low for star fruit farmers and

business actors in agro-tourism. The work of starfruit farmers has been passed down from generation to generation, and most of them have become farmers when they finish elementary school or drop out of school. The level of education is needed to form quality human resources because education can create a workforce mindset so that it can compete in the world of work. The higher the education of a worker, the broader his knowledge and insight, can think more directed so that in the end, his productivity also tends to be higher (Suyono and Hermawan, 2013).

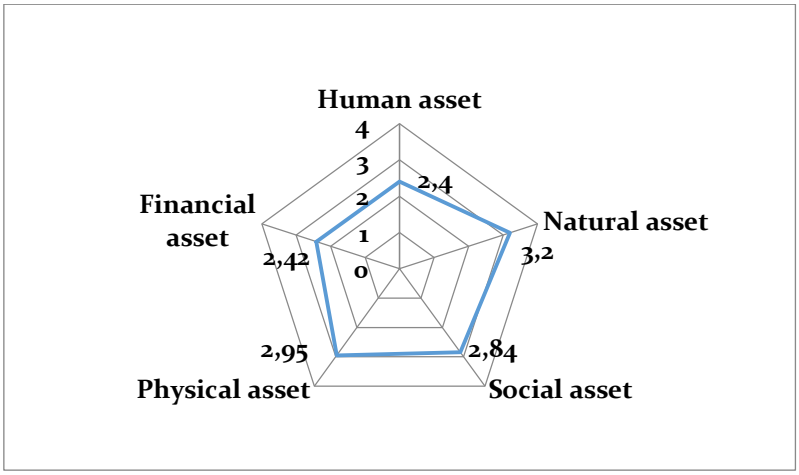

Figure 2. Pentagon assets in agrotourism

The Pentagon was developed to present information about community assets visually, describing the relationships between these capitals (DFID, 1999). This diagram was created using Microsoft Excel by entering the scores obtained from descriptive statistical analysis. The level of accessibility to livelihood assets is different for each individual, as is the value of the benefits of these assets for livelihoods. Many factors influence it. Furthermore, by analogy, the position of the Pentagon's midpoint or deepest point indicates that individuals or households' access to resources is zero or does not have access at all. While the part away from the centre point of the Pentagon is an ideal condition, where a person or household has optimal access to the resources/capital they need. With this pentagon analogy, we can describe various conditions of changing levels of accessibility to resources/livelihood capital. So, in the pentagon asset picture above, it can be seen that human assets (highest assets) are getting closer to the centre point, and natural assets (lowest assets) are getting farther away from the centre point.

3.2. Effect of Livelihood Assets on the Disaster Recovery Process Evaluation of the Measurement Model (Outer Model): Validity and Reliability Testing

Convergent validity is part of the measurement model, which is usually referred to as the outer model in SEM-PLS. At the same time, covariance-based SEM is called confirmatory factor analysis (CFA). There are two criteria to assess whether the outer model meets the requirements of convergent validity for the reflective construct, namely (1) the loading factor must be above 0.7 and (2) the p-value is significant (<0.05). If the loading factor is less than 0.40, the model should eliminate the indicator. However, it is preferable to examine the effects of the decision to eliminate these indicators on average variance extracted (AVE) and composite reliability for indicators with a loading factor between 0.40 and 0.70. The composite reliability was 0.7, while the AVE limit value was over 0.50. (Sholihin and Ratmono, 2013).

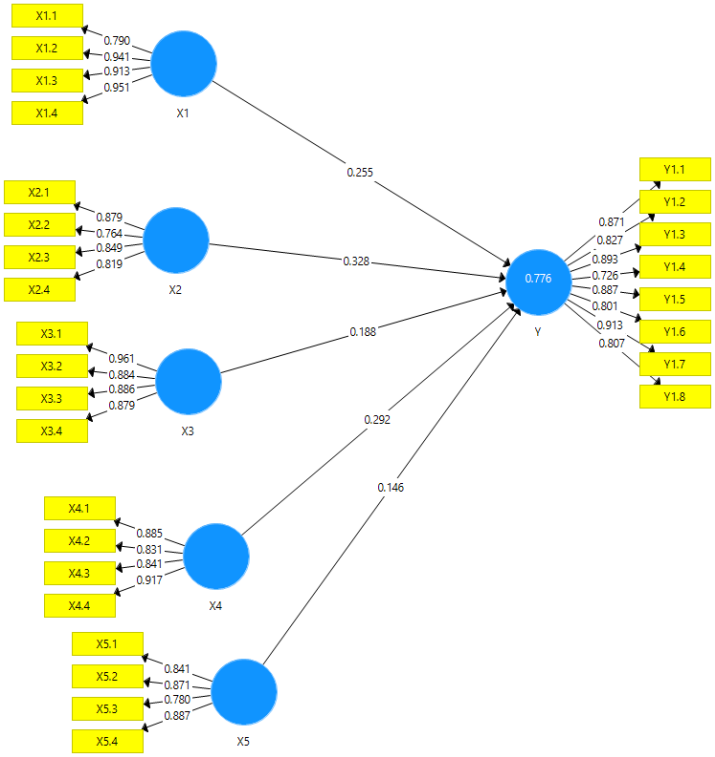

Figure 3. Validity testing based on loading factor

The total loading values were > 0.7 based on the testing of the validity of the loading factor, which indicates that it has satisfied the validity standards based on the loading value. It is known that variable Y (disaster recovery) is the highest indicator in developing digital solutions and the lowest indicator in designing risk communication. According to most respondents, digital innovations applied in Kebun Belimbing Ngringinrejo Agrotourism are tourism promotion through social media, Blogspot, and non-cash payments at agrotourism locations. Meanwhile, regarding risk communication, there are no emergency procedures available during the COVID-19 pandemic or other disasters in agrotourism, but there are already evacuation routes and gathering points.

In addition, validity testing is carried out based on the average variance extracted (AVE), the average loading squared from the construct indicators. AVE value of 0.5 or more indicates that the average of a construct describes more than half of the indicators' variants. That is a concurrent validity criterion that is met for reflective measurements.

Table 3. Validity testing based on average variance extracted (AVE)

	Average Variance Extracted (AVE)
X1	0.812
X2	0.687
X3	0.816
X4	0.756
X5	0.716
Y	0.710

It is known that the full AVE values were > 0.5, which indicates that it has satisfied the AVE's validity criteria. Furthermore, reliability testing was carried out based on Cronbach's Alpha (CA) value which is an estimate based on the intercorrelation of latent indicators. Cronbach's alpha (CA) is a conservative measure because it produces lower reliability values. In contrast, Composite Reliability (CR) tends to overestimate. Therefore, Hair et al. (2017) suggest combining the two in a reliability assessment. Composite Reliability (CR) varies between 0 and 1. The higher the value, the higher the

reliability. The interpretation is the same as that of Cronbach's Alpha (CA). CR of > 0.7 is acceptable for research.

Table 4. Reliability testing based on cronbach's alpha (CA)

	Cronbach's Alpha (CA)
X1	0.921
X2	0.850
X3	0.925
X4	0.892
X5	0.867
Y	0.941

Since all CA values were greater than 0, they all satisfied the criteria for reliability according to Cronbach's alpha.

Table 5. Reliability testing based on composite reliability (CR)

	Composite Reliability (CR)
X1	0.945
X2	0.897
X3	0.946
X4	0.925
X5	0.909
Y	0.951

The fact that all CR values were more than 0.7 indicates that they all met the CR-based criteria for reliability. Then, the Fornell-Larcker method was used to conduct the discriminant validity test. Discriminant Validity Test in Table 6

Table 6. Discriminant validity test

	X1	**X2**	**X3**	**X4**	**X5**	**Y**
X1	$\sqrt{AVE_{X1}} =$ 0.901					
X2	0.407	$\sqrt{AVE_{X2}} =$ 0.829				
X3	0.465	0.389	$\sqrt{AVE_{X3}} =$ 0.903			
X4	0.505	0.145	0.482	$\sqrt{AVE_{X4}} =$ 0.869		
X5	0.447	0.435	0.539	0.478	$\sqrt{AVE_{X5}} =$ 0.846	
Y	0.688	0.611	0.654	0.629	0.643	$\sqrt{AVE_{Y}} =$ 0.843

During a discriminant validity test, the correlation between a latent variable and other latent variables is measured and compared to the value of the latent variable's square root of the AVE. It is understood that the correlation between each latent variable and the other latent variables was smaller than the square root value of AVE for that latent variable. Therefore, it is said that it has satisfied the criteria for discriminant validity.

3.3. Significance Test of Effect / Hypothesis Test (Inner Model)

The R-Square value of Y was 0.776 which means X1, X2, X3, X4, X5 were able to explain Y of 77.6%. The analysis result that using SEM-PLS may be summarized that four sustainable livelihood assets, namely human assets, natural assets, social assets, and physical assets have a significant influence on disaster recovery. While financial assets do not have a significant effect on disaster recovery.

Table 7. Significance testing of effect

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
X1 -> Y	0.255	0.247	0.080	3.185	0.002
X2 -> Y	0.328	0.326	0.080	4.100	0.000
X3 -> Y	0.188	0.174	0.084	2.236	0.026
X4 -> Y	0.292	0.297	0.098	2.992	0.003
X5 -> Y	0.146	0.149	0.105	1.392	0.164

Based on the results in Table 7, the results obtained are:

1. X1 (Human assets) has a positive effects on Y, with coefficient value path (original sample) 0.255, and significant, with P-Values = 0.002 <0.05 (Hypothesis Accepted).
2. X2 (Natural assets) have the positive effects on Y, with coefficient value path (original sample) of 0.328, and significant, with P-Values = 0.000 <0.05 (Hypothesis Accepted).
3. X3 (Social assets) have the positive effects on Y, with coefficient value path (original sample) of 0.188, and significant, with P-Values = 0.026 <0.05 (Hypothesis Accepted).
4. X4 (Physical assets) have the positive effects on Y, with coefficient value path (original sample) 0.292, and significant, with P-Values = 0.003 <0.05 (Hypothesis Accepted).
5. X5 (Financial assets) have the positive effects on Y, with coefficient value path (original sample) of 0.146, and not significant, with P-Values = 0.164 > 0.05 (Hypothesis Rejected)

4. Conclusions

Human assets have a score of 2.40 (low), natural assets have a score of 3.20 (high), social assets have a score of 2.84 (high), physical assets have a score of 2.95 (high), and financial assets have a score of 2.42 (low). These factors determine the viability of sustainable livelihoods for starfruit farmers and business participants in Ngringinrejo Starfruit Agrotourism (low). Pentagon assets show that the highest assets are natural assets, and the lowest are human assets. The analysis results using SEM-PLS show that four sustainable livelihood assets, namely human, natural, social, and physical, have a significant influence on disaster recovery. In contrast, financial assets do not significantly affect disaster recovery. The most significant indicators for the disaster recovery process in agrotourism are developing digital solutions, and the lowest indicator is designing risk communication.

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