

Sustainability Assessment of The Coastal Community of Tobati Village For Environmental Sustainability, Jayapura City, Papua Province, Indonesia

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Abstract Community sustainability assessment for environmental sustainability is an effort that can maintain a stage as expected, where people live to meet their needs in an environmentally friendly and socially just manner. This study aims to produce sustainability values based on ecological aspects, socio-cultural aspects, and spiritual aspects. The method used in data collection is Community Sustainability assessment (CSA) and the sample is selected intentionally (purposive sampling). The results showed that the Tobati village community had reached a good initial state towards sustainability with a total score of 909 or ranging from 500-998 of the sustainability score. These results are obtained from each aspect with a weighted value, namely: ecological aspects (188), socio-cultural aspects (318), and spiritual aspects (403). This shows that the people of Kampung Tobati have reached a good start towards sustainability.

Key words: Sustainability Assessment, Community Sustainability Assessment (CSA), Tobati, Jayapura

INTRODUCTION

The environment could be a solidarity of space with all objects, control, conditions and living things, counting people and their behavior, which influence the progression of life and the welfare of people and other living things. Environmental administration is an coordinates exertion within the utilization, course of action, support, supervision, control, rebuilding, and improvement of the environment (Paulangan., 2014). Environmental factors can also affect the life of macro benthos which are related to the mangrove ecosystem (Muskananfolo et al. 2020). The results of ecosystem change trends until 2030 were determined using the MOLUSCE algorithm in QGIS based on ecosystem distribution maps in 2010 and 2020 and the main factors influencing natural and socio-economic conditions, including terrain elevation, population density, distance to roads, distance to rivers and watercourses (Kasim and Halid., 2025).

The current pattern of utilization and use of natural resources is experiencing a high escalation to meet human needs as a result of the high population growth rate. Resource crises such as: food, water and energy prove that a management process is needed that prioritizes aspects of welfare, justice and more importantly sustainability. Sustainability is a personal or hereditary effort that must be maintained because it is a legacy from parents and families that should be preserved (Antoh, et al., 2018).

Coastal and marine areas have enormous economic potential and are utilized efficiently and sustainably. The potential of coastal and marine economy based on activity sector includes: capture fisheries, marine and coastal tourism, aquaculture, processing industry, fishery products, and forestry (mangrove) (Sari et al., 2021). Youtefa Bay and its surroundings have several functions and uses, namely as a capture fisheries and aquaculture area, a transportation route for fishermen, tourism, and a fishing boat dock. Youtefa Bay, especially Tobati Village, is now experiencing disturbances in its environmental conditions. This is due to the high level of household activities and high levels of business activities carried out by the community at Youtefa Market, Entrop Terminal, and Entrop PTC, which produce a lot of waste which is then channeled or dumped into the waters of Youtefa Bay so that the waters of Youtefa Bay become polluted. The high level of waste that pollutes the waters of Youtefa Bay due to the increasing activity of the people of Jayapura City which is high with many activities of consuming goods and services is feared to have a negative impact on environmental sustainability such as turbid river and sea water, damage to mangrove vegetation, decreased aesthetic and tourism value. If changes in environmental quality in Youtefa Bay continue to occur, it is feared that the biological components in it will experience changes that will cause fish to migrate or become extinct. This will have an impact on low fish catches. Marine pollution not only kills marine biota and ecosystems, but also endangers the health of the people living in Youtefa Bay,

especially in Tobati Village (Sari, et al., 2021). Marine management policies can be based on local community wisdom. This has been done in spatial data analysis in the Kei Islands (Syahibul K, et al., 2020).

Tobati Village is one of the villages located in South Jayapura District, Jayapura City, Papua Province. The location of the Tobati tribe settlement is right in the waters or sea area. This village has an area of $\pm 0.53 \text{ km}^2$ and is inhabited by a population of around 350 people. Almost all of the people of Tobati Village work as fishermen, but the interaction between native culture and outside culture has resulted in a transformation. Where people who used to work as fishermen have now changed professions to become traders, private employees or work in other informal sectors. The main transportation for these people is boats when they are going to carry out activities from and where they are going to travel (Mariati, et al., 2017). The coastal area of Tobati Village used to be overgrown with mangrove vegetation, so the people of Tobati Village used to use the mangrove forest as a place to find food such as: fish, shrimp, crabs, shellfish, chopping sago, and collecting firewood. However, along with the development of development and environmental pollution due to waste, its current condition has experienced a lot of decline in quality and change (Arizona & Sunarto., 2016).

Mangrove biological system harm happens due to changes within the work of a few or all of the arrive zone from its unique work to the ecosystem, which can hurt the environment and the potential of the arrive itself. The harm to the mangrove environment in Tobati Town started with the clearing or deforestation and the change of timberlands into built-up arrive. Arriving, that's changed over into a central terminal, shopping center, and government and private workplaces, and this improvement has an impact on the accessibility of natural resources (Arizona & Sunarto., 2016). The area of mangroves in the Youtefa Bay area is decreasing along with the high level of land use for the needs of residential development, road and bridge infrastructure in Jayapura City (Hamuna & Tanjung, 2018).

Based on the problems that occur in Youtefa Bay, especially Tobati Village, the researcher is interested in conducting a study entitled "Assessment of Community Sustainability for Environmental Sustainability in Tobati Village, South Jayapura District, Jayapura City". The objectives of this study are: to produce sustainability values based on ecological, socio-cultural, and spiritual aspects in Tobati Village, South Jayapura District, Jayapura City.

MATERIAL AND METHOD

The inquire about was conducted for two months, to be specific from December 2021-January 2022 in Tobati town, South Jayapura Area, Jayapura City (Figure 1).



Figure 1. Map of research location

Information collection was carried out through studies and interviews utilizing the Community Supportability Evaluation (CSA) survey. The method utilized was a test of ten respondents purposely chosen, specifically: Innate community pioneers (1 individual), devout pioneers (1 individual), ladies pioneers (1 individual), youth pioneers

(2 individuals), town government authorities (1), ranchers (2 individuals), and Rural expansion (2 individuals). The meeting strategy is to welcome respondents in a room by implies of a survey held and to discuss together to elicit answers to the information and data collected from chosen respondents. This procedure aims to ensure that each respondent can complement the answers inquired and can clarify in detail to induce a precise reply. In expansion, the perception of the area and scope of the field is achieved through photo documentation. The measured community maintainability is related to 3 perspectives: environmental, socio-cultural, and otherworldly (Table 1).

The method is the Community Supportability Appraisal (CSA). Collecting information for CSA is by meeting respondents with a purposive inspection strategy. The following are the information collection parameters:

Table 1. Community Sustainability Assessment Variables in Tobati Village, Jayapura City

Variables	Weight
Ecological Aspects	
1. Meaning and importance of the role of the home	0-50+ (*)
2. Nourishment accessibility (generation and dispersion)	0-50+ (*)
3. Foundation (buildings and transportation)	0-50+ (*)
4. Designs of utilization and strong squander management	0-50+ (*)
5. Water (source, quality, and utilization designs)	0-50+ (*)
6. Fluid squander management and water contamination	0-50+ (*)
7. Vitality (sources and utilization)	0-50+ (*)
Total A	333+< (**)
Socio-cultural aspects	Nilai
1. Openness (belief, security, and shared spaces)	0-50+ (*)
2. Communication (stream of thoughts and data)	0-50+ (*)
3. Systems (accomplishments and administrations)	0-50+ (*)
4. Social supportability	0-50+ (*)
5. Education	0-50+ (*)
6. Wellbeing administrations	0-50+ (*)
7. Economic sustainability (local economic vitality)	0-50+ (*)
Total B	333+< (**)
Spiritual aspects	Nilai
1. Cultural sustainability	0-50+ (*)
2. Arts and recreation	0-50+ (*)
3. Spiritual association	0-50+ (*)
4. Community connection	0-50+ (*)
5. Community strength	0-50+ (*)
6. Modern holographic viewpoint (worldwide worldview	0-50+ (*)
7. Worldwide peace and awareness	0-50+ (*)
Total C	333+<C (**)
Total A+B+C	999+ (***)

Source: Antoh et al.2018

*= 50+< **=333+< ***=999+

*=score of 1 variable, **=score 1 aspect, ***=score of total 3 aspects

The esteem of community supportability gotten from the appraisal is at that point summed to get a esteem. The summed parts are: the esteem of the component viewpoints or factors, the esteem in 1 perspective, and the overall esteem of 3 angles to obtain the esteem of community supportability within the town of Tobati.

Table 2. Parameters for evaluating community sustainability

Rating Level	Score	The condition of community sustainability
Variable/ (*)	50+	Illustrated an exceptionally great advance towards supportability

Aspects (A,B,C)/ (**)	25-49	Appears to be a great beginning
	0-25	Coherence.
	333 ⁺	Shows that activity must be taken to be feasible.
	166-332	Illustrated an exceptionally great advance towards maintainability.
Total of each Aspects (T)/ (***)	0-165	Appears to be a great beginning
	999 ⁺	Progression.
	500-998	Shows that activity must be taken to be economical.
	0-449	Illustrated an exceptionally great advance towards maintainability.

Source: Antoh et al.2018

*=score of 1 variable, **=score of 1 aspect, ***=score of total 3 aspects

RESULTS

Community sustainability assessment for environmental sustainability in Tobati Village was conducted using the CSA questionnaire, the accumulation of questionnaire assessments is shown in Table 4.1. Tobati Village, administratively included in the South Jayapura District, Jayapura City. The location of the Tobati tribe settlement is right in the waters or sea area, with an area of $\pm 0.53 \text{ km}^2$ and inhabited by a population of around 350 people. The overall boundaries of the Tobati village are as follows: the north borders Hamadi Village, the South borders Engross Village, the West borders Entrop Village and the East borders the Pacific Ocean.

The outcome of the estimation of the supportability of biological, socio-cultural, and otherworldly perspectives within the Tobati Town range, South Jayapura Area, Jayapura City, to 10 respondents, including Inborn Community Pioneers, Devout Pioneers, Ladies Pioneers, Youth Pioneers, Town Government, and Instructors.

Table 3. The value of community sustainability in Tobati Village, South Jayapura District, Jayapura City

Variables		Weight
❖ Ecological aspects		Score
1.	The meaning of the place of residence	27
2.	Food availability (production and distribution)	12
3.	Infrastructure (buildings and transportation)	32
4.	Pattern (consumption and management of solid waste)	33
5.	Water (source, quality and usage patterns)	27
6.	Management (liquid waste and water pollution)	15
7.	Energy (source and use)	42
Total A		188
❖ Socio Cultural aspects		Score
1.	Openness (Trust and security; shared space)	52
2.	Communication (ideas and information flow)	37
3.	Network (achievements and services)	48
4.	Social sustainability	73
5.	Education	27
6.	Health services	42
7.	Economic sustainability (health of the local economy)	39
Total B		318
❖ Spiritual aspects		Score
1.	Cultural sustainability	55
2.	Arts and recreation	32
3.	Spiritual sustainability	53

4.	Community related	69
5.	Community resilience	56
6.	New holographic (world or global view)	66
7.	Global peace and thought	72
	Total C	403
	Total A+B+C	909

Source: Antoh et al, (2018).

Based on (Table 2) obtained from the results of interviews with respondents who were deliberately selected covering ecological aspects, socio-cultural aspects, and spiritual aspects as follows.

SUSTAINABILITY OF ECOLOGICAL ASPECTS

The results of the assessment and addition of values obtained from each component in the ecological aspect show a good start, where it is heading towards sustainability with a total value of 188 or ranging from values: 166-332. Therefore, it is necessary to take action to increase progress in this aspect, so that it can show good progress towards sustainability. The following is a graph showing the value of each component that makes up the ecological aspect.

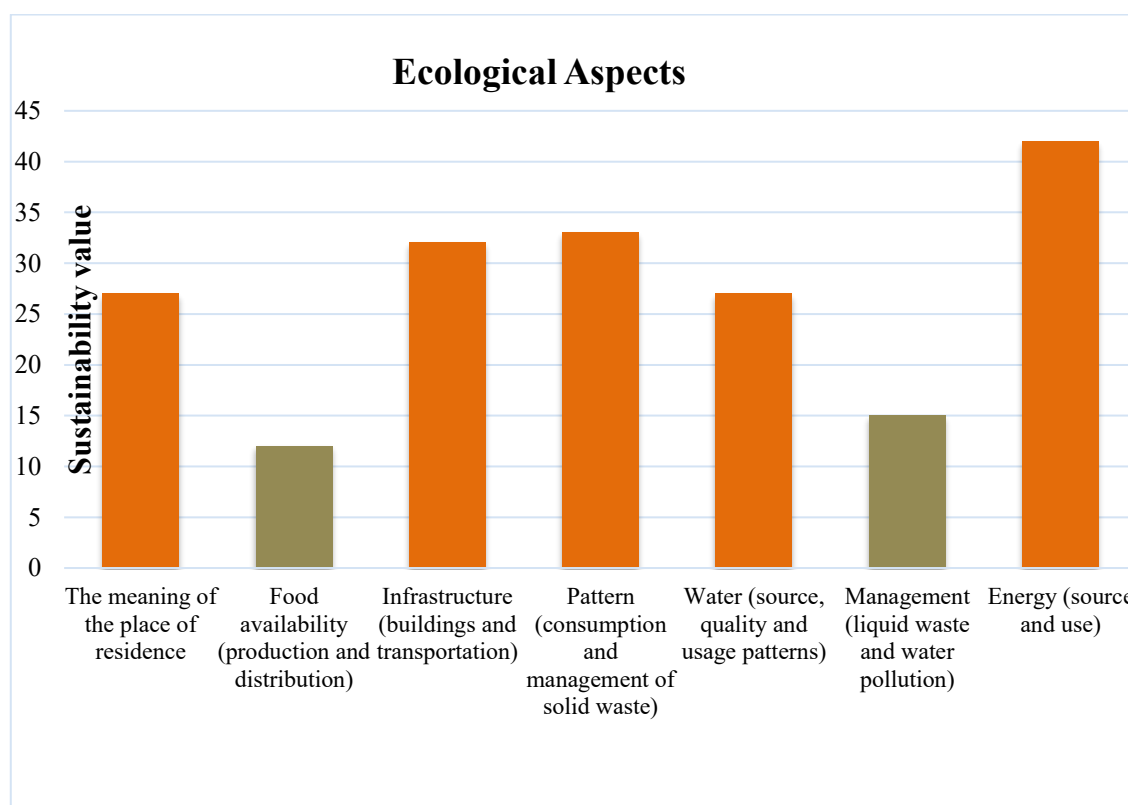


Figure 2. The value of the ecological aspect of sustainability

Of the seven components in the ecological aspect, there are five components that show a good start towards sustainability ranging from 25-49. Among them are: the meaning of residence with a score of 27, infrastructure (buildings and transportation) with a score of 32, patterns (consumption and solid waste management) with a score of 33, water (sources, quality, and usage patterns) with a score of 27 and energy (sources and usage) with a score of 42. Components that have low scores indicating that action must be taken to be sustainable are food availability (production and distribution) with a score of 12, and management (liquid waste and water pollution). The interview results showed that the ecological aspect was low so that it did not reach a score of 333⁺, influenced by environmental problems. This is due to the high change in land use where sago forests that were previously

used to meet the food needs of the community have now been converted into residential areas, namely in the Autonomous Region and the area around Entrop. In addition to development, waste is a major cause that affects environmental quality, especially the quality of water which has decreased so that the ability to catch fish to meet the daily needs of the community has also decreased. Other studies have shown significant increases in average temperatures and decreased rainfall, which leads to reduced river flow and worsening water quality (Dinar et al. 2025). As a result, the Tobati village community cannot produce and meet food needs from their own area. To meet the community's current food needs, the Tobati village community gets it from outside the village area. This is in line with research by Budiarti, et al., (2013) which states that the sustainability of the community in terms of ecology requires corrective action. This needs to be anticipated through the preservation of agricultural land, namely by increasing the functional value of the land. and research conducted by Mawarni., (2020) in Wiyantri Village, Skanto District, Keerom Regency. Furthermore, the study stated that the low ecological aspect is influenced by environmental problems that continue to increase along with the dynamics of population growth and the surrounding environment.

SOCIO-CULTURAL ASPECT

The results of the assessment and summation of the values obtained from each component in the socio-cultural aspect show a good start towards sustainability with a total value of 318 or ranging between (166-332). Therefore, it is necessary to take action to improve progress in this aspect, so that it can show good progress towards sustainability. The following is a graph showing the value of each component that makes up the socio-cultural aspect.

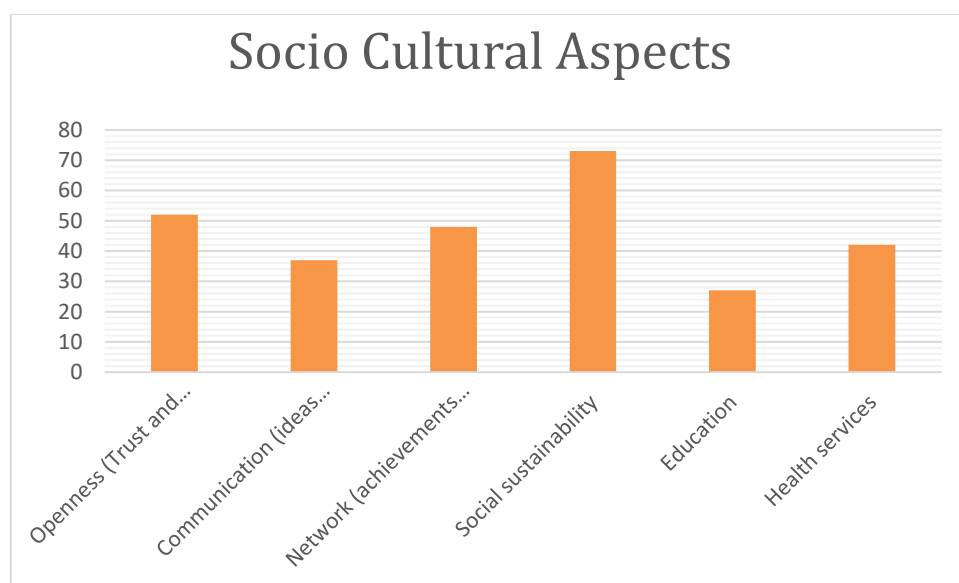


Figure 3. Sustainability value of socio-cultural aspects

Of the seven components in the socio-cultural aspect, there are two components that show very good progress towards sustainability ranging from 50⁺. Among them are social sustainability with a score of 73, and the openness factor (trust and security, shared space) with a score of 52. The results of the interview stated that the high components of social sustainability and openness are because the Tobati community has high social relations and tolerance to help each other. Decision making is always carried out transparently and involves all members of the community. If there is a conflict between members of the community, the conflict is resolved well amicably. Other components show a good start towards sustainability ranging from 25-49. Among them; network factor (achievement and services) score 48, health services score 42, economic sustainability (local economic health) score 39, communication (flow of ideas and information) score 37, and education factor which has a fairly low score from the seven components with a score of 27. From the interview results, it was stated that the thing that can influence the education component to be quite low is due to economic factors that have a real impact so that most people in the past could not continue their education to college. However, this has been

attempted so that it does not happen to the next generation where children are encouraged to be able to complete their education to college. Another thing that can also influence is the location of the settlement which is quite far from the school environment, so that every morning children have to cross Youtefa Bay by boat to go to school. The education component can have a direct influence on the community to be able to manage nature and the resources they have well to achieve their welfare. This is in line with research by Hidayat, et al., (2021) which states that in order to reduce the level of vulnerability and achieve general welfare for the people of Putik Village, equalization of primary and secondary education is carried out in accordance with the number one mission of medium-term development, namely: (1) realizing quality and affordable education and health services evenly. and research by Antoh, et al., (2018) which states that the minimum education obtained has a direct influence on the community to be able to manage their nature including their yards.

SPIRITUAL ASPECT

The results of the assessment and summation of the values obtained from each component in the spiritual aspect show very good progress towards sustainability with a total value of 403 or around the value (333⁺) so it needs to be maintained for the sustainability of the community. The following is a graph showing the value of each component that makes up the spiritual aspect.

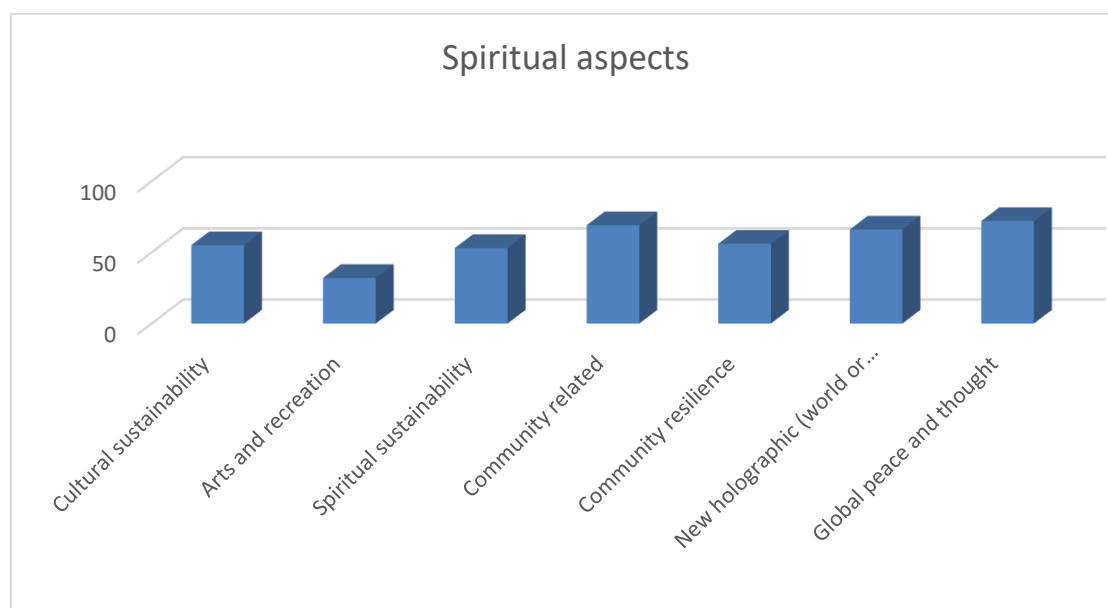


Figure 4. Sustainability value of spiritual aspects

Of the seven components in the spiritual aspect, there are six components that show very good progress towards sustainability ranging from 50⁺ and only one component shows a good start towards sustainability ranging from 25-49. Among them: cultural sustainability score 55, spiritual sustainability score 53, community connectedness score 69, community resilience score 62, new holographic (world/global view) score 66, and global peace and thinking score 72. The interview results show that the Tobati community has a three-hearth government, namely the Government (village head), traditional head (Ondoafi) and church head (Pastor). The Tobati community is a community that lives under the authority of the Government, where their lives are regulated by the government, so they must follow the rules and carry out their obligations as good citizens. In addition to the state government, there is also a traditional government or what is known as Ondoafi. The Tobati community has guidelines, customs, and rules of life that must be passed on and known by their generations. Local wisdom in the concept of territorial division and customary rules must be maintained and implemented to support the sustainability of its cultural life. In addition to the state government and customs, the Tobati community realizes that their lives are also regulated by the church (God), so they submit and carry out their duties as church members and carry out routine worship in the church together, in addition to other worship activities such as

fathers, mothers, teenagers to children are carried out routinely according to the days agreed upon in the congregation. Worship activities are certainly carried out to build bonds of faith and mutual respect between people in the village as a form of togetherness. This is in line with Ngabalin's research., (2015) which states that solidarity in community life in Fak-fak is also very high. Helping each other and sharing is the lifestyle of the Fak-fak people; they have the slogan "One stove Three stones", in the original language "Toromit War Istery", which contains the philosophy of "unity" or unity, oneness, and supporting each other in working. The meaning of the slogan was then expanded to become a unity of movement, and joint action between elements of Customary, Religious, and Government elements, in the management of Fak-fak regional development towards welfare and prosperity.

The component that shows a good start towards sustainability is art and recreation with a score of 32. Therefore, action is needed to increase progress in this component, so that it can show good progress towards sustainability. The overall sustainability assessment of the seven components has a value of 409, indicating very good progress towards sustainability, so it needs to be maintained for the sustainability of its community. The high spiritual aspect is because the community has trust in religious figures and is organized and regular in worship. This is in line with the research of Budiarti, et al., (2013) which states that social, mutual cooperation, and spiritual or religious values in Cikahuripan Village and Cihideung Village, especially in Cikahuripan Village are still high and need to be maintained for the sustainability of its community.

Based on information that has been obtained from the environmental perspective, socio-cultural perspective, and otherworldly angle. It is known that the entirety of each viewpoint appears to be a great beginning towards maintainability, with a score of 909, extending from 500-998. In the ecological aspect, a score of 188 was obtained, meaning that the Tobati village community has shown a good start towards sustainability, in the socio-cultural aspect, 318 was obtained, indicating a good start towards sustainability, and in the spiritual aspect, 409 was obtained in this aspect, the community has shown very good progress towards sustainability. Based on the aggregate assessment of community sustainability, it shows that the majority of the Tobati village shows a good process towards sustainability.

CONCLUSION

Assessment of community sustainability in Tobati Village, South Jayapura District, Jayapura City. Based on the information gotten from the biological viewpoint, socio-cultural perspective and otherworldly angle, it appears a great begin towards supportability with a add up to esteem of 909 or extending between 500-998 from the supportability score. The results were obtained from each aspect with a value weight, namely, the ecological aspect 188, the socio-cultural aspect 318, and the spiritual aspect 403. This shows that the Tobati Village community has achieved a good initial state towards sustainability.

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