

RESEARCH ARTICLE



Pentahelix Stakeholder Analysis in Developing Ecotourism Based on *Paradisaea minor jobiensis* Conservation in Sawendui, Yapen Islands

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ABSTRACT

Sawendui Village, Yapen Islands Regency, has ecotourism potential *Paradisaea minor jobiensis*. One approach to preserving *P. minor jobiensis* is the development of ecotourism. Ecotourism development requires pentahelix stakeholder involvement, which consists of the community, businessmen, government, academics, and media, who have different roles, interests, and influences in terms of ecotourism. The objectives of this study were identify stakeholders, measure the level of interest and influence of stakeholders, and classify stakeholders related to *P. minor jobiensis*-based ecotourism in Sawendui Village. This study identified 16 stakeholders related to ecotourism using pentahelix grouping, qualitative and quantitative methods through data collection using questionnaires and semi-structured interviews. The Snowball Method was used to get respondents from each stakeholder group. Further study classified stakeholders based on their interests and influence as a pentahelix group. The research results showed that not all ecotourism stakeholders have high interest and influence. The community has the highest interest because they get many benefits from ecotourism, while the government has the highest influence because of its strong institutions. The community is included in the subject classification, the government is included in the key player classification, the media is a context setter, and the crowd consists of academics and businessmen. Increasing stakeholder interest and influence is needed to accelerate ecotourism development. Collaboration between stakeholders in ecotourism needs to be carried out. As a key player, the government has the authority to mobilize all stakeholder groups.

Introduction

Sawendui is a village in the Yapen Islands Regency, Papua Province, designated as a natural tourist location for observing *Paradisaea minor jobiensis* [1]. The subspecies *Paradisaea minor jobiensis* (*P. minor jobiensis*), locally known as *cenderawasih*, has a limited distribution and is an endemic subspecies on Yapen Island [2]. Data related to *P. minor jobiensis* are not found in the IUCN Red List of Threatened Species. The only data available are information regarding *Paradisaea minor*, classified as the least concern (LC) because of its wide distribution, but global population calculations still need to be obtained [3]. The assessment of *Paradisaea minor* needs to adequately describe the actual condition of *P. minor jobiensis* in nature, as Raunsay and Abidondifu [2] stated that the *P. minor jobiensis* population continues to decline. However, *P. minor jobiensis* population in Sawendui is estimated to have increased in recent years, along with community awareness and participation in preserving nature [2]. Community participation and improved environmental conditions align with ecotourism principles [4].

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Ecotourism based on endemic fauna, including *P. minor jobiensis*, is good for development because it positively affects conservation [5]. Endangered wild animals have become an attractive tourist destination, including Indonesia [6]. *P. minor jobiensis* has unique chirping, morphology, and behavior, which is an ecotourism attraction [7,8]. The process of preserving species is used for learning ecotourism activities [9]. Ecotourism activities in the form of bird watching, photography, tracking, and camping can be conducted by exploiting the uniqueness of paradise birds. The natural beauty of Sawendui and the presence of *P. minor jobiensis* attracted foreign tourists.

Previous studies have been conducted on Yapen, a *P. minor jobiensis* population [2], the availability of *P. minor jobiensis* nest-making vegetation [10], and trees for *P. minor jobiensis* activities [11]. There is yet to be any study on ecotourism stakeholders in Yapen, while Kristiana and Nathalia [12] stated that tourism development needs to involve stakeholders. Sawendui is suitable as an ecotourism-based *P. minor jobiensis* conservation location that involves all stakeholders. Stakeholders are often associated with the pentahelix concept, which can play a role in encouraging the tourism sector and system [13].

Stakeholder participation in tourism development is necessary [14]. Natural resource management tends to cause conflicts among stakeholders because they use the same resources for different purposes [15,16]. Pentahelix stakeholders include society, businessmen, the government, academics, and the media [13]. Stakeholder analysis can be conducted by identifying stakeholders and their support, grouping and classifying them, and studying the relationships between related stakeholders [15,16]. This is the basis for stakeholder analysis to determine the extent of the impact of *P. minor jobiensis* conservation on the development of ecotourism in Sawendui. Furthermore, this study focuses on identifying stakeholders, measuring their level of interest and influence, and classifying stakeholders related to *P. minor jobiensis*-based ecotourism in Sawendui Village. This study aims to obtain collaborative planning between stakeholders to optimize ecotourism development based on conservation of a bird of paradise.

Materials and Methods

Study Area

This study was conducted between September 2023 and February 2024. The study area was Sawendui Village, Raimbawi District, Yapen Islands Regency, Papua Province, Indonesia (Figure 1). Sawendui Village is a location for ecotourism based on the conservation of *P. minor jobiensis*. Sawendui is one of five *Paradise minor* observation locations in Papua Province. The abundance of the *P. minor jobiensis* population in Sawendui is estimated to still be large and easy to find. Sawendui is often visited by foreign tourists and bird watchers who are interested in the existence of *P. minor jobiensis*.

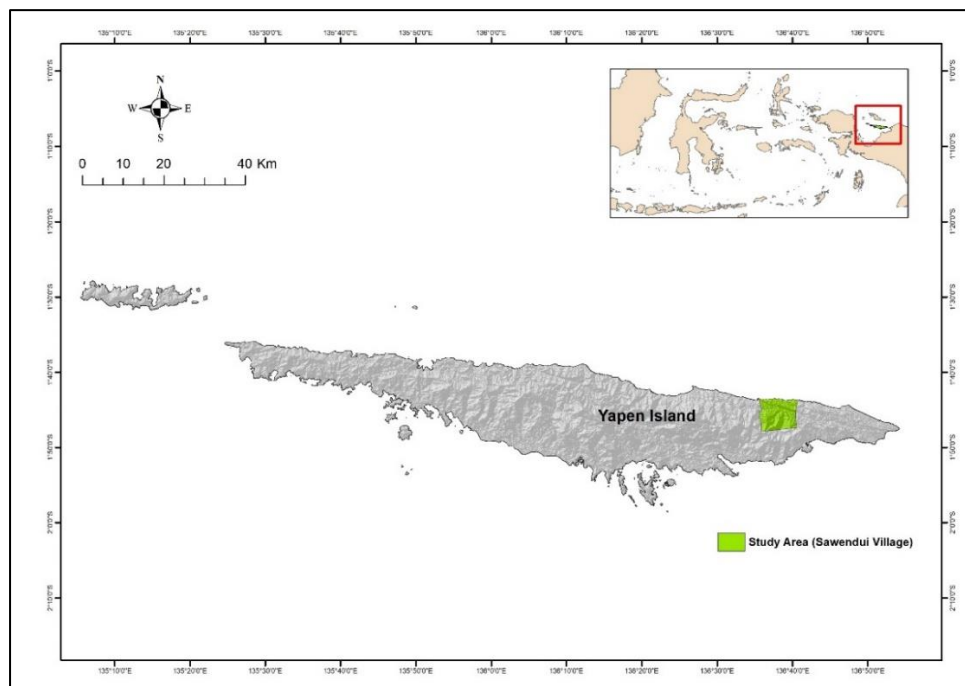


Figure 1. Map of *P. minor jobiensis*-based ecotourism research location.

Data Collection

This study used both qualitative and quantitative data-collection methods. A combination of qualitative and quantitative methods is appropriate for stakeholder-related research [17]. Quantitative data were obtained from respondents who completed the questionnaires. Qualitative data were obtained through in-depth interviews using an interview guide.

Respondents were selected using non-probability sampling and the snowball sampling method. Determining respondents through the snowball sampling method provides representative results that are related to each other [18]. The determination of the second respondent and so on is determined based on information from the first respondent, thereby obtaining more complete data [19]. The study had 16 respondents. Three respondents represented the community, three represented entrepreneurs, seven represented the government, two represented academics, and one represented a media respondent.

Data Analysis

All categories of stakeholders identified were key informants. Key informants have several criteria, including being the most knowledgeable, having authority, and playing an important role [20]. Respondents' stakeholders represented a connection with ecotourism, an understanding of Sawendui's conditions, and had visited and conducted ecotourism activities in Sawendui. Respondents were selected because they had experience and knowledge of the research objectives [12,21]. The stakeholder identification results were grouped into a pentahelix.

Pentahelix identifies stakeholders with different interests and influences that require measurement. The level of interest and influence was measured through each of the 5 statements [22,23]. Stakeholder interests are known in the following statements; 1. Stakeholder involvement, 2. Benefits of ecotourism development, 3. Authority related to ecotourism development, 4. Stakeholder program, 5. Level of dependency. Stakeholder influences are known in the following statements; 1. Fighting for aspirations, 2. Facility contribution, 3. Institutional capacity, 4. Budget support, 5. Implementation capability [22,23].

The analysis of the level of interest and influence was performed using triangulation [24]. The interest and influence values were obtained from a combination of the quantitative values of the questionnaire and qualitative values of the in-depth interviews [25]. Quantitative assessment using a questionnaire provides values using a Likert scale ranging from 1 to 5, which indicates the value of strongly disagree, disagree, neutral, agree, or strongly agree [26]. A qualitative assessment was conducted using a list of semi-closed questions. Combining qualitative and quantitative methods is one way of obtaining data in several different ways, which is a characteristic of the triangulation of data collection techniques [27,28]. The triangulation method is used to validate data from several pieces of information obtained in previous research [27–30]. The answer to this statement contains an understanding of the level of interest and influence of stakeholders regarding ecotourism development. The value given is 1 to 5, which means very no influence or very no interest, and then increases gradually to a value of 5, which means very influential or very interested [19,22,23]. A description of interest and influence scores is presented in Table 1.

Table 1. Scores and criteria for stakeholder interests and influence in developing ecotourism based on bird of paradise conservation in Sawendui, Yapen Islands Regency.

Score	Related to the development of based ecotourism conservation of paradise	
	Interest	Influence
1 ≤ score < 2	Stakeholder involvement is very low The benefits obtained are very low Very low authority Ecotourism is unrelated with task Very low level of dependency	Very incapable fight for aspiration Contribution Very low facilities Capacity institutions related to information Budget support in the form of promotion Ability implementation is very low
2 ≤ score < 3	Low stakeholder involvement Benefits obtained low Authority low Ecotourism supports task Level of dependency low	Not capable fight for aspiration Contribution facility low Capacity technology -related institutions Budget support in the form of empowerment public Ability implementation low
3 ≤ score < 4	Sufficient stakeholder involvement high Benefits obtained enough high Authority Enough high Ecotourism is explanation from task Level of dependency enough high	Enough capable fight for aspiration Contribution facility enough high Capacity institutions related to resources man Budget support in the form of security Ability implementation Enough high

Score	Related to the development of based ecotourism conservation of paradise	
	Interest	Influence
4 ≤ score < 5	High stakeholder involvement Benefits obtained high Authority high Ecotourism is one task principal Level of dependency high	Capable fight for aspiration Contribution facility high Capacity institutional costs Budget support for facilities development Ability implementation high
5	Stakeholder involvement is very high The benefits obtained are very high Very high authority Ecotourism is task principal The level of dependency is very high	Very capable fight for aspiration Contribution very high facilities Capacity institutions related to collaboration Budget support for infrastructure development Ability very high implementation

The mapping and categorization of stakeholders for the development of ecotourism based on *P. minor jobiensis* in this study adopted an analysis model regarding the typology of stakeholder analysis methods for natural resource management [16]. The analysis of stakeholder interests and influence is classified into four groups [15,16]. A depiction of the classification of the four stakeholder groups is shown in Figure 2.

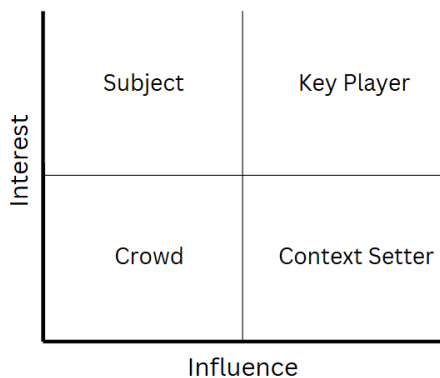


Figure 2. Pentahelix stakeholder interest and influence matrix.

Result

Identification of Stakeholders

The stakeholder identification results show that 16 stakeholders are involved in ecotourism. The community has 3 stakeholders, the business has 3 stakeholders, the government has 7 stakeholders, academics has 2 stakeholders, and the media has 1 stakeholder. Stakeholders have their respective roles, namely: policy creator, coordinator, facilitator, implementer, and accelerator [31]. The numbers, stakeholder information, and roles are listed in Table 2.

Table 2. Results of pentahelix stakeholder identification in ecotourism development in Sawendui.

Category	Institutions/ stakeholders	Role of stakeholders [31]
Community	1. Community figure 2. Bontenang Group 3. Insirei Group	Implementer
Businessman	1. Tour and Travel Entrepreneur 2. Hotel Entrepreneur 3. Culinary Entrepreneur	Facilitator
Government	1. Sawendui Village Government 2. Raimbawi District Government 3. <i>Kesatuan Pengelolaan Hutan Produksi</i> (KPHP) Yapen Islands 4. Yapen Islands Tourism, Youth and Sports Department 5. Yapen Resort – <i>Balai Besar Konservasi Sumber Daya Alam</i> (BBKSDA) Papua 6. Biak Section - BBKSDA Papua 7. Balai Pengelolaan Hutan Lestari (BPHL) Jayapura	Policy creator, coordinator
Academics	1. Brawijaya University 2. Pamulang University	Accelerator
Media	1. Suara Indonesia	Accelerator

Ecotourism development programs require stakeholder cooperation. Synergy between relevant stakeholders is needed according to their respective roles and functions as well as to build good cooperative relationships [19]. Each stakeholder has a different and important role and must be understood in developing tourism objects and attractions in a place [32]. The roles of each stakeholder are listed in Table 3.

Table 2. The role of existing stakeholders involved in developing ecotourism based on the conservation of birds of paradise in Sawendui, Yapen Islands Regency.

Institutions/ Stakeholders	Existing role
Community Figure	Carrying out initial initiatives in conservation and protection efforts for birds of paradise and spreading understanding of conservation to the community. Continue to make efforts to protect animals and the environment.
Bontenang Group	Carry out periodic monitoring and counting of birds of paradise. Under certain conditions, he becomes a tour guide/tourist companion.
Insirei Group	Carry out periodic monitoring and counting of turtles. Helping the Cenderawasih group in protecting the forest from encroachment.
Tour and Travel Entrepreneur	Providing tourism packages by planning time, events and activities. Providing travel packages to Sawendui.
Hotel Entrepreneur	Providing accommodation for domestic and foreign tourists transiting in Serui.
Culinary Entrepreneur	Providing culinary options with appropriate levels of hygiene standards and culinary suitability.
Sawendui Village Government	Coordinate the community carrying out ecotourism support activities and provide suggestions for site level input.
Raimbawi District Government	Conduct local potential surveys and communicate information to higher stakeholders . Create site-level policies that support ecotourism.
KPHP Yapen Islands	Develop environmental service programs in production forests, currently focusing on other areas that KPHP has designated as ecotourism locations
Yapen Islands Tourism, Youth and Sports Department	Create policies and collaboration related to ecotourism (formulation, implementation, monitoring, evaluation).
Yapen Resort - BBKSDA Papua	Carrying out security of forest areas (patrols, monitoring and preventing encroachment)
Biak Section - BKSDA Papua	Carrying out potential inventory activities as well as protecting and securing forest areas
BPHL Jayapura	Carrying out planning, implementation and evaluation of permits for the use of protected forests (including use of environmental/non-timber services)
Brawijaya University	Planning research and community development activities according to science (forestry)
Pamulang University	Planning research and community development activities according to science (biology)
Suara Indonesia	Carry out promotions related to ecotourism activities

Level of Stakeholder Interest and Influence

Each stakeholder identified has a different level of interest and influence. It is necessary to measure the interests and influence of stakeholders within the pentahelix group. The values of stakeholders' interests and influences are presented in Table 4.

Table 4. Stakeholder Influence and Interests in ecotourism development in Sawendui, Yapen Islands Regency.

Pentahelix Category	Stakeholders	Interest						Influence					
		1	2	3	4	5	Total	1	2	3	4	5	Total
Community	Public figure	3.6	4.4	3.8	2	5	18.8	3	1	3	2	2.4	11.4
	Bontenang group	3.6	4	3.4	3	5	19	3	1.1	2	2	2.4	10.5
	Insirei group	3.2	3.8	3	2	5	17	2	1.1	2	2	2.4	9.5
	Average	Community interest					18.3	Community influence					10.5
Businessman	Tour and travel entrepreneur	4.2	4	1.4	4	3	16.6	2	1.3	4	1	2.8	11.1
	Hotel entrepreneur	2	2.4	1.8	2	2	10.2	1	1.4	2	1	2.2	7.6
	Culinary entrepreneur	1.2	2.2	1	1	1	6.4	1	1	1	1	1.6	5.6
	Average	Businessman interest					11.1	Businessman influence					8.1
Government	Sawendui village government	3.6	3.8	3.4	3	4	17.8	3	1.6	3	2	1.8	12.4
	Raimbawi district government	3.2	3.6	2.4	3	3	15.2	4	1.6	5	3	3.2	16.8
	KPHP Yapen Islands	1.8	2	1.2	4	2	11	2	1	3	2	2	10
	Yapen Islands Tourism, Youth and Sports Department	3.4	3.6	4.2	5	3	19.2	5	1.9	5	4	4.2	20.1
	Yapen Resort – BBKSDA Papua	2.4	2.6	3.8	2	2	12.8	4	2.1	5	3	3.8	17.9

Pentahelix Category	Stakeholders	Interest						Influence					
		1	2	3	4	5	Total	1	2	3	4	5	Total
	Biak Section – BBKSDA Papua	2.6	2.4	4	2	2	13	4	2.3	5	4	3.8	19.1
	BPHL Jayapura	1.8	1.4	2.8	2	2	10.2	4	1	5	3	2.8	15.8
	Average	Government interest					14.2	Government influence					16.0
Academic	Brawijaya University	1.8	2.4	2.6	2	2	10.8	3	1	2	2	2.8	10.8
	Pamulang University	1.8	1.4	1.8	2	2	9	3	1	2	2	2.6	10.6
	Average	Academic interest					9.9	Academic influence					10.7
Media	Suara Indonesia	2	2.4	1.8	2	2	10.2	4	1	5	1	2.8	13.8
	Average	Media interest					10.2	Media influence					13.8

Stakeholder Classification

Stakeholder classification is based on the interests and influence of each stakeholder regarding an issue or problem [25]. Measuring the level of interest and influence of stakeholder groups can reflect differences in support for developing ecotourism based on *P. minor jobiensis* conservation in Sawendui. Stakeholder classification can facilitate analysis of the level of interest and influence of stakeholders on how a system works [23]. The role of each stakeholder is divided into 4, namely subject, key player, context setter, and crowd [15,16]. Figure 3 shows stakeholder mapping based on stakeholder interests and influences.

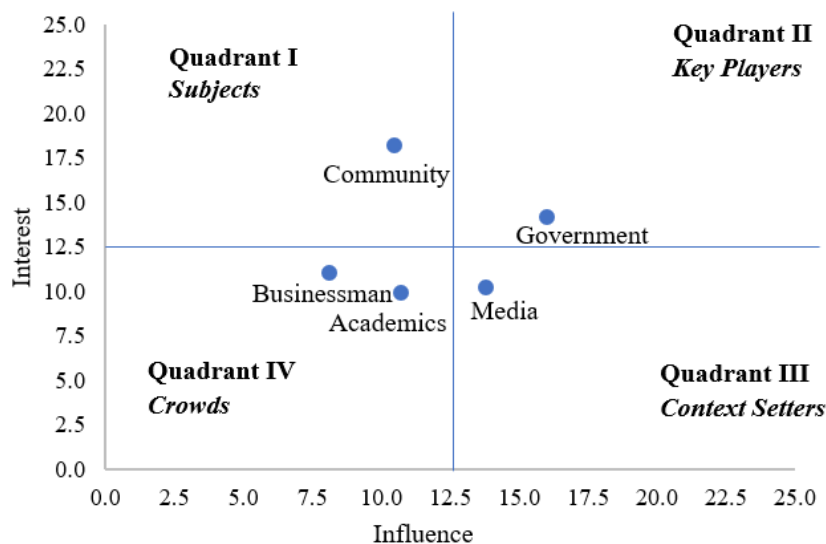


Figure 3. Classification of stakeholders based on level of interest and influence in ecotourism development in Sawendui, Yapan Islands Regency.

Discussion

Identification of Stakeholders

The community stakeholders consisted of community figures, the Bontenang group, and the Insirei group (Table 2). The community was aware of the importance of protecting nature, especially *P. minor jobiensis* (Table 3). Community participation and awareness in preserving and maintaining animal populations are important to prevent illegal hunting [33]. The birds of the paradise conservation group called Bontenang and the turtle conservation group called Insirei were formed by the Sawendui people. The community's determination to form groups is a manifestation of the Sawendui community's social capital. Social capital has a positive impact on forest resource management, thereby realizing forest sustainability [34].

The implementer is a person in the activity, namely the community [31]. Implementation can also improve the quality of community groups. Community figures encourage people to not hunt for *P. minor jobiensis*. The way community figures protect the environment reflects their responsibility for maintaining ancestral customs. The Bontenang Group plays a primary role in monitoring and protecting *P. minor jobiensis* habitat. Habitat protection is carried out through intensive monitoring and securing of trees known as habitats and locations for *P. minor jobiensis*. The Insirei Group also often helped the Bontenang Group monitor *P. minor jobiensis*.

Businessmen identified as related to ecotourism in Sawendui are tour and travel entrepreneurs, hotel entrepreneurs, and culinary entrepreneurs. Facilitators are stakeholders who provide and fulfill the needs of a program [31]. The role of businessmen in ecotourism is to provide various services needed by visitors as well as to act as a bridge for services that can be provided by the community (Table 3). The ideal role of a businessman is to develop tourism businesses that can benefit society [35]. Of the three businessmen, tour and travel entrepreneurs carry out most activities related to ecotourism in Sawendui Village.

Seven stakeholders in the government group were identified as related to ecotourism, consisting of the local government and central government. The stakeholders included in the local government category are the Sawendui Village Government, the Raimbawi District Government, the KPHP Yapen Islands Regency, and the Yapen Islands Tourism, Youth, and Sports Department. The central government consists of the Yapen Resort and the Biak Section of BBKSDA Papua, as well as BPHL Jayapura. The capacity and direct role of ecotourism are largely owned by local governments. The central government does not have a role that directly relates to ecotourism. The role of the central government is more related to the conservation and preservation of nature and animals. The government plays the role of a policymaker or decision-maker and coordinates related matters with other stakeholders [31]. All governments play a role in coordinating ecotourism activities and formulating policies that support ecotourism. Ecological matters in ecotourism are the focus of the KPHP Yapen Islands Regency, the Yapen Resort, the Biak Section of BBKSDA Papua, and BPHL Jayapura. Meanwhile, economic and social matters are the focus of Sawendui Village Government, Raimbawi District Government, and Yapen Islands Tourism, Youth, and Sports Department.

Stakeholders in the academic category included Pamulang University and Brawijaya University. Both academics have been involved in ecotourism activities in Sawendui and have experienced community empowerment and research in Sawendui. Community empowerment was conducted to increase the contribution of ecotourism. Academics act as accelerators because they contribute ideas and concepts that can be implemented by the community [31]. Sawendui's potential for ecotourism has had a positive impact on science. Ecotourism is an activity that can be used for learning in terms of conservation and biology [36].

Stakeholders in the media category are *Suara Indonesia*. Media plays an important role in ecotourism. Journalists in the tourism industry are supporting force [37]. Media provides support related to tourism development programs, including promotions that strengthen destination branding. Promotion and publication are the media's roles as expanders [38], which is also in line with accelerators [31].

Level of Stakeholder Interest and Influence

The highest interest belongs to the community stakeholder group, with an average of 18.3, whereas the lowest interest (9.9) belongs to the academic stakeholder group (Table 4). The community is very dependent on ecotourism because the benefits of ecotourism are quite numerous, namely additional income, opening access for interaction with outsiders, and continuing to protect *P. minor jobiensis* and the environment sustainably. The interests of the community need to be known in detail because they relate to the benefits obtained or the impacts of ecotourism [17]. Currently, there is no further collaboration with academics regarding ecotourism. This underlies academics' low involvement in ecotourism development. Academics receive a small benefit from ecotourism development, namely the protection of natural resources in general.

The highest influence on ecotourism development was owned by the government, with an average of 16, while the lowest influence (8.1) was owned by businessmen (Table 4). The government has a high influence due to its better institutional capacity compared to other stakeholder groups. The government is also the group most capable of fighting aspirations related to ecotourism in Sawendui. The government has the power to collaborate with several stakeholders. The government can fight for ecotourism aspirations related to conservation, economics, ecology, society, and culture [38]. Businessmen do not contribute to facilities and budgets and do not have the institutional capacity to aspire to ecotourism. The small influence of businessmen is because there is no legal certainty regarding ecotourism in Sawendui [17]. Involving the community is a way to preserve the tourism sector [17]. Community groups differ in influence and interests, although they are not very significant. Community figures have the greatest influence because they can mobilize the community to conserve *P. minor jobiensis*. Community figures are involved in implementing ecotourism, and the community still respects them. Regarding interest, the Bontenang Group had the highest interest in community groups. The Bontenang Group also receives significant benefits from ecotourism, which includes protecting natural resources and sources of income and creating jobs. The community as the "host" is the party that has the right to obtain economic, social, and cultural benefits from tourism [39]. One of the jobs available for ecotourism is to serve as a guide. Jobs born from ecotourism are signs that the community must organize ecotourism [40].

Businessmen are expected to create added value and develop ecotourism [38,40]. The levels of interest and influence of the business groups differ significantly. Tour and travel entrepreneurs have a much greater influence on ecotourism. The ability of tours and travel entrepreneurs to implement ecotourism includes establishing relationships with fellow stakeholders, attracting tourists, and promoting potential. Tour and travel entrepreneurs are involved in most ecotourism activities, such as planning, organizing, implementing, and evaluating. The development of ecotourism supports tours and travel businesses to provide destinations for its guests. Hotels and culinary entrepreneurs have low interest and influence on ecotourism. Few ecotourism visitors to Sawendui use hotels and restaurant services. Apart from that, there is no government priority regarding ecotourism, so hotels and culinary entrepreneurs cannot carry out activities without clear ecotourism regulations [17].

Ideally, the government has many responsibilities in developing ecotourism, including making policies and regulations, preparing budgets, providing guidance and training, and preparing facilities that support ecotourism [40]. Many governments involved in ecotourism do not always indicate a high influence and interest. The Tourism, Youth, and Sports Department Yapan Islands have duties and functions that are directly related to ecotourism. This makes the influence and interests of the tourism department higher than those of the other central and local governments. Through its institutional capacity, the tourism office submitted proposals for developing the facilities needed for specific location conditions. Dependence on the tourism department is high because ecotourism has the potential for non-tax state revenue/ *penerimaan negara bukan pajak* (PNBP), creates jobs, and attracts tourist visits. The influence of regional or national governments, if carried out optimally, can help communities improve their standard of living [39].

The levels of importance and influence of academics did not differ significantly. The University's remote location means that academics cannot provide any facilities related to ecotourism, but they can contribute ideas based on the latest science. Academics have conducted simple training in the form of community empowerment programs. The implementation of science by academics through community services in the form of providing training is expected to increase the skill of the community [17]. Academics receive a small benefit from ecotourism development, namely the protection of natural resources in general. Ecotourism relates to the preservation of nature and animals.

The media does not provide facility assistance in developing ecotourism, but can collaborate with other institutions. The media does not provide a budget for ecotourism development; the form of support is through promotions in the news. It is hoped that introducing tourism through social media information will make tourist locations better known and have the potential to develop [41]. The media do not have many benefits related to ecotourism development. In addition, the media has no authority in developing ecotourism other than providing information. Ecotourism development can be a source of news that can be picked up by media.

Stakeholder Classification

The community is included in the subject quadrant because it has high interest but little influence on ecotourism development (Figure 3). The subject quadrant indicates that the community does not have the power to develop ecotourism even though ecotourism development provides many benefits. The subject is a group that supports activities, but their influence is relatively low [15,16]. These subjects need to be empowered in ecotourism development activities. This subject has great potential, but its role is often neglected [42]. This subject requires the support of key players through empowerment activities so that they can actively participate in ecotourism development.

The government included in the key player quadrant is a stakeholder that has high influence and interest (Figure 3), suggesting that the government plays an important role in conserving *P. minor jobiensis* as well as developing *P. minor jobiensis*-based ecotourism. Key players can use their power to fight for interests and aspirations related to ecotourism [43]. Key players are classified as a critical group; therefore, they need to collaborate with other stakeholders to achieve better performance [44]. Stakeholders in the key player category have many relationships with other stakeholders and have a sufficiently large capacity to develop tourism [22]. Key players are often seen as the driving force behind the success of other stakeholders' activities and developments [42].

The stakeholders included in the context setter quadrant were the media (Figure 3), indicating a lack of news regarding *P. minor jobiensis*-based ecotourism in Sawendui. Context setters are stakeholders whose importance is low but who highly influence ecotourism development. The low interest of stakeholders in the context setter quadrant is partly because the main tasks of stakeholders are not directly related to ecotourism

[19]. The stakeholders included in the crowd quadrant are businessmen and academics (Figure 3), suggesting that both are not very involved and benefit from ecotourism development in Sawendui. Crowds are stakeholders with little interest or influence [15,16]. This group is included in the decision-making process. Regular monitoring and evaluation of crowd groups are required to develop their interests and influence [44].

Conclusions

There are 16 stakeholders involved in developing ecotourism based on *P. minor jobiensis* conservation in Sawendui, Yapen Islands Regency, which were grouped into five Pentahelix categories: community, businessman, government, academics, and media. All stakeholders were classified into four categories based on their interests and influence. The community is a subject of interest because it is highly interested in the development of ecotourism. However, it has little influence, and the government is the key player in its high interest and influence related to the development of ecotourism. The media as a context setter caused by the lack of interest in the development of ecotourism despite having influence is quite high, and businessman and academics as a crowd due to the low interest and influence in the development of ecotourism. Collaboration among stakeholder classifications is required to increase interest and influence. The government, as a key player in developing ecotourism based on *P. minor jobiensis* conservation in Sawendui, needs to empower the community, encourage the media to promote Sawendui's potential, encourage businessmen to improve infrastructure, and encourage academics to explore the value of conservation and other potential in Sawendui Village.

Author Contributions

FAC: Writing - Review & Editing, Analysis and Interpretation of data; **SB:** Conceptualization design of research, Supervision; and **ER:** Conceptualization methodology, Analysis and Interpretation of data, Critical review/revision, Supervision.

Conflicts of interest

There are no conflicts to declare.

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