

## Analysis of Determinants of Women's Empowerment in the Tourism Sector in Penglipuran Village Using a Bayesian Network

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### Abstract

This study aims to identify and analyze the factors that influence women's empowerment in the tourism sector in Penglipuran Village, Bali. Penglipuran Village, known for its cleanliness, local wisdom, and *awig-awig* rules that govern the social life of its community, has great potential in empowering women so that they can be involved in tourism. Although tourism is growing rapidly, women's involvement in this sector has not been optimal, for example, the lack of product innovation and business sustainability is still an obstacle in improving their competitiveness. This is because women's empowerment is still not effectively implemented. Data collection was conducted through interviews, questionnaires, and FGDs. There were 20 institutional and stakeholder respondents in the FGD. This research uses the Bayesian Networks method to analyze the causal relationship between influential economic variables, such as social capital, education, *awig-awig*, gender equality, access to resources, skills, infrastructure, and local policy support. The results of this study show that there are several potential influences on women's empowerment, such as gender equality, *awig-awig*, education, social capital, and government regulations. Determining five main nodes as target nodes with a 100% probability of success in improving women's empowerment is 9%. By utilizing the Bayesian Belief Network, this study shows that gender equality, *awig-awig*, education, social capital, and government regulations are important factors, along with other variables, such as infrastructure and skills, that influence women's empowerment in Penglipuran Village.

**Keywords:** bayesian network; women empowerment; tourism; Penglipuran Village.

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## INTRODUCTION

### Background

Penglipuran Village, with its unique traditional architecture and local wisdom, has enormous tourism potential. The organized layout of the village, the uniform traditional houses, and the clean and beautiful environment are the main attractions for tourists. In addition, the existence of well-maintained customs, such as the cooperation system and traditional ceremonies, is also an attractive added value for tourists who want to get to know more closely the lives of Balinese people. The tourism potential of Penglipuran Village lies not only in its natural and cultural beauty, but also in the potential development of community-based tourism products, such as homestays, culinary specialties, and handicrafts. With good management, Penglipuran Village can become a sustainable tourist destination that can improve the welfare of the local community.

Penglipuran Village was named the cleanest village in the world in 2016. Thanks to its cleanliness, Penglipuran Village also received the ISTA (Indonesia Sustainable Tourism Award) in 2017. The village was included in the Green Destinations Foundation's Sustainable Destinations Top 100. (Suartika, 2018) In 2023, Penglipuran Village also made it into the ranks of the best tourist villages in the world. This award was given by The World Tourism Organization (UNWTO). Penglipuran Village helps develop the potential of tourist villages by giving women the opportunity to do business and drive the economy. Women in Penglipuran Village have access to various tourism activities, such as traditional stalls, where almost all houses have stalls and home-based businesses. Penglipuran Village has a wide range of processed specialty products that can be used as souvenirs for visitors. Although the tourism sector is growing rapidly, women's involvement in tourism in this village is still not optimal.

The rapid development of the tourism industry involves many layers, one of which is the role of women. In the tourism sector, women's empowerment is a global concern, especially tourism that is sustainable by involving local communities as the main actors. But over time, women's involvement in the world of tourism began to increase, but the limited innovation of the products sold and the lack of sustainability became a new problem that hampered their competitiveness. Because the products sold from one house to another are the same products and there is not even a significant comparison. In this case, it is necessary to empower the women themselves.

Women's empowerment is a strategic way to increase women's potential and increase the role of women in both the public and domestic domains. (Rosramadhana et al., 2022). In the context of women's empowerment, economic factors are one of the main drivers. However, the influence of economic variables such as social capital, access to resources, as well as local policy support on women's empowerment in each village can be different. In Penglipuran Village itself, *awig-awig* (regulations) and social capital are important factors that potentially encourage or limit the role of women in innovating. Therefore, this study focuses on analyzing the determinants of women's empowerment in the village tourism sector, using the Bayesian Networks research method to analyze the relationship between influential variables.

Bayesian Networks are used because of their ability to model causal relationships between variables, allowing researchers to estimate the probability of women's involvement in tourism based on various factors. With this method, this study aims to provide a comprehensive picture of what factors have the most influence on women's empowerment and how such empowerment can improve tourism sustainability in Penglipuran Village. This research is expected to make an important contribution to the literature on women's empowerment in the tourism sector and

can be a reference for policy makers at the local level in developing more effective and sustainable empowerment strategies for women in tourist villages.

## LITERATURE REVIEW

### Women Empowerment

In the literature discussing various aspects of women's empowerment, research scholars have provided profound insights. One of the most researched topics in this literature is about the threats women face and the opportunities afforded to them as they strive to be empowered. Women's ability to work in companies and access to microfinance for business opportunities or government entrepreneurship are two examples of women's economic empowerment in the social sphere (Norouzi Isfahani et al., 2023). Small and medium enterprises (SMEs) play a significant role in a country's economic development when the government initiates funding and financing programs for women entrepreneurs. Based on the research data, when women are provided with entrepreneurial funding and financing.

In the article by Gantini et al. (2023) entitled "Analysis of the factors that influence the level of women's empowerment", using several variables including individual characteristics, competence, and availability of information with several *indicators* in it. The results showed that individual characteristics, competence, and information availability contributed 61% to the level of women's empowerment; individual characteristics have a positive influence of 0.77 and are significant to the level of women's empowerment. For women to participate more actively in the economy and development, women's competencies must be improved and information must be available (Gantini et al., 2023). In addition, there is also an article entitled "Factors Affecting Women Empowerment: A Micro Financing Perspective" written by Adeel et al. (2023) using Skill Development and

Education as mediators and moderators to achieve Women empowerment resulting in a statement that women entrepreneurs in Pakistan face many challenges in the business environment, including an unsupportive business environment and cultural-social barriers (Adeel et al., 2023).

### Social Capital

Social capital is a concept that emphasizes the importance of social relationships, trust, and norms in human life. It describes how we as social beings tend to work together and help each other. Social capital acts as the "glue" of society, enabling us to achieve common goals. However, the concept is complex and has many interrelated dimensions, so its impact can be positive or it.

Pierre Bourdieu sees social capital as more than just a set of connections. According to him, social capital is a kind of "social asset" that a person gets from his or her network of relationships, but is also influenced by social factors such as class, gender, and race (Richardson & Bourdieu, 1986). These social assets are not static, but rather constantly changing and dependent on the situation. Moreover, social capital is also closely linked to other forms of capital such as economic and cultural, giving individuals who possess it a form of power and advantage in society. Unfortunately, Bourdieu's concept is quite complex and may be difficult for people outside the field of sociology to understand (Claridge, 2018).

James Coleman views social capital as the result of rational individual action in a social context (Coleman, 1988). He emphasized that social capital not only creates inequality, but also provides mutual benefits for all group members. Coleman sees social capital as the result of cooperation and trust between individuals, which ultimately contributes to social welfare. Thus, Coleman's theory brings together the perspectives of sociology and economics in understanding the important role of social capital in society (Tzanakis, 2013).

Robert Putnam views social capital as the shared wealth of a society reflected in the level of trust, social relationships, and norms that support cooperation (Putnam et al., 1994). He sees social capital as a public asset that can be measured as a whole, for example at the city or country level. Although Putnam's ideas are popular, many criticize him for oversimplifying the concept of social capital and ignoring the complexity of social relationships (Portes, 1998). However, Putnam is still considered an important figure in introducing the concept of social capital into social studies. The concept of social capital, despite its diverse perspectives, offers a richer understanding of society and human behavior. The integration of various views, such as Bourdieu, Coleman, and Putnam, is important to understand the potential and challenges of social capital in different contexts.

### **Gender Concept**

The concept of gender, which initially focused on the biological differences between men and women, has evolved into a complex social construction (Matos, 2008). Gender studies, born out of the feminism movement, have managed to uncover structured gender inequalities in various aspects of life, including in the tourism sector. If we look at the history of the women's movement (feminism), there are two major phases. The first phase focused more on the struggle for equal rights with men, such as the right to vote or work. However, in the second phase, women activists began to realize that simply demanding equality was not enough. They began to see that there were significant differences between the experiences of men and women, and these differences needed to be recognized and valued.

Using a gender lens, we can see how gender roles affect women's access to economic opportunities, leadership positions and types of jobs in the tourism industry. Gender studies have also criticized traditional views of knowledge that often ignore

the perspectives of women. Thus, gender studies not only provide a deeper understanding of gender inequality, but also offer powerful analytical tools to design effective interventions to empower women in the tourism sector. Through research, training, policy advocacy, and partnerships with women's organizations, we can create a more inclusive work environment and encourage women's full participation in all aspects of the tourism industry.

### **Development Sustainability**

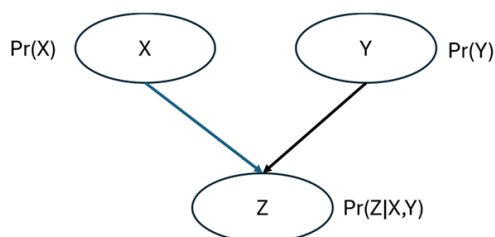
The concept of sustainable development means that the development of the current generation does not have to require future generations to sacrifice lower social welfare than the current generation (Suparmoko, 2020). This concept emphasizes the importance of balancing economic growth, social justice, and environmental preservation. The main objective of sustainable development is to meet the needs of the present generation without compromising the ability of future generations to meet their needs. This concept emerged as a response to conventional development models that often ignore environmental and social impacts. The Brundtland Report in 1987 became an important milestone in the development of this concept. It also explained the pillars of sustainable development, namely the economic, social, and environmental dimensions. In addition, it also explains the challenges faced in achieving sustainable development, such as inequality, environmental damage, and limited resources. Nevertheless, the text also highlights the importance of sustainable development to achieve long-term well-being for people and planet.

### **METHODS**

Researchers will use the Bayesian Belief Network (BBN) method to analyze the data obtained. The data used in this study were collected from two main sources: primary data obtained directly from the Penglipuran Village community

through questionnaires, in-depth interviews, and FGDs. Meanwhile, secondary data was obtained from various related institutions such as the Tourism Office and other government agencies. Involving as many as 20 respondents as representatives of various elements of actors, namely the community, government, entrepreneurs, academics, regulators, and the media will be the subject of this research. The data obtained from the questionnaire will be the basis for further discussion in the Forum Group Discussion (FGD). A total of 19 people will be present to represent the six hexahelix actors and will also participate in this FGD. The FGD aims to dig deeper into the factors influencing women's empowerment in Penglipuran Village and to design potential tourism activities involving women.

Bayesian networks are models that use probability to represent a system's uncertainty. This model consists of two main components: a network structure in the form of a directed acyclic graph (DAG) that describes the cause-and-effect relationship between variables, and a conditional probability table (CPT) that contains probability values that indicate the likelihood of an event occurring based on other events (Fauzi & Ariyani, 2024). Figure 1 provides a visual example of the basic structure of a Bayesian network. In this example, we can see how variables X and Y affect variable Z, so X and Y are referred to as the parents of Z, while Z is referred to as the child of X and Y. Although this figure only shows three variables, keep in mind that BBN can be designed to represent more complex relationships involving a larger number of variables.



**Figure 1.** Simple Structure of DAG  
(Source: Fauzi & Ariyani, 2024)

This research utilizes BBN to assess and consider the probabilities of the factors that influence the level of women's empowerment in the tourism sector in Penglipuran Village. One of the main advantages of BN is its ability to model changes in input variables based on the level of output, known as "*what-if*" (Fauzi & Ariyani, 2024). Policy makers, for example, can easily test policy interventions by changing inputs and see how it affects the network structure. In addition, causal relationships in a Bayesian Network are easy to understand, and can easily add additional variables as needed (Ariyani & Fauzi, 2024) The network structure is attractive and easy to understand for demonstrating intervention theories and evaluating them against real-world data. In addition to these advantages, Bayesian Network can also handle uncertainty strictly in probabilistic terms. Therefore, BBNs are suitable for analysis in a management context and are especially relevant for situations of incomplete or even bad data.

Furthermore, the Focus Group Discussion (FGD) results will be processed using Bayesian Belief Network (BBN) with GeNIe software to build a causal model that represents the relationship between these variables. This BBN model will allow us to identify the variables that have the most significant influence on the level of women's empowerment, as well as to understand the mechanism behind the relationship. As such, this research is expected to make a valuable contribution to the development of more effective policies to improve women's empowerment in the tourism sector.

## RESULTS AND DISCUSSION

### Analysis of Relationship/Interaction between Tourism Sector Women Empowerment Variables in Penglipuran Village (Using BBN Analysis)

To determine the factors associated with women's empowerment in the tourism sector in Penglipuran Bangli Village, we

must first identify the key variables associated with empowerment. This variable identification is done through a literature review to review theories and also the results of previous research that has been done. This resulted in 8 variables that are considered to have a major influence on the quality and effectiveness of women's empowerment. The variables are social capital, gender equality, natural resources and environment, education, skills, *awig-awig*,

government regulation, and infrastructure.

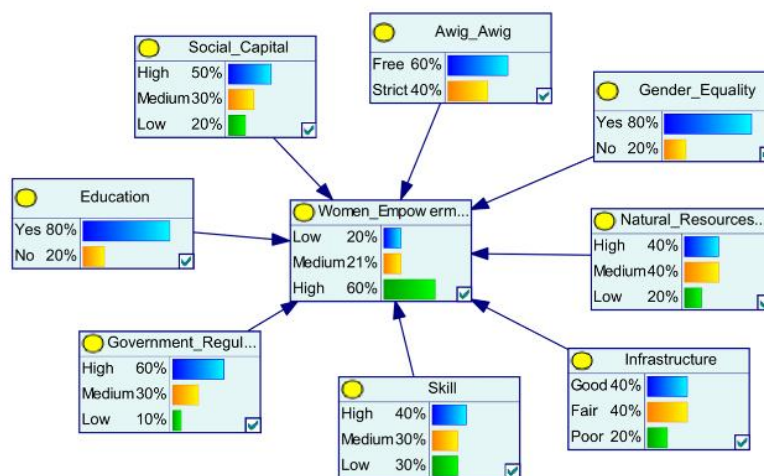
Based on these variables, researchers conducted a Forum Group Discussion (FGD) to determine the variables that became the nodes in the BBN structure. The FGD was conducted with 19 representatives of relevant stakeholders in the Penglipur Village area in May 2024. The following variables were agreed as variables related to women's empowerment in the tourism sector in Penglipur Village.

**Table 1.** Variables Category and Their Associated Nodes

Variable Category	Variable Nodes	Measurement
Women empowerment	Effectiveness of women's empowerment	High, Medium, Low
Social capital	community's shared values and networks	High, Medium, Low
Gender equality	The level of gender equality in society	Yes, No
Natural resources and environment	Natural resources and environmental conditions in the village	High, Medium, Low
Education	Women's educational	Yes, No
Skill	Women's skills especially in the tourism sector	High, Medium, Low
<i>Awig-awig</i>	Customary regulations/social norms that apply in the village related	Free, Strict
Government regulation	Government policies related to tourism and women's empowerment	High, Medium, Low
Infrastructure	Availability of infrastructure	Good, Fair, Poor

Researchers used GeNIe 4.1 software in this study to build the BBN model. The structure of the Bayesian Network regarding the determinants of women's

empowerment in tourism sustainability in Penglipur Village can be seen in Figure 2.



**Figure 2.** BBN Model of Analysis of Determinants of Women's Empowerment in the Tourism Sector in Penglipur Village Using Bayesian Network (Source: Author's estimation using GeNIe, 2024)



As can be seen from Figure 2, with the current CPT value obtained from the stakeholder gathering, using the 80% gender equality rate and also with the 80% Education rate opportunity as the main indicators, the women empowerment rate is high at around 60%. Identifying the relationships between variables in the network structure is the next step in Bayesian

network analysis. This is achieved in Genie through power analysis using Influence diagrams. A strength analysis allows us to understand the potential cause-and-effect relationships among variables, with the width of the arc representing the strength of each connection between a parent node and a child node. The strength influence scores are presented in Table 2.

**Table 2.** Score of Strength Influence

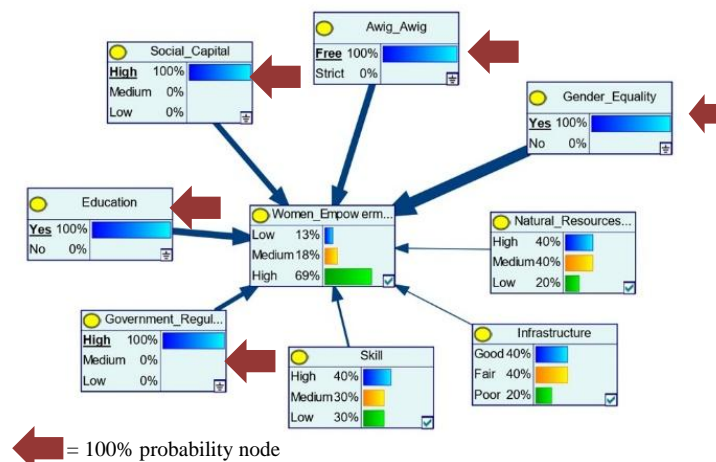
Parent	Child	Average	Maximum
<i>Awig-Awig</i>	Women Empowerment	0.0984532	0.278388
Education	Women Empowerment	0.0980602	0.272213
Gender Equality	Women Empowerment	0.145107	0.360555
Government Regulation	Women Empowerment	0.0685622	0.311769
Infrastructure	Women Empowerment	0.0158342	0.360555
Natural Resources and Environment	Women Empowerment	0.0102494	0.242693
Skill	Women Empowerment	0.0341352	0.3
Social Capital	Women Empowerment	0.083445	0.310966

Source: Author’s estimation using GeNIe (2024)

In Table 2, the most significant influence is seen from the influence of gender equality on women's empowerment in Penglipuran Village with an average score of 0.145 and a maximum score of 0.361, followed by the influence of *awig-awig* or customary regulations on women's empowerment with an average score of 0.099 and a maximum of 0.273. In addition, there is an influence of education of 0.0981

government regulations of 0.069, social capital of 0.085, resources and environment of 0.0103 and infrastructure of 0.0158.

The researcher analyzes how variables affect sustainability in the BBN structure to understand the important factors that influence women's xas target nodes with 100% probability, indicated by the "evidence" arrows in Figure 3.



**Figure 2.** BBN Model of Analysis of Determinants of Women's Empowerment in the Tourism Sector in Penglipuran Village Using Bayesian Network (Source: Author's estimation using GeNIe, 2024)

By indicating "yes" for gender equality, "free" for *awig-awig*, "high" for social capital, "yes" for education, and "high" for the influence of government regulations, the level of women's empowerment increased from 60% in the initial probability to 69% in the subsequent probability. The selection of these factors is based on the commitment of Penglipuran Village management and the Customary Institution to improve women's empowerment. Women's empowerment in Penglipuran Village is strongly influenced by several key factors. The customary institution, as the main pillar of the community, plays a crucial role in promoting gender equality through the implementation of *awig-awig* that supports women's participation.

Government support in the form of inclusive regulations and increased access to education for women are also key drivers. This synergy between custom and state has created a conducive environment for women to develop their potential. In an effort to empower women in the tourism sector, Penglipuran Village management together with BUMN have successfully established the Pelipur Lara Market. This market serves as a platform for women to promote and sell their local products to tourists and is held only on Saturdays and Sundays.

The application of *awig-awig* or customary regulations that are flexible certainly also supports the increasing effectiveness of women's empowerment in the tourism sector. This is because when there are customary regulations that are flexible to the changing times and the needs of the community, it allows for adaptation by women in Penglipuran Village. Therefore, it is also important to involve the high role of customary institutions in addressing women's capacity to increase women's empowerment, which will ultimately aim to engage in the sustainability of tourism in Penglipuran Village.

## CONCLUSION

This study successfully reveals the complex dynamics of women's empowerment in the tourism sector in Penglipuran Village. Using Bayesian network analysis, the study identifies that gender equality, *awig-awig* (customary law), education, and government support are key factors that significantly influence the level of women's empowerment. These findings indicate that women's empowerment is not a simple process but rather the result of interactions between various social, cultural, and economic factors.

To enhance women's empowerment in the tourism sector of Penglipuran Village, a comprehensive effort involving multiple stakeholders is required. These efforts include reforming *awig-awig* to be more inclusive and flexible, increasing women's access to education and training, and strengthening government support through gender-responsive policies. Additionally, it is crucial to build strong partnerships between the government, the community, and the private sector to develop sustainable and community-based tourism.

This study makes a significant contribution to the development of both theory and practice in women's empowerment within the tourism context. The findings can serve as a reference for policymakers, development practitioners, and other researchers in designing more effective programs and interventions to improve women's well-being and achieve sustainable development goals.

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