

Building Ecological Awareness: Implementing Environmental Ethics and Sustainability in Indigenous Communities Through a Traditional Ecological Knowledge Approach

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ABSTRACT

Efforts to preserve the environment and sustainability on the island of Bali, especially in the Tenganan, Penglipuran and Trunyan Traditional Villages, through a traditional ecological knowledge approach. This program aims to increase ecological awareness and implement environmental ethics and sustainability in indigenous communities. Implementation methods involve surveys, education, training, program implementation, and evaluation. The results show that through comprehensive education and training, as well as the implementation of sustainable programs, communities can adopt environmentally friendly practices and preserve their traditional ecological knowledge. Program impact evaluation re-engages indigenous communities to obtain feedback, ensuring the program is sustainable and effective. In conclusion, this program succeeded in combining various approaches to create positive changes in behavior and attitudes towards the environment in Balinese traditional communities, as well as strengthening their traditional ecological knowledge.

Keywords: Application of Environmental Ethics, Indigenous Communities, Traditional Ecology

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INTRODUCTION

The island of Bali, known as the "Island of the Gods", not only captivates tourists with its enchanting natural beauty, but also with its rich culture and deep traditions. One of the most interesting aspects of life in Bali is how its traditional communities manage and protect their environment. In the midst of global challenges related to climate change and environmental degradation, the approach taken by the Balinese traditional community through traditional ecological knowledge offers valuable lessons for environmental conservation and sustainability efforts. (Geertz, C. 1980)

Bali, as one of the most popular tourist destinations in the world, is not only known for its natural beauty and rich culture, but also for the local wisdom possessed by its indigenous people. Indigenous communities in Bali have long practiced environmental ethics and sustainability through their traditional ecological knowledge. This approach has proven effective in maintaining natural balance and community welfare. (Lansing, J.S. 2006)

Ecological awareness in Bali cannot be separated from the Tri Hita Karana concept, which teaches harmony between humans, nature and God. This environmental ethic has been closely woven into the daily lives of Balinese people and is reflected in various traditional practices, such as subak (traditional irrigation system) and religious rituals that respect nature. The application of environmental ethics and sustainability through traditional ecological knowledge has proven effective in maintaining ecosystem balance and community welfare. (Stephen Lansing. 1991)

Traditional ecological knowledge is a cultural heritage passed down from generation to generation, including a variety of practical knowledge regarding how to farm, maintain forests, and manage natural resources sustainably. In Bali, this knowledge not only serves as a practical guide, but also forms the ethical basis that governs human interactions with the environment. In the modern context, integrating traditional ecological knowledge with scientific and technological approaches offers great potential for addressing complex environmental challenges. (Atmosudiro, S. 1997)

Traditional ecological knowledge in Bali involves a deep understanding of the natural environment and its interactions with human activities. The concept of "Tri Hita Karana" is one of the principles that underlies harmony between humans, the environment and God. Tri Hita Karana teaches the importance of maintaining balance between humans and nature (palahan), humans and each other (pawongan), and humans and God (parahyangan). (Suryani, LK 2008)

Balinese indigenous people have long applied traditional ecological knowledge in various aspects of their lives, reflecting a balance between human needs and nature conservation. One prominent sustainable practice is the Subak system, a traditional irrigation system that regulates water distribution fairly and efficiently. This system ensures the sustainability of rice farming, which is the main food source for the Balinese people. In addition, routinely held traditional ceremonies often involve environmental maintenance activities, such as reforestation, cleaning water sources, and preserving sacred forests. Organic farming practices are also an important part of their lives, where the farming methods used avoid harmful chemicals, maintain soil fertility, and maintain ecosystem balance. (Whitten, T., Soeriaatmadja, RE, & Afiff, SA 1996)

The environmental ethics adhered to by traditional communities in Bali prioritize collective responsibility and awareness of the impact of individual actions on the environment. The culture of mutual cooperation, which is at the heart of their social life, strengthens relations between community members and promotes joint efforts in protecting the environment. In addition, customs and customary law play an important role in regulating the use of natural resources and environmental conservation. These rules not only stipulate how resources should be used, but also provide sanctions for those who violate them, with the main aim of maintaining natural balance and environmental sustainability for future generations. (Pedersen, R. 2008)

The aim of serving indigenous communities in Bali focuses on several important aspects related to environmental preservation and community development. First, this program aims to increase ecological awareness among indigenous communities through an in-depth understanding of the importance of environmental conservation and sustainability. This is achieved by educating them about traditional ecological knowledge that has been passed down from generation to generation. Second, this program integrates environmental ethical values and practices from traditional ecological knowledge into daily life, so that indigenous peoples can apply environmental ethics in all their activities. (Granquist, B. 2004)

Apart from that, this program also encourages the preservation and strengthening of culture and traditional knowledge related to ecology. In this way, the culture and knowledge not only stay alive but are also strengthened and passed on to future generations. Community capacity building is another important goal, where communities are given training and workshops to improve skills in managing natural resources sustainably. No less important, this program also seeks to build collaboration with various stakeholders such as the government, NGOs and academics to support ecological sustainability in Bali. This partnership is expected to strengthen environmental conservation efforts through synergy between various parties who have an interest and responsibility in protecting the ecosystem. (Lansing, J.S., & Kremer, J.N. 1993)

The expected impacts of this program include various positive aspects for indigenous communities and their environment. One of the main impacts is changes in people's behavior in protecting and caring for the environment, where they are expected to be able to implement daily practices that are more environmentally friendly and sustainable. In addition, implementing sustainable practices based on traditional ecological knowledge is expected to reduce environmental damage and improve the quality of local ecosystems.

Preserving local wisdom is also one of the expected impacts, with traditional ecological knowledge remaining an integral part of the culture of Bali's traditional communities. It is hoped that active community participation in environmental conservation and sustainability programs will increase, both at the local and regional levels. Furthermore, achieving independence for indigenous communities in managing their natural resources in a sustainable manner is one of the main goals, so that they do not need to depend on external assistance. Apart from that, it is hoped that this program can create a sustainable natural resource management model that can be replicated in other communities, both in Bali and in other regions in Indonesia. Ultimately, all of these efforts are expected to improve the quality of life of indigenous communities through a

healthier and more sustainable environment and better economic prosperity associated with traditional ecological practices. (Lansing, J.S., & Fox, KR 2011)

Community service through the program "Building Ecological Awareness: Application of Environmental Ethics and Sustainability in Indigenous Communities through a Traditional Ecological Knowledge Approach in Bali" is expected to bring significant positive changes. The following is a table of PKM activity plans

No.	Tahapan Kegiatan	Deskripsi Kegiatan
1.	Survey dan Analisis Awal	- Melakukan survei untuk memahami kondisi lingkungan dan kesadaran ekologis di masing-masing desa.
		- Mengumpulkan data tentang praktik ekologi tradisional, perubahan lingkungan, dan tingkat kesadaran masyarakat terhadap isu lingkungan.
		- Melakukan analisis awal untuk mengidentifikasi tantangan utama, kebutuhan, dan peluang dalam membangun kesadaran ekologis di setiap desa.
2.	Pendidikan dan Pelatihan	- Menyusun program pendidikan dan pelatihan berdasarkan hasil analisis awal.
		- Menyampaikan materi tentang pengetahuan ekologi tradisional, praktik-praktik ramah lingkungan, dan pentingnya mempertahankan warisan lingkungan.
		- Melakukan pelatihan secara partisipatif dengan melibatkan tokoh-tokoh masyarakat dan pemangku kepentingan lokal.
3.	Implementasi Program	- Melaksanakan program-program konkrit di masing-masing desa, seperti kampanye lingkungan, praktik pertanian berkelanjutan, atau upaya pelestarian sumber daya alam lokal.
		- Mengutamakan kolaborasi antara tim proyek dan masyarakat setempat dalam menjalankan program-program ini.
4.	Monitoring dan Evaluasi	- Melakukan monitoring secara berkala selama dua bulan pelaksanaan untuk memastikan efektivitas program dan mengukur dampaknya terhadap kesadaran ekologis masyarakat.
		- Melakukan evaluasi berkala untuk mengevaluasi kemajuan, mengidentifikasi kekurangan, dan melakukan penyesuaian jika diperlukan.
		- Melibatkan aktif masyarakat dalam proses monitoring dan evaluasi untuk memperkuat keberlanjutan program.

In this table, each activity stage is explained briefly along with a description of the activity which includes the steps to be carried out. This helps to plan and execute each stage in a more structured and efficient manner. This activity was carried out in three villages, namely Tenganan Traditional Village, Penglipuran Traditional Village, and Trunyan Traditional Village, with the aim of exploring more deeply the potential that exists in each of these villages. This program not only aims to preserve the environment but also strengthen local culture and wisdom, increase community capacity, and build productive collaboration with various parties for long-term sustainability.

METHOD

In May and June 2024, community service will be carried out in three Traditional Villages in Bali: Tenganan, Penglipuran, and Trunyan. This PKM aims to build ecological awareness and implement environmental ethics and sustainability in indigenous communities through a traditional ecological knowledge approach. The implementation method involves several stages arranged systematically:

1. Initial Survey and Analysis
 - The project team conducted surveys to understand environmental conditions and ecological awareness in each village.
 - Data on traditional ecological practices, environmental changes, and the level of public awareness of environmental issues were collected.
 - Initial analysis was carried out to identify the main challenges, needs and opportunities in building ecological awareness in each village. (Lansing, J.S. 2006)
2. education and training
 - Based on the results of the initial analysis, education and training programs were developed to increase public understanding of ecology and the importance of sustainability.
 - The materials presented include traditional ecological knowledge, environmentally friendly practices, and the importance of maintaining environmental heritage.
 - Training is carried out in a participatory manner, involving community leaders and local stakeholders to ensure deeper understanding and acceptance of the program. (Atmosudiro, S. 1997)
3. Program Implementation
 - After education and training, concrete programs are implemented in each village.
 - These could be environmental campaigns, sustainable agricultural practices, or efforts to conserve local natural resources.
 - Collaboration between the project team and local communities is essential in implementing these programs. (Pedersen, R. 2008)
4. Monitoring and Evaluation
 - During the two months of implementation, regular monitoring was carried out to ensure the effectiveness of the program and measure its impact on the community's ecological awareness.
 - Periodic evaluations are also carried out to evaluate progress, identify deficiencies, and make adjustments if necessary.
 - Active community involvement in the monitoring and evaluation process helps strengthen program sustainability. (Granquist, B. 2004)

Through this approach, it is hoped that the communities in the Tenganan, Penglipuran, and Trunyan Traditional Villages can strengthen their awareness of the importance of protecting the environment, implementing environmentally friendly practices, and preserving their traditional ecological knowledge for future generations.

RESULTS AND DISCUSSION

Education and training

First of all, the implementing team conducted a survey and initial analysis to understand the environmental conditions and level of ecological awareness in each village. The survey includes an assessment of environmental practices and local understanding of ecology. (Whitten, T., Soeriaatmadja, RE, & Afiff, SA 1996) The results of the survey are the basis for designing an approach that suits the needs of each indigenous community. Then gain sufficient understanding, the next step is education and training.



Figure 1. Education about the importance of protecting the environment and environmental ethics

The team provided information about the importance of protecting the environment and how environmental ethics can be applied in everyday life. This training involves active participation from local communities to ensure good understanding and greater adoption of environmentally friendly practices.

After the preliminary steps of survey and initial analysis, the community service project in the traditional villages of Tenganan, Penglipuran, and Trunyan in Bali continued with a series of more in-depth education and training activities. (Lansing, JS, & Kremer, JN 1993) These steps not only aim to provide information, but also to build active community involvement in environmental conservation efforts. The following is further development regarding the education and training stages:

1. Environmental Education

The implementation team develops a comprehensive education program on environmental issues relevant to each village, this includes:

- 1) Introduction to Local Ecology: Provides a deeper understanding of local ecosystems, endemic species, and the importance of maintaining natural balance.
- 2) The Importance of Conservation: Highlights the negative impacts of human activities on the environment and encourages awareness of the importance of nature conservation for the well-being of future generations.

- 3) **Climate Change:** Provides an understanding of global climate change and its impact on the local environment, as well as mitigation efforts that can be carried out by the community.
2. **Practical Training**

In addition to theoretical education, practical training is also an integral part of this program:

 - 1) **Sustainable Agricultural Practices:** Helping communities implement environmentally friendly agricultural techniques, such as the use of organic fertilizer, natural pest control, and crop rotation.
 - 2) **Waste Management:** Teaches effective ways to sort and manage waste, including the use of recycling and compost.
 - 3) **Utilization of Natural Resources:** Introduce the concept of wise and sustainable use of natural resources, including sustainable water and forest management.

3. **Community Involvement**

For this program to be successful, active participation from local communities is essential:

 - 1) **Group Discussions:** Hold group discussions to facilitate the exchange of ideas and experiences between residents, and strengthen the sense of ownership of the program.
 - 2) **Community Activities:** Organizing joint activities, such as environmental clean-up or tree planting, to strengthen solidarity and a collaborative spirit in protecting the environment.
 - 3) **Local Skills Development:** Encourage the development of sustainable local skills, such as traditional handicrafts using environmentally friendly materials.

By combining theoretical education, practical training, and community involvement, this program aims to create sustainable changes in behavior and attitudes towards the environment in the Tenganan, Penglipuran, and Trunyan indigenous communities.

Program Implementation

Program implementation is carried out on an ongoing basis, by involving indigenous communities in making small but significant changes in their lifestyle.



Figure 2. Environmentally friendly agriculture

The focus is on reducing the use of single-use plastic, environmentally friendly agricultural practices, or preserving local natural resources. During the implementation process, the team carries out monitoring to track progress and identify obstacles or challenges that may arise. In sustainable program implementation, involving indigenous communities in making small but significant changes in their lifestyles is key to achieving long-term success. (Lansing, JS, & Fox, KR 2011) This approach covers a variety of areas, including reducing the use of single-use plastics, environmentally friendly agricultural practices, and preserving local natural resources. The following are further developments regarding sustainable program implementation:

1. Reducing the Use of Single-Use Plastics
 - Indigenous communities are encouraged to reduce their use of single-use plastics by replacing them with environmentally friendly alternatives such as cloth shopping bags, reusable drinking water bottles, or reusable food containers.
 - This program requires outreach and education campaigns to make people aware of the negative impacts of single-use plastics on the environment and human health.
 - Monitoring is carried out to track the decline in single-use plastic use and measure its impact on the local environment, such as reducing plastic pollution in rivers or the sea.
2. Environmentally Friendly Agricultural Practices
 - Indigenous communities are given training on environmentally friendly agricultural techniques, such as the use of organic fertilizer, natural pest and disease control, and crop rotation.
 - In addition, this program also includes an introduction to traditional agricultural practices that have been proven to be sustainable in the long term.
 - Monitoring is carried out to track increases in agricultural productivity, soil health, and the availability of natural resources such as water and soil.

3. Preserving Local Natural Resources
 - Indigenous communities are encouraged to be active in preserving local natural resources such as forests, rivers and biodiversity.
 - These programs may include tree replanting activities, environmental cleanup programs, or monitoring illegal logging or destructive fishing activities.
 - Monitoring is carried out to track the increase in the number of trees, river water quality, and the presence and sustainability of endemic species in the area.
4. Monitoring and Identifying Challenges
 - During the implementation process, the project team regularly monitors to track progress and identify obstacles or challenges that may arise.
 - The results of this monitoring are used to adjust the program to make it more effective and relevant to the needs of local communities.
 - Involving the community in the monitoring process also helps increase their participation and support for the environmental programs being implemented.

By involving indigenous communities in the implementation of these sustainable programs, it is hoped that there will be sustainable positive changes in people's lifestyles and daily practices, as well as the creation of a healthier and more sustainable environment for future generations.

Evaluation and follow-up

Finally, an evaluation of the program's impact is carried out. This evaluation re-engages indigenous communities to obtain feedback on the effectiveness of the program and to evaluate whether initial objectives have been achieved. (Geertz, C. 1980) From here, recommendations can be made to improve the program in the future or expand it to other areas. Evaluation of program impact is a crucial stage in the community service cycle. Through this evaluation, it can be seen to what extent the program has succeeded in achieving its initial objectives and what impact it has had on the indigenous communities targeted by the program. Evaluations that re-engage indigenous communities provide opportunities for them to provide direct feedback on program effectiveness and express their experiences and views.

1. Re-Engaging Indigenous Communities
 - 1) Consultations and Interviews: The project team may hold consultation and interview sessions with indigenous community members to gain an in-depth understanding of their experiences during the program. This will help in understanding their views on the program and identifying aspects that need to be improved or improved in the future.
 - 2) Focus Group Discussions: Hold focus group discussions with various segments of society from various layers and age groups in indigenous communities. This discussion can open a space for community members to share their experiences, thoughts and suggestions about the program.
2. Evaluation of Initial Goal Achievement:
 - 1) Measuring Performance Indicators: The project team needs to evaluate the achievement of the initial program objectives by measuring previously established performance indicators. This can include increased ecological awareness, adoption of environmentally friendly practices, behavioral changes, and other positive impacts.

- 2) Satisfaction Surveys: Use surveys or questionnaires to assess community satisfaction and perceptions of the program. Questions in the survey may include program relevance, community involvement, and perceived benefits.
3. Recommendations for Program Improvement or Expansion:
 - 1) Identify Challenges and Opportunities: Based on the evaluation results, identify the challenges faced and opportunities that exist to improve or expand the program in the future. This may include the need for additional training, adjustments to communications strategies, or expansion of program coverage to other areas.
 - 2) Community Participation: Strengthen community participation in planning and implementing future programs. Inviting them to be actively involved in the decision-making process can increase the sustainability and relevance of the program.
4. Collaboration with External Parties
Building partnerships with external parties such as non-governmental organizations, academic institutions, or government agencies to support program improvements or expansion. This kind of collaboration can bring additional resources and valuable experience.

By conducting a comprehensive program impact evaluation and re-involving indigenous communities in the process, valuable recommendations can be produced to improve the program in the future or expand it to other areas more effectively and sustainably.

Overall, the program seeks to support and strengthen traditional ecological knowledge in Balinese traditional communities, thereby building ecological awareness and enhancing sustainable practices in harmony with the natural environment.

CONCLUSION

The conclusion of this discussion focuses on the importance of education and training in building ecological awareness and encouraging sustainable practices in Balinese traditional communities, especially in the Tenganan, Penglipuran and Trunyan Traditional Villages. The implementation team began by conducting a survey and initial analysis to understand the environmental conditions and level of ecological awareness in each village, which then became the basis for designing an approach that suits local needs.

Furthermore, through comprehensive environmental education and practical training, the community is given a deep understanding of the importance of protecting the environment and given the skills to implement environmentally friendly practices in everyday life. This program not only provides information, but also builds active community involvement in environmental conservation efforts.

Program implementation is carried out in a sustainable manner, with a focus on reducing the use of single-use plastics, environmentally friendly agricultural practices, and preserving local natural resources. Through regular monitoring, the project team can track progress and identify challenges that arise during implementation, enabling

adjustments to the program to make it more effective and relevant to the needs of local communities.

Finally, program impact evaluation re-engages indigenous communities to obtain direct feedback on the program's effectiveness and to evaluate whether initial objectives have been achieved. From the results of this evaluation, recommendations can be made to improve the program in the future or expand it to other areas more effectively and sustainably.

Overall, this program successfully combines theoretical education, practical training, and community engagement to create sustainable changes in behavior and attitudes towards the environment in Balinese traditional communities. Thus, this program not only strengthens traditional ecological knowledge, but also empowers communities to become agents of change in maintaining the sustainability of the natural environment.

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