

CLIMATE VILLAGE BASED ON MITIGATION AND ADAPTATION WITH TRI HITA KARANA PHILOSOPHY IN BANYUASRI VILLAGE

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Abstract

Banyuasri Village is located in Buleleng District, Buleleng Regency, Bali Province, Indonesia, which has an area of 1.45 km² which is located 15 meters above sea level. The population of Banyuasri Village is 10,704 with the majority earning their living as traders, civil servants. According to the Secretary of the Banyuasri Village, I Made Sujana Dibya S.E, he explained that rubbish and waste are one of the crucial problems for Banyuasri Village. The increasing risk of natural disasters is felt by the community. The solution that can be proposed by the Ormawa Working and Reasoning Group of the Undiksha Technical and Vocational Faculty at the 2023 Ormawa PPK is through a climate village program based on adaptation and mitigation. The implementation method is that all PPK members are allowed to make program suggestions and take responsibility for the work they hold (participatory). Reference to the significance criteria for conformity with government programs, namely PPN 6/PN6/PP2/KP1/RKP2023 in the RAKER 2023 book, Directorate of Environmental Criminal Law Enforcement and Forestry. From the results obtained, the IKP category achieved 81% significance (SS), the dominance of the most on-target targets was pro-p 4 (67%), pro-p 2 (14%), pro-p 3 (10%), pro- p 1(9%). This is in accordance with the observations of the 2023 Bali climatology station's dry season forecast bulletin update. The northern part of the Banyuasri sub-district market is at ZOM 418 (beginning of the second dry season in April 11-20 with a rainfall value of less than 85% with a peak in June.

INTRODUCTION

Banyuasri Village is located in Buleleng District, Buleleng Regency, Bali Province, Indonesia which has an area of 1.45 km² located 15-meters above sea level. The total population of Banyuasri Village is 10,704 with the majority of them living as traders, civil servants, The biggest potential of Banyuasri Village is to have one of the largest markets in the city of Singaraja. Another potential is in terms of irrigation and agriculture. According to the Secretary of Banyuasri Village I Made Sujana Dibya S.E, he explained that waste and waste are one of the crucial problems for Banyuasri Village. The increasing risk of natural disasters is felt by the community. The solution that can be proposed by Ormawa Working and Reasoning Group of the Faculty of Engineering and Vocational Undiksha at the 2023 Ormawa PPK is through a mitigation and adaptation-based climate village program that involves the participation of the community, government, and educational intuition in realizing environmental sustainability and community welfare.

Climate change is currently characterized by the increasing frequency of hydrometeorological disaster events, including reduced water availability reserves and or can even cause excess amounts of water discharge at other times, as well as forest and land fires. These hydrometeorological disasters have the potential to increase based on projections of future climate change, and can affect the security of water, food, and energy resources. Mitigation is defined as a series of efforts to reduce disaster risk both through physical development and awareness and improvement of the ability to face disaster threats. While adaptation is an effort to adapt to the environment by making changes that lead to increased resilience and resilience to these changes.

The word Tri Hita Karana comes from Sanskrit, where the word Tri means three, Hita means prosperous or happy and Karana means cause or cause. Tri Hita Karana means three harmonious relationships that cause happiness to mankind. For this reason, these three things must be maintained and preserved in order to achieve a harmonious relationship. As stated in the teachings of Hinduism that "happiness and well-being" is the goal to be achieved in human life, both happiness or physical well-being or birth called "Jagadhita" and spiritual and inner happiness called "Moksa".

Research conducted by Luh Putu Widya Fitriani on "Realizing a Hindu Society that Cares for the Environment through Understanding Environmental Law and Tri Hita Karana Teachings" (Fitriani, 2021). The difference between this research and the research conducted lies in the object of research, while the similarities of this study are the same discussing Tri Hita Karana. This research has not explained the climate based on mitigation and adaptation using the Tri hita Karana philosophy. Therefore, researchers take the problem to explain and explain the research to be carried out.

METHOD

The method used is Socialization and Demonstration based on Counseling.

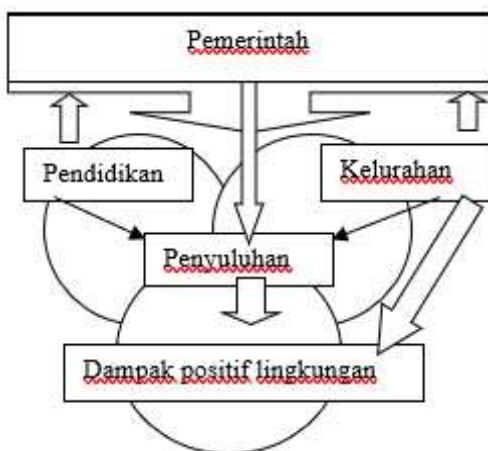


Diagram 1. (Extension Strategy Model)

Indicators of Conformity with Government Programs

The indicators we use are the National Development Priority Matrix 6, PN6/PP2/KP1 (RKP 2023) table

Table 1. Indicators of Conformity with Government Programs

National Priorities PN	Priority Program PP	Priority activities KP	Project Priority Pro-p
Building the environment, increasing resilience disasters, and climate change	Improved disaster resilience and climate	Increased climate resilience	1 Protection of coastal and marine sector vulnerabilities
			2 Water resistance protection in climate-risk areas
			3 Protection of food resistance to climate change
			4 Protection of public health and the environment from the effects of climate change

$$\sum \left(\frac{N_i}{N_{maks}} \right) \times 100$$

IKP

Where:

IKP = Indeks kesesuaian Program

Ni = Nilai Parameter Ke – I (bobot x skor)

N maks = Nilai Maksimum Suatu Kategori program

Table 2. Maximum Values

Bobot Kegiatan Pro p N Maks	
Pro-p 1	2,5
Pro- P 2	2,5
Pro- P 3	2,5
Pro- P 4	2,5
Total	10

Table 3. Weighting the Value of a Work Program

Bahan-Alat	6,25
Proses pembuatan	6,25
Sosialisasi	6,25
Produk	6,25

Conformity class

1. Sangat sesuai (SSS) : 83-100%
2. Cukup sesuai (SS) : 50-<83%
3. Sesuai Bersyarat (S) : 17-<50%
4. Tidak Sesuai (TS) : <17%

All KDP members are allowed to propose programs and hold accountable for the program held (participatory) within the team leader's expectations. With all administrative and consumptive needs through treasurers and secretaries so that this role is very important in the sustainability of the work program. After successfully carrying out these activities are evaluated with the above criteria.

Table 4. Time and Place

No	Pemegang Proker	Target Estimasi	Sasaran Lokasi
1	Kadek Edy Sukarma	1jam/2 jam	Area vital Pemukiman ./perumahan/Balai Adat
2	Kadek Rosila Putri	IUJP 1	Areal dalam Pura
3	Dewa Gede Agung	IUJP	Rumah Penduduk

No	Pemegang Proker	Target Estimasi	Sasaran Lokasi
	Wibhisana Natih		
4	I Putu Bayu Ananta Surya	IUJP	Drainase Jalan
5	Dewa Made Wisma Dwipayoga	IUJP	Areal Pemasaran
6	Ni Luh Gede Putri Desta Parwathi	1jam/2jam IUJP	Rumah Penduduk, Balai Adat
7	Desak Putu Mahadewi Saraswati	1jam/2jam IUJP	Rumah Penduduk, Balai Adat
8	I Gusti Agung Michael Swisnandya	IUJP	LRHA
9	Gede Yudistira	IUJP	LRHA
10	Putu Eka Sugiartawan	IUJP	LRHA
11	Gusti Putu Younky Prakasa	IUJP	LRHA
12	Gede Rendy Wetu Dinatha	1jam/2jam	Balai Adat
13	I Putu Gede Dharma Saputra	1jam/2jam IUJP	Rumah Penduduk, Balai Adat
14	I Komang Sasra Wiardana	IUJP	LRHA

Information:

IUJP = Instalsi Unit Jangka Panjang

LRHA = Lahan Rehabilitasi/Kosong

RESULT AND DISCUSSION

BIOPORI (D.1)

Biopori is a groundwater management system in the form of small wells with a diameter of about 10-15 cm and a depth of up to 100 cm (Meiyuntariningsih et al., 2022) (Safriani et al., 2020). The walls of the pit are made with materials that can absorb water, such as soil mixed with sawdust or other organic material. Biopore Infiltration Holes are designed to absorb and store rainwater efficiently (A'yunin, 2016) (Nur et al., 2020) (Nainggolan et al., 2019).

The following steps:

1. Make cylindrical holes vertically Diameter 10 cm, Depth 100 cm, with a distance between holes 50-100 cm



Figure 1. (Pipe Punching and Cutting)

2. The hole will be filled with organic waste from the leaves periodically depending on the rate of shrinkage
3. Compost formed in the pit can be taken at the end of the dry season



Figure 2. (Joint installation of STT Kel. Banyuasri)

Biopori	Score =	Point	Pro-P=
Rosila	25	miss = 0	4
Putri			

HOLISTIC HEALTH (D.2)

1. Free Health Check-up

In collaboration with Posyandu Banyuasri Village and Puskesmas 1 Buleleng with the main target of the elderly, including checking tension, blood sugar, and uric acid.



Figure 3. (Free Medical Checkup)

2. Elderly Gymnastics together Practice some basic movements especially for the elderly together.
3. Yoga and Meditation Training, Practice some basic movements especially for the elderly with professional instructor Dr. dr. Made Kurnia Widiastuti Giri. S.Ked., M. Kes.



Figure 4. (Yoga and Meditation)

4. Herbal Medicine Making Training, Utilizing crums that grow in nature, processed in the best way to produce herbal medicines that are good for the body.



Figure 5. (Herbal Medicine Making)

This activity is the final series carried out from a series of Holistic Health, in its implementation this activity also presents professional instructors in their fields, namely Dr. dr. Made Kurnia Widiastuti Giri. S.Ked., M.Kes.

Holistik	Score =	Poin	Pro-p
Edy	25	miss =	4
Sukarma		0	

DRAINAGE CLEANER (D.3)

The Automatic Drainage Cleaning tool system uses several components, namely, infrared proximity sensors, servo motors, raindrops sensors, arduino uno, LCD, and batteries. Everything is designed in a waterproof container, which later the servo will be connected to a sweeper, can be a brush or broom, to clear obstacles (Suarda et al., 2019) (Romadona et al., 2019) (Pratiwi, 2019).

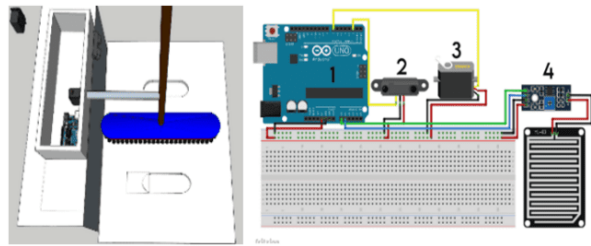


Figure 6. (Arduino System Plan)



Figure 7. (Drainage Cleaning Machine Installation)

PB	Score =	Poin	Pro-p
Drainase	18,75	miss	4
Bayu		=6,25	
Sasra			

WWTP (Wastewater Sewerage Plant) B.1

A simple, effective and affordable solution in sewage filtration. By using a large drinking bottle with a capacity of 1.5L with several filter media.



Gambar 8. (Model IPALS)

IPALS	Score =	Poin	Pro-p
Agung	12,5	miss	2
Wibhisana		2x (12,5)	

BUDIDAYA EMBER (AQUAPONIC) A.1

The availability of fish in the sea will be depleted (*decrease*) if *mass capturing fishing efforts* continue (*increase*) there needs to be restocking efforts or transfer fish consumption to fresh commodities so that fish stocks in high waters remain *sustainable* (Supriyati, 2021) (Susilawati & Si, 2019). Cultivation using buckets is chosen because it can double *harvesting*. This activity invited resource person Muhammad Hendrajaya S.Pi. and was supported by BBI (Ringdikit Fish Seed Center).



Figure 9. (Fish Seed and Bucket Aquaculture Installation)



Gambar 10. (Setelah Siap Panen dan di Representasikan)

Budidaya	Score =	Point	Pro-p
Ember	25	miss =	1 & 3
Rendy		0	

HIDROPONIK DFT (B.2)

Plant cultivation systems control *hydro* (Water) generally uses electric water pumps to circulate water so as to save water. In this activity, *a wick system and DFT (Deep Flow Technique)* are applied (Tobing, 2021) (Isnaeni & Yunita, 2019) (Permana & Mursidi, 2020).



Figure 11. (Hydroponic Installation Assembly)



Figure 12. (Socialization of Hydroponics and Vegetable Harvesting)

Hidroponik	Score =	Point	Pro-P
Desak	25	miss= 0	2 & 3
Saraswati			
Dharma			
Saputra			

VERTICULTURE (C.1)

Verticulture allows for a more efficient spatial layout. Increase crop productivity. By providing better access to sunlight, nutrients, and water (Wahyudi, 2020). The size of Ventri is a 4-inch pipe and uses a pot as a support.



Figure 13. (Creation of Verticulture Installation)



Figure 14. (Verticulture and Vegetable Harvesting Socialization)

Ventriculture	Score =	Point	Pro-P
Desta	25	Miss = 0	3

CHARCOAL BRIQUETTES (D.4)

In terms of price, briquettes are generally sold more expensive than charcoal. 1 kg charcoal briquettes in the market are sold for around Rp 25,000.00, while ordinary wood charcoal costs only Rp 7,000.00. The composition of glue is measured 3 tablespoons of starch with 400 ml of water mixed with charcoal powder that has been ground. Stir over low heat until the flour is mixed to form a glue dough. After that, it is formed according to the mold and dried in the sun for 2 days. It is hoped that this innovation can provide *income* to the community.



Figure 15. (Hands-on Installation)



Figure 16. (Product ready for market)

Briket	Score =	Point	Pro-P
Wisma	25	Miss	4
		= 0	

MAGOT BSF (D.5)

BSF maggot feed contains high protein as much as 35% to 45% which can be used for poultry and fish feed. The size of the cage is made which is the size of 1m x 1 m x 1.7 m, Made of soft mesh (wall) UV Plastic (Roof) The main purpose is the management of organic food waste into economical products.



Figure 17. (Proker Installation & Extension)

Maggot	Score=	Point	Pro-p
BSF	25	Miss	4
Eka		= 0	

TONG CACING & TONG KOMPOSTER (D.6)

Composting Organic food waste using *Eisenia Fetida* worm as a composter, the disgetive residue of the metabolic activity of the worm produces *vermicompost* which is good for soil structure recovery. The worms are placed in a damp barrel and darkly covered. If the number of barrel worms continues to increase in one barrel, it can be used as ungags feed or protein-rich ornamental fish feed.



Figure 18. (Worm Tong Installation and Proker Counseling)

Composting barrels are tools or containers used to process organic waste into compost naturally with the main purpose of composting vats is to decompose organic matter, such as food scraps, dry leaves, grass, and other organic waste into nutrient-rich compost (Purnomo, 2021).



Figure 19. (Socialization of Composter Barrels)

Tong	Score =	Point	Pro-p
Cacing &	25	Miss	4
Komposter		= 0	
Yudistira			

VACANT LAND (D.7)

The implementation of an integrated agricultural system in yards / dry land is expected to improve food security. This program accommodates 3 joint programs as the central area of waste recycling management and ventricultre agriculture, all socialization activities of 3 combined waste management programs are held on rehabilitation/vacant land.



Figure 20. (Soil nutrient enhancement activities)

Lahan	Score=	Point	Pro-p
Kosong	25	Miss=	4
Youngky		0	
Michael			

OTHER PROGRAMS

Environmental Disputes (Gotong Royong)

Gotong royong as one of the main activities in this program not only provides physical hygiene but also provides long-term benefits. (Widayati, S. (2020). In this activity we have held gotong-royong activities at several sacred arel points in traditional activities.



Figure 21. (Gotong Royong at Tirta Sudhamala Temple & Taman Alit Temple)

Combined Dilution

Table 5. (Combined Extension)

No	Proker
1	C.1
	B.2
2	D.5
	D.6
	D.7

Table 6. SKOR

NO	proker	skor	avrage	Ni
1	D.1	25	56,8	57,8
2	D.2	25x5	284	286
3	D.3	18,7	42,4	45,4
4	B.1	12,5	28,3	32,3
5	A.1	25	56,8	61,8
6	B.2	25	56,8	62,8
7	D.4	25	56,8	63,8
8	D.5	25	56,8	64,8
9	D.6	25	56,8	65,8
10	D.7	25	56,8	66,8
11	C.1	25	56,8	67,8
				811,3

IKP = 81.1% (SSS, Very Compatible)



Table 7. EXECUTION TABLE

No	Proker	Duration/hour	Place (banyuasri)	pstr
1	D.1	2	Pr, Subak	20>
2	D.2	3	Perum	23>
		3	Satelit	30>
		4	Balai Adat	40>
		2	Balai Adat	26>
		3	Perum	20>
			Lingga	
			Balai Adat	
3	D.3	IUJP	Jl Ahmad Yani	-
4	B.1	IUJP	-	-

No	Proker	Duration/hour	Place (banyuasri)	pstr
5	A.1	1	Balai Adat	10>
6	B.2	IUJP	Citizens'	-
		2	homes	25>
		IUJP	Balai Adat Rumah Warga	-
7	D.4	1	LRHA	17>
		IUJP	LRHA	-
8	D.5	IUJP	LRHA	17>
		1	LHRA	-
9	D.6	IUJP	LHRA	-
		1	LHRA	17>
10	D.7	IUJP	LHRA	-
		IUJP	LHRA	-
		1		17>-
		IUJP		
11	C.1	IUJP	LHRA	-
		IUJP	Citizens'	-
		1	homes Balai Adat	
tot		25 jam		191>

CONCLUSSION AND RECOMMENDATION

Based on the diagram, it can be concluded that the target targets are more about (Pro-p4), PN6/PP2/KP1 (RKP 2023), namely health protection from climate change. This is in accordance with the condition of the condition of Banyuasri Village, which is based on the 2023 Bali climatology station dry season forecast bulletin update. the northern part of the Banyuasri Village market is at ZOM 418 (Early dry day II in April 11-20 with a rain value of less than 85% with a peak in June And in the cases we encountered in the field from April to November 24, 2023, there was almost little rain.

Health improvement and disaster mitigation are special points of concern for Banyuasri Village, actually environmental management in Banyuasri Village is good, but the climate crisis is a factor that can risk food and water security, as well as public health. Therefore, based on the results of the implementation of the PPK Ormawa POKJA FTK program in Banyuasri Village, it can help realize welfare and preserve the environment for a better future by targeting policies, PN6/PP2/KP1 (RKP 2023)

REFERENCES

- A'yunin, Q. (2016). Application Of Organic Waste As Renewal Technology Of Earthworm Cultured Media. *Journal of Innovation and Applied Technology*, 2(1), 226–229.
- Fitriani, L. P. W. (2021). Mewujudkan Masyarakat Hindu Yang Peduli Lingkungan Melalui Pemahaman Hukum Lingkungan Serta Ajaran Tri Hita Karana. *Pariksa: Jurnal Hukum Agama Hindu*, 4(2), 37–46.
- Isnaeni, S., & Yunita, R. (2019). Adopsi teknologi vertikultur skala rumah tangga pada beberapa jenis sayuran di Desa Parakannyasag, Tasikmalaya. *Journal of Empowerment Community*, 1(1), 27–32.
- Meiyuntariningsih, T., Maharani, A., Rizkinannisa, J. R., & Hastiani, F. N. (2022). Pengolahan Sampah dengan Metode Biopori: Waste Treatment with Biopori Method. *Poltekita: Jurnal Pengabdian Masyarakat*, 3(1), 113–122.
- Nainggolan, A. A., Arbaningrum, R., Nadesya, A., Harliyanti, D. J., & Syaddad, M. A. (2019). Alat pengolahan air baku sederhana dengan sistem filtrasi. *WIDYAKALA JOURNAL: JOURNAL OF PEMBANGUNAN JAYA UNIVERSITY*, 6, 12–20.
- Nur, R., Mattiro, S., Rizky, A., Saputro, M. A., & Jannah, M. (2020). Sosialisasi Penjernih Air Dengan Penggunaan Bahan Sederhana Di Desa Sungai Kali Kec. Barambai Kab. Barito Kuala–Kalimantan Selatan. *PADARINGAN (Jurnal Pendidikan Sosiologi Antropologi)*, 2(2), 247–259.
- Permana, B. I., & Mursidi, A. (2020). Peranan Tentang Nilai Gotong Royong Sebagai Bentuk Penerapan Sila Ke-Tiga Pancasila Di Desa Wonorejo Kecamatan Banyuputih Kab. Situbondo. *Citizenship Jurnal Pancasila Dan Kewarganegaraan*, 8(1), 13–20.
- Pratiwi, M. A. (2019). *Studi Evaluasi dan Rehabilitasi Sistem Drainase di Tanjung Selor, Kabupaten Bulungan, Provinsi Kalimantan Utara*. Universitas Brawijaya.
- Purnomo, C. W. (2021). *Solusi pengelolaan sampah Kota*. UGM PRESS.
- Romadona, I. I., Andawayanti, U., & Cahya, E. N. (2019). Analisis Reduksi Genangan Pada Saluran Drainase Di Pesisir Kota Palu Yang Berwawasan Lingkungan (Analysis Of Inundation Reduction In Drainage Channel At Coastal Palu City With Environmental Insight). *Jurnal Teknik Pengairan: Journal of Water Resources Engineering*, 10(1), 39–50.
- Safriani, E. W., Halimah, A. N., Rahmawati, E. M., & Dewi, R. P. (2020). Lubang Resapan Biopori Sebagai Upaya Mitigasi Bencana Banjir di Kelurahan Sewu Kota Surakarta. *Abdimas Dewantara*, 3(1), 1–8.
- Suarda, M., Suputra, I., & Suaniti, N. M. (2019). *Peningkatan Kualitas Air Bersih*

Pedesaan Dengan Penerapan Sistem Penyaring Air Aliran Up-Flow Pada Sistem Air Bersih Di Desa Menyali. 18. April.

Supriyati, W. (2021). *Briket Arang dari Limbah Kayu*. Penerbit NEM.

Susilawati, S., & Si, M. (2019). Dasar-dasar bertanam secara hidroponik. *Kampus Unsri Palembang: Universitas Sriwijaya*.

Tobing, W. L. (2021). Pemanfaatan lahan pekarangan melalui sistem vertikultur budidaya sayuran Kelompok Tani Sinar Manumuti Desa Upfaon. *Bakti Cendana*, 4(1), 68–75.

Wahyudi, T. (2020). *Pengelolaan komoditas hortikultura unggulan berbasis lingkungan*.