

BUKTI KORESPONDENSI IJG

The screenshot shows an email inbox with the following entries:

No	From	Subject	Date
1	Eko Haryono	[IJG] Editor Decision: Accept Manuscript - Dear Puji Hardati, Congratulat...	12/23/22
2	Puji Hardati	[IJG] Harmonization Of Community Around the Upstream of Garang River...	12/23/22
3	Eko Haryono	[IJG] Editor Decision: Revision Required - Dear Puji Hardati, We found tha...	12/23/22
4	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	12/22/22
5	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	12/20/22
6	Eko Haryono	[IJG] More Revision Required - Dear Puji Hardati, English needs improve...	12/10/22
7	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	12/2/22
8	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	11/25/22
9	Eko Haryono	[IJG] Editor Decision: More Revision Required - Dear Puji Hardati, Please ...	11/21/22
10	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	11/17/22
11	Eko Haryono	[IJG] Editor Decision: Major Revision Required - Dear Puji Hardati, You sh...	10/22/22
12	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	10/21/22
13	Puji Hardati	Harmonization Of Community Around the Upstream of Garang River, Cen...	9/13/22
14	Puji Hardati	[IJG] Harmonization Of Community Around the Upstream of Garang River...	8/9/22
15	Eko Haryono 2	[IJG] Editor Decision: Resubmit - Dear Puji Hardati, Please also all the au...	8/7/22

No	Tanggal Pengiriman	Keterangan
1	27 Juni 2022	Artikel dikirim ke jurnal UGM lewat link
2	12 Juli 2022	Artikel masuk ke IJG International Journal of Geography
3	07 Agustus 2022	Permintaan editor untuk Resubmitted sesuai guideline IJG
4	09 Agustus 2022	Mengirim revisi artikel awal ke IJG
5	13 September 2022	Mengirimkan revisi dan menambahkan metadata dari semua penulis.
6	21 Oktober 2022	Penulis menanyakan/memastikan bahwa manuskrip sudah sampai IJG
7	22 Oktober 2022	Keputusan Editor: Diperlukan Revisi Besar (Major Revision Required)
8	17 November	Pengiriman hasil revisi (2 reviewer) dari penulis ke editor IJG
9	21 November	Editor mengirimkan revisi tambahan dari reviewer ke 3
10	25 November	Konfirmasi dari penulis tentang tambahan masukan dari reviewer ke 3
11	2 Desember	Penulis mengirimkan hasil revisi dari reviewer ke 3
12	10 Desember	Editor meminta untuk perbaikan bhs inggris (mengubah kalimat present tense ke past tense) dan mengubah referensi gaya APA. Meminta untuk dilakukan proofreading dan mengunggah sertifikat proofread.
13	20 Desember	Penulis mengirimkan hasil revisi dan bukti dari 'Indo-Lingua Proofreader' yang diminta IJG
14	22 Desember	Penulis mengirimkan sertifikat dari 'Indo-Lingua Proofreader'
15	23 Desember, [jam 9:58 AM]	Editor memberitahukan bahwa gaya kutipan dan rujukan tidak sesuai dengan APA edisi ke-6.
16	23 Desember [jam 1:31 PM]	Penulis mengirimkan revisi paling akhir, termasuk perbaikan referensi
17	23 Desember [jam 1:54 PM]	Editor memutuskan: Editor Decision: Accept Manuscript
18		Tampilan artikel dalam website jurnal IJG

SUBMITTED ARTIKEL Tanggal 27 Juni 2022

The screenshot shows a web browser window with the URL journal.ugm.ac.id/jgg/author/index?sort=submitDate&sortDirection=1. The page has two tabs: "ACTIVE" (selected) and "ARCHIVE". A table lists submission details:

ID	MM-DD SUBMIT	SEC	AUTHORS	TITLE	STATUS
75767	06-27	ART	Hardati, Setyowati, Arsal, Amin,...	HARMONIZATION OF COMMUNITY AROUND THE UPSTREAM OF GARANG...	IN REVIEW: REVISIONS REQUIRED

Below the table, there is a "Start a New Submission" section with a link "CLICK HERE to go to step one of the five-step submission process." and a "Reffbacks" section with filters "ALL", "NEW", "PUBLISHED", and "IGNORED". A table of references is shown:

DATE ADDED	HITS	URL	ARTICLE	TITLE	STATUS	ACTION
2020-04-28	45	https://www.google.com/	Rural Farm and Non-farm Linkages in a	-	New	EDIT DELETE

A sidebar menu on the right includes "Search Scope", "Browse" (By Issue, By Author, By Title, Other Journals), and "USER" information: "You are logged in as. pujihardati" with links for "My Journals", "My Profile", and "Log Out".

Catatan Email komentar Editor 7 Agustus

The screenshot shows an email from Eko Haryono (e.haryono@ugm.ac.id) dated Sun, Aug 7, 1:37 AM. The subject is "[JG] Editor Decision: Resubmit". The email content includes:

Dear Puji Hardati,

An initial review found that your manuscript does not comply with JG author guidelines. Please read carefully the author's guidelines in preparing the manuscript. A literature review sub-section is not needed. A literature review must be embedded in the introduction without subsections.

Some references are not cited in the text

1. Sugiesti, S.F dkk (2021)
2. Suhandini, P. (2008)
3. Ujianti (2018)

References from websites must be provided with a date when the website is accessed

Use reference management software (Mendeley, EndNote, gets)

Best wishes,
Editor in Chief
Indonesian Journal of Geography,
Faculty of Geography, Universitas Gadjah Mada, Yogyakarta

Chief Editor
Indonesian Journal of Geography
<http://jurnal.ugm.ac.id/index.php/jg>
0024-9521 (print), 2354-9114 (online)
Phone: +62 812-2711-480



Eko Haryono <e.haryono@ugm.ac.id>
to Puji, me, Thriwati, Muhammad, Edy ▾

Aug 7, 2022, 1:39 AM ★ ↶ ⋮

Dear **Puji Hardati**,

Please also all the author affiliation and other information in metadata.

Best wishes,
Eko Haryono

...

↶ Reply

↶ Reply all

↷ Forward

Catatan email tanggal 9 Agustus 2022

← [📧] [🕒] [🗑️] [📧] [🕒] [↶] [📧] [🗑️] [⋮] 4 of 9 < > [📧]

297

[IJG] Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia [🖨️] [📧]

External → Inbox x

45

P **Puji Hardati** puji.hardati@mail.unnes.ac.id [via](mailto:puji.hardati@mail.unnes.ac.id) ugm.ac.id Tue, Aug 9, 5:41 AM ☆ ↶ ⋮

to Eko, puji.hardati, me ▾

Dear Prof Haryono

We have received your email. We will process the revision immediately. Thank you.

Chief Editor
Indonesian Journal of Geography
<http://jurnal.ugm.ac.id/index.php/ijg>
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Catatan email tanggal 13 September 2022

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Q IJG X [🔍] [⋮] ● Active [🕒] [⚙️] [⋮]

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Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia External → Inbox x

P **Puji Hardati** puji.hardati@mail.unnes.ac.id [via](mailto:puji.hardati@mail.unnes.ac.id) ugm.ac.id Tue, Sep 13, 7:54 AM

to Eko, puji.hardati, me ▾

Dear Prof Eko Haryono

We have sent our revision and also added the metadata of all authors. Hope this email finds you well. Thank you.

Chief Editor
Indonesian Journal of Geography
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Catatan email tanggal 21 Oktober 2022

The screenshot shows a Gmail interface with a search bar containing 'IJG'. The email is from Puji Hardati (ujm.ac.id) to Eko Haryono, dated Friday, October 21, 9:57 AM. The subject is 'Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia'. The body of the email reads: 'Dear Prof Eko Haryono. By sending this email we would like to make sure that our manuscript is not facing any obstacles during the review process. Please do not hesitate to contact me. Thank you.' Below the main text, it identifies the sender as the Chief Editor of the Indonesian Journal of Geography, providing the journal's website (<http://jurnal.ugm.ac.id/index.php/ijg>), ISSN (0024-9521 print, 2354-9114 online), and phone number (+62 812-2711-480).

Catatan email tanggal 22 Oktober 2022

The screenshot shows a Gmail interface with a search bar containing 'IJG'. The email is from Eko Haryono (e.haryono@ugm.ac.id) to Puji Hardati, dated Saturday, October 22, 10:58 PM. The subject is '[IJG] Editor Decision: Major Revision Required'. The body of the email contains the following text: 'Dear Puji Hardati, You should improve the quality of your manuscript by revising your manuscript according to the reviewer's comments. Please carefully respond to the reviewer's comments when submitting the revision and please clearly indicate the changes that you made (or highlight them) to address the reviewer's comments. Or, you can directly reply to the reviewer's comments in the comments box written by the reviewer. You should also use the template attached below. We will not process and consider for publication a revised paper without specific response to each reviewer's comments. Once again, thank you for submitting your manuscript to the Indonesian Journal of Geography and I look forward to receiving your revision no later than 30 days from now. If you failed to meet the deadline, we may have to consider your paper rejected.' The email then lists reviewer comments: 'Reviewer #1 Editor comments: 1. English needs improvement and native speaker proofreading; 2. What the manuscript means by around? Is it outside the watershed?; 3. Harmonization concept needs elaboration; 4. Figure 4. What kind of utilization? It needs explanation; 5. What is the river border? Is it riparian or watershed?'. 'Reviewer #2' and 'General comments' sections are also present, with the general comments stating: 'The paper aims to show the harmony between the population and the environment in a context of (heavily) degrading and (partly) urbanizing watersheds. Many existing works emphasize the physical geographical dimensions of the watershed. The paper intends to fill the gap in the absence of work on the condition of harmony between the population and the'.

CATATAN REDAKSI JURNAL IJG

Dear Puji Hardati,

You should improve the quality of your manuscript by revising your manuscript according to the reviewer's comments. Please carefully respond to the reviewer's comments when submitting the revision and please clearly indicate the changes that you made (or highlight them) to address the reviewer's comments. Or, you can directly reply to the reviewer's comments in the comments box written by the reviewer. You should also use the template attached below. We will not process and consider for publication a revised paper without specific response to each reviewer's comments. Once again, thank you for submitting your manuscript to the Indonesian Journal of Geography and I look forward to receiving your revision no later than 30 days from now. If you failed to meet the deadline, we may have to consider your paper rejected.

Reviewer #1

Editor comments

1. English needs improvement and native speaker proofreading
2. What the manuscript means by around? Is it outside the watershed?
3. Harmonization concept needs elaboration
4. Figure 4. What kind of utilization? It needs explanation
5. What is the river border? Is it riparian or watershed?

Reviewer #2

General comments:

The paper aims to show the harmony between the population and the environment in a context of (heavily) degrading and (partly) urbanizing watersheds. Many existing works emphasize the physical geographical dimensions of the watershed. The paper intends to fill the gap in the absence of work on the condition of harmony between the population and the environment of the upper part of the watershed by proposing a conceptual model.

Other Comments:

Harmonization is usually between two parties; harmonization is a process. But the paper discusses the condition of harmony between the two rather than harmonization as a process. In this paper, it could be a harmony between the population dynamics and the environment. So the title may be better adjusted: The Harmony between population dynamics and the environment in the Upper Garang River, Central Java, Indonesia.

The outcome of the study is a conceptual model, so there is a need to describe how to produce the model in the methodological section. The methodological part does not discuss how to build the model.

In showing the balance between the population and the environment, the paper discusses the composition between farm and non-farm employment, which reflects the dependency of the different villages on the agricultural/natural environment. The article should show the harmony between population and environment partly from this discussion. The diversification indexes should be seen and interpreted as a proxy for the condition/situation of balance between the people and the environment (how bad or good the proportion is).

The paper should explain/describe the causes and implications of the variation in the diversification index among studied villages.

Further exploration is essential to make the importance of the existence of university campuses in shaping the harmony between the population and the environment in the upper part of a watershed. Does it improve or worsen the balance between the two? How does it affect harmony?

Some misconceptions/inaccuracies in using the term watershed or river can be improved.

Best wishes,

Eko Haryono

Universitas Gadjah Mada

e.haryono@ugm.ac.id

Editor in Chief

Indonesian Journal of Geography,

Faculty of Geography, Universitas Gadjah Mada, Yogyakarta

Chief Editor

Indonesian Journal of Geography

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The harmony of the population dynamics and the river environment in the Garang River upstream in Central Java, Indonesia

Dikomentari [L1]: Previous title: Harmonization of Community Around the Upstream of Garang River, Central Java Province, Indonesia

Abstract The dynamics of the population interacting with nature can cause environmental damage, for example, the degradation of the watershed carrying capacity. This study aims to analyze the harmonization of the population dynamics and the environment alongside the river. The research was conducted in four villages: Munding, Lerep, Kalirejo, and Pakintelan. The villages are located in the Garang River upstream. The research respondents included the village household heads, supported by key informants from community leaders and the river care communities. The data collection methods employed observation, questionnaires, interviews with proportional random sampling, and document studies. The analysis procedure used the descriptive method. The results showed that 1) the population of the Garang River's upstream is very dynamic, with population growth rates varying from 1.05% to 3.93%, 2) the population's livelihood and dominant land use is the agricultural sector, 3) the community realized that their harmonic relationship with the environment is critically needed for supporting farming activities and their daily necessities and 4) the society keep running the river maintenance such as "bersih sungai" or river cleaning and "sedekah bumi" or worship to the environment. The harmony of society to the river environment is carried out in several activities: waste management, cleaning rivers, maintaining clean waterways, actions to create a clean and healthy environment, and joining the environment caring. The harmony of the population dynamics and their environment will be realized through the integration of diversity, interdependence, unity, and the value of caring.

Keywords: population dynamic; land utilization; the value of caring.

Abstrak Dinamika penduduk yang berinteraksi dengan alam dapat menyebabkan kerusakan lingkungan, terutama penurunan daya dukung DAS. Penelitian ini bertujuan untuk menganalisis bentuk keharmonisan antara dinamika penduduk dan lingkungan sekitar sungai. Penelitian dilakukan di empat desa, yaitu Desa Munding, Lerep, Kalirejo, dan Pakintelan. Desa-desa tersebut terletak di sekitar hulu Sungai Garang. Responden penelitian adalah para kepala keluarga di desa-desa yang didukung oleh informan kunci dari tokoh masyarakat dan komunitas peduli sungai. Metode pengumpulan data melalui observasi, angket, wawancara, dan studi dokumen. Prosedur analisis menggunakan metode deskriptif. Hasil penelitian menunjukkan bahwa 1) penduduk desa sekitar sungai sangat dinamis, dengan laju pertumbuhan penduduk bervariasi dari 1,05% hingga 3,93%, 2) mata pencaharian penduduk dan penggunaan lahan dominan berpusat pada sektor pertanian, 3) penduduk menyadari bahwa keharmonisan antara penduduk dan lingkungan sangat diperlukan untuk mendukung kegiatan pertanian dan kebutuhan sehari-hari, dan 4) bentuk pemeliharaan sungai berupa "bersih sungai" dan "sedekah bumi". Keharmonisan antara penduduk dan lingkungan dilakukan dalam kegiatan: pengelolaan sampah, pembersihan sungai, menjaga kebersihan saluran air, aksi menciptakan lingkungan yang bersih dan sehat, dan bergabung dalam Komunitas Peduli Lingkungan. Keharmonisan antara dinamika penduduk dan lingkungan di hulu Sungai Garang akan terwujud melalui keterpaduan keberagaman, saling ketergantungan, persatuan, dan nilai peduli.

Kata kunci : dinamika penduduk; pemanfaatan lahan; nilai peduli.

1. Introduction

Damage to the river environment is an obstacle that accelerates water scarcity [1]–[4]. It can occur due to the degradation of the carrying capacity of the watershed, particularly in the upstream area due to forest damage [5]. Land degradation declines the watershed's ability, which eventually causes flooding in the rainy season and water shortage in the dry season [6]. It happens because the watershed cannot store water during the rainy season. In addition to flooding and water shortages, other problems that arise due to land degradation are erosion and sedimentation. Erosion and higher river sedimentation of the Garang watershed upstream indicate that the Garang watershed is in a lousy shape [7]. The cause is natural factors and human intervention in managing the land [8]. Sustainable watershed management is achievable through balancing utilization with maintenance and protection of river areas. In addition, compliance with norms and requirements in watershed management is an indicator of successful river environmental sustainability [9], [10].

Efforts to restore river functions reduced due to human intervention are possible by executing river restoration. River restoration can improve community relations with water by empowering communities to maintain rivers [11]. River improvement efforts can potentially restore ecosystem processes and services and improve and transform human

relationships with the rivers. Watershed problems are very complex. Therefore, it involves many parties to solve them. Garang River is one of the monuments for managing water resources in Semarang City [12], [13]. The main problems of the Garang River include the quantity and quality of river water. The quantity or the amount of water causes flooding, while water quality is related to clean water. As many as 60% of Semarang City residents depend on Garang river water used as clean water by PDAM (Municipal Waterworks). The research results on the Garang River water quality showed that the copper concentration had exceeded the quality standard of Government Regulation no. 82 of 2001. The water pollution index is 1.23, which means the river is lightly polluted. Therefore, river management must be comprehensive for sustainable use to achieve one river management [12].

Along with the phenomenon of land degradation, population dynamics will never cease. Globally, national and local population changes in the number, density, growth, and structure. Population and the environment are similar to two sides of a coin, where harmonization must occur in both [14]. Globally, the world's population reaches 7,373 billion, and Indonesia ranks fourth with a population of about 274 million [15]. Meanwhile, the number of rivers has never risen even though population growth in the villages around the Garang River has increased along with the development of Semarang City, Central Java. Changes in land use in the last ten years show substantial land conversion from agricultural to non-agricultural land. Rice fields, mixed gardens, dry fields, and forests have turned into settlements. Increasing the number of people residing in the area with diverse activities can change the orientation of land use. The existing changes are using agricultural land for other uses that decrease the quality and quantity of agricultural production and the quality of the environment. Therefore, indirectly, it causes a change in the community's economic, social, and cultural orientation.

The degradation in quantity and quality of the Garang River environment is due to human behavior in managing the river. In Central Java Province, the Garang River watershed has been tagged with an alert status and placed as a high priority for watershed management in Central Java. The majority of residents around the river are still apathetic to any changes. They do not care about the environment, especially the river environment. Local wisdom and the community's mindsets must be changed by raising awareness and providing river education. To make up the mindset, public involvement or participation in watershed management is crucial [16]. Furthermore, innovative environmental education must be conveyed to the broader community to foster environmental awareness.

This study analyzes the harmony between the population dynamic and its environment in the Garang River upstream. Many previous researchers have studied the Garang River and Garang Watershed, focusing on their physical conditions. Meanwhile, this study investigated the harmony between the population dynamics with the **environment in the Garang River upstream**. Based on the empirical research, the study is to develop a conceptual model of the harmonic relationship between population dynamics and the environment of the Garang River upstream. **For instans, the research will become role model for creating the harmonization life concept in the river environment.**

2. Research Methods

The research location was generally **in** the Garang River, precisely in the selected villages located **in the Garang river** upstream. **The household heads** residing nearby the river comprises the research population. There are 40 villages in the Garang watershed upstream. Household samples were taken by purposive sampling, in which there were two stages: (1) selecting study villages and (2) determining the number of respondents (**household heads**). In the first stage, four villages were selected by purposive sampling, namely **Munding, Lerep, Kalirejo, and Pakintelan, because these villages are the closest villages** to the river. Closeness to the river reflects more significant interaction and dependency on the river environment. Many of their residents interacted with the river environment **directly**. Three villages were in the administrative area of Semarang Regency, while one village was in the administrative area of Semarang City. The four villages are located upstream in the Garang river, as shown on the location map (Fig. 1). In the second stage, the head of household samples was drawn from the selected villages through proportional-random sampling. The number of respondents is 99 heads of households. **The number of respondents was determined proportionally, by comparing the number of households in the village with the total number of household heads.**

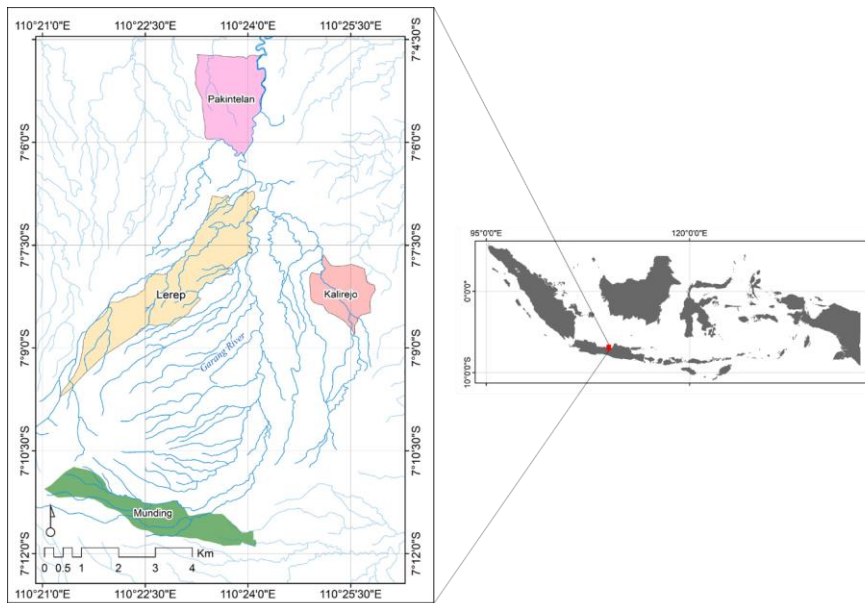


Figure 1. Location map of Munding, Lerep, Kalirejo, and Pakintelan villages

This research employed a quantitative approach. There were several considerations in conducting this quantitative research: 1) research variables are more appropriate when examined using a quantitative approach because the research produces data from ordinal, intervals, and ratios that suit to measure the phenomena under investigation; 2) this research revealed measurable aspects; 3) this research gained new data and insights explained about positivistic phenomena. The research variables were population dynamics, land use, and **environmental management**. The data used were primary and secondary data. The primary data were obtained through selected respondents, informants, and field observations, while secondary data were obtained from relevant governmental agencies.

The data collection techniques employed field observations, questionnaires, interviews, and document studies (Table 1). The observations focused on community activities on the river in four villages selected as research samples. Meanwhile, the interviews were conducted to collect data on river utilization and caring activities. On the other hand, the document study was employed to collect data from several research agencies, such as population data from the Central Statistics Agency, monograph data from villages and sub-districts, and data on the physical condition of the river environment from the Environment Agency.

The descriptive analysis was employed, including the quantitative analysis of population dynamics. **The descriptive analysis was to provide the description of the research subject based on the data.** The secondary data: literature review, and analysis of population harmonization through in-depth interviews with the selected household heads. **The percentage (P) of each variable was analyzed using variable frequency (a, b) as formulated as follows:**

$$P = \left(\frac{a}{a + b} \right) \times 100\%$$

Percentage analysis can describe the condition of the position of the variable to the overall condition of the variable. The analysis stages were expected to provide an overview of the general condition and population harmonization in the villages **nearby** the river.

Table 1 Characteristics of Respondents

No.	Type of Respondent	Characteristics	Total	Data Collection Techniques
1	Household Heads (total= 7,652) - Munding (964) - Lerep (3,022) - Kalirejo (1,277) - Pakintelan (2,389)	The household head who lives in the village nearby the river	99 12 39 17 31	Questionnaire
2	Public figure	Village officials in each village	4	interview
3	River care forum	Member	2	Interview

Source: field survey

The conceptual model refers to research variables related to the harmony between the population dynamics and the environment. The harmonization concept focuses on the interaction between relatively fixed environmental conditions and an increasing population. This interaction will form a harmonious harmony between the people and their environment, the environment is preserved, and the population is fulfilled their needs (Fig.2).



Figure 2. The Basic Concepts of Harmony between Population and the Environment

3. Result and Discussion

3.1. Population Dynamics in the Villages in the Garang River's Upstream

Munding, Lerep, Kalirejo, and Pakintelan villages are located in the Garang River upstream (Table 2). Munding Village is administratively part of the Bergas District, while Lerep Village is part of the West Ungaran District. Meanwhile, Kalirejo Village is part of the East Ungaran District. The three villages are located in the Semarang Regency area. On the other hand, Pakintelan Village is part of the Gunungpati District, Semarang City. Munding and Lerep villages are located at the top of the watershed with steep slopes. In contrast, Kalirejo and Pakintelan villages are relatively flat.

Munding Village is at an altitude of 682 meters above sea level (masl). The area's topography is a peak slope in the Garang River's upstream ranges. Administratively, Munding Village is part of the Bergas District, Semarang Regency. The distance from the city to the district is about 11 kilometers (km). The location is accessible by passing a paved and winding highway using private two and four-wheeled vehicles because there is no public transportation. The village has a natural beauty due to being located at a high altitude. When visiting the springs in Munding Village, there are also natural views of the surrounding area.

Lerep Village is one of the villages located 409 meters above sea level on the peak's slopes. The village has a distance from the village to district office of about 1.5 km. It is accessible from various directions through paved roads despite the lack of public transportation. Its location at an altitude provides springs used as tourist destinations. On the other hand, Kalirejo Village is located at an altitude of 360 meters above sea level, with the highest accessibility among the four villages. Highways and public transportation traverse the village. The distance to the Capital Regency is approximately only about 3 km. Furthermore, it has access to the entrance and exit to the Semarang-Solo highway and the Trans Java Ungaran expressway gate. Meanwhile, Pakintelan Village is part of Gunungpati District, Semarang City, located in a flat area.

Table 2 The Dynamics of Villagers Close to The Garang River's Upstream

Population	Villages around the River			
	Munding	Lerep	Kalirejo	Pakintelan
Total population 2016	2,845	9,012	3,523	4,065

Total Population 2020	3,166	11,711	4,273	5,676
Population growth 2016-2021 (%)	1.07	2.65	1.94	3.39
• Population density (people/square kilometers)	1.768	1.717	1.405	2.132
• Land area (square kilometers)	1.79	6.82	3.04	2.66
Livelihoods (%)				
• Agriculture	45.02	17.24	11.12	0.89
• Non-agriculture	54.98	82.78	88.88	91.11
• Diversification index	3.43	4.70	4.13	1.83
Land use (%)				
• Agriculture	80.73	70.66	21.11	81.96
• Non-agriculture	19.27	29.34	78.89	18.04

Source: Central Bureau of Statistics of Semarang Regency, 2020-b; Central Bureau of Statistics of Semarang Regency, 2020-c; Central Bureau of Statistics of Semarang Regency, 2020-d; and Central Bureau of Statistics of Semarang City, 2020.

The dynamics of the population in the villages of the Garang River's upstream vary widely. The population of these four villages is more than three thousand people. Lerep Village has the largest population, with 11,711 people, while Munding Village has the least, with 3,166 people. The population has increased over the last five years. The highest population growth rate occurred in Pakintelan Village, which reached 3.39%, and the lowest was in Munding Village, which only got 1.07%. The increasing population, followed by high growth, resulted in high population density. The high population density occurs because the increasing population does not follow the expansion of the area. The highest population density occurred in Pakintelan Village, and the lowest in Kalirejo Village. Pakintelan Village, apart from having the highest population growth, also has the highest population density. This village occupies a relatively flat topography, administratively is part of the city of Semarang, and is adjacent to the campus of Universitas Negeri Semarang. Therefore, Pakintelan Village quickly became densely populated as it provided student accommodation and allied services. This situation has offered more significant opportunities for diversification in the livelihoods of the population in the non-agricultural sector. In addition, the existence of the campus is beneficial for the village residents.

Munding village has the lowest population and growth compared to the other three villages. This situation is due to the village having the smallest area compared to the three villages. In addition, its location is on the slopes with wavy morphology and winding road access. Meanwhile, Lerep Village has the largest population because it has high accessibility, close to the factory area, government offices, trade, and education center. In contrast, Pakintelan Village has the highest population growth because it is close to Universitas Negeri Semarang. The population movement causes population growth in urban areas. Consequently, the demand for land and consumption of natural resources increase, coupled with the ecological footprint to maintain ecological services [17][18].

Population livelihoods near the river dominate the non-agricultural sector, from 54.98% to 91.11% (Figure 3). Pakintelan Village has the highest population who work in the non-agricultural sector, whereas the least is Munding Village. In comparison, the livelihoods of the people in the agricultural sector are more diminutive, ranging from 0.89% - 45.02%. In Munding Village, 45.02% of the population makes a living in the agricultural sector, while in Lerep Village, located at the upstream reaches of the Garang river, only 17.24% of the population makes a living in the agricultural sector. In general, the population nearby the river has a livelihood in the agricultural and non-agricultural sectors. This condition supports the results of research conducted in rural Vietnam [19]. The livelihoods of the population in rural Vietnam, apart from the agricultural sector, were also in the non-agricultural sector, such as farming, non-farming work, wage-earning, and non-labor work [19].

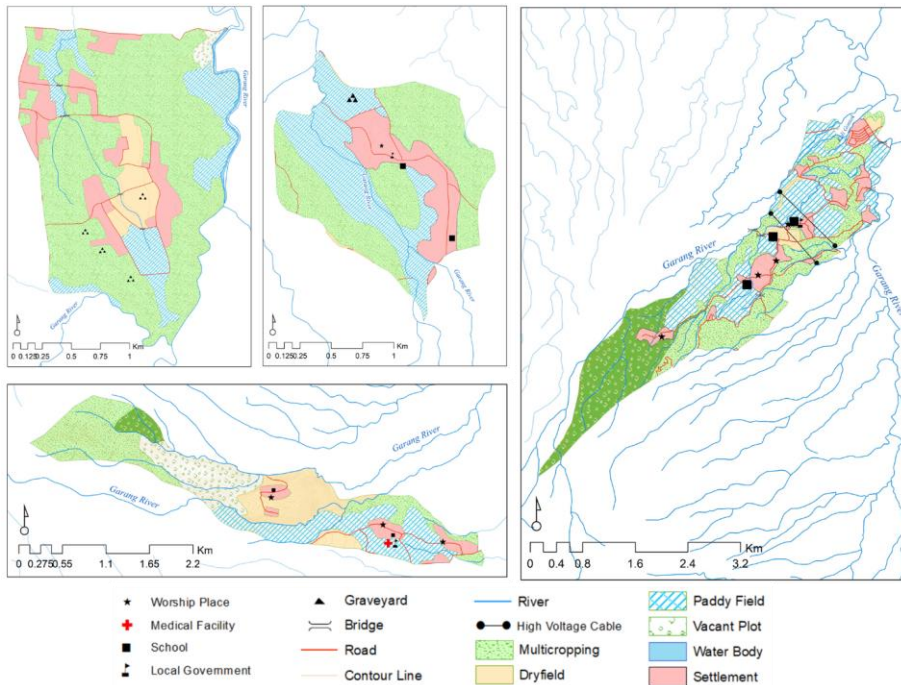


Figure 3. Land use map of the research locations (source: modified from BIG [20])

Most people residing in the Garang River upstream make a living in the agricultural sector. However, carrying out agricultural and non-agricultural activities is very varied. Agricultural activities are carried out in several ways: intensification, extensification, diversification, and mobility. Intensification and extensification are done through land management by nurseries, fertilization, and pest control. On the other hand, increasing arable land by sharing the results with the land owner was chosen because of the increasingly demanding access to land, the high price of land, and limited capital.

The diversification aspect of the agricultural and non-agricultural combination activities is observable in the four villages. Diversification with agriculture is very dominant in the villages of Munding, Lerep, and Kalirejo. Meanwhile, in Pakintelan Village, there is a tendency for prevalent non-agricultural activities, such as processing, manufacturing, and service sectors [15]. The diversification in the combination of agricultural and non-agricultural sectors that occurs upstream of the Garang river is also carried out by residents in other places [21]–[24].

The diversification of livelihoods carried out by the population varies greatly, with the diversification index value ranging from 1.83 to 4.7 (Table 2). In Pakintelan village, the diversification value is the lowest. The existing conditions exhibit that most of the population has a livelihood in the non-agricultural sector, which reaches 91.11 percent, and the rest have a livelihood in the agricultural sector. The highest diversification index occurs in Lerep Village. This condition is due to the balanced combination of people's livelihoods between the agricultural and non-agricultural sectors are only 17.24 percent. Still, the population whose livelihoods are in the non-agricultural sector, which consists of the industrial, trade, services, and other sectors, ranges from 12.02 percent to 26.17 percent. This condition shows that non-agricultural and agricultural activities are essential in shaping rural diversification. Diversifying livelihoods with non-agricultural activities has an important role in improving the ecological functions of the upper part of a watershed [24], [25].

Residents in the Garang river upstream adopt intensification, extensification, and plant diversification strategies. The home garden is the field for crop diversification strategies. The home garden has a dual function; besides being a source of local food, it also has a social function, an environmental function, and a biophysical function [26]. Meanwhile, residents in the non-agricultural sector choose a combination of diversification that involves non-permanent mobility to nearby cities: daily commuting and circular mobility. Commuting is the optimum choice for those working within commuting distance from their home villages. In contrast, circular migration is the option of those whose distance to cities of destination does not permit commuting.

3.2. *The Harmony of Land Use in Four Villages of the Garang River's Upstream*

Riverbanks, as a place to accommodate floods, naturally provide various benefits for the community [6], [27]. These benefits include flood regulation, clean water supply, tourist attraction, water purification, carbon storage, and improvement of human health. River conservation includes effective use, maintenance, and preservation activities that can be effective if it has good governance and strict adaptive management [28]. River improvements reintroduce natural processes that configure rivers to provide the diversity of habitats required for healthy river ecosystems. This effort ensures long-term recovery to address the initial problem that causes river degradation [29].

Table 3. Land Use Types in four Villages in the Garang River's Upstream

Type of Utilization Land	Munding	Lerep	Kalirejo	Pakintelan
River Water Source	100.00	74.36	17.65	22.58
River Terrace	16.67	12.28	12.28	12.90
River Environment Utilization	58.33	43.59	43.59	17.74

Source: Primary Data, 2018

Community efforts in preserving the river environment are measured by the river environment's condition, utilization, and management. River environment conditions include abiotic, biotic, and socio-cultural conditions. On the other hand, river environmental management consists of river environmental conservation activities, conservation of water bodies, community organizations, and the government's role. In Munding Village, river water is utilized for waterfall tourism activities, watering plants, and daily needs. Long pipes distribute water from springs to settlement areas. Accessibility to the waterfall is considerably good. In the area around the river, some perennials function as catchment areas. There are swales planted with secondary crops such as cassava, bananas, coffee, beans, and others (Table 3 and Fig. 2). The type of land use carried out by the community around the river is part of the harmonization effort. The community around the river carries out harmonization by utilizing the land around the river. Rivers are used as a source of water to meet agricultural needs. The people of Munding Village use the dominant river as a water source. This condition shows that their water needs are highly dependent on the river. Harmony is a universal law that guarantees the continuity of the system. There are four keywords of harmony, namely diversity, interdependence, unity, and having the highest value [30].

The utilization of river water sources in Lerep Village reached 74.36%. These utilization activities include daily necessities fulfillment, waterfall tourism, and irrigation. Water reservoirs are channeled using pipes directly to the community's houses for everyday essentials. Meanwhile, the utilization of river terraces is around 12.28%, with activities that include rice farming and planting crops and perennials. Overall, the utilization of the river environment in this area is 43.59% (Table 3 and Fig. 4).

The quality of the river basin or watershed is identifiable from the water flow and water's color, indicating the watershed's decreasing quality. The color of the water identifies the quality of the Garang watershed upstream, and there are differences in the rainy and dry seasons [31]. In the rainy season, the amount of river water increases, followed by changes in river water discharge so that the dominant color is brown. The brown color of the river water indicates the process of erosion and sedimentation. In the dry season, there is a lack of water, and the river discharge tends to be calm, so the color of the water is very transparent. However, at some points of observation, the color of the water tends to be cloudy, even black. This condition is triggered by human activities that throw garbage and household waste into the Garang river.



Figure 4. Riparian in the upstream areas in Munding and Lerep Villages (source: field survey)

Dikomentari [L2]: Previous sentence: River Conditions in Upstream Areas and Utilization of River Borders in Munding and Lerep Villages

The utilization of river water sources in Kalirejo Village (Fig. 5) to irrigate rice fields was approximately 17.65 percent. The use of river water was not remarkably significant due to the unclean river water. Pakintelan Village used 22.58 percent of river water for watering plants and fishing. On the other hand, the utilization of river terraces was 12.90 percent for planting secondary crops and perennials. Overall, the utilization of the river environment in this area was around 17.74 percent. This percentage indicated that the utilization of the river environment was low. The low utilization occurred because the location of the river was far from the settlement. Henceforth, the community rarely comes to the river (Fig. 5). Communities nearby the river utilize river water, river terraces, and the river environment for agricultural activities. The riverbanks are used for dams, the function of the dams is to protect the river body from scouring river water, and the embankments are also used for roads. The community around the river always tries to achieve a balance of harmony between needs and environmental conservation [14], [32]–[34].



Figure 5. Riverside land cover and land use in Kalirejo and Pakintelan Villages (source: field survey)

Dikomentari [L3]: We changed the word “utilization” to land cover and land use, to avoid the ambiguity.

Cultural and environmental conditions related to community behavior in utilizing the river environment include river water utilization and riparian management. In the uppermost area, Munding Village, river water was used for waterfall tourism activities, watering plants, and daily needs. Water was distributed using long pipes for everyday needs, channeled from springs directly to community houses. In addition, riparian management already exists around the waterfall for tourism activities. In contrast, the area around the river flow is planted with perennials as water catchment areas. Furthermore, swales were planted with secondary crops, such as cassava, banana trees, coffee, and numerous vegetable crops, near the river.

Table 4 Utilization and Management of the Garang River’s Upstream

Utilization and Management	Munding	Lerep	Kalirejo	Pakintelan
Land use	Tourism, Water management, waste management	Tourism, agriculture, and garden plants	Watering crops and livestock	Garden plants and fishing
Management	River riparian land management	River riparian land management	River riparian land management	River riparian land management

Source: Primary Data, 2018

The riparian in Lerep Village was used for watering plants. In addition, some communities used it for their daily necessities. Some were also used for waterfall tourism and fishing activities (Table 4). Management of riparian was by planting secondary crops and plants such as -sengon, bamboo, and others. The riverbanks were paved with concrete, and there were signs prohibiting littering.

Meanwhile, households in Kalirejo Village used river water for agricultural activities, such as watering plants and livestock. In contrast, the management of the riparian was by using the land as rice fields and planting secondary crops around the river. The utilization of river water in the central watershed, namely Pakintelan Village, focused on agricultural activities, such as irrigation, watering plants, and fishing. Furthermore, there was also riparian management by making swales in several places for agricultural activities and planting perennials to control erosion and water discharge.

3.3. The Harmony of Population Activities in the Environment of Garang River's Upstream

The cultural practices and environmental conditions related to people's lives upstream of the Garang River included 'sedekah bumi' and 'bersih sungai' (Table 5). 'Sedekah bumi' and 'bersih sungai' are activities to harmonize human behavior and environmental conservation. 'Sedekah bumi' is a cultural activity held once a year, intending to show gratitude to God Almighty for His gifts of the river. 'Bersih sungai' is a community effort to protect the river so it can flow water optimally, maintaining water quantity and quality. 'Sedekah bumi' and 'bersih sungai' are efforts to ensure balance, harmony, and adequacy of the natural environment. These cultural activities are a form of harmonization of the population to the environment around the Upstream Garang River.

In Munding Village, 'sedekah bumi' was carried out well, where 100 percent of it was 'bersih sungai' activities. In contrast, in Lerep Village, 'sedekah bumi' activities were 100 percent, and 'bersih sungai' 71.79 percent. Meanwhile, in Kalirejo Village, 'sedekah sungai' was 76.47 percent and 'bersih sungai' 17.65 percent. The cultural tradition of 'sedekah bumi' developed in Kalirejo Village was rituals to ancestors by preparing offerings and having a feast ('Tumpengan'), followed by a traditional puppet show ('wayang'). On the other hand, 'sedekah bumi' in Pakintelan Village was 54.84 percent and 'bersih sungai' 38.71 percent. The community carries out environmental conservation efforts by carrying out the culture that their ancestors have inherited [14], [32]–[34]. This activity is a form of harmonization between the community and the environment through a culture of environmental care.

Table 5 Environment Cultural in the Villages nearby the Garang River's Upstream

Environment Cultural	Munding	Lerep	Kalirejo	Pakintelan
'Sedekah bumi'	100	100	76.47	54.84
'Bersih sungai'	100	71.79	17.65	38.71

Source: Primary Data, 2018

The tradition of 'sedekah bumi' is well preserved because it has been inherited from generation to generation, always upholding the kinship system. The following tradition means participating in preserving culture [35], [36]. The development of tourism in Lerep Village has an impact on fostering social attitudes in the form of cooperation and togetherness, caring for the community's culture, and positively impacting environmental preservation.

River environmental management is a form of harmonization of community activities in the environment, in the form of river environmental conservation activities, water conservation, community organizations, and the role of government (Table 6). Munding Village conducted water and soil conservation around 100% as a river environmental

management activity in the upper watershed. These water conservation activities included rainwater retention and the construction of infiltration wells. This activity originated from the NGO Mercy Corp, which handled the Garang watershed upstream. Meanwhile, soil conservation incorporated intercropping planting, fertilizing with organic fertilizer, and making swales on sloping land. This activity aimed to restrain the rate of erosion and maintain soil fertility. Furthermore, there were other activities, such as fully conserved water bodies, including 'bersih sungai' rivers cleanup, no litter around rivers, planting trees, and maintaining the function of riparian.

Table 6. River Environmental Management Activities in the Garang River's Upstream

Type of Activity	Munding	Lerep	Kalirejo	Pakintelan
Water and soil conservation (%)	100.00	76.92	29.41	64.52
Conservation of water (%)	100.00	87.18	76.47	51.61
Community organization (%)	66.67	56.41	0.00	0.00
Government Role (%)	100.00	74.36	70.59	41.94

Source: Primary Data, 2018

Some of the river environmental management activities include water and soil conservation, conservation of water, and involvement in social institutions, as a form of effort towards harmonization, such as research conducted by [37]. However, the realization of the harmonization of the community around the river still requires the role of the government. River systems supporting river restoration are aligned with a watershed's broader social, economic, and ecological aspects [10], [29].

Community organizations are growing, and each village has a community group according to its potential. One organization that cares for the environment, namely the River Care Community (KPS), is a form of harmonization of community participation in protecting the river environment. 'KPS' has a chairman and members who guide so that activities are directed, coordinated, and synergistically between 'KPS' and other stakeholders. The number of 'KPS' members is still limited because not all communities around the river can communicate directly with outsiders. The focus of 'KPS' activities is on locations that experience severe environmental conditions and must be addressed immediately.

The harmonization carried out by the community of the Garang River upstream can be learned from several things, namely the type of land use, utilization and management, cultural and environmental conditions, and river environmental management activities [37], [38]. Harmonizing the community around the river is very important to meet the needs and create harmony, balance, and sufficiency. Society must seek harmony with its business. Population harmonization is a population effort to achieve harmony, balance, and conformity with the surrounding environment [32], [34]. In addition, community harmonization is carried out by utilizing the land around the river and protecting the environment around the river.

To create harmonization, the community around the river constantly paid attention to the dynamic conditions of the community. They also balance, harmonize, and adjust strategies to utilize and care about the river. The population constantly changes at any time, either increasing or decreasing. On the other hand, the community must fulfill its endless needs from limited natural resources. Therefore, they need harmonization to achieve a sustainable life. Dynamic people interact with the environment to meet their needs. The interaction of the community with the environment is carried out by utilizing land and caring for the river environment. In addition, these interactions are achievable by maintaining social harmonization so that harmonious and balanced interactions occur (Fig. 6).

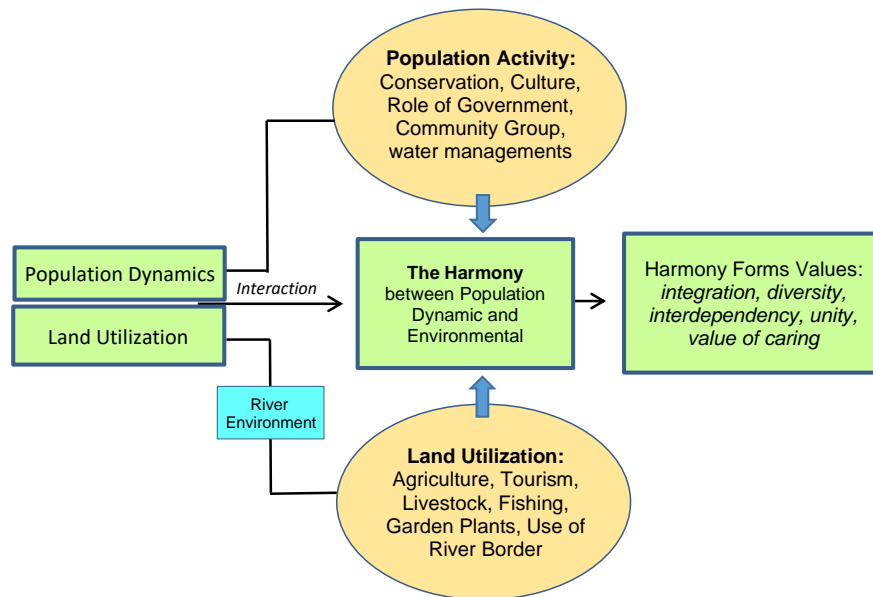


Figure 6. The Concept of the Harmony between Population Dynamic and Environment in the Garang River's Upstream

Harmonization is an effort of the population to create a balance of harmony and life. The environment in the Garang River upstream is a habitat for living things, including the activities of residents who work as farmers and non-farmers. The population is very dynamic; the number is increasing, while the land is limited, so every inch of land becomes the foundation of the life expectancy of every resident. While the land is increasingly limited and the population is not limited [39]. Harmonization is something that cannot be abandoned, must always be worked on, and cannot just come without effort to achieve a sustainable livelihood. The Garang River's upstream is one of the water sources to meet the needs of people who live both upstream and downstream [7], [22]. Harmony is a universal law that guarantees the continuity of the system. Only a few studies have examined the coordinated development of the social, water, and ecological economies [37]. The relationship between human activities and river water system shows that there is a harmonious development between the socio-economic system and the river system, analyzed using the theory of harmony [40] – [42]. There are four keywords of harmony, namely diversity, interdependence, unity, and having the highest value [30], [43].

4. Conclusion

Residents of the Garang River upstream are very dynamic; various activities are carried out. Activities in the non-agricultural sector are increasingly varied. The activities in the agricultural sector always pay attention to environmental conditions so that the interaction between the two produces harmony between the population dynamic and the environment. It is hoped that the concept of harmony between population dynamics and the environment can be applied in other more expansive areas.

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to Eko, puji.hardati, me Thu, Nov 17, 5:58 AM

Dear Prof Eko Haryono

Thank you for all the input you have given to us. For the submitted manuscript we have followed all the comments from the reviewers, and we also answered all the inputs in a different sheet. I hope this resubmission finds you well.

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MASUKAN DARI REVIEWER 3#

1 Harmonization of Community Around the Upstream of Garang River, Central Java Province, Indonesia

Abstract The dynamics of the population interacting with nature can cause environmental damage, especially the degradation of the carrying capacity of the watershed. This study aims to find the form of dynamics and harmonization of the community alongside the river. The research was conducted in four villages, namely Munding Village, Lerep, Kalirejo, and Pakiselan. The villages were located around the upstream of Garang River. The research respondents included the heads of the families in the villages, supported by key informants from community leaders and the river care community. The data collection methods were through observation, questionnaires, interviews, and document studies. The analysis procedure used the descriptive method. The results showed that 1) the villagers around the river were very dynamic, with population growth rates varying from 1.05% to 3.93%, 2) the population's livelihood and dominant land use centered in the agricultural sector, 3) the community around the river realized harmonization by utilizing the river to support farming and daily necessities, and 4) forms of river maintenance in the form of village clean-ups, *gotongroyon*, and community service. The dynamics and harmony of the community around the river are carried out in activities: waste management, cleaning rivers, maintaining clean waterways, actions to create a clean and healthy environment, and joining the Community Care for the Environment. The harmonization of the community in the villages around the river will be realized through the integration of diversity, interdependence, unity, and the value of caring.

Keywords: environmental damage; carrying capacity; river care

Abstrak Dinamika penduduk yang berinteraksi dengan alam dapat menyebabkan kerusakan lingkungan, terutama penurunan daya dukung DAS. Penelitian ini bertujuan untuk mengetahui bentuk dinamika dan harmonisasi masyarakat sekitar sungai. Penelitian dilakukan di empat desa, yaitu Desa Munding, Lerep, Kalirejo, dan Pakiselan. Desa-desa tersebut terletak di sekitar hulu Sungai Garang. Responden penelitian adalah para kepala keluarga di desa-desa yang didukung oleh informan kunci dari tokoh masyarakat dan komunitas peduli sungai. Metode pengumpulan data melalui observasi, angket, wawancara, dan studi dokumen. Prosedur analisis menggunakan metode deskriptif. Hasil penelitian menunjukkan bahwa 1) penduduk desa sekitar sungai sangat dinamis, dengan laju pertumbuhan penduduk bervariasi dari 1,05% hingga 3,93%. 2) mata pencaharian penduduk dan penggunaan lahan dominan berpusat pada sektor pertanian. 3) masyarakat sekitar sungai menyadari harmonisasi pemanfaatan sungai untuk menunjang pertanian dan kebutuhan sehari-hari, dan 4) bentuk pemeliharaan sungai berupa bersih desa, *sadranan*, dan pengabdian masyarakat. Dinamika dan kerusakan masyarakat sekitar sungai dilakukan dalam kegiatan: pengelolaan sampah, pembersihan sungai, menjaga kebersihan saluran air, aksi menciptakan lingkungan yang bersih dan sehat, dan bergabung dalam Komunitas Peduli Lingkungan. Harmonisasi masyarakat di desa-desa sekitar sungai akan terwujud melalui keterpaduan keberagaman, saling ketergantungan, persatuan, dan nilai peduli.

Kata kunci: dampak lingkungan, daya dukung, peduli sungai.

1. Introduction

Damage to the river environment is an obstacle that accelerates water scarcity. It can occur due to the degradation of the carrying capacity of the watershed in the upstream area due to forest damage (Zuriyani, 2017). The phenomenon of land degradation causes the ability of the watershed to decline, which eventually causes flooding in the rainy season and water shortage in the dry season because the watershed cannot store water during the rainy season. In addition to flooding and water shortages, other problems that arise due to land degradation are erosion and sedimentation. Erosion and higher river sedimentation in the upstream of Garang watershed indicate that the Garang watershed is in bad shape (Dewi Liesnoor Setyowati & Suharini, 2011). The cause is due to natural factors and human intervention in managing the land (Juhadi et al., 2021). Sustainable watershed management is achievable through a balance between utilization with maintenance and protection of river areas. In addition, compliance with norms and requirements in river basin management is an indicator of successful river environmental sustainability (J.Tippett et al., 2005; Selek & Selek, 2020).

Efforts to restore river functions reduced due to human intervention are possible by executing river restoration. River restoration has the potential to improve community relations with water by empowering communities to maintain rivers (Carr, 2015). River improvement efforts have the potential to restore ecosystem

AcerAspire
Add a sampling method in the abstract

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The introduction must start with research background that has the adequate number of citations (at least 20) from reputable international journals published in the last 10 years. The middle of the introduction contains research problems. The introduction ends with the objectives and benefits of the study

53 processes and services and improve and transform human relationships with rivers (Fox et al., 2017). Watershed
54 problems are very complex. Therefore, it involves many parties to solve them. Garang river is one of the
55 monuments for managing water resources in Semarang City. The main problems of Garang River include the
56 problem of quantity and quality of river water. The problem of quantity or the amount of water causes flooding,
57 while water quality is related to clean water. As many as 60% of Semarang City residents depend on Garang
58 river water used as clean water by PDAM (Municipal Waterworks). The research results on the Garang River
59 water quality showed that the copper concentration had exceeded the quality standard of Government
60 Regulation no. 82 of 2001. The water pollution index is 1.23, which means the river is lightly polluted.
61 Therefore, river management must be comprehensive for sustainable use to realize the concept of one river
62 management (Ujianti et al., 2018).

63 Along with the phenomenon of land degradation, population dynamics will never cease. Globally, national
64 and local population changes in terms of number, density, growth, and structure. Population and the
65 environment are similar to two sides of a coin, where harmonization must occur in both (BKKBN, 2020).
66 Globally, the world's population reaches 7.373 billion, and Indonesia ranks fourth with a population of about
67 274 million (BPS, 2021). Meanwhile, the number of rivers has never risen even though population growth in the
68 villages around the Garang River has increased along with the development of Semarang City, Central Java. In
69 the change in land use over the last ten years, there has been a conversion of agricultural land to non-agricultural
70 land, while rice fields, mixed gardens, dry fields, and forests have turned into settlements. Increasing the number
71 of people with various types of activities can change the orientation of land use. Changes that occur are the use
72 of agricultural land that reduce the quality and quantity of agricultural production and the quality of the
73 environment. Therefore, indirectly, it causes a change in the community's economic, social, and cultural
74 orientation.

75 The phenomenon of degradation or decrease in quantity and quality of Garang River is due to human
76 behavior in managing the river. The Garang watershed has an alert status and remains a priority for managing
77 watersheds in Central Java. The majority of residents around the river are still apathetic to any changes. They do
78 not care about the environment, especially the river environment. Local wisdom and the community's mindsets
79 must be changed by raising awareness and providing river education. (Perkins, 2011) asserted that public
80 involvement or participation in watershed management is crucial. Furthermore, innovative environmental
81 education must be conveyed to the broader community to foster environmental awareness.

82 The purpose of this study was to analyze the harmony of the population around the river. Many researchers
83 have conducted researches on Garang River and Garang Watershed, most of which focus on physical conditions.
84 Meanwhile, this study investigated the harmonization of the population around the river.

85 86 2. Research Methods

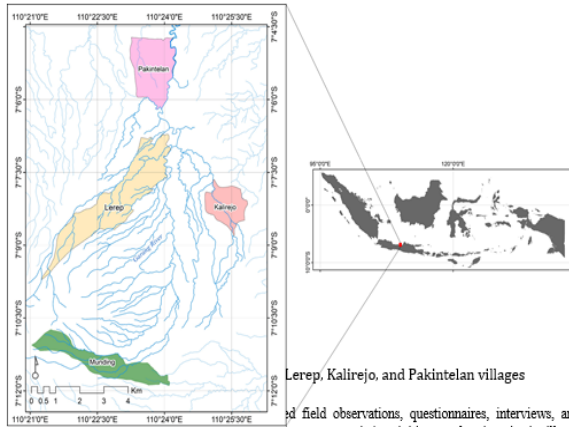
87 The research location was generally around the Garang River, precisely in the villages around the Garang
88 river, the upstream of Garang watershed. Villages around the river and heads of the families from the houses
89 near the river are the research population. There are 40 villages in the upstream of Garang watershed. Village
90 samples were taken by purposive sampling method, in which there were two stages, namely village sampling
91 and determining the number of respondents (heads of families). In the first stage, by purposive sampling, four
92 villages were selected, namely Munding Village, Lerop Village, Kalirejo Village, and Pakintelan Village
93 because they were closest to the river and many of their residents interacted with the river environment. Three
94 villages were in the administrative area of Semarang Regency, while one village was in the administrative area
95 of Semarang City. The four villages are located around the Garang river, as shown on the location map (Fig. 1).

96 This research employed a quantitative approach. There were several considerations in conducting this
97 quantitative research: 1) research variables are more appropriate when examined using a quantitative approach
98 because they are data ordering, intervals, or ratios; 2) this research revealed measurable aspects; 3) this research
99 gained new data and insights explained about positivistic phenomena. The research respondents were the heads

Win7 Tambah manfaat pada akhir pendahuluan

The benefit of the research is to find the concept of harmonization between the population and the environment, so that the unique value of caring is found. Furthermore, the findings of this study can be applied to other wider areas.

100 of families in four selected villages. The number of respondents is 99, the number of respondents in each village
 101 is determined by proportional random sampling. The research variables were population dynamics, land use
 102 around the river, and concern for the river. The data used were primary and secondary data. The primary data
 103 were obtained through respondents, informants, and field observations, while secondary data were from relevant
 104 governmental agencies.



105
 106 Lerep, Kalirejo, and Pakintelan villages
 107 and field observations, questionnaires, interviews, and
 108 documentary sources (Lidovic et al., 2016). The villages included on community activities on the river in 4 villages
 109 selected as research samples. Meanwhile, the interviews were conducted to collect data on river utilization and
 110 care. On the other hand, the document study was employed to collect data from several research agencies, such
 111 as population data from the Central Statistics Agency, monograph data from villages and sub-districts, and data
 112 on the physical condition of the river environment from the Environment Agency.

113 The data analysis employed the descriptive analysis method. The stages of data analysis included analysis
 114 of population dynamics in four selected villages quantitatively, then explained descriptively using secondary
 115 data from documentation studies, and analysis of population harmonization in four selected villages obtained
 116 through in-depth interviews with the selected family heads as respondents.

117 The percentage of each variable was analyzed using the formula $a = \frac{a}{a + b} \times 100 \text{ percent}$. Percentage
 118 analysis can describe the condition of the position of the variable to the overall condition of the variable. The
 119 analysis stages were expected to provide an overview of the general condition and population's harmonization in
 120 the villages around the river.

121

Table 1 Characteristics of Respondents

No.	Type of Respondent	Characteristics	Total	Data Collection Techniques
1	Head of family	The head of the family who lives in the village around the river	99	Questionnaire
2	Public figure	Village officials in each village	4	interview
3	River care forum Member	Member	2	Interview

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 It must be explained what is the reason for taking 99 sample of respondents

Acer Aspire
 In the research method, it must be explained what is the reason for taking a sample of respondents using the proportional random sampling method

Acer Aspire
 It must be explained what is the descriptive analysis method

Acer Aspire
 It must be explained what is the method for analyzing the data obtained through in-depth interviews with the selected family heads

Acer Aspire
 Is the formula true? Please check

122

123 **3. Result and Discussion**

124 *3.1. Population Dynamics in the Villages around the upstream Garang River*

125 **Munding, Lerep, Kalirejo, and Pakintelan** villages are located around the upstream of **Garang** River (Table
126 2). **Munding** Village is administratively part of the **Bergas** District, while **Lerep** Village is part of the West
127 **Ungaran** District. Meanwhile, **Kalirejo** Village is part of the East **Ungaran** District. The three villages are located
128 in the Semarang Regency area. On the other hand, **Pakintelan** Village is part of the **Gumungpati** District,
129 Semarang City. **Munding** and **Lerep** villages are located at the top of the watershed with steep slopes, while
130 **Kalirejo** and **Pakintelan** villages are relatively flat.

131 **Munding** Village is located at an altitude of 682 meters above sea level (masl). The area's topography is a
132 peak slope and is in the upper ranges of the **Garang** river. Administratively, **Munding** Village is part of the
133 **Bergas** District, Semarang Regency. The distance from the city to the district is about 11 kilometers (km). The
134 location is accessible by passing a paved and winding highway using private two and four-wheeled vehicles
135 because there is no public transportation. The village has a natural beauty due to being located at an altitude.
136 There are also natural views of the surrounding area when visiting the springs in **Munding** Village.

137 **Lerep** Village is one of the villages located 409 meters above sea level on the peak's slopes. The village
138 has a distance from the village to the district office, about 1.5 km, and is accessible from various directions
139 through paved roads despite the lack of public transportation. Its location at an altitude provides springs used as
140 tourist destinations. On the other hand, **Kalirejo** Village is located at an altitude of 360 meters above sea level,
141 with the highest accessibility among the four villages. Highways and public transportation traverse the village.
142 The distance to the Regency Capital is approximately only about 3 km. Furthermore, it has access to the
143 entrance and exit to the Semarang-Solo freeway and the Trans Java **Ungaran** expressway gate. Meanwhile,
144 **Pakintelan** Village is part of **Gumungpati** District, Semarang City, located in a flat area.

145

146 Table 2 The Dynamics of Villagers Around The Upstream Garang River

Population	Villages around the River			
	Munding	Lerep	Kalirejo	Pakintelan
Total population 2016	2,845	9,012	3,523	4,065
Total Population 2020	3,166	11,711	4,273	5,676
Population growth 2016-2021 (%)	1.07	2.65	1.94	3.39
Population density (people/square kilometers)	1.768	1.717	1.405	2.132
Land area (square kilometers)	1.79	6.82	3.04	2.66
Livelihoods (%)				
Agriculture	45.02	17.24	11.12	0.89
Non-agriculture	54.98	82.78	88.88	91.11
Diversification index	3.43	4.70	4.13	1.83
Land use (%)				
Agriculture	80.73	70.66	21.11	81.96
Non-agriculture	19.27	29.34	78.89	18.04

147 Source: Central Bureau of Statistics of Semarang Regency, 2020-b, Central Bureau of Statistics of Semarang
148 Regency, 2020-c, Central Bureau of Statistics of Semarang Regency, 2020-d, and Central Bureau of Statistic of
149 Semarang City, 2020.

150 The dynamics of the population in the villages around the upstream of **Garang** River vary widely. The
151 population of these four villages is more than three thousand people. **Lerep** Village has the largest population



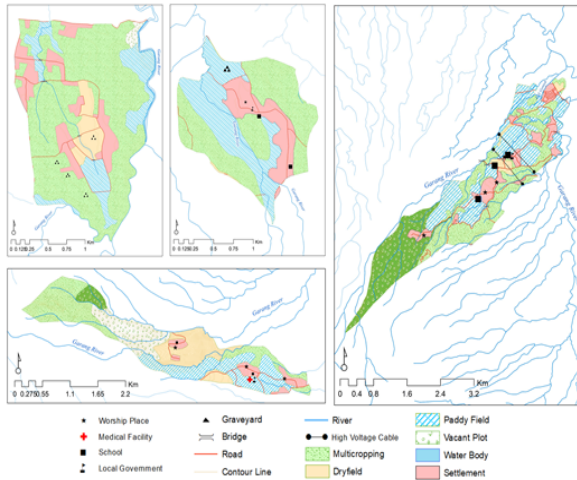
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The Results and Discussion section must contain a theoretical dialogue (i.e., link the results with the findings of previous research, compare them—similar or different, and explain the reasons behind the similarity and difference) The Results and Discussion also have to provide, if any, unexpected findings.

152 with 11,711 community, while **Munding** Village is the least with 3,166 community. The population has
 153 increased over the last ten years. The highest population growth rate occurred in **Pakintelan** Village, which
 154 reached 3.39%, and the lowest was in **Munding** Village, which only reached 1.07%. The increasing population,
 155 followed by high growth, resulted in population density. This population density occurs due to the increase in
 156 population is not followed by the expansion of the area. The highest population density occurred in **Pakintelan**
 157 Village and the lowest in **Kalirejo** Village. **Pakintelan** Village, apart from having the highest population growth,
 158 also has the highest population density. This village is located in a relatively flat topography, administratively is
 159 part of the city of Semarang, and is adjacent to the Universitas Negeri Semarang campus. Therefore, **Pakintelan**
 160 Village quickly developed into a densely populated village because it supports campus life.

161 **Munding** village has the lowest population and growth compared to the other three villages. This situation
 162 is due to the village having the smallest area compared to the three other villages. In addition, its location is on
 163 the slopes with wavy morphology and winding road access. Meanwhile, **Lerep** Village has the largest population
 164 because it has high accessibility, close to the factory area, government offices, trade, and education center. In
 165 contrast, **Pakintelan** Village has the highest population growth because it is close and located in the same area
 166 (**Gumungpati** District) as Universitas Negeri Semarang, an education facility in **Banaran** Village. Population
 167 growth in watersheds is also occurring in other areas, such as in the watersheds of the Victoria Basin, Kenya
 168 (Onyango et al., 2021). Population growth is caused by the phenomenon of population movement to urban
 169 areas, consequently the demand for land and consumption of natural resources coupled with the ecological
 170 footprint to maintain ecological services (Obiefuna et al., 2021).

171 Community livelihoods around the river are dominantly in the non-agricultural sector from 54.98% -
 172 91.11% (Figure 2). **Pakintelan** Village has the highest population who work in the non-agricultural sector,
 173 whereas the least is **Munding** Village. In comparison, the livelihoods of the population in the agricultural sector
 174 are more diminutive, ranging from 0.89% - 45.02%. In **Munding** Village, located at the upper stream of the
 175 **Garang** river, 45.02% of the population makes a living in the agricultural sector, while in **Lerep** Village, located
 176 at the upper reaches of the **Garang** river, only 17.24% of the population makes a living in the agricultural sector.
 177 In general, community around the river have a livelihood in the agricultural and non-agricultural sectors. This
 178 condition supports the results of research conducted in rural Vietnam (Phan et al., 2019). The livelihoods of the
 179 population in rural Vietnam, apart from the agricultural sector, were also in the non-agricultural sector, such as
 180 farming, non-farming work, wage-earning, and non-labor works (Phan et al., 2019).



Markup Area

182 Figure 2. Land use map of the research locations

183

184 Communities around the river have varied livelihood strategies, such as intensification, extensification,
185 diversification, and mobility. Livelihood strategies executed by community around the river are similar to those
186 carried out by community in other places (Burgers, 2008; Hardati, 2018; Ian Scoones, 1998). Community
187 around the river who employ the strategy of intensification and extensification are primarily farmers and farm
188 laborers. The intensification strategy is limited to land management, nurseries, fertilization, and pest control. On
189 the other hand, a small part of the population only carries out the extensification strategy by adding to the non-
190 owned arable land, where they then share the profits with the landowners. This strategy is chosen because access
191 to land increasingly gets more challenging, which is unaligned with capital or assets and the high land price.

192 Livelihood strategies are apparent in both the agricultural and non-agricultural sectors. Diversification in
193 the agricultural sector is by planting seasonal crops, such as perennials, fruits, and vegetables, while utilizing
194 intercropping on various plants. The strategy is applied in the fields and yards. Yard has multiple functions, such
195 as social functions, environmental functions, and biophysical functions. It also acts as a supplier of household
196 food reserves. This condition also supports the research results conducted in Kulon Progo, who suggested that
197 yard is one of the local food producers (Rijanta, 2020). This strategy can help conserve land and air. Moreover,
198 the intercropping method has multiple benefits: producing various crops and preventing erosion because
199 different plants in one land area can help absorb water and prevent erosion. Furthermore, this strategy can build
200 harmonization among community around the river. On the other hand, the strategy in the non-agricultural sector
201 is carried out in various methods, namely becoming a grocery shop trader, food stall, and household necessities
202 stall. In addition, in the service sector, by becoming employees and factory workers.

203 The mobility strategy carried out by community around the river is in line with their works outside the
204 agricultural sector. Most of the mobility carried out is non-permanent roundtrip or speedy, and a small portion of
205 the circulation is weekly. Dynamic community with various livelihood strategies followed by concern for the
206 river will produce a harmonization. Harmonization of community around the river is achievable by
207 appropriately employing and caring for the river. In community harmonization, there is an interaction between
208 the community and the environment around the river.

209

210

211 3.2. Harmonization of Utilization of Land in Four Villages Around the Upstream Garang River

212 Riverbanks, as a place to accommodate floods, function naturally to provide various benefits for the
213 community, including flood regulation, clean water supply, tourist attraction, water purification, carbon storage,
214 and improvement of human health. River conservation includes effective use, maintenance, and preservation
215 activities that can be effective if it has good governance and strict adaptive management (Chun et al., 2012;
216 Kingsford, 2011). River area improvements reintroduce natural processes that configure rivers to provide the
217 diversity of habitats required for healthy river ecosystems and ensure long-term recovery to address the initial
218 problem that causes river degradation (Speed et al., 2016).

219

220 Table 3 Types of Utilization of Land in 4 Villages Around the Upstream Garang River

Type of Utilization Land	Villages around the River (percent)			
	Munding	Lerep	Kalirejo	Pakintelan
River Water Source	100.00	74.36	17.65	22.58
River Terrace	16.67	12.28	12.28	12.90
River Environment Utilization	58.33	43.59	43.59	17.74

221 Source: Primary Data, 2018

364 is very limited, so that every inch of land becomes the foundation of the life expectancy of every resident, land
365 is increasingly limited and the population is not limited. Harmonization is something that cannot be abandoned,
366 must always be worked on, and cannot just come without effort, so that a sustainable livelihood can be achieved.
367 The Upstream *Garang* River is one of the sources of water to meet the needs of people who live not only
368 upstream, but also downstream (Raharjo, 2017; Hardati, 2018). Harmony is a universal law that guarantees the
369 continuity on the *system*, there are four key words of harmony, *namely* diversity, interdependence, towards
370 unity, and having the highest value (Wiranegara et al., 2013).

371 4. Conclusion


373 The development of the community around the river is very dynamic along with the decline in the livelihoods of
374 the population in the agricultural sector, so that the non-agricultural sector is increasing rapidly. Villages around
375 the river with dynamic community make land use around the river diverse. The community uses the river area
376 for agriculture, tourism, fisheries, and household needs, by: balancing, aligning, adjusting the utilization
377 strategy, and caring for the river. The harmonization of the community around the river can be seen from their
378 concern for the river through social, cultural activities, to achieve the economy and prosperity together. Concern
379 for the river is a very urgent problem, all parties involved must always pay attention to the interests of the
380 community around the river in utilizing the land around the river. Population dynamics are part of a holistic,
381 interrelated, and sustainable harmonization of society. The concept of harmonization in the form of land use by
382 the community, supported by community concern, through individual and social environmental behavior, will
383 result in harmonization in the form of diversity, interdependency, having unity and caring value.


384 Acknowledgment

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 **Acet Aspire**
If needed, suggestions formulated from research
conclusions, e.g., future research suggestions, can be added
at the end of the Conclusion section.

 **Acet Aspire**
Please check the references one by one and make sure that they
exactly match the in-text citations.

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454

Catatan email tanggal 25 November 2022

The screenshot shows a Gmail interface with a search bar containing 'puji.hardati@mail.unnes.ac.id'. The email is titled 'Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia' and is marked as 'External'. The sender is Puji Hardati, and the recipient is Prof Eko Haryono. The email body contains an apology and a revision deadline of 30 days. The sender's contact information is provided at the bottom.

Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia External

Puji Hardati puji.hardati@mail.unnes.ac.id via ugm.ac.id
to Eko, puji.hardati, me

Fri, Nov 25, 2022, 10:17 AM

Dear Prof Eko Haryono

We apologize for this circumstance. We will work on this revision from the third reviewer less than 30 days counted from your last notification. Thank you.

Chief Editor
Indonesian Journal of Geography
<http://jurnal.ugm.ac.id/index.php/ijg>
0024-9521 (print), 2354-9114 (online)
Phone: +62 812-2711-480

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Catatan email tanggal 02 Desember 2022

The screenshot shows a Gmail interface with a search bar containing 'puji.hardati@mail.unnes.ac.id'. The email is titled 'Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia' and is marked as 'External'. The sender is Puji Hardati, and the recipient is Prof Eko. The email body states that the manuscript has been revised as mandatory from the third reviewer. The sender's contact information is provided at the bottom.

Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia External

Puji Hardati via ugm.ac.id
to Eko, puji.hardati, me

Fri, Dec 2, 2022, 11:24 PM

Dear Prof Eko

We have changed the manuscript as mandatory from the third reviewer. I hope you can find the highlighted revision we sent.

Chief Editor
Indonesian Journal of Geography
<http://jurnal.ugm.ac.id/index.php/ijg>
0024-9521 (print), 2354-9114 (online)
Phone: +62 812-2711-480

Reply Reply all Forward

Catatan email tanggal 10 Desember 2022

The screenshot shows a Gmail interface with a left sidebar containing navigation options: Compose, Inbox (303), Starred, Snoozed, Sent, Drafts (45), and More. The main content area displays an email from Eko Haryono (e.haryono@ugm.ac.id) to Puji, me, Thriwaty, Muhammad, and Edy. The subject is "[IJG] More Revision Required" and it is marked as "External". The email body contains feedback on English grammar and citation style, followed by contact information for Eko Haryono, Editor in Chief of the Indonesian Journal of Geography.

Gmail Search in mail Active

[IJG] More Revision Required External > Inbox x

Eko Haryono <e.haryono@ugm.ac.id> Sat, Dec 10, 11:08 AM (1 day ago) ☆
to Puji, me, Thriwaty, Muhammad, Edy ▾

Dear Puji Hardati,

English needs improvement. Some syntax, word choice, and sentence agreement were found. The method in the abstract is still in the present tense. It must be the past tense.
Citation and references must use APA style 6th or 7th edition

If you once have made English proof editing please upload the certificate.
You might also use <https://goodlingua.com/> for the English editing.

Best wishes,
Eko Haryono
ID SCOPUS: 6508073148,
Faculty of Geography, Universitas Gadjah Mada
e.haryono@ugm.ac.id
Editor in Chief
Indonesian Journal of Geography,
Faculty of Geography, Universitas Gadjah Mada, Yogyakarta

Chief Editor
Indonesian Journal of Geography
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Phone: +62 812-2711-480

Catatan email tanggal 20 Desember 2022

The screenshot shows a Gmail interface with a search bar at the top containing 'puji.hardati@mail.unnes.ac.id'. The left sidebar includes 'Compose', 'Inbox' (305), 'Starred', 'Snoozed', 'Sent', 'Drafts' (47), and 'More'. The main content area displays an email from 'Puji Hardati via ugm.ac.id' to 'Eko, puji.hardati, me' on 'Tue, Dec 20, 2022, 10:24 PM'. The subject is 'Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia'. The body text reads: 'Dear Prof Eko Haryono', 'By sending this email, we would like to inform you that we had consulted to Indo-Lingua Proofreader for our manuscript. The last submission (today) was the proofread manuscript from Indo-Lingua.', and contact information for the Chief Editor of the Indonesian Journal of Geography. At the bottom, there are buttons for 'Reply', 'Reply all', and 'Forward'.

Catatan email tanggal 22 Desember 2022

The screenshot shows a Gmail interface with a search bar at the top containing 'puji.hardati@mail.unnes.ac.id'. The left sidebar is identical to the previous screenshot. The main content area displays a follow-up email from 'Puji Hardati via ugm.ac.id' to 'Eko, puji.hardati, me' on 'Thu, Dec 22, 2022, 6:52 AM'. The subject is the same as the previous email. The body text reads: 'Dear Prof Eko Haryono', 'Please kindly check the Proofreading Certificate that we have just sent. We hope this mail finds you well.', and the same contact information for the Chief Editor. At the bottom, there are buttons for 'Reply', 'Reply all', and 'Forward'.

Catatan email tanggal 23 Desember 2022 - Jam 9:58 AM

The screenshot shows a Gmail interface with a search bar at the top containing 'puji.hardati@mail.unnes.ac.id'. The left sidebar shows folders: Compose, Inbox (305), Starred, Snoozed, Sent, Drafts (47), and More. The main content area displays an email from Eko Haryono with the subject '[IJG] Editor Decision: Revision Required'. The email body contains the following text:

Dear Puji Hardati,

We found that the citation style and referent do not comply with the APA 6th edition.

Best wishes,
Eko Haryono
Faculty of Geography, Universitas Gadjah Mada
e.haryono@ugm.ac.id
Editor in Chief
Indonesian Journal of Geography,
Faculty of Geography, Universitas Gadjah Mada, Yogyakarta

Chief Editor
Indonesian Journal of Geography
<http://jurnal.ugm.ac.id/index.php/ijg>
0024-9521 (print), 2354-9114 (online)
Phone: +62 812-2711-480

At the bottom of the email, there are three buttons: Reply, Reply all, and Forward.

Catatan email tanggal 23 Desember 2022 - Jam 1:31 PM

The screenshot shows a Gmail interface with a search bar at the top containing the email address 'puji.hardati@mail.unnes.ac.id'. The left sidebar includes a 'Compose' button and a list of folders: 'Inbox' (305), 'Starred', 'Snoozed', 'Sent', 'Drafts' (47), and 'More'. Below the folders is a 'Labels' section with a plus sign. The main email content area displays the subject line: '[JGG] Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia'. The sender is identified as 'Puji Hardati via ugm.ac.id' with a profile picture containing the letter 'P'. The recipient is 'Eko, puji.hardati, me'. The email text reads: 'Dear Prof Eko Haryono', followed by 'Here we uploaded our last submission regarding to the citation problem.' Below this is a horizontal line and contact information for the 'Chief Editor' of the 'Indonesian Journal of Geography', including a URL, ISSN numbers, and a phone number. At the bottom of the email, there are three buttons: 'Reply', 'Reply all', and 'Forward'.

Catatan email tanggal 23 Desember 2022 - jam 1:54 PM

The screenshot shows a Gmail interface on a desktop browser. The search bar at the top contains the email address 'puji.hardati@mail.unnes.ac.id'. The left sidebar shows the 'Compose' button and a list of folders: 'Inbox' (305), 'Starred', 'Snoozed', 'Sent', 'Drafts' (47), and 'More'. Below the folders are 'Labels' and a plus sign. The main content area displays an email from 'Eko Haryono' (e.haryono@ugm.ac.id) to 'Puji, me, Thriwaty, Muhammad, Edy' on 'Fri, Dec 23, 2022, 1:54 PM'. The subject is '[JG] Editor Decision: Accept Manuscript'. The email body contains the following text:

Dear Puji Hardati,

Congratulations! After considering your responses to reviewer's comments, We have reached the decision regarding your submission to Indonesian Journal of Geography, "Harmonization Of Community Around the Upstream of Garang River, Central Java Province, Indonesia" to Accept your manuscript to be published in Indonesian Journal of Geography.

You will receive emails regarding the details of your publication. We may also request a technical edit of your manuscript if necessary.

The Indonesian Journal of Geography requires manuscripts to be written in good and correct English, so if you or one of your co-authors are not English native speakers, please provide us proof that your manuscript has gone through the proofread stage, as evidenced by a certificate from the proofreading company/services.

If your manuscript has not gone through the proofread stage and or does not have a certificate, you can use the proofreading services that have collaborated with us and claim a 5% discount via the following link <https://goodlingua.com/>

Thank you for submitting to the Indonesian Journal of Geography and we look forward to receiving your manuscript in the future.

Best wishes,
Eko Haryono
Faculty of Geography, Universitas Gadjah Mada
e.haryono@ugm.ac.id
Editor in Chief
Indonesian Journal of Geography,
Faculty of Geography, Universitas Gadjah Mada, Yogyakarta

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The Relationship between Population Dynamic and Garang River Upstream Environment in Central Java, Indonesia

https://doi.org/10.22146/ijg.75767

Puji Hardati^(1*), Dewi Liesnoor Setyowati⁽²⁾, Thriwati Arsal⁽³⁾, Muhammad Amin⁽⁴⁾, Edy Trihatmoko⁽⁵⁾

- (1) Faculty of Social Science, Universitas Negeri Semarang
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 (*) Corresponding Author

Abstract

The interaction of the human population with nature can cause environmental damage such as the degradation of the watershed carrying capacity. Therefore, this study aimed to analyze the relationship between population dynamic and the upstream environment alongside Garang River using four villages including Munding, Lerex, Kalirejo, and Pakintelan. Data were collected from several stakeholders including selected heads of households supported by key informants such as community leaders and the river care communities using field observation, a household survey through questionnaires, in-depth interviews, and documentation. The households used as samples were selected through proportional random sampling and the data retrieved were analyzed through a descriptive quantitative method which involved the cross-tabulation of household data on economic activities and environmental management practices. It was discovered that 1) the population of the Garang River's upstream was very dynamic with growth rates varying from 1.05% to 3.93%, 2) the main livelihood of the population and dominant land use was the agricultural sector, 3) the community realized that the harmonic relationship with the environment was a critical condition to support farming activities and fulfil daily necessities, and 4) the society kept maintaining the river through different activities such as "bersih sungai" or river cleaning and "sedekah bumi" or thanksgiving to the environment. Moreover, the harmonic relationship between the people and the river environment is in form of several activities. These included waste management, cleaning rivers, maintaining clean waterways, actions to create a clean and healthy environment, and joining the efforts to care for the environment. The harmony was observed to have been realized through the integration of diversity, interdependence, unity, and the value of providing care.

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The Relationship between Population Dynamic and Garang River Upstream Environment in Central Java, Indonesia

Puji Hardati¹, Dewi Liesnoor Setyowati², Thriwaty Aarsal³, Muhammad Amin⁴, Edy Trihatmoko⁵

^{1,2,3}Faculty of Social Science, Universitas Negeri Semarang, ⁴Universitas Lampung, ⁵Universitas Gadjah Mada

Received: 2022-08-07
Accepted: 2022-12-23

Keywords:
population dynamic; land utilization;
the value of care

Correspondent email:
andreas.siswandi.99@gmail.com

Abstract The interaction of the human population with nature can cause environmental damage such as the degradation of the watershed carrying capacity. Therefore, this study aimed to analyze the relationship between population dynamic and the upstream environment alongside Garang River using four villages including Munding, Lerep, Kalirejo, and Pakintelan. Data were collected from several stakeholders including selected heads of households supported by key informants such as community leaders and the river care communities using field observation, a household survey through questionnaires, in-depth interviews, and documentation. The households used as samples were selected through proportional random sampling and the data retrieved were analyzed through a descriptive quantitative method which involved the cross-tabulation of household data on economic activities and environmental management practices. It was discovered that 1) the population of the Garang River's upstream was very dynamic with growth rates varying from 1.05% to 3.93%, 2) the main livelihood of the population and dominant land use was the agricultural sector, 3) the community realized that the harmonic relationship with the environment was a critical condition to support farming activities and fulfil daily necessities, and 4) the society kept maintaining the river through different activities such as "bersih sungai" or river cleaning and "sedekah bumi" or thank-giving to the environment. Moreover, the harmonic relationship between the people and the river environment is in form of several activities. These included waste management, cleaning rivers, maintaining clean waterways, actions to create a clean and healthy environment, and joining the efforts to care for the environment. The harmony was observed to have been realized through the integration of diversity, interdependence, unity, and the value of providing care.

Organize

1. Introduction

The damage to the river environment is one of the causes of water scarcity (Admiraal, 1995; Bedri et al., 2014; Olokesusi, 1994; Warner, 2007). This can be observed from the degradation of the carrying capacity of the watershed, particularly in the upstream area due to deforestation (Zuriyani, 2017). It is also important to note that the degradation of land normally declines the watershed's ability, thereby causing flooding in the rainy season and water shortage during the dry season (Mahmud, Kusumandari, Sudarmadji, & Supriyatno, 2019). This is mainly because the watershed cannot store water during the rainy season. Some problems which also associated with land degradation include erosion and higher river sedimentation. These were observed to have made the Garang watershed upstream to be in a lousy shape (Dewi Liesnoor Setyowati & Suharini, 2011) and reported to be caused by natural factors and human intervention in managing the land (Juhadi et al., 2021). Meanwhile, it is possible to achieve sustainable watershed management by balancing utilization with the maintenance and protection

Garang River is one of the monuments associated with the management of water resources in Semarang City (Hartatik, 2014; Ujjanti, Anggoro, Bambang, & Purwanti, 2018). However, the river has both quantity and quality problems which are related to flooding and inadequate clean water, respectively. It has been reported that approximately 60% of the residents depend on the water from the river for consumption (PDAM Municipal Waterworks). The results of water quality showed that the copper concentration exceeded the standard required by Government Regulation no. 82 of 2001. It was also discovered that the water pollution index is 1.23, indicating lightly polluted. Therefore, there is a need for sustainable management to ensure adequate quantity and quality for the river (Ujjanti et al., 2018).

The dynamic of the population on Java Island is expected to have a continuous effect on land degradation. This is also affected by the changes in the number, density, growth, and structure of the population in the globe. It has also been stated that population and the environment can be likened to two sides of a coin that need to harmonize (BKKBN, 2020). This is