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Community enhancement of the environmental quality of riverbank settlements: A case study of Tridi Kampong, Indonesia

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Abstract

Resettlement programmes in riverbank areas remain an alternative solution to overcoming the problems of urban flooding, the addressing of which can also lead to reducing slums. Such programmes have many weaknesses, but even so, several countries continue to implement them. This paper will elaborate: 1) an understanding that reductions in flood risk and enhancements to environmental quality along riverbanks can be realised, without the need for resettlement, as a result of cooperation between local communities, governments and businesses; 2) the socio-economic benefits of improving the riverbank environment in Tridi Kampong, Malang City, Indonesia. This study employed qualitative and quantitative methods. The results of quantitative analysis and of interviews and direct observation indicate that collective action by the community has the greatest influence on the construction of that community's commitment to improving the environment. Environmental improvements have resulted in significant socio-economic benefits by making the kampong a domestic and international tourism destination and drawing increased numbers of visitors to the region.

Key words: *environmental risk management, informal settlement, social exchange, socio-economic benefits, tourism destination*

INTRODUCTION

Today, flooding in urban areas is increasing because of climate change and rapid urban development. Increasing populations, in conjunction with the limited availability of urban land, have led riverbanks to become residential areas. Riverbanks that become densely populated also become increasingly vulnerable to flooding, a condition that commonly unfolds in developing countries such as India [GHOSH, SAHU 2018], Bangladesh [ADB 2014; BHUIYAN *et al.* 2017] and Indonesia [LUBIS *et al.* 2017; UTAMI *et al.* 2014]. Riverbanks within these regions may be inhabited by low-income communities or by traditional communities that have inhabited the area for generations [ADB 2014; ESARITI *et al.* 2018; GHOSH, SAHU 2018; SATTERTHWAITTE *et al.* 2020; SOEMARNO 2010; UTAMI *et al.* 2014]. Unmanaged riverbanks may face greater risk of disasters such as landslide and erosion [BHUIYAN *et al.* 2017; VAROUCHAKIS *et*

al. 2016; XU *et al.* 2018] as a result of rising water levels during floods [THI, MINH 2019], and river shifting [GHOSH, SAHU 2018]. In areas that border the road, the potential hazards of flooding are also because of the possibility of backwater on the surface of the road [SEDYOWATI *et al.* 2018].

To reduce the risk of disasters and the concentration of slums in riverbank settlements, some countries simply relocate residents without making any effort to develop infrastructure or implement other programmes to reduce risk. This policy may create conflict between the affected community and the government, especially if the mechanisms of compensation for relocation are unsatisfactory [GHOSH, SAHU 2018].

Resettlement programmes are often viewed as the worst option because they give the impression that displacement of communities is the only way to avoid damage [CHAN 1995]. Communities' responses to resettlement programmes differ; some are able to adapt to their new settlements, but

others reject the programme, retaining both their original areas of residence and their original ways of life [ARTUR, HILHORST 2014]. The successful implementation of a resettlement programme requires the identification of factors that might affect the success of that programme. Local authorities can use an understanding of these factors as a basis for the development of appropriate measures, such as recommendations on how people can adapt their habits, as well as their social and economic activities, to live with and even benefit from floods rather than preventing them [DANH, MUSHTAQ 2011]. Further research on resettlement programmes is needed to better understand why resettled individuals choose to leave their new locations and return to their original homes [ARNALL *et al.* 2013]. Extensive consultations with affected people must be carried out to discuss resettlement plans, including economic relocation and rehabilitation plans to address the loss of individuals' productive assets. For this reason, institutional capacity must be expanded to reduce social risk through the implementation of a number of externally funded projects [ADB 2014].

Learning from the accumulation of the above experience, Indonesia is currently beginning to develop and implement community-based approaches to solving problems in urban areas. Flood solutions, especially in the floodplains, have striven to attend as closely as possible to the interests of affected communities. This quality is intended to optimise community involvement in solving flood problems so that the programme will be sustainable [WMO 2006]. For example, the Glitung Kampong Drainage Channel Project in Malang City (carried out in 2018 by the Public Works Service) supported utilisation by the community for fish and vegetable cultivation, having the benefit of improving the well-being of the local community [SEDYOWATI *et al.* 2020]. This approach includes the development of kampong identities. In developing an identity and creating what is known as a "thematic kampong", residents jointly determine a topic or motif and develop a unique tourist destination based on the local cultural, natural and social heritage. The concept of the thematic kampong encourages people to proactively become involved. It is driven by economic and social possibilities, increases in local potential, financial support from outside parties, the initiatives of communities and community leaders, and the potential for increased income [IDZIAK *et al.* 2015]. Thematic kampongs are likened to development oriented towards the formation of ideas and unique, specific topics [KŁOCZKO-GAJEWSKA 2014].

Many studies have examined the characteristics of settlements and communities along the riverbanks. Particular topics of focus include how such communities' are involved with anticipating and coping with disasters that may occur [SOME *et al.* 2009; TAYLOR 2015], doing so in accordance with local wisdom and values [LUBIS *et al.* 2017], such communities' traditions, cultures and architectures [ESARITI *et al.* 2018; IDHAM 2018], buildings adapted to variable water levels (including flooding) [JANUCHTA-SZOSTAK, KARAS-KIEWICZ 2020], collaboration between stakeholders [DWIRAHMADI *et al.* 2019], the use of limited space for trading activities [RONARIZKIA *et al.* 2019] and government support for families [PUTRA *et al.* 2014]. However, there is a lack of

studies that provide real evidence of a community's success in managing the flood risk and transforming the environmental conditions from those of slums to those of a well-organised kampong that is attractive as a tourist destination. Previous studies have only discussed elements of riverbank tourism itself [CHEN *et al.* 2018], not the role of the community. To address this neglected area, this research focuses on the community's role in the process of transforming from slum to thematic kampong. This research aims to provide evidence, and guide the realisation, of synergy and cooperation between the government, local communities and supportive third parties, such as businesses, in order to achieve optimal outcomes in improving the well-being of riverbank communities.

MATERIALS AND METHODS

STUDY AREA

Tridi Kampong, formerly known as Embong Brantas Kampong, is one of eleven thematic kampongs in Malang. It is a tourist destination with a strategic location in the middle of the city, being located along the edge of the Brantas River. Indonesian regulations prohibited construction between 10 and 20 m from the edge or border of the river, which, including its border, is the property of the state. However, this riverbank settlement was a residential centre for quite some time before these regulations were enforced. Because residents enjoy rental rights over the houses in the area, they have been continuously settled from generation to generation for decades. Also in the area are official homes for employees of the Indonesian Train Company. The narrowness of the land along the river has led the settlement to become congested, and the facilities and infrastructure there are inadequate.

The term Tridi – derived from and literally meaning 3D – refers to the three-dimensional (3D) images that decorate many the walls of many houses. With hundreds of unique three-dimensional images, this kampong has become an area of interest and is visited by tourists both domestic and international. With an area of around 15,000 m² and a population of 588, Tridi Kampong is a densely populated residential site with a unique charm (see Photo 1).



Photo 1. Tridi Kampong as seen from the highway
(phot. L. Sedyowati)

METHODS

In this study, the role of community is represented by the community's commitment to improving the environment. The commitment construct was synthesised from parameters consisting of the community's ability to adapt to flooding, the collective action of the community in improving the environment, government programmes that motivate the community and the presence or absence of strong desire to improve and beautify the kampung. To understand community commitment, it is important to study the process of transforming Tridi Kampong from slum to the thematic kampung it is currently known as. The process can be understood as a synergistic cooperation between Malang City government, local communities and support from third parties such as businesses.

This study adopted two approaches. Firstly, the qualitative method, for which it follows the research tradition of phenomenology that conducted intensively, the number of research informants is less than ten people [GENTLES *et al.* 2015]. This research used nine informants who met the research criteria such as over 15 years old, were able to explain the development of settlements in the study area, and were willing to become participants. The informants consisted of community leaders (i.e. head of local citizen association, head of local women organization, head of youth organization), religious leaders, local government officers (i.e. Public Works Service, Environmental Service, Tourism Office, and Regional Disaster Management Agency). Secondly, the quantitative method, for which it engaged in questionnaire-based assessment. A documentation study was conducted to initially understand the Tridi Kampong's transformation, the change in its environmental quality, and the community's efficacy in adapting to floods, including reducing flood hazards. In-depth interviews and direct observation were undertaken to verify the transformation process of the kampung and to uncover changes in community behaviour, as well as the socio-economic impact of the transformation and the collective action of the community itself as a stakeholder in improving its environment. Field observations were conducted to understand the current community practices of flood-risk management, the interactions between local communities and local government (and its associated agencies), and the creativity, innovation and acumen of the community in improving the environment. Questionnaires were distributed as a means of empirical research to discover how the parameters in question influenced the community's commitment. The questionnaire contained 20 statements describing five research variables. The research variables comprised one dependent variable, namely community commitment to improving the environment (Y), and four independent variables, namely the capacity of the community to adapt to flooding (X_1); the collective action of the community to improve the environment (X_2); government programmes to motivate the community (X_3); and a strong desire to improve and beautify the kampung (X_4). The data for each variable is a quantification of ratings of the corresponding statements. Each statement could be rated on a six-point Likert scale, whose options were strongly agree (a score of 6), moderately agree (score

5), slightly agree (score 4), slightly disagree (score 3), moderately disagree (score 2) and strongly disagree (score 1). Each variable was represented by four statements, for a total of 20 statements across the questionnaire. The data for each variable were obtained from the mean value of each set of four statements. All of the 147 respondents were from the riverbank communities under investigation.

RESULTS AND DISCUSSION

TRANSFORMATION OF TRIDI KAMPONG

Physical change. Although Tridi Kampong now looks clean and beautiful and enjoys a thriving community, the kampung underwent a lengthy process to achieve those results. Before being known as Tridi Kampong, the area was commonly referred to as Embong Brantas Kampong, a name owed to its location by the Brantas River. The results of the documentation study revealed that the kampung had been a slum known for its poor economic conditions. The houses were close together and poorly arranged, and the streets of the kampung were narrow and dirty. Many clotheslines were poorly organised; the walls of the houses were not painted well. Several buildings were nearly collapsed or even uninhabitable. Because the kampung was not supported by municipal garbage-collection services at the time, people disposed of garbage in the river, resulting in many piles of garbage along the shore (Photo 2). Such piles became more and more scattered as the river overflowed in times of heavy rain and flooding. As a result of these conditions, people were particularly vulnerable to health problems.



Photo 2. A corner of the riverbank that was used as a site of garbage disposal (phot. L. Sedyowati)

In 2016, an undertaking initiated by the community and supported by the army became the starting point for the revival of what would become Tridi Kampong. The endeavour was marked by a massive kampung-cleaning process that began at the riverbanks. One informant reported that at that time, close to 180 members of the Indonesian National Army mobilised to help residents clean up the river flow and other points in the kampung that had become garbage-disposal sites. This cleaning process lasted for two days, was funded by the army and was supported by in-kind community contributions such as food, drink and labour.

Afterwards, the walls of the houses were painted and decorated with pictures defined by their unique three-dimensional effects (as shown in Photo 3), which were created by the community themselves. These images would become the inspiration for the name “Tridi Kampong”. The images’ three-dimensional effect was deliberately chosen for its uniqueness as such images are still very rare in Malang. A paint company, recognising the potential of the residents, became interested in providing capital assistance in the form of paint and painting tools to support the changes in Tridi Kampong. The process of transforming from a slum kampong to an attractive thematic kampong and tourist destination was greatly facilitated by the cooperation between the community, the government and the paint company, which provided support in the form of hundreds of gallons of paint and spray-paint tools, brushes, ladders, etc. to enable the painting process. Tridi Kampong’s appearances before and after transformation are shown below in Photo 4 and 5.



Photo 3. A community-created picture in Tridi Kampong with the characteristic three-dimensional illusion, which causes the image to look like a real object (phot. L. Sedyowati)



Photo 4. Study area before transformation, known as Embong Brantas Kampong (phot. L. Sedyowati)

Changes in social behaviour. Tridi Kampong’s metamorphosis from slum to tourist destination was also accompanied by changes in social behaviour, including in the areas of attitudes, actions and decision-making. The in-depth interviews found that while initially some people initially held negative (opposing) attitudes towards the changes and others positive (supportive) ones, community groups eventually succeeded in securing the agreement of the entire



Photo 5. Study area after transformation, known as Tridi Kampong (phot. L. Sedyowati)

community to the reestablishment of Embong Brantas Kampong as Tridi Kampong. The character of the residents underwent a similar change: many who were initially resistant to the entry of foreigners into their neighbourhood have now become friendlier and more open. This change of community character supports the sustainability of Tridi Kampong as a tourist destination. The community also decided to support the formation of Tridi Kampong by considering what strengths the community possessed, especially those of the young people. A community’s strengths comprise its creative and innovative ideas, its skills and its ability to network with external parties. Today, the community also perceives additional benefits obtained through its transformation, such as increased well-being, deeper religiosity, strengthened family ties and greater mutual cooperation. This finding is in line with the theory of social exchange developed by HOMANS [1958].

Changes in environmental quality. In the past, the riverbank settlement decreased the water quality of the river through its residents’ habit of disposing of food packaging, food scraps, soapy water, chemical-infused water used for washing and so forth directly into the river. However, since Embong Brantas Kampong changed into Tridi Kampong, there has been a drastic improvement in the area’s cleanliness. According to the direct observation, the community is aware of the need to consistently maintain environmental cleanliness. No longer is landfill and household waste disposed of into the river, a fact that is also reflected by the river’s increasing water quality, as shown by the biological oxygen demand (*BOD*) and dissolved oxygen (*DO*) measurements illustrated in Figures 1 and 2. This data, which was obtained from the Environmental Agency of Malang City (Ind. Badan Lingkungan Hidup Kota Malang), reflects the highest *BOD* and *DO* levels recorded in the dry season (an area near Tridi Kampong is one of six points of monthly measurement along the Brantas River). Figure 1 shows the decrease in *BOD* in the Brantas River near Tridi Kampong from 2015–2019; the increase in *DO* over the same period is shown in Figure 2.

Figure 1 shows a *BOD* value in 2015 close to $20 \text{ mg}\cdot\text{dm}^{-3}$, which is the highest value of the last five years. This value sharply dropped as the transformation of Embong Brantas Kampong to Tridi Kampong led to environmental changes to the area. For the last three years, the *BOD* value near the area has rested stably between $3\text{--}6 \text{ mg}\cdot\text{dm}^{-3}$. A similar

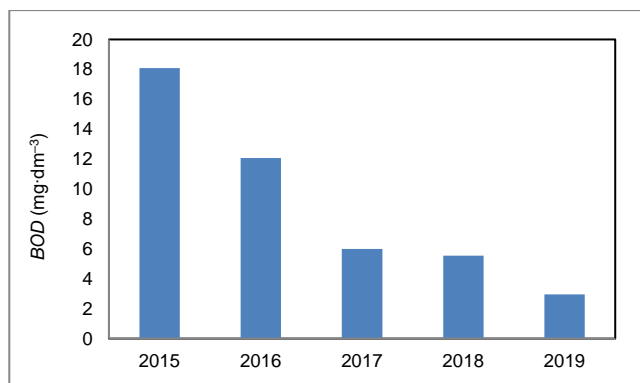


Fig. 1. Decrease in biological oxygen demand (BOD) in the Brantas River near Tridi Kampong from 2015–2019; source: own elaboration based on data of Environmental Agency of Malang City

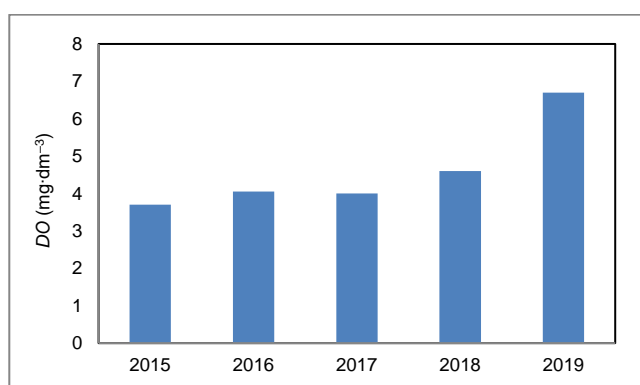


Fig. 2. Increase in dissolved oxygen (DO) in the Brantas River near Tridi Kampong from 2015–2019; source: own elaboration based on data of Environmental Agency of Malang City

change can be seen in the region's DO levels (Fig. 2), which from 2015 to 2019 increased from 4 to 7 mg·dm⁻³. It can be reasonably concluded from these findings that changes in the environmental quality of riverbank settlements have impacts on the water quality of the Brantas River.

Other efforts to increase environmental quality are supported by the Agriculture Service of Malang City Government. To beautify densely populated environments, they enable urban farming practices by utilising the narrow land and the walls of people's homes. The cultivated plants are vegetables and traditional medicines (herbs) such as lemongrass (*Cymbopogon citratus* (DC.) Stapf), betel (*Piper betle* L.), curcuma (*Curcuma zanthorrhiza* Roxb.), ginger (*Zingiber officinale* Roscoe), turmeric (*Curcuma longa* L.), guava (*Psidium guajava* L.), lime (*Citrus aurantiifolia* hort. ex Tanaka), and *Aloe vera*, which can be used to meet communities' nutritional needs and improve the constitutions of residents. The soil at the study site is highly fertile, thanks to nutrient-carrying sediment dispersed by the Brantas River. This conforms to the results of the study of XUE *et al.* [2017], which found that soil at the foot of a riverbank is more nutritious and thus induces superior plant growth. However, the ecological impact of river basin management practices should be carefully considered. According to the head of local women organization, the yields of vegetables and medicinal plants are monetised as substitutes for the

cost of nutritional-fulfilment and health interventions, and the annual reduction in health costs is approximately USD90 per person.

ADAPTATION TO FLOOD HAZARDS

Research conducted by UTAMI *et al.* [2014] at the Embong Brantas area, which includes Tridi Kampong, concluded that over the next 10, 20, 50 and 100 years, floods are estimated to cause increases of 0.65, 0.71, 0.81 and 0.98 m, respectively, in average water levels from the normal river level. Increased river water levels are expected to pose a small threat to cumulative areas of 1.3, 0.9, 0.4 and 0.2 ha, respectively; a moderate threat to areas of 1.0, 1.3, 1.6 and 1.6 ha, respectively; and a major threat to areas of 0.7, 0.8, 1.0 and 1.2 ha, respectively. However, this prediction is contrary to field conditions reported in the field. Responses to the questionnaire indicate that the houses of respondents living alongside the river were submerged less than once per year. This low frequency indicates that in fact, flooding rarely occurs in the Tridi Kampong region, deviating from the results of Utami and others research.

Even so, the community has adapted well to the risk of flooding, as demonstrated by the fact that nearly 80% of questionnaire respondents reported being able to anticipate and minimise losses related to flooding and landslides by applying the procedure described in the questionnaire. This validates the results of Hariyani's study [HARIYANI 2018], which found that although the area around the study site experienced landslides and floods three times in 2015 and 2016, the community still wishes to remain in the riverbank area – despite the fact that the Malang City Government has provided two flats for relocation of the settlement since 1996, owing to the Malang Mayor's Policy Regarding Environmental Management 1988–1998 [ADITAMA, PAMUNGKAS 2017]. These facts show that the community is aware of the risk of disaster and has adapted well to it, in addition to possessing other socio-economic reasons to prefer remaining in their current location. The community also has an early-warning system for flooding that uses simple information and communications technology, as well as housing modifications, an evacuation route and a disaster task force [DAI 2016; UTAMI *et al.* 2014]. To minimise surface runoff during heavy rain, some open spaces are replaced with paving blocks, especially on sloped surfaces, as shown in Photo 6. The use of paving block instead of asphalt pavement is intended to absorb low-intensity rainfall and retard the rate of surface runoff when it rains at high intensity. This is in accordance with the results of research led by SEDYOWATI *et al.* [2017].

THE COMMUNITY'S COMMITMENT TO IMPROVING THE ENVIRONMENT

Reliability and validity tests. The most influential factors in building community commitment to improving the environment were derived from the results of a questionnaire analysis of 147 respondents. The questionnaire was analysed to collect measurable data on the five variables described above. A reliability test of the questionnaire returned



Photo 6. Paving block on sloped surfaces in the study area (phot. L. Sedyowati)

a Cronbach’s alpha value of 0.62, indicating that the questionnaire instrument is reliable and that the dependent variable can be further analysed using regression analysis. For each statement in the questionnaire, the relationship between the independent variable and the dependent variables as described by the correlation coefficient, and the calculated *P*-values at the significance level of 0.05, are shown in Table 1.

Multiple regression analysis. This analysis was undertaken to generate an equation predictive of a different communities’ commitments to improving the environment, using the same Likert-scale questionnaire as the research instrument. Table 1 indicates that all independent variables have statistically significant influences on the dependent variable, both when the constant is zero and when it is not (although a lone *P*-value approaches, but does not reach, the significance cut-off of 0.05). Therefore, multiple regression analysis can be conducted both with a zero constant and a non-zero constant. Multiple regression analysis with a non-zero constant resulted in the following equation:

$$Y = -0.16 + 0.22X_1 + 0.53X_2 + 0.15X_3 + 0.06X_4 \quad (1)$$

where: *Y*, *X*₁, *X*₂, *X*₃, and *X*₄ as in Methods (page 206).

Equation (1) shows that if all independent variables are equal to zero – in other words, there is no community adaptability, no potent collective action to improve the environment, no government programme to encourage and facilitate and no strong desire to change – then community commitment has a value of negative 0.16. Rationally, there are only two possible conditions, namely: there is a commitment (represented by a positive value) or there is no commitment (represented by a zero value). Therefore, multiple regression

analysis was conducted again, this time setting the constant to zero. This means that it is assumed that no variables beyond the four independent variables described above comprise the community’s commitment to environmental improvement. The analysis showed that the simultaneous effect of all independent variables on the dependent variable was 0.98. In other words, all independent variables support one another in forming the dependent variable (community commitment). This analysis resulted in the following equation:

$$Y = 0.22X_1 + 0.51X_2 + 0.15X_3 + 0.06X_4 \quad (2)$$

Equation (2) shows that community commitment to improving the environment is correlated with a strength of 0.22 to community adaptability, 0.51 to collective action, 0.15 to government programmes and 0.06 to a strong desire to change. It can also be concluded that community potency is positively correlated with community commitment, having the greatest coefficient (0.51). The ability to adapt to flooding has the second largest positive correlation (0.22). This result supports the findings of the research of UTAMI *et al.* [2014], which states that the people of Embong Brantas already have the ability to adapt to floods by modifying their homes to minimise the hazards posed by flooding.

It can also be seen that Equation (1) and Equation (2) have nearly the same coefficients on all their independent variables. This shows that the exclusion of the possibility of other variables’ effects on community commitment, represented by the intercept, does not have a statistically significant effect. The four selected variables are in themselves sufficient to explain the factors that influence the formation of commitment.

Equation (2) was then used to generate simulation data, whose comparison with the observation data is depicted in Figure 3. Those data were then tested using Nash–Sutcliffe efficiency (*NSE*), root mean square error (*RMSE*) and mean absolute error (*MAE*) values to calculate the efficiency and error of the equation. The results of these tests are presented in Table 2.

The deviation between the simulated data and the observed data is described in Figure 4. The linear slope of the observation data forms an angle of 45° to the *X* axis. The linear equation of the simulation data reveals that as *x* moves from 0 to 8, *y* climbs from 0.65 to 7.51. The slope of the linear simulation data is calculated with an arc tangent of 7.51 minus 0.65, and then divided by 8, for a result of 40.6 degrees from the *X* axis. The deviation between the simulation and observation data is 5 degrees (or 10%), a relatively small deviation.

Table 1. Results of validity test

Code	Variable	“Constant is not zero” regression			“Constant is zero” regression		
		<i>r</i>	<i>P</i> -value	significance	<i>r</i>	<i>P</i> -value	significance
X1	adaptation to flooding	0.302	0.000	valid	0.969	0.000	valid
X2	collective action	0.403	0.000	valid	0.987	0.000	valid
X3	government programme	0.349	0.000	valid	0.984	0.000	valid
X4	desire to change	0.163	0.049	valid	0.980	0.000	valid

Explanations: *r* = correlation coefficient, *P* = probability value. Source: own study.

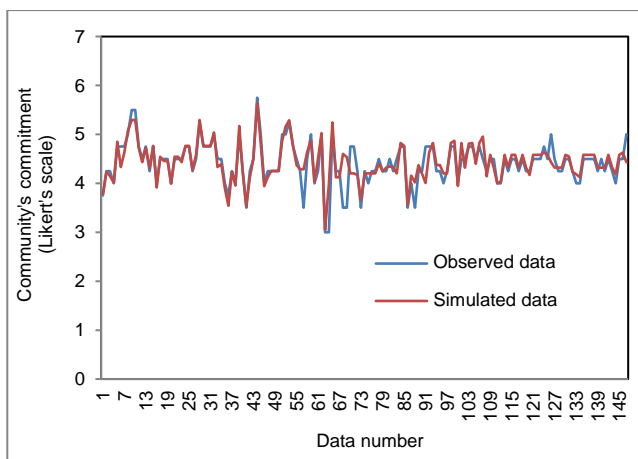


Fig. 3. Comparison of observation and simulation data; source: own study

Table 2. Results of model test

No.	Model test values	"Constant is not zero" regression	"Constant is zero" regression
1	Nash–Sutcliffe efficiency	0.71	0.70
2	root mean square error	0.22	0.22
3	mean absolute error	0.24	0.25

Source: own calculation.

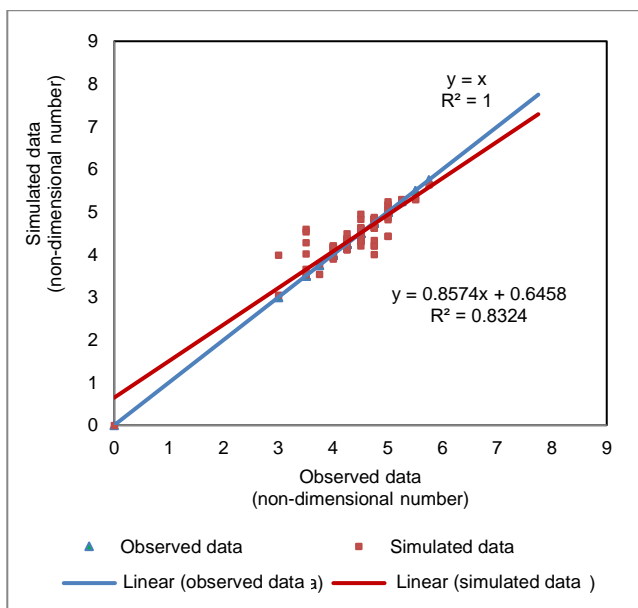


Fig. 4. Deviation of simulated data from observed data; source: own study

SOCIO-ECONOMIC BENEFITS

Infrastructure-development projects should be investigated to understand their impacts on the environment and the socio-economic development of the affected communities. Environmental protection and other regulations of water and pollution should be related to the evolution of the social behaviour of the population [MAROUF, REMINI 2019]. The transformation of Embong Brantas Kampong to Tridi Kampong had significant socio-economic impacts; Tridi

Kampong, as a hotspot of thematic tourism in Malang, has earned appreciation not only from tourists but also from various non-tourist parties, including government officials from within and outside the country. Such officials have come to conduct visitation and study because they were inspired by the success of this kampong’s rise to the position of a tourist destination. Tridi Kampong also won various awards in the field of urban tourism at the local and national levels in 2017, 2018 and 2019.

As a location that reflects the culture of the kampong in urban areas, Tridi Kampong has also become increasingly well-known, having been used as the shooting location for three national film sequels starring a well-known icon to young people in Indonesia. The film was in great demand in the community, especially amongst young people, because the contents of the story closely mirror the daily lives of youth and the various dynamics of the problems they face. In 2019, a U.S. band called Krewella also used Tridi Kampong as the background for their music video. These anecdotes reflect that Tridi Kampong has its own appeal, not only in Indonesia but across the world. That appeal was documented by Krewella’s social media posts, which discuss the group’s good impression of the area.

According to the interviews with the community leader, another significant socio-economic impact has been by a reduction in the number of unemployed youth. In the past, around 60% of working-age youth lacked a permanent job, as a result of which they simply spent their time hanging out, playing games or becoming inebriated. Today, Tridi Kampong is a place where local youth can empower themselves economically. For example, a young man can earn decent compensation for drawings, starting at IDR500,000 (exchange rate of USD1 = IDR 15,000) and varying according to the size and complexity of the requested picture. Other jobs also grant young people the opportunity to use their time productively, often without requiring special expertise, as with positions maintaining the parking of cars and motorbikes. For motorbike visitors, a parking fee of IDR10,000 buys tickets for two people. Part of this fee is deposited with a local association, and the rest is paid to the parking attendants. The job can provide an income of around IDR100,000 per weekday and even more (around IDR200,000–300,000) during the holiday season. Observation revealed that even with limited land, the motorcycle-parking is arranged neatly, orderly and safely, thanks to parking attendants who are always alert when guiding vehicles in and out of the site.

Small kiosks on the terraces of people’s homes constitute another source of income for the local community. These kiosks are opened particularly to cater to visitors’ needs for food and drink. The provision of good service facilities is a key component in tourism development [ZIERNICKA-WOJTASZEK, LISIAK 2020]. To optimise limited space, the process of preparing food is often completed on the terrace itself. During observation, it was apparent that the cooking utensils used are modern and clean so that food hygiene is guaranteed. The community also provides photoshoots and 25×25 cm paintings, each for IDR30,000. According to the head of local citizen association, there are averaging 25,000 visitors per month, of which 20% are foreign tourists; the total income of Tridi Kampong reaches

USD10,000 per month. The total economic benefits from tourist visits, parking and food sales, combined with the savings of flood-risk reduction (USD15,000 annually) and the reduction in health costs, enabled also by people supplementing their nutrition and maintaining their health with the medicinal plants they grow themselves, reach around USD153,000 in one year.

CONCLUSIONS

The role of the community represented by its commitment to improving the environment has successfully transformed Tridi Kampong from a slum to a thematic kampong. This change has been followed by an increase in the community's resilience to the hazards of flooding. The most influential factor in strengthening community commitment is the community's strength, that is, its creative and innovative ideas, its skills and its ability to network with external parties. This research also provides evidence that cooperation between government, local communities and support from third parties such as businesses has been successfully implemented to improve the environment without the need for resettlement programmes. This success is readily confirmed by the increase in the well-being of the riverbank community and the kampong's stunning transformation into a famous tourist destination, and its socio-economic impacts have implications for the sustainability of community activities aimed at maintaining and improving the quality of the environment through further exploration of community potential. The community must continue its creative and innovative efforts so that it can invite other third parties to participate. With continuous effort, it is hoped that the tourist-attractiveness of Tridi Kampong can be maintained and can make a significant contribution to the tourist development of Malang City. Additional research is necessary that focuses on developing a framework for these findings to be applied to other regions.

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