**The Early Thought of Water Transportation and Green Transportation for Tourism Special Region in Jogyakarta Province**

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**Abstract**

Special Region of Jogyakarta Province should utilize water transportation to be unique and reduce traffic jump. Along the rivers and watersheds Progo river and Opak river many tourist attractions that need to be created unique location with a pleasant transportation and relatively not far distance.

The objection of increasing tourism in Jogyakarta in order to sustainably, green transpotation, provide jobs and improve the lives of residents around the river. Survey conducted using secondary data. Survey of every long holiday happened crowded everywhere, Secondary data used the amount of tourism , geography, geology, river map, rainfall and hydrological data, the population in the upper river, sustainable tourism in Venice by water transport

Argument of potensial tourism, engineering issues, community social responsibility (CSR) , community participation and financing by utilizing the potential of nature, community culture, local wisdom. Analyzed to develop tourism with main stream water transportation .. In some places made jetti for passengers up, down. To get to the sights with transportation without pollution likely as bike, horse-drawn carriage andong, wheelchair.

Initial findings of the authors conducted is the potential of water transportation to be a mainstay of tourism, the potential of sustainable transportation to increase the number of tourism, qualitative engineering analysis, potential community participation, CSR potential, and community and local government financing potensial. Initial thinking it is necessary to follow up on multi-year research of various disciplines and be analyzed in an integrated manner.

Conclusion of the completion of engineering is not difficult as long as the allocation of costs for gradual surveys, laboratories, design and physical implementation to achieve optimal results, community participation along the watershed, CSR, Local governments provide funds. If water transportation can be implemented will be very interesting tourism especially abroad, is access to tourism especially foreign tourist who is still under 10% .

**Key word :** ***Sustainable tourism,* *Water and green transportation, engineering , CSR and community partipation*.**

1. **INTRODUCTION**

Special Region of Jogyakarta Province is interested tourism . Data 2015 shows 4,122,205 people in 2015, most tourism in December, after that in May, with the number of foreign tourists is still 308,485 people or 7,48% according to table 1.

|  |
| --- |
| **Tabel 1. Number of Tourists to DIY Year 2015 (per -month and type of accommodation)** |
| **Tourism statistic,Tourism department, D.I.J Province 2015** |
| **No.** | **Tourist** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **June** | **July** | **Agst** | **Sept** | **Oct** | **Nov** | **Dec** | **Total** |
| I | **Foreigner Tourists** |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | Star Hotel |  15,125  |  13,759  |  16,412  |  19,391  |  19,324  |  19,627  |  23,174  |  26,371  |  19,383  |  20,607  |  18,700  |  20,098  |  231,971  |
|   | Non Star Hotel |  5,626  |  5,184  |  6,321  |  7,465  |  6,839  |  6,735  |  7,676  |  7,912  |  5,363  |  5,812  |  4,739  |  6,842  |  76,514  |
|   | Sub Total |  20,751  |  18,943  |  22,733  |  26,856  |  26,163  |  26,362  |  30,850  |  34,283  |  24,746  |  26,419  |  23,439  |  26,940  |  308,485  |
| **II** | **Local Tourists** |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   | Star Hotel |  131,067  |  105,407  |  118,158  |  133,985  |  160,235  |  134,527  |  93,501  |  112,742  |  127,097  |  147,675  |  135,829  |  183,073  |  1,583,296  |
|   | Non Star Hotel |  171,132  |  152,638  |  180,906  |  182,482  |  225,486  |  199,574  |  140,879  |  170,242  |  162,067  |  191,670  |  198,153  |  255,195  |  2,230,424  |
|   | Sub Total |  302,199  |  258,045  |  299,064  |  316,467  |  385,721  |  334,101  |  234,380  |  282,984  |  289,164  |  339,345  |  333,982  |  438,268  |  3,813,720  |
| **Grand Total** |  **322,950**  |  **276,988**  |  **321,797**  |  **343,323**  |  **411,884**  |  **360,463**  |  **265,230**  |  **317,267**  |  **313,910**  |  **365,764**  |  **357,421**  |  **465,208**  |  **4,122,205**  |

The objection of increasing tourism in Jogyakarta in order to sustainably, water and green transpotation and provide jobs and improve the lives of residents around the river

Enhanced services to tourism with relatively short distance, green environment, green transportation is expected more foreign tourism and the community participate in the convenience, security of tourism and transportation management by the community so that people's lives more prosperous and happy.ran d

engan panjang sungai 140 km. Tetapi 75 % daerah aliran Kali Progo te

DI Yogyakarta is located in the central-southern part of Java Island, geographically located at 8º 30 '- 7º 20' South Latitude, and 109º40 '- 111º 0' East Longitude. Based on the land area, the DIY region can be grouped into four physiographic units, namely the physiographic unit of Merapi Volcano, Sewu Mountain or Seribu Mountain physiographic unit, Kulon Progo Mountain physiographic unit, and Lowland physiographic unit.

Two major watersheds (DAS) in DIY are Progo waters in the west, and Opak-Oya watershed in the east. The famous rivers in DIY include Serang River, Progo River, Bedog River, Winongo River, Boyong-Code River, Gajah Wong River, Opak River, and Oya River.

Progo River is an area of ​​2380 km2 that passes the province of Central Java and DI Yogyakarta. Progo River is one big river that passes Jogyakarta city. River basin with a river length of 140 km, but 75% flow in Yogyakarta.The main headwaters in Merapi volcano as well as mountain menorah, merbabu volcano and cleft mountain then empties on Trisik beach on the south coast of Java to the Indian Ocean, then empties on the coastal trisik on the south coast of Java to the Indian Ocean. Progo or Progo River is one of the river great that crossed the city of Yogyakarta.While in the estuary of the river Progo is famous as a sand mining area. In the upstream area, precisely in Magelang, the flow of Progo River is used as a rafting sports area because this time has a challenging rapids.

The big time makes the area around Progo River suitable for use as agricultural land. In the Ngluwar village of Magelang district , the Netherlands has damaged the Progo River for irrigation facilities for the people of Yogyakarta. This dam is known as "Ancol Bligo" which is currently used as a place of recreation. This flow of irrigation flows from Ngluwar towards the east dividing Sleman District to Klaten District and is known as Sewer Mataram or the Van Der Wijck ditch.

 Progo River is a river that flows Central Java and Yogyakarta Special Region of Indonesia. In the province of Special Region of Yogyakarta, this river becomes the natural border of Kulon Progo with Sleman and Bantul District . There are several tributaries that flow to Progo, such as Kali Krasak (upstream in Mount Merapi), Kali Elo, Kali Deres, and Kali Kuas.



Figure 1. Progo River watersheds (DAS)

This river is sourced from the slopes of Mount Sumbing which passes to the southeast. In the Ngluwar area, Magelang District, Progo River is dammed for irrigation facilities for the people of Yogyakarta by the Dutch. This dam is known as "Ancol Bligo" which is now a place of recreation of citizens. This flow of irrigation flows from Ngluwar towards the East dividing Sleman District and into Klaten regency and is known as the Mataram Sewer ("Van Der Wijck Ditch"). Progo River boils down to Congot Beach, on the southern coast of Java.

In the area around the estuary, many found sand mining while in the upstream, in the area of ​​Magelang, the river is used by white water rafting fans to exercise. In general, Progo Photography has a good tourism potential but has not been developed optimally.

The use of space on the riverbanks is regulated in the spatial regulations of each region, but in its development the main function of river basin area as the area of ​​"buffer" is fading and replaced into a container for community activities. These more flexible patterns of space use trigger spatial conflicts in some urban rivers in Indonesia

Progo River at Merapi flows into the southern sea, among them dividing the plains of Sleman District with Kulon Progo District. In general, Progo River is very familiar with the citizens of Yogyakarta Special Region because the water of Progo River is very meritorious in irrigating rice fields.\

In general, the physical condition of settlements in the watershed is quite feasible and the development of river banks is still relatively low so that the naturalness is maintained. Some of the inhabitants work as farmers. The river flow of Kali Progo is used by the people as an irrigation stream to irrigated their fields.



 Figure 2. Progo River divided Sleman and Kulon Progo District

Progo River comes from Mount Merapi and continues to flow into the southern sea, has various potentials that can be developed. One of its potentials, is in the field of tourism. Progo times potentially as tourist attractions, especially for arum rafting / rafting. This is supported by its large current and its long, rocky streams. Actually the potential of arum rafting in this area has started there since a long time, but has not developed optimally.

Urban development generally originates from a small settlement (urban embryo), which spatially has a strategic location for economic activity. Over time, the city has grown as a result of population growth, socio-economic and cultural changes, and its interaction with other cities and surrounding areas. One of them is the use of river bank area as a place of economic activity. This is due to the increasingly limited vacant land or other resources that can be utilized as a source of economic activity.

Physically, the development of a city can be characterized by its increasingly crowded and denser population, its buildings are getting closer, and the area is built, especially the settlement that tends to be wider, as well as the more complete city facilities that support activities / activities in urban space. However, the increase in the number of population and the expansion of the region built a city is not always followed by an increase for the region of influence. Not even every part of the city has increased, but instead experienced environmental degradation. This indicates that the city experiences a dynamic phenomenon with respect to urban development. Therefore, the development of riverbanks must still pay attention to the environmental balance so that people's life and environment remain harmonious.

As a place that has a good tourism potential, the government should contribute more attention to the area, in order to develop optimally. Attention from the government that can be given such as giving counseling to the surrounding community, the government can also provide assistance in the form of additional facilities that can support the formation of a tourism city.

Authors and friends visiting the province of DI Yogyakarta during the three or four day holiday traffic jump everywhere, tourist sites filled with touris bus. This is what drives writers to research based on visits and secondary data.

Land transportation must be made another alternative that is water transportation by using Progo times and Opak times

Upper river Opak 65 km long in the mountain Merapi flows to the south with the estuary overlooking the Indian Ocean on the coast Samas. This river passes the west side of Taman Wisata Prambanan Temple. DAS 638.89km2.

 Opak River has a river length of approximately 65 Km Progo-Opak-Serang River Water Resources Management starting from upstream through Cangkringan District, Ngemplak Sub-district, Kalasan Sub-district, Prambanan Sub-district, and Berbahdi Sub-district of Sleman District. Then Sub Piyungan, District Pleret, District Jetis, Imogiri District, District Pundong and ends in District Kretek. The average monthly water flow of the Opak River is about 12.35 m3 / sec with a maximum of 83.2 m3 / sec and a minimum of 1.89 m3 / sec. The Opak River has quite a few tributaries

From the results of the previous research the parameters of water quality measured include physical (temperature, salinity, depth), chemical (ammonia, nittrat, phospat), and mokrobiologi (total coliform). From the results of the known water quality of the estuary of the River Opak ammonia parameters ranged from 0.02-0.06 mg / L, nitrate parameters ranged from 0.34 to 0.81 mg / L, phospat parameters ranged from 0.06 to 0.46 mg / L, and a total coliform of 30,825 colonies / 100mL. Thus the quality status of the mouthwater quality of Opak River is contaminated.

1. Flora and fauna

 Opak River water is cloudy, but it does not mean very polluted because the living creatures that live there quite a lot and varied. Variations of living things are one of them in the area of ​​irrigation channel Opak River that crosses along the road to Parangtritis Beach there are various kinds of fish, including broom fish (Hypostomus plecostomus), On the banks of the river there are hundreds of water hyacinths (enceng gondok).

1. Utilization

Opak river is used by local people in some areas for example in Kembangsongo Jetis Bantul, residents use Opak River as their livelihood to fulfill their daily needs such as looking for sand for sale as building material and not a few people fishing in this river. In addition, residents are also looking for timber coming from upstream areas carried by flood flows for fuel. In addition there is damage in some areas around the river. One of them on the river channel in the area of ​​Sanden, Selomartani, Kalasan suffered severe damage due to illegal mining. The river that used to be 40 meters wide now becomes 50 meters more. The damage is one kilometer along the path of the area. At some point, the original river mouth has shifted up to 15 meters to the side. In addition, the mine caused the loss of agricultural land more than 500 meters. The long drought also caused the water debit of the Opak River to drop about 40 percent. This happens because of the lack of water catchment areas and water catchment areas are not functioning optimally. Examples of water catchment areas include the Dieng hill area in Wonosobo that suffered heavy damage and the slopes of Mount Merapi that were damaged by eruption in 2010 but now gradually recovered after the reforestation in the watershed.

At the mouth of the Opak River there is a mangrove forest area located in the village of Tirtohargo, Kretek district, Bantul district. Baros Hamlet is a pioneer area of ​​mangrove forest in one of the areas in the mouth of the River Opak so that the mangrove forest area is often called Mangrove Baros Area. Mangrove plants grow thick, nearby there are grasses used by farmers to feed livestock. There is garbage drifting from the upper reaches of the river and caught in the estuary area when the tide makes sea water and the beach look dirty. The area has successfully developed mangrove forests that were previously predicted to be unable to grow with unsuitable land and environmental conditions. Mangrove planting is one effort to save coastal area from abrasion of south sea waves.

Previous researcher found that winds in the Indian Ocean region in the region are from the southeast to the southwest, which affects the ocean currents carrying sediment or sediment to the land, because the direction of the wind to the southwest, the ocean currents leading to the shoreline headed southwest, bringing sediment in the same direction. The ocean current itself meets the current of the Opak River. "The strong Opak river currents bring the sediment to the shore so that besides there is sediment from the sea, there is also the sediment that comes from the land carried by the river," explained Yan. Finally, according to Yan, river currents and ocean currents will be "fight each other" so it will determine whether there is a deflection of the direction of the river flow near the estuary.



Figure 3. Opak River Map

**2.. METHODS**

Conducting survey in DIY Province. During the holidays, writers and friends always get solid access / traffic to the tourist area. Interview of primary data of traffic jump, condition along Progo and Opak river with some people living in Daerah Istimewa Yogyakarta. Analysis based on secondary data and primary data only to validate. Secondary data is

1. Map of Kulon Progo infrastructure. Ministry of Public Works
2. Tourism Statistics 2015. Department of Tourism
3. Rainfall and hydrological data from Metrology and Geophysics
4. River map, long, width, depth, layout, profile of the river
5. Geografi map of the internet Bakosurtanal
6. Geological results from the Internet Ministry of ESDM
7. Design and Reserved by [Citraweb Nusa Infomedia](http://www.citra.web.id/)

 Secondary Data Analysis shows it as a method of research. Judge (1982: 1; dinukil Johnston, 2014: 620), "Secondary data analysis remains an under-used research technique in many fields. Given the increasingly availability of previously collected data to researchers, it is important to further define secondary data analysis as a systematic research method. " Heaton (2004: 16; dinukil Andrews, et.al., 2012: 12) formulates the secondary data analysis (ASD) as a research strategy which makes use of pre-existing quantitative data or pre-existing qualitative data for the purposes of investigating new questions or verifying previous

The analysis of secondary data can thus be formulated as follows.

1. ASD is not a method of data analysis, but a method (strategy) research. Therefore, according to Andrews et al (2012), data analysis methods such as grounded theory (analysis of qualitative data) and stastisic analysis (quantitative data analysis) can be used by secondary data analysis methods.
2. ASD uses or utilizes secondary data, ie data that already exists. In this case ASD researchers do not collect their own data, either by interviews, questionnaires or listings, performing tests, using a scale of scales or likert scale, or observation. Secondary data that can be data of research results, dapt also in the form of institutional documentary documentary.
3. The purpose of ASD, according to Heaton, can be to explore and discover new research questions, or to test the results of previous studies.

Andrews et al., For example, notes the aims of ASD's research objectives, among others, to:

1. Apply new research problems-explicitly research with new research objectives different from previous studies (Heaton, 2004),
2. Use old data to generate ideas (fielding, 2004),
3. "Testing" the results of a research that has been done, either prostrating "verification" (testing untruth with correct evidence), "refutation" (testing the truth with evidence of unrighteousness) or "refinement"
4. "exploring" data from different perspectives (Hinds, Vogel & Clarke-Steffen, 1997) - "exploring" data intended to "tamper" the data (in a neutral sense) or explore, dive, filter the data.

**3. ARGUMENT**

Initial thinking based on the experience of 3 or 4 days holiday has been happening congestion to the tourist area, Overcoming the long distance, the most possible alternative water transportation, because D.I Jogyakarta in pass several rivers, the author of the early thought on the river progo and opak river. The main obstacle to engineering, but engineering can always be solved well, the main is direct measurement and laboratory tests, and designs that take into account the rules of engineering, utilizing natural potential but not damage the nature.

The obstacles and problems of water transportation in D.I Jogyakarta Provinci are:

1. River as a source of life that needs to be preserved as it is, the community still cult the areas that are considered mystical
2. River is meandering
3. Easy shallow, because of the strong current deposits of the Opak River, where the cold lava bursts of the Kulon Progo river.
4. Many large stones, dangerous for ships.
5. Not yet organized as water transport
6. Untouched for water transportation
7. The social environment is not yet supportive
8. Engineering has not been done so it is still natural.
9. The mouth of the Opak river is a lot of mangroves and grasses for fodder for people's lives that should not be disturbed or damaged.
10. The water of the Opak River has reduced by about 40 percent, but now it is recovering after a reforestation in the watershed.

Water transportation for tourism will attract more tourism in the future because:

1. Crowded / traffic jump is reduced especially during holidays
2. Green transpotation, green environmental, green life of interest to tourism and the world leads to clean air, small energy, the use of non-natural materials is minimized.
3. Healthy environment to support healthy community
4. The desire to enjoy the natural scenery along the river
5. The sensation of enjoying water transport
6. Short distance
7. Involving communities along rivers and tourist sites to improve skills, experd and community life

Constraints or problems are not difficult to do a solution as long as there is willingness and support of local government and civil service or chairperson of indigenous community. Please note the culture and local wisdom. In order to be accepted by the community and local government

Apart from the car parks by the mainland bridge, and a private port area, all transport in Venice is by boat. And the more you think about it, the more difficulties that represents. Deliveries, emergency services, taxis - everything that is done on wheels in other cities must here be done by boat.

So boats are a major part of everyday life, not just for passenger transport but for pretty much everything else too. This is very helpful for parents with children - architecture and churches might get boring, but who can get bored of boat-spotting? You could try setting your children challenges to spot as many of the following types of boat as possible

The transportation system was designed in such a way that the width between the casters could be varied. Even in the narrowest position, for example on the landing stage, the case stood stably upright. The system permitted the Schnabel to be wheeled safely to the Museo Carrer, guarded on each side by an escort of no fewer than eight people

Vessels mark the pinnacle of efficiency, making vines and dense, stiff woods possible without sacrificing conductivity or cavitation resistance. However, vessels make cavitation‐resistant wood more expensive and may compromise refilling efficiency versus tracheids. Vascular networks maximize hydraulic conductivity and protection from cavitation at minimum investment by following Murray’s law and localizing resistances to the periphery. A future challenge is to quantify the significance of xylem structure in terms of the carbon cost of transpiration and the net carbon profit via gas exchange.

Texas, a waterways curriculum for introducing the marine industry to youth, inland water transport in India, and a waterway simulation model for demand elasticity and benefit measurement.

The Venice Lido is reinventing itself as a hub of sustainable tourism. Sustainable tourism” and “Venice” don’t exactly go hand in hand, of course – and sustainable tourism is also one of those 2017

The reality is Venice, is surviving a long war with the water, and we don’t know for how long it will true for sure is a unique Structural Engineering

Venice has been sinking over the years due to steadily rising sea levels. Compared to sixteen hundred years ago. Venice's standard sea level has dropped six feet, which has led to increased flooding. As industrial activity and pumping from the aquifer beneath the city has increased, erosion surrounding the lagoon has reached critical levels. The Italian government has decided to work alongside Ocean and Construction Engineers in safeguarding Venice by building mobile barriers across the lagoon inlets surrounding the city.
Tempers have been frayed in the World Heritage-listed city this summer, with residents rallying against the daily influx of up to 70,000 tourists – many of whom are day trippers and cruise ship passengers.

1. **FINDING**

The main obstacles and problems understand the culture and local wisdom of the river and the environment. Obstacles and problems that exist can be the strength of the sale value for touris especially from the abroad. The value of forces that appeal to tourism include:

1. The people who still cult the mystical areas are given facilities so that they are localized and attractive to other regions or countries
2. River winding impact on the river there are sides that settled and eroded. The eroded part is given a reinforcement, while the precipitate is made a sediment pond, so that it is allocated dredging. River meandering, when arranged as beauty. Winding avoids very heavy currents carrying large materials, thus endangering humans.
3. Sediment ponds can be used as localized sand mining.
4. Big stone as a place to step down, ride passengers ..
5. Transportation of water to increase tourism interest because of close distance, unique transportation, unique customs, heritage buildings, crafts.
6. The social environment will support for a better life by engaging in the management of water transport and green transportation.
7. With a touch of engineering that takes into account the environment and uniqueness will add to the attraction of tourism.

The author will continue research on sediment laboratory research, flow / debit, soil structure, natural environment, life, community habit, natural environment must be well laid out so that sustainable, sustainable and increase environmental benefits to the community. Engineering analysis should be thorough, appropriate solutions when supported with primary slope data, sediment samples, soil structure, flow survey, flow rate or flow rate. Secondary data of tributaries, vomit lava, wide watershed, catchment area, river wall material. Engineering is not a difficult thing, but it costs money to do research, laboratory testing, design and physical execution. DAS and Cathment areas along the river so as to avoid damage and calamities

Analysis needs to be done:

1. Approach to society, adapting to culture
2. Local wisdom should be explored to increase the added value of tourism
3. The meandering river should be utilized to be beautiful and unique
4. Easy shallow, with engineering is not difficult that is made sediment ponds, pond lava explotion before the sediment into the river.
5. Boulder a valuable material to be placed in jetti, where tourism goes up, down river transportation
6. Organize the entire transportation of the river, transportation, jetti down, passengers, transportation managers, payment systems, organize the social and natural environment
7. Needs to be arranged by riverside, flow depth, transportation convenience, garbage can be provided on boat / boat and tourism location. River walls of concrete eg sheet pile so that not easily eroded compared to rock plastering.
8. Transportation to tourist sites without machines, eg bicycle, beca, andong, wheelchair. Wheelchairs need to be connected to the back there is a power swing if no electric keypad is expected.
9. River transport by boat is used instead of vessel to minimize environmental damage
10. Social environment needs to be arranged, managed, upgraded to provide needed tourism, friendly service, Indonesian and English language skills, skills, expertise in caring for and running water transportation.
11. Analyze the success of other countries that have a sophisticated tourist location and successful water transport sustainable tourist visits

Initial solutions should be followed up with more detailed and more mature research and review:

1. Culture is a selling and enhanced value for tourism, unique, exciting water transport
2. Local wisdom from home, accessories, batik cloth, should be performance on water transport.
3. River meandering there is a eroded side, side settles, it needs to be determined to avoid and resolve and should be utilized to be beautiful and unique
4. Sediment ponds in one place so that one place if you want to dredge, easy and cheap. The structure jetti from the surrounding material by recognizing the behavior of the river from the laboratory results.
5. Boulder natural material that is very useful for the structure of jetti and the safety of the cruise line and river wall.
6. Organize the entire transportation ie clean river, reduced energy, unique means of transportation, according to local wisdom, jetti in some places not far from the location of the tour, the manager of water and land transportation, payment system with e money and directly when using water transportation and tourist attractions , arrange the environment along the river with a tree to prevent landslides and store water, organize the social environment with the community and use batik uniforms
7. Boat with engine that analyzed strength, speed, minimize contamination,
8. River banks are arranged with rock structures that are potential for the river, the depth of the stream should be kept stable so that maintenance is necessary, the transport convenience is not subject to rain, heat, environmentally friendly machinery, cleanliness of the river, ships and tourist sites must be maintained dump trucks / boats and tourism locations
9. Reforestation mainly catchment area of ​​Opak and Progo river, reforestation in addition to increase the volume of water as well as beautiful scenery along the water transport
10. The social environment needs to be organized, improved, improved on-the-job training training, karmic arrangements, healthy serving of food or drink serving with hospitality, Indonesian and English skills, skills, expertise in caring for and running water transportation.
11. Transportation to the location without a machine that is andong, bicycle, wheelchair to get to the tourist location alarak 2 km ..

1. **CONCLUSION**

The initial thinking of water transportation is expected to be well realized, so that the Special Region of Jogyakarta Province becomes a tourism province that is used as an example in Indonesia and the world due to transportation to non-stop tourist areas, short-distance fun and many cultures, art heritage is preserved into a sustainable tourism province

The initial idea of ​​water transport needs to be followed up with further engineering research which is outlined in the form of reports and detailed engineering designs, after obtaining laboratory results from sampling water to measure current velocity, sediment velocity, soil structure. The main obstacle to high sediment and vomit lava, it is not difficult for engineers to get the right solution but the main research and laboratory results of water flow, sediment, soil structure, secondary data lava lahar, river depth, width and history of complete and riel river. Reforestation in the catchment area to increase the volume of water and green scenery that gives the coolness of the eyes and oxygen .. Boat machine that is relatively small produces CO2. Management of waterways and accessibility tourism must be community-based, sustainable services, increasingly satisfying the tourists

In addition it should be surveyed with details of participation or community involvement during the construction, operation and maintenance of transportation. It is worth to survey companies that can contribute costs as participation in Community Social Rensposibility. Local government involvement mainly in financing during construction. In addition, research the system or financing scheme during operation and maintenance. Comparative studies should be conducted in countries that utilize water transport with heritage like Venice Italy

Recommendations If water transportation can be implemented will be very interesting tourism especially abroad, is access to tourism especially foreign tourist who is still under 10% . Waterways is green environment, green transportion, green life with ship or boat patterned culture of Special Region of Yogyakarta Province . The level of community life will be more prosperous and safeguard, helping the tourists sustainably

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