

THE BRANTAS RIVER CRISIS: THE SAND MINING PROBLEM AND THE SEARCH FOR SOLUTION

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ABSTRACT

This article examines the dynamics of power relations in the Brantas River sand mining and its influences on the fate of the most important river of East Java. By relying on archival sources, contemporary newspapers, and oral history interviews, it is argued that the Brantas river crisis occurred due to the acceleration of sand extractions facilitated by improved extraction technology in the form of mechanical sand extracting machines and the growing demand for sand for infrastructure development. Automated sand mining caused damage to infrastructure and settlements in various places along the river from downstream areas that continue to creep upstream, as well as the loss of biodiversity richness. The search for a solution has been going on for some time but failed to stop mining and bring the Brantas River out of the crisis. The failure occurred not because of the absence of a legal protection, but the difficulty of implementing regulations in the field due to the involvement of unscrupulous officials and politicians in the Brantas sand business, as well as the temptation of large and comfortable profits from mining that lured sand miners amid the limited available alternative sources of livelihood.

Keywords: sand mining, impact, river crisis, control measures, Brantas River, East Java

ABSTRAK

Artikel ini membahas dinamika relasi kuasa dalam penambangan pasir Sungai Brantas dan pengaruhnya terhadap nasib sungai terpenting di Jawa Timur ini. Dengan mengandalkan sumber arsip, surat kabar kontemporer, dan wawancara sejarah lisan, diargumentasikan bahwa krisis sungai Brantas terjadi karena percepatan ekstraksi pasir yang difasilitasi oleh perubahan teknologi ekstraksi dalam bentuk mesin diesel penyedot pasir mekanis dan meningkatnya permintaan akan pasir untuk pengembangan infrastruktur. Penambangan pasir mekanis menyebabkan kerusakan infrastruktur dan permukiman di berbagai tempat di sepanjang sungai dari daerah hilir yang terus merambat ke hulu, serta hilangnya kekayaan keanekaragaman hayati. Pencarian solusi telah berlangsung selama beberapa waktu, tetapi gagal menghentikan penambangan dan membawa Sungai Brantas keluar dari krisis. Kegagalan itu terjadi bukan karena tidak adanya payung hukum, tetapi kesulitan menerapkan peraturan di lapangan karena keterlibatan pejabat dan politisi yang tidak bermoral dalam bisnis pasir Brantas, serta godaan keuntungan besar dan mudah dari penambangan. memancing para penambang pasir di tengah sumber mata pencaharian alternatif yang tersedia terbatas.

Kata kunci: penambangan pasir, dampak, krisis sungai, tindakan pengendalian, Sungai Brantas, Jawa Timur



INTRODUCTION

Historical study on rivers has been growing in Indonesia, though it remains less developed compared with that of western countries (Mauch and Zelller, 2008; Schonach, 2017). The river historiography of Indonesia has focused mainly on three main issues: (1) river as a center of civilization, (2) river as a source of disasters, and (3) river as an increasingly polluted entity. Important examples of study focusing on the first issue are Gunawan (2008) focusing on Brantas river and Asnan (2016) dealing with the role of rivers in Sumatera. Valuable historical studies focusing on waterways as a source of disaster include the work of Gunawan (2010) on floods in Jakarta and Husain (2020) on floods in Surabaya. There are a few other works on floods in Panarukan, Lamongan, Semarang, and Jember (Nawiyanto, 2016). Among the river historiography focusing on pollutions issues are Lucas and Djati (2000) focusing rivers of East Java, Nawiyanto et al. (2018) on Brantas river, and Ridho (2017) on rivers of Sidoarjo. The last two issues have been growing in importance amidst the growing problems of floods and river pollutions in Indonesia. Floods often hit various parts of the country, including the Indonesian capital city of Jakarta, meanwhile many significant rivers across the country, especially in Java, Sumatera, and Kalimantan, have also been seriously polluted (Keraf, 2010, p. 44).

Despite the rising number of historical studies on rivers, little has been known about the impact of human river-based modes of production, especially river sand mining. There has been a growing concern about the adverse effects of sand mining across Asian countries. In China, sand mining has been feared to have destroyed the habitat of aquatic organisms, caused the extinction of the Yangtze river dolphin and endangered finless porpoise ("Construction: Limit China's Sand Mining," 2017). Meanwhile, in India, sand mining has severely impacted on the Mahanadi river ecosystem, infrastructure facilities, and the livelihood of people

(Kohli, 2015). Joining the global concern on the impact of sand mining, this paper aims at discussing the problems of Brantas river sand mining. This issue is interesting to study during the rise of sand mining activities, which seem to be in contrast with the control measures taken by government officials. Based on 2004 data, there were 6,280 workers involved in the Brantas river sand mining with a volume of more than 2.7 million tons of sand per year (Soekistijono, 2008, p. 204).

The choice of the Brantas river as the focus of the discussion was based on the consideration of its status as the most important site of sand mining in East Java and the position of the Brantas river as the main river in East Java. The Brantas River starts its flow with a spring in Sumber Brantas Village (Kota Batu) on the slopes of Mount Arjuna. On the way downstream in the Madura Strait, the river is joined by other small rivers in the area that it crosses from Malang, Blitar, Tulungagung, Kediri, Jombang, to Mojokerto. From here, the Brantas River branches off into Kali Mas, which flows towards Surabaya and Kali Porong, which crosses Sidoarjo. Brantas river has a watershed area of 11,800 km² or 1/4 of the location of East Java Province. The length of the Brantas river reaches 320 km, which flows around Mount Kelud (Parwanto, 2008, pp. 175-176).

The main questions to be dealt with in this paper are: How did the sand mining activities lead to the Brantas river crisis? What impact did the sand mining have on the environment and society? How was the Brantas river crisis due to sand mining contained to find a solution?

RESEARCH METHODS

This paper employed a historical method. It includes four major stages, namely (1) heuristics (gathering historical sources that are relevant to the subjects); (2) source criticism (critical treatment of the collected sources to determine the authenticity and credibility of information to become historical facts); (3) interpretation (examining historical facts to compose

historical arguments); and (4) historiography (synthesis in the form of historical writing) (Storey, 2011). The consulted data include both primary and secondary historical sources. Primary sources in the form of archival materials and contemporary newspaper reports were collected from the *Dinas Perpustakaan dan Kearsipan Provinsi Jawa Timur* in Surabaya (The Surabaya-based East Java Library and Archives Agency). Other valuable archival materials include bundles of archival materials of the Bakesbangbol Jatim and Jasa Tirta collections. Part of the important archival materials is in the form of notes made by a key actor who used to run a sand mining business in Kediri.

This paper also employed oral history as a complementary method to enrich information contained in the written sources. This method was used to dig out information that has gone unnoticed in the written sources and remains kept in the memories of the historical actors and witnesses. It was applied by doing interviews with figures who got involved directly in the river sand mining business and also contemporary eyewitnesses of the events. The secondary sources for this paper include books, articles, and research reports that are relevant to the discussed subject matter and were collected from separate places in Jember, Surabaya, and Kediri. The theoretical inspiration that frames the discussion of the paper is taken, especially from Swyngedouw (2015), underlining the political nature of human-river interactions. The river is a contested arena of competing claims that are made by different groups of interest. Each group has its aspirations and visions of rivers that are different from one group to another. With this framework, this paper shall show the dynamics of power relations in the Brantas River sand mining and its influences on the fate of the most important river of East Java.

RESULTS AND DISCUSSION

Sand mining-linked Brantas River Crisis

Sand mining in the Brantas River has been going on for centuries. This activity in-

creased rapidly in the Dutch colonial era along with the construction of infrastructures such as dams, bridges, roads, factories, offices, and residences to support the interests of plantations. Infrastructure development required large volumes of sand materials, and Brantas has been the primary source. Mining was carried out by mobilizing the workforce of the population living along the Brantas River as well as the force recruited by the Dutch East Indies colonial government from other regions through the corporal work system (Purnama, 2011, p. 17).

Sand mining grew along with the development of urban infrastructure. Surabaya noted the rapid growth of residential areas for Europeans since the beginning of the 20th century (Basundoro, 2013, pp. 76-80). In addition to the settlement, the development of Surabaya as a center of progress at the eastern tip of Java was supported by the rapid growth of the industrial sector in various forms (Dick, 2002, pp. 264-267). Infrastructural development, which continued to grow, needed increasing volumes of river minerals, mainly sand. Even the demand for sand did not only come from Europeans, but some also came from indigenous people who began to adopt more permanent housing. These two sources of demand became the driving force for the development of commercial sand mining, which started to bloom mostly since the beginning of the 20th century (Jasa Tirta, 2012, p. 13).

In the beginning, sand mining was traditionally carried out. River sand was mined by diving into the riverbed using *cikrak* or *cungkre*. From the bottom of the river, sand was collected on a boat until it reached a specific volume. The boat, which has been filled with sand, was then taken to the edge of the river to be moved to the field by using sand put on the head. The people in Kediri called the workers cool coolies. Manual sand mining requires around 17-20 people per boat (Mondir, personal communication, June 28, 2019). The demand for Brantas sand for building materials continues to grow, along with the increase in infrastructural develop-

ment in East Java. Brantas sand has been in excellent order because of its good quality. The increasing need for sand made manual sand mining unable to meet market demands.

The use of conveyors began to be adopted in mining activities since the mid-1980s to solve this problem. Mining was still done manually, but in the transfer of sand from the boat to the truck, a conveyor machine was used. In the form of a rubber conveyor connected to two or more pulleys rotating through which sand was transported from the boat to the top and then flowed into the tailgate (Mondir, personal communication, June 28, 2019). Sand mining with conveyor machines usually involved 9-10 people per boat (Supriono, personal communication, June 28, 2019). Based on the jobs they performed, the sand mining workers were divided into two groups, namely *bojong* coolies and *cutat* coolies. *Bojong* coolies refer to sand miners who dive in the riverbed to get sand, whereas *cutat* coolies is a local term for sand mining workers who move sand from a boat to a conveyor's aid. The use of conveyors indeed increased the volume of sand they extracted from the river, but demands for sand have also grown much faster. The markets came from building contractors in various regions in the East Java province, especially Surabaya, Gresik, Tulungagung, Trenggalek, Blitar (Mondir, personal communication, June, 28, 2019).

Since the mid-1980s, the practice of mining the Brantas River sand began to change with the development of mechanical mining implements. This new model of sand mining activity was characterized by the use of a diesel engine that functioned as a sand-suction tool (*Bakesbangpol Archive No.3080*). This machine worked to suck sand through a pipe that extended directly to the edge or middle of the river with or without having to use a boat (E. Sodik, personal communication, June 27, 2019). Robust diesel engine power sucked up sand along with gravel from the riverbed and channeled it directly to the riverbank. The suction machine was also

equipped with a filter that separated the rock from the sand, and the sand went straight into the truck bed (Supriono, personal communication, June 27, 2019).

With the use of suction machines, the volumes of collected sand were larger than manual mining. One sand extraction machine with five workers, for example, in one day, can contain as much as 20 trucks of sand. Manually mining sand by involving five miners was only able to collect a maximum of 2 trucks of sand per day (Mondir, personal communication, June 28, 2019). Data from 2004 showed that the volumes of sand extracted from the Brantas River in Kediri Regency and Kediri Municipality reached 567,200 tons, with details of 318,500 tons coming from mechanical mining. The remaining 248,700 tons came from manual mining activities (Soekistijono, 2008, p. 204).

The main impetus for the rise of mechanical sand mining was the increased demand for sand for infrastructural development in Surabaya. Initially, automated sand mining developed in Sidoarjo and Mojokerto. With the depletion of sand reserves, mining activities shifted towards Jombang and continued into the Brantas River region in Kediri, whose sand deposits were still considered large ("Nyatakan Perang Lawan Cukong Pasir," 2010). In Kediri, the practice of mechanical sand mining emerged in several locations, such as in the Districts of Kras, Gampengrejo, Parpar, Mojo, Ngadiluwih, Purwoasri, and Kota. Automated sand mining continued to increase in number throughout the year. More and more people, especially those who live along the Brantas River in Jombang and Mojokerto, wanted to earn money easily and quickly by carrying out mechanical mining. In fact, among these people, there were unscrupulous government officials who were tempted to get involved in the Brantas sand exploitation business. The massive extraction of sand made the Brantas River sand reserves continued to decrease because the speed of the formation of sand reserves by the flow of water that transports them from the upstream region was far exceeded. As a re-

sult, the Brantas riverbed was getting more in-depth, and the impact was quickly present before the eyes, threatening the environment and economy of the Brantas watershed area. The following section will discuss its repercussions.

Sand Mining Impacts

The acceleration of the Brantas River sand mining had a serious impact on the environment and local society. As a form of extraction of minerals from nature, the effects of mining activities depends mainly on the type of extraction technology, and the available mineral deposits. Historical perspectives on the mining of the Brantas River sand show that changes in mining resources have turned them from a blessing into the disaster. The pursuit of maximum profits through the accelerated exploitation facilitated by the adoption of sand-suction technology has brought considerable infrastructural damage, economic losses, and threats to the Brantas riverine ecosystem.

The long-standing Brantas sand mining has been traditionally seen as economically and environmentally beneficial. Brantas River sand mining provided a source of income for miners and essential materials for infrastructure development. Mining also reduced the risk of flooding due to the silting of rivers resulting from the accumulation of volcanic material sediments from Mount Kelud. Siltation of the riverbed reduced the capacity to accommodate the large volume of water in the rainy season, thereby increasing the threat of flooding. Sand mining prevented siltation and maintained its depth so that the river could hold a greater volume of water. Sand mining, to a certain extent, has long functioned in the framework of flood-linked disaster mitigation because it increased the capacity of rivers to reduce the risk of water overflowing (Faturrohman, 2012, p. 15).

The broad benefits of sand mining disappeared with the spread of mechanical sand mining. Automated sand mining has deepened the Brantas riverbed. In a letter from the Regional Secretary of East Java

Province, Drs. Soemarjono Hadikoesoemo told the Head of the Ditsopol of East Java on 9 December 1987 that the Brantas riverbed had decreased between 1-2 meters and caused the disruption of the function of the irrigation intake building in the dry season (*Bakesbangpol Archive No. 3080*). Perum Jasa Tirta Kediri as the manager of the Brantas River in the Kediri region, recorded a decrease in the Brantas River base from 2004 to 2009. In 2004 the Brantas River base had fallen between 3-4 meters, and in 2006 the decline had reached 8 meters (Mahmudi, 2012, p. 12). Head of the Kediri Regency Environmental Office, Didik Eko Cahyono, in 2010, stated that the depth of the Brantas River, which was initially 20 meters, increased with a range of 6-12 meters ("Ungkap Kerusakan Lingkungan," 2010). The increasing depth of the Brantas River bottom had a devastating effect on irrigation buildings, flood control, bridges, residential buildings, and yards located above and along the Brantas River basin.

Concerns about the adverse effects of sand mining that damaged bridges and river channels have started to be voiced since 1984. General Leader of the Brantas River Basin Development Project, Ir. Roedjito DM Dipl, in his letter to the Governor of East Java, dated 20 July 1984, reported damage to the Porong Bridge and Permisan Bridge that endangered traffic safety (*Bakesbangpol Archive No.3080*). The threat of injury did not only occur in the Sidoarjo region but also in other areas. In the East Java Deputy Governor's Office Note Soeparmanto to the Governor of East Java on 10 November 1986, it was mentioned that the Bumi Tarik Foundation carried out the mechanic sand mining activities damaging the Porong Sidoarjo bridge. While in the Kedung Bocok Village, the activities were done by the chief of Sebani Village, Simin, and his son, Suharto Sumoredjo. They served as the head of Mliriprowo village. Reported damage also occurred at the Brantas River concrete embankment

around the Mojokerto Toll Bridge (*Bakesbangpol Archive No. 3080*).

The increasing depth of the Brantas River also damaged irrigation buildings and other public facilities. The Waruturi Dam in Gampengrejo Subdistrict was reported to be hanging and decreasing its vital capacity, which was very crucial to regulate irrigation in the Kediri, Jombang, and Nganjuk areas (Fathurohman, 2012, p. 16). In Mojokerto, sand mining caused the functioning of the Sipukadon Sipon in Gedek District and Gotan Intake in Kudu District, which interfered with the irrigation of paddy fields (*Bakesbangpol Archive No. 3080*). At least 67 public facilities were reported in bad condition, some of which were severely damaged (Jasa Tirta, 2012, p. 34). The Dutch built Mrican Bridge connecting the western and eastern regions of the Brantas River was reportedly falling. The supporting iron legs hang because the underlying sediment was gone.

On 28 April 2010, the Mrican Bridge was even closed and awaiting repairs because the conditions endangered the users' safety. The bridge was reportedly broken along 15 meters and curved in the middle after the collapse of its poles hit by a sand mining boat ("Ditabrak Perahu Penambang, Jembatan Mrican Tutup Total," 2010; "Jembatan Mrican Ditutup Sengsarakan Warga," 2010). Damage also befell the newly built Semampir Bridge in 1995 because its foundation collapsed due to eroded sediment ("Benang Kusut Penambang Pasir Sungai Brantas: Sedi-men Pasir Tersedot, Pondasi Ambles," 2010). The damage was also reported to occur on the Brawijaya Bridge that connects the western and eastern Kediri City, which is divided by the Brantas River ("Jembatan Baru Kediri Tunggu Tahun Depan," 2010). Houses and yards of residents were also damaged as happened in the Mlati, Tambengbendo, and Sukoanyar villages of Mojo District, and in the Ngadiluwih village of Ngadiluwih District (H. Setiono, personal communication, June 29, 2019).

The cost to rehabilitate damaged infrastructure due to mechanical sand

mining was not small. Emergency repairs for damage in Kediri were said to have cost up to 800 billion. Overall damage rehabilitation was told to take up to trillions of funds, a burden of funds that the government indeed was could not bear ("Ungkap Kerusakan Lingkungan," 2010). Some of the damage, especially related to the loss of biodiversity of the Brantas River ecosystem, was even feared that it would not be able to recover. Observations made by Ecoton found that within six months, the biodiversity of Brantas River fish was reduced from 41 species to 35 species. The type of fish lost is the Bader group because the breeding ground disappears due to sand dredging ("Ancam Tenggelamkan Mesin Penyedot Pasir," 2010). Brantas sand mining was thus part of what Jared Diamond (2014) called "ecocide," the destruction of the environment that sustains the community. As Diamond shows through his study of the fate of various world civilizations, the failure to solve ecological problems is the path to the collapse of society. The following section will outline efforts to contain the destruction of the Brantas River environment due to sand mining.

Searching for a Solution

The adverse impact of mechanical sand mining has triggered responses from the government and the community. From the government, the answer came from the Implementing Agency for the Development of the Kali Brantas River Basin. In a letter to the Governor of East Java dated 20 July 1984, Ir Roedjito asked the governor to stop and reorganize mining activities by technical requirements that could be accounted for (*Bakesbangpol Archive No. 3080*). The emergence of responses from authorities handling the river is similar to the colonial period, which shows the initiative of those responsible for irrigation interests in promoting conservation for the sake of irrigation and hydrological functions. Borrowing the term used by Hannigan (2006, pp. 65-66), they are "claim makers" in the social construction of environmental problems, who

press their views for corrective measures through public policy.

The Governor of East Java responded by issuing a letter dated 16 August 1984 addressed to 9 district and city leaders in the area crossed by the Brantas River. In his letter, the governor instructed the cessation and prohibition of extracting sand in several locations. On 24 January 1985, the Regional Secretary of the East Java Region, Trimarjono, sent a letter to 9 regional leaders, calling for their attention back to the immediate cessation and prohibition of all sand extractions in places mentioned as prone to undermine the maintenance of development projects in the Brantas River. Their floods often threaten (*Bakesbangpol Archive No. 3080*).

Calls for curbing to regional leaders did not bring many results. The Assistant Governor, together with the Deputy for Public Works and the head of the Lower Brantas and Central Brantas Projects who conducted a field survey in December 1985, sent a letter to the governor of East Java. The report mentioned the difficulty of banning sand mining and the condition of some embankments which were prone to breaking during the rainy season. On 5 November 1986 the Governor of East Java Wahono issued a letter to 9 regional leaders along the Brantas River to be more assertive and not hesitating to curb the sand mining of the Brantas River, as well as coordinating with the Regional Public Works Service and mining permit examination (No. *Bakesbangpol Archive No. 3080*). Even the Pangdam V / Brawijaya also sent a letter to the government of East Java Province, which contained requests for information related to the problem of controlling Brantas River sands. In response to his message, Regional / Regional Secretary of East Java Province, Drs. Soemarjono delivered evidence of correspondence between regional leaders and affirmation of the governor's policy in curbing the taking of the Brantas River sand and its implementation in the region (*Bakesbangpol Archive No. 3080*).

The problem of mining has become even more complicated during the reform

era with the decline in compliance with the law. Mechanical mining practices were widespread and challenging to control. The government responded to this problem in various ways. In terms of regulation, the Governor of East Java issued Governor's Decree No. 29 of 2003 concerning the management of sand mining businesses along the Kali Brantas River, Surabaya River, Kali Porong, and Kali Marmoyo. Two years later, the Regional Regulation of East Java Province No. 1 of 2005 was issued concerning the control of mining business in class C minerals in the river area. This set of regulations was intended to provide a more legal protection in controlling sand mining activities. Commitment to resolve the problem of destructive sand mining was manifested by all regional governments whose territories are crossed by the Brantas River by declaring a "war" against the Brantas River sand mining.

In the field, enforcement of regulations was carried out both persuasively and through raids. A mechanical sand mining raid activity, for example, was carried out in Semampir Town of Kediri City in April 2010. In this operation, a joint apparatus collapsed conveyor buildings ("Penambang Pasir kembali, Jembatan Mrican Retak," 2010). The combined forces of the Kediri PP Satpol and TNI conducted raids in Ngadiluwih and Mojo Districts. The control operation seized mining equipment and secured it to the Kediri Regency Satpol PP Office ("Penambang Pasir kembali, Jembatan Mrican Retak," 2010). The mechanical sand mining activities were devised up to 14 July 2010. After that, these activities were considered criminal acts in violation of the law, which were threatened with legal sanctions ("Penambang Pasir kembali, Jembatan Mrican Retak," 2010). This case did not make the mechanical sand miners afraid. They resumed operations, inviting control operations. During a raid on 12 August 2010, authorities seized and sank two units of sand-suction diesel into the river bed ("Jembatan Baru Kediri Tunggu Tahun Depan," 2010).

Not all control operations were always successful in the field. Some of them leaked so that the miners could escape and hide the mining equipment before the authorities arrived at the location (“Benang Kusut Penambang Pasir Sungai Brantas (1): Ada Pemodal Besar yang Menjadi Bandar,” 2010). To run the ambush of the enforcement apparatus, a mechanical miner at the Waruturi Dam Gempengrejo Kediri was reportedly using a method of moving by boat (“Penambang Pasir Waruturi Siasati Razia Petugas”, 2017). The failure of the policing operation pushed the government to find another way. The municipal government of Kediri, for example, approached the mechanical sand mining community and invited them to negotiate a solution. An agreement was reached and was signed by both parties on 20 October 2010. In this agreement, the miners said they were willing to carry out the profession from miners to sand traders. They would collect sand directly from sand pockets in the Udanawu Blitar area or the Kelud Mountain lava flow.

Meanwhile, the municipal government promised facilities in the form of locations to sell sand and capital assistance. In practice, the agreement was challenging to implement. The day after the deal was signed, several miners had resumed operations as reportedly taking place behind the Kediri’s DPRD building (“Sehari Diteken Sudah Dilanggar,” 2010).

Some people who felt the adverse effects of mining voiced opposition to mechanical mining activities in the form of aspirations and harsher actions. Residents of Jongbiru Village in Gempengrejo district and Jabon Village of Banyakan district were reported to drive out the miners and even more extreme, they were forced to set fire to the boats of mechanical miners who did not heed their refusal. However, this effort was unsuccessful in stopping the activities of illegal miners who received capital injections from the sand mafia bosses who supported them. Capital support for mining took a variety of forms, such as sand extracting diesel engine

loans, conveyors, boats, and other equipment (“Benang Kusut Penambang Pasir Sungai Brantas (1): Ada Pemodal Besar yang Menjadi Bandar,” 2010; “Benang Kusut Penambang Pasir Sungai Brantas: Sedimen Pasir Tersedot, Pondasi Amblas,” 2010).

Community rejection, regulation, control operations, and negotiations did not succeed in stopping sand mining in the Brantas River. The main factor that caused the failure was the weakness in law enforcement due to the involvement of many elements among the government and political figures in the Brantas River sand business (“Razia Penambangan Pasir Liar DAS Brantas Kediri,” 2012). These elements were often called “promoters,” whose existence was justified by several people, both from the government circles and mining actors. Bambang Sumarjono, the former head of public service in Kediri, said that the government officials who illegally collaborated with the mechanical sand miners were some of his friends. Eko Budi Santoso, a former member of the Satpol PP and Kediri Transportation Department staff, said that not only were officials, but some promoters were also political actors (“Sehari Diteken Sudah Dilanggar,” 2010). A respondent who was also a sand mining operator in Ngadiluwih stated that he had operated two sand extractors belonging to local security officials (Supriono, personal communication, June 28, 2019).

CONCLUSION

The sand mining-linked Brantas River crisis was born as a consequence of changes in the extraction technology, from traditional mining to mechanical one. Sand mining, which initially provided economic benefits and mitigation of the Brantas river flood disaster in tens or even hundreds of years, turned into a disaster with the development of mechanical mining. The demand for sand has increased sharply in line with infrastructure development, especially in the metropolitan Surabaya and its surrounding areas, making Brantas sand a

promising product for immense profits and was widely sought after by sand mining entrepreneurs. From Mojokerto and Jombang, mechanical sand mining extended to the Kediri region and the upper Brantas River region, where the sand deposits have not been massively exploited. The adverse impact caused by mechanical sand mining immediately arose because the extraction speed far exceeded the rate of the formation of sand sediment by the river flow that transports it from its source on Mount Kelud. Many buildings located above and along riverbanks were damaged and could no longer function well. Some buildings and gardens were even lost due to landslides provoked by the steep slope and growing depth of the Brantas riverbed. In addition to the economically detrimental impact, mechanical sand mining has presented signs of an irreversible environmental disaster.

Damage to the Brantas River due to anthropogenic factors originating from mechanical mining indeed raised an awareness that environmental crisis is occurring. This awareness grew not only among the government, but also among non-government organizations, and especially citizens who felt the detrimental effects of mechanical sand mining in the form of damaged transportation infrastructure. Various measures to overcome the problem of automated sand mining have been carried out, ranging from regulatory basis, negotiations, control operations, to legal prosecution of violators. However, all efforts that have been made have not been effective in stopping sand mining operations. The environmental crisis of the Brantas River due to mechanical sand mining has not shown any signs of coming to an end until now. In fact, it seems even worse due to other causes affecting the fate of this river, especially pollution. More challenging and collaborative actions to protect the Brantas river ecosystem are a must and urgently needed. Otherwise, the lamented death of the life-giving element of the environment will inevitably come very soon.

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