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UTILIZATION OF SYPHON METRO KEPANJEN AS OUTDOOR LEARNING SITE FOR HISTORY STUDENTS

1st Joko Sayono
Faculty of Social Science
Universitas Negeri Malang
Malang, Indonesia
joko.sayono.fis@um.ac.id

2nd Lutfiah Ayundasari
Faculty of Social Science
Universitas Negeri Malang
Malang, Indonesia

3rd Wahyu Djoko Sulistyo
Faculty of Social Science
Universitas Negeri Malang
Malang, Indonesia

4th Ronal Ridhoi
Faculty of Social Science
Universitas Negeri Malang
Malang, Indonesia

***Abstract*— Malang is one of the largest sugarcane plantations in Java in the colonial ruler. Several factors that support this success was soil fertility, supply of water, and infrastructure. Although this area has two kinds of topography namely lowland and hills but the colonial still able to manage these regions as one of the best sugarcane producers. The challenge is to be solved by developing the two different irrigation namely irrigation systems *romeijn* and syphon. These systems that supports Malang as one of the center of sugarcane in Java. In recent days, this infrastructure still can be witnessed, but unfortunately it is not many people are aware of the existence and function syphon that extends above the Metro river, Kepanjen. Therefore, this article try to discuss about the history of syphon metro Kepanjen and its function. Then, offer an outdoor learning scheme by using the site for the students Department of History. This was undertaken with the aim disseminate history of syphon to the community so that they have sense of belonging to preserve this site and took a very important lesson to the existence of the site.**

Keywords*— *Syphon, Malang, outdoor learning

I. INTRODUCTION

Malang is hinterland region which is famous with fertility and prosperity. Those factors have been interesting a number of community members to stay in this place. Since, Hindu-Buddha period this region has become a center of settlements for example the existence of two kingdom namely Dinaya and Singosari. In the next time, especially in Colonial period Malang not only use as the main settlement and recreation but also as one of the important plantation area in Java.

The position of Java as one of the most important regions that produce sugar can has been indentified by [1] he say that Java is in second place after cuba as producer of sugar cane in the world, about one per eight the world the demand of sugar produced in this region by employing 90 thousand permanent workers and millions of workers off of all time cropping and milled. This study has been exposed by [2] he found that only three places in Java which does not become sugar cane plantation namely top of Semeru Malang, coastal region of Yogyakarta, and west of Tegal. This showed just how much most of areas on Java used as the area for the sugar cane plantations, including those Malang.This region is well known as one of the sugarcane producing area in the Colonial period ([3], [4]). Statistically, Malang areas contributed 28.76 % sugar confection in East Java [5].

However, this article would not discuss plantation development, but it will discuss about the other side of succesful story of Malang as sugarcane producer in colonial era through study of site that was constructed by colonial regime in South Malang namely Syphon Metro Kepanjen. In recent days, this site is located in district Sengguruh (currently better known in Kepanjen). Gutters pipe siphon is one of supporting infrastructure for development sugarcane in South Malang, especially Kepanjen. The function of Syphon as important device to irrigate sugarcane plantation. It is due to Kepanjen has hilly topography, to cope with this problem in the early 20Th century Colonial government build a siphon to make it easier for irrigation developing sugarcane plantations in this area.

Syphon Metro Kepanjen is the important site that have to known by history student when they learn about the development of sugarcane plantation in South Malang. During this time, syphon site is not popular among the community, even though history student. This ignorance is caused by the lack of source and historiography about it. In addition, the absence of syphon from historiography make its information does not expressed both for academicians and the general public. Therefore, using syphon as media in outdoor learning especially in History and Local Wisdom course for history student in State Malang University will be one of sollution to make this site popular. Through this activity, hopefully that student not only has comprehensive knowledge, but also understand that irrigation device such as syphon has important role for the success of plantation.

II. FINDING AND DISCUSSION

A. Sugarcane Plantation in South Malang

Malang have topographically unique compared with other parts of East Java. This area ringed by mountain ranges

active and passive. In the north side there is mountain range of Arjuno-Welirang, Kawi-Butak mountains in the west, Kendeng hill in the south, and a row of the hill country of Bromo-Tengger-Semeru in the east. It means that Malang is a fertile valley which have good availability of water and good ecology for human life. The detail of topography can be seen on the following map 1.

Based on map, it can be seen that the ecological condition of Malang especially in the plantation region is devided into several areas. Coffee plantations suitable planted on a high altitude such as Ngantang, Penanggungan, Karanglo and Pakis .While for sugarcane is more suitable planted on plains region that is in quite low and not too cold, as in Sengoro district (Sengguruh) and the western of Gondanglegi. In addition, based on the Hudiyanto's research [4] tobacco also have been planted for the district Pakis that are relatively close to the hill country of Bromo-Tengger-Semeru. Even tobacco plantations owned by financier Chinese ethnic Han Khoen Ko is also have a license from colonial ruler.

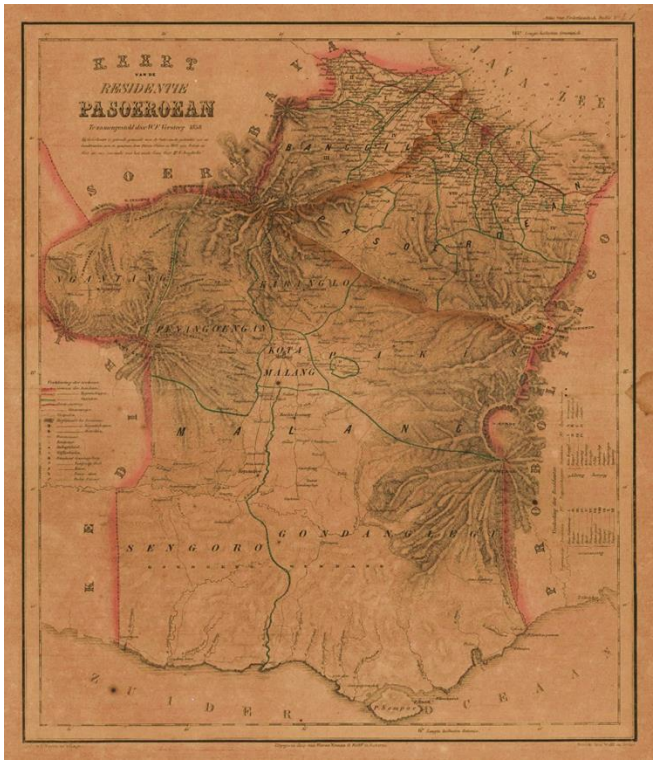

Fig. 1. Malang Region (sumber: www.maps.kit.nl)

Deviding basis of plantation in Malang is determined by colonial government and financier based on suitability of each plant with their environment. [4] explained that coffee is the main product in north and west Malang. Whereas, sugarcane is produced in south, soutwest and northwest of Malang. The centre of production in Kepanjen, Gondanglegi, Dampit, Bululawang, Sumberpucung, Wajak, Pakis, Tumpang, Ponokusumo, dan Sumbermanjing. Then, processing cane into sugar is done in several factories such as P.G. Krebet, Kebonagung, Sempal Wadak, dan Panggungrejo.

Although south Malang have the potential sugarcane, but not yet found particular historiography that describe this matter, while this study is very important. During this time, the study of sugarcane plantation in Malang only studied with social and economic point of view ([4]; [6]; [7]; [8]). Whereas, studies on supporting infrastructure plantations is rare. While, infrastructure like syphon in Kepanjen is the main factor to support plantation ecology as irrigation device. Therefore, it is required a new perspective to re-write history of plantation in Malang including the supporting infrastructure such as syphon. This is done to enrich historiography of plantation in Malang. The study of irrigation and syphon site in Kepanjen will be described further in section next.

B. History of Irrigation in South Malang in Colonial Era

The study of sugarcane plantation alsways related with socio-economy aspect, such as the community around plantation, labour, the number plantation product etc. While, the study of supporting infrastructure among sugarcane plantation like information about irrigation is limited. Whereas, this infrastructure is the main factor of the success of Java as second sugar exporters after Cuba. Irrigation can be broadly defined as the practice of applying additional water (beyond what is available from rainfall) to soil to enable or enhance plant growth and yield, and, in some cases, the quality of foliage or harvested plant parts [9]. This activity has been done by human to support their life. Historically, the earliest archeological evidence of irrigation in farming dates to about 6000 B.C. in the Middle East's Jordan Valley [9].

The discovery of a trace irrigation business in indonesia was found since the Hindu-Buddha period. For example, an excavation Candrabaga and Gomatti rivers by Purnawarman, king of Tarumanegara as the effort to avoid flood and drought resilient crops. Other example can be seen until now are segaran a relic of Majapahit kingdom complete with the canals as a stream of water to irrigate the rice fields. Irrigation activities which a man commits the more advanced with the advent of the science as physics, mathematics, chemical, biology, and mineralogy ([9]; [10]). The progress and expansion of irrigation in indonesia has been increasingly thrive in colonial era especially in Cultivation System period until Ethical Policy. Such phenomena as it was not only occurred in indonesia but also in another colonized countries like in Vietnam and Burma under French colonization [11].

The Dutch colonial government in Indonesia pay special attention to the problems of irrigation because of the construction of this infrastructure is an important factor for the success of sugar confection which they sell in the market. Several steps they do is to set up the bureau of the ministry of special as public work, allocated special funds that reached its peak in 1920 with around ten million guilders per year and established a chair in Delft in 1903 for East Indian Hydraulic Engineering and in 1921 a similar chair was created at the newly established Polytechnic in Bandung [10]. In general [10] dividing the development of modern irrigation in colonial Java traced its origins from a small number of unconnected headworks (1830-1885), through to the execution of the earliest projects for entire areas accompanied by managerial directives (1885-1920) and

finally to the realisation of entire series of systems of irrigation and control (1920-1945).

Malang as the one of the most important area that produce sugarcane become a priority in developing irrigation infrastructure by colonial government. Based on the step of developing irrigation system that conduct by Ravesteijn, Malang stated in second step of this system where irrigation tunneling has been done under manajerial directives. [11] said that between 1890 to 1907 there are 19 irrigation project that do by colonial ruler and most of them is located in East and Central Java. Irrigation canal in Malang that was built by colonial ruler is Syphon Metro Kepanjen that can be seen until this day. Syphon is the pipe that use to move the water with specific measure and pressure. As Garret says [12] that syphon is a device or medium to move wter through the pipe with certain size from upstream (the higher regions) toward downstream (the lower region). Usually syphon is used in daily life such as pipe in toilet, agricultural irrigation, and petrol mover in car tank.

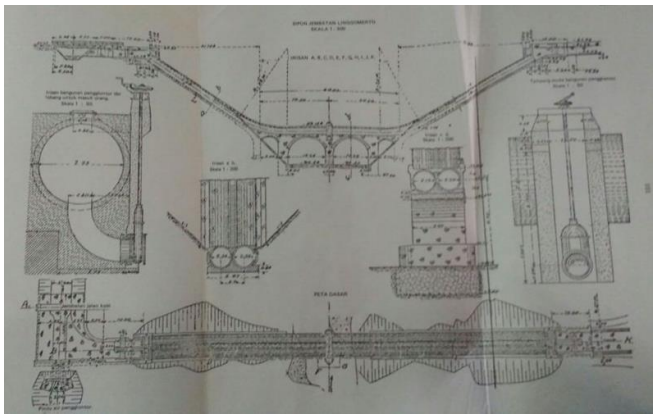

Fig. 2. Design of Syphon Metro [13]

This article not going to dicuss about syphon technically, but it will be study about the use of syphon as medium in outdoor learning activity for history student. In the prior explanation has been discussed that Malang have unique topography, especially in south region including Kepanjen that have many hills. Sugarcane in this area required an adequate supply of water, so this area need particular irrigation system that suitable with it's environment. One of the suitable systems is syphon due to it impossible if the ruler built many dams to canalized the water from the one hill to another hill. This condition is different with another low-land region such as Surabaya, Mojokerto, Sidoarjo, Pasuruan, Probolinggo and Basuki. In this region canalized water is easier rather than in Malang. Irrigation system in low-land region usually use romein gate or rolak (see fig 2).

The form of plantation and agricultural irrigation in Java are dominated by dam .Open-close system water gate done for irrigation plantation and agriculture in Java. It is also prevent the occurrence of floods due to overflowing water the large rivers in Java, such as Bengawan Solo and Brantas river [14]. Cultivation System policy that applied by the governor general of van den Bosch in 1830 cause to restructuring the irrigation systems in Java. At first indigenous farmers use dam as irrigation system, but a lot of times it can not prevent flood disaster, an excess or deficiency water at their crops.Then colonial ruler come up with their modernization through Bureau of Public Works to cope with irrigation problem [11]. One of the first projects was namely Stuwdam Lengkong (now called Rolak Songo) in 1854, in the Brantas river, Tarik district, Sidoarjo [15].

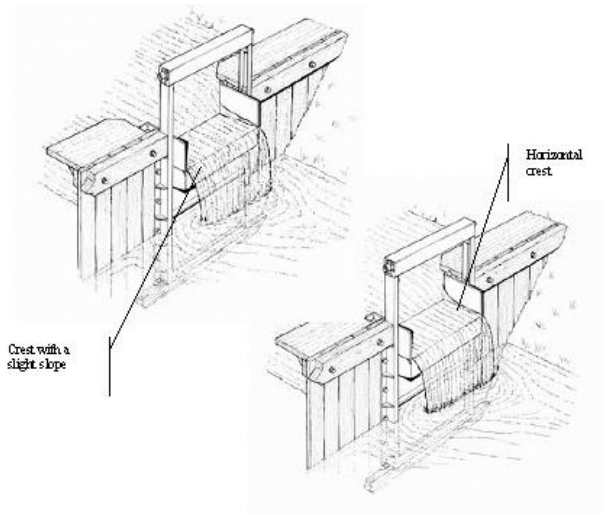

Fig. 3. Romijn/rolak as irrigation system in low-land region [11]

In the case of Malang, not only use Romeijn or rolak system but also use syphon system as irrigation especially in sugarcane plantatio in Sengguruh district (now Kepanjen). It used due to Kepanjen region has hilly topography. The function of syphon is canalized water from one hill to next hill (see picture 3). Hinterland and hill have thir own level of difficulty in term of irrigation. Building gutter pipe, dam and artificial river become the main choice to develop sugarcane plantation in that time.

Fig. 4. Syphon site in Kepanjen

Syphon site extending on Metro River that connected Kepanjen with Talangagung. Colonial ruler was built syphon in 1903 to irrigate rice fields and sugarcane plantation in west Kepanjen (Talangagung, Jatikerto, Slorok, Ngebruk, Sumberpucung, and Karangkates) which is usually got drought as a result from lack of supply of water (situsbudaya.id, 2017).

C. Utilization of Syphon Metro as Outdoor Learning Site

Outdoor learning is learning activities that implemented in outside the class by using all of that is, it was an object good nor environment as medium and source of learning. This learning activities not restricted to one outside a space activities, but any activity that is performed outside a space activities related to increase knowledge can be categorized as

outdoor learning [16].The statement in line with the opinions of [17] stated that outdoor learning can be seen as the form of learning activity that taking place in outside the class. Learning activities that designed to give real experience to the student so the process of learning become more meaningful and concrete [18].

Outdoor learning and can be applied to all the level, kids and adult. Based on statement in Learning and Teaching Scotland [19] learning process in outdoor can really enrich curriculum and make learning to be fun, meaningful and relevant for children and the young man. [20] Learning activities outside the classroom have to well prepared including pay attention to several factors such as student preferred learning style, students' phobia and student learning experience. This is done with the aim that learning can be exactly reach the instructional goals.

TABLE I. OUTDOOR STUDY ACTIVITY

No	Step		Activity
1.	*Preparation*	*1.*	*Lecturer set an indicator that will be reached by students*
		2.	*Lecturer divide students into groups*
		3.	*Lecturer set an object and time*
		4.	*Lecturer have to check readiness of students either physically and psychologically Lecturer melakukan apersepsi*
		5.	*Lecturer explain the goals of the activities that must be achieved by students.*
		6.	*Lecturer explain the prior knowledge about the site*
2.	*Implementation*	*1.*	*Lecturer describe general condition of the site*
		2.	*Lecturer accompanied the students get to the site*
		3.	*Lecturer give time to students to explore the site*
		4.	*The students work in team to explore and study the*
		5.	*Lecturer and student discussed about the findings*
		6.	*Lecturer and student draw any conclusions from the various findings*
		7.	*Lecturer and student finished their outdoor learning activity*
3.	*Follow up*	*1.*	*Lecturer explain the project that must be done by student related with the site.*
		2.	*The students make observation report*
		3.	*Evaluation*

Using outdoor learning model give many advantages to the ecture and student for example give more interesting learning experience, fostering resposibilities and enviromental care ([21], [22]). In addition, the links between knowledge in the classroom and the real world outside of class can help develop skill, knowledge, and understanding in the meaningful context (www.educationscotland.gov.uk). Tohose is skills are the important equity that must have by history teacher candidates and a practitioner of the history to make they have sense of belonging through the historical sites in their neighborhood. During this time, only heritage site that accept special attention from the government. In contrast, another historical site often ignored even sometimes be demolished. The existence of those site is very relevant if used as the object of outdoor learning. Hopefully, through outdoor learning activity the student will not only can increase the competency academic but also concern and attention to participate preserve the site [23]. In addition personally students will have a very meaningful experience from the activities of outdoor learning applied either physically, psychical and cognitive because they saw and observe a direct object of the study [24].

Based on those explanation, using syphon as the site that visited in outdoor learning activity for history student is seen as the one of way to promote the existence of the site in order to make it more known and preservated. In other words, through this activity the student can explore further information about the history of syphon as well as its important role in a golden age of developing sugarcane plantations in Malang.The other thing that it is also important to undertake the activity reflection on the latest condition agricultural life of an Indonesian society tends to be dominated by foreign, as an example every year the government should import of sugar to fulfilling its national demand. Whereas, in previous century sugar confection in Java is the largest of second in the world after Cuba. By studying the condition and the management of sugarcane plantations in Java especially Malang on the colonial ruler under technology regime is expected to be capable of being discovered the colonial management possitive aspect as a recommendation for agricultural and plantation progress in Indonesia future.

In the implementation of outdoor learning by using syphon as the visited site needs to be designed as in the table 1. The instuctional design can be implemented to several course that related with the existence of Syphon Metro Kepanjen such as Indonesia in Colonial Regime or History and Local Wisdom.

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