



THE MANAGEMENT OF NATURAL RESOURCES IN 10 - 14 AD, THE HINDU-BUDDHIST ERA, BASED ON OLD JAVANESE INSCRIPTION IN THE MALANG HIGHLANDS, EAST JAVA: ENVIRONMENTAL ARCHEOLOGY STUDY

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ABSTRACT

Based on geological studies, the Malang Highlands, East Java, Indonesia is a former ancient lake that dried up and turned into a wide and fertile plateau. Such natural conditions allow the growth and development of Hindu-Buddhist civilization in 10 - 14 AD, namely the socio-cultural life of a well-ordered community. This includes the structure of natural resource management by the state and society. Around 19 old Javanese Inscription certificates were issued by the king at that time. Some of these inscriptions contain the standard rules of the kingdom in relation to the management of natural resources, but so far there has not been an in-depth study of the rules of natural resource management in this region. The study was conducted by literature study, toponymy analysis, geographical spatial analysis on topographical maps, and interpretation of natural resource management, through an environmental management approach. The results showed that there were rules for felling trees in primary forest areas, state forest management for the benefit of maintaining sacred buildings and there were rules for the sale and purchase of endemic plants, namely spices.

KEYWORDS

Hindu-Buddhist era, 10-14 AD, Malang Highland, natural resources, old Javanese Inscriptions

ABSTRAK

Berdasarkan studi geologi, Dataran Tinggi Malang, Jawa Timur, Indonesia merupakan bekas danau purba yang mengering dan berubah menjadi dataran tinggi yang luas dan subur. Kondisi alam yang demikian memungkinkan tumbuh dan berkembangnya peradaban Hindu-Budha pada 10 - 14 Masehi, yaitu kehidupan sosial budaya masyarakat yang tertata rapi. Ini termasuk struktur pengelolaan sumber daya alam oleh negara dan masyarakat. Sekitar 19 akte Prasasti Jawa kuno dikeluarkan oleh raja saat itu. Beberapa prasasti tersebut memuat aturan baku kerajaan dalam kaitannya dengan pengelolaan sumber daya alam, namun sejauh ini belum ada kajian yang mendalam tentang aturan pengelolaan sumber daya alam di wilayah ini. Penelitian dilakukan dengan studi literatur, analisis toponimi, analisis spasial geografis pada peta topografi, dan interpretasi pengelolaan sumber daya alam, melalui pendekatan pengelolaan lingkungan. Hasil penelitian menunjukkan adanya aturan penebangan pohon di kawasan hutan primer, pengelolaan hutan negara untuk kepentingan pemeliharaan bangunan suci dan terdapat aturan jual beli tanaman endemik yaitu rempah-rempah.

KATA KUNCI

Zaman Hindu-Budha, 10-14 M, Dataran Tinggi Malang, Sumber Daya Alam, Prasasti Jawa Kuno

INTRODUCTION

The Malang Highland region is a geological area and based on research by Mohr (1922) and Bemmelen (1949) is a former ancient lake that has dried up, then turned into a very wide and fertile land (Mohr, 1922; Van Bemmelen, 1949). This happened towards the end of the Upper Pleistocene until the beginning of the Holocen. The highland in the west is surrounded by the Kelud-Butak-Kawi Volcano group, on the north side surrounded by the Anjasmoro-Arjuno-Welirang-Penangungan Volcano group, on the east side the Tengger-Bromo-Semeru Volcano group and on the south side is surrounded Southern Mountains (Daldjoeni, 1984; Van Bemmelen, 1949).

In the highlands or valleys, there are several hills, namely hills of Gunung Layar, Gunung Ronggo, Gunung Katu, Gunung Wedon, Gunung Wukir, Gunung Buring and hills of Gunung Wedi. There are also some rivers namely Kali Lajing, Kali Amprong, Kali Lesti, Kali Metro and Kali Bangau. Some of these rivers merge into large rivers namely Kali Brantas ((F.J.M.v Liempt, 1939). Because the Malang Highland as a geological area is surrounded by volcanic groups and limestone mountains and is drained by several rivers that never dry up, the geological area by Mohr (Mohr, 1922) is categorized as a very fertile area. In this connection, based on the determination of Vink (Vink, 1983) and the description of Poerbatjaraka (Porbatjaraka, 1951) towards in 10-14 AD in this geological region, a Hindhu-Buddhist civilization with a highly organized level of culture was developed (Koentjaraningrat & di Indonesia, 2002; Rahardjo et al., 2011). Including cultural arrangements related to natural resource management, namely management of tropical forest cover (Brandes & Krom, 1913; Pigeaud, 1960; Suhadi & Richadiana K, 1996).

Research on the management of tropical forest cover in this region before in 10-14 AD has never been done by previous researchers. The research is only limited to the toponymy analysis based on Old Javanese Inscription and does not involve the determination of geographical spatial in this region. Brandes (BRANDES & KROM, 1913) in the transcript of the Gulunggulung Inscription (851 Ç = 929 AD) *voorzijde* - line 4: toponymy about Alas i Bantaran is not accompanied by an explanation of the geographical conditions and geographic spatial location of Alas i Bantaran. Likewise, the toponymy transcript of Alas Lor in the Muñcang Inscription (866 Ç = 944 AD) *voorzijde* - line 8, Brandes does not include an explanation of the geographical condition of the Alas Lor in the geographical spatial and how was the relation of the Alas Lor in the context of the cultural order at that time? The same was done by Pigeaud (Pigeaud, 1960) on the study of the Katiden Inscription transcript (1317Ç = 1392 AD) *recto*-line 5 about the existence of natural resources on the Alas Alang-alang i Gunung Lëjar, also not accompanied by a study of geographical spatial and its relation to order culture at that time. Also about toponymy transcript of the toponymy Alas Kakayu on the same inscription *verso* - line 1, there has been no in-depth study in relation to the geographical spatial and cultural order in 1392 AD.

From the description above, it can be stated that the mention of toponymy of natural resources, namely tropical forest cover: Alas i Bantaran, Alas Lor and Alas Kakayu have been recorded in the documents of Gulunggulung Inscription (851 Ç), Muñcang (866 Ç) and Katiden Inscription (1317 Ç). Based on the inscription, it is known that in 10 - 14 AD in the geological area of the Malang Highlands there was a tropical forest cover whose existence was officially recorded and recognized by the state. As stated by Buchari (Buchari, 1968), inscription is one type of official state document and is the primary data in historiography of Ancient Indonesian History: Hindhu-Buddha Era. This is because the inscriptions are usually written on a stone or metal plate, issued by the royal ruler, namely the king or high officials of the kingdom for the purpose of establishing an area as *sima swatantra*. Usually in the charter of the inscription contains the names of state officials, *watĕk* officials, women or village officials, forestry officials, officials of the management of sacred buildings and also includes toponymy of natural resources including natural resources of tropical forest cover: Alas i Bantaran that alas or forest of the *sima swatantra* region.

But the problem so far is that there has been no in-depth study of toponymy analysis of natural resources: tropical forest cover in geographic spaces and its relation to the cultural order of the Hindu-Buddhist era, based on Environmental Archeology studies. In connection with the problem of this research, then on this occasion, the need to conduct further research, namely toponymy study of tropical forest cover and its relation to the management of tropical forest cover by the state and community based on inscription of the 10-14 AD, through the Environmental Archeology approach (Butzer, 1982). The scope of research includes land use natural resources, natural resource use, natural resource conservation and regulation by the state regarding trade management of natural resource products (Vink, 1983) in the 10-14AD in the geological area of the Malang Highlands.

This paradigm is in accordance with the concept of natural resource management proposed by Vink (1983) that natural resource management includes land use, management of natural resources, utilization of natural resources by state institutions and communities and conservation of natural resources which are usually also called resource conservation natural power. Conservation of natural resources includes certain restrictions on the use of natural resources, controlling damage to natural resources by humans and regulating by the state on exploitation of natural resources.

METHOD

The research location is in the geological area of the Malang Highlands, the administrative area of Malang Residency, East Java Province (Fig.1). The research steps include several stages, namely data collection, data analysis and interpretation (Sharer & Ashmore, 1979). Data was collected by literature review on the data source of the Gulunggulung Inscription (851 Ç) and the Muñcang Inscription (866 Ç) of transcription and reading by

Brandes (BRANDES & KROM, 1913). It is also based on data sources from Katiden Inscription (1317 Ç) from transcription results and Pigeaud readings (1960a) and Ukir Nagara Inscription (1120 Ç) from Isatriadi transcription results and Suhadi and Richadiana reading. The literature review results are then followed up with a toponymy analysis of the names of natural resources in geographic spaces based on topographic maps and validated through surface surveys.

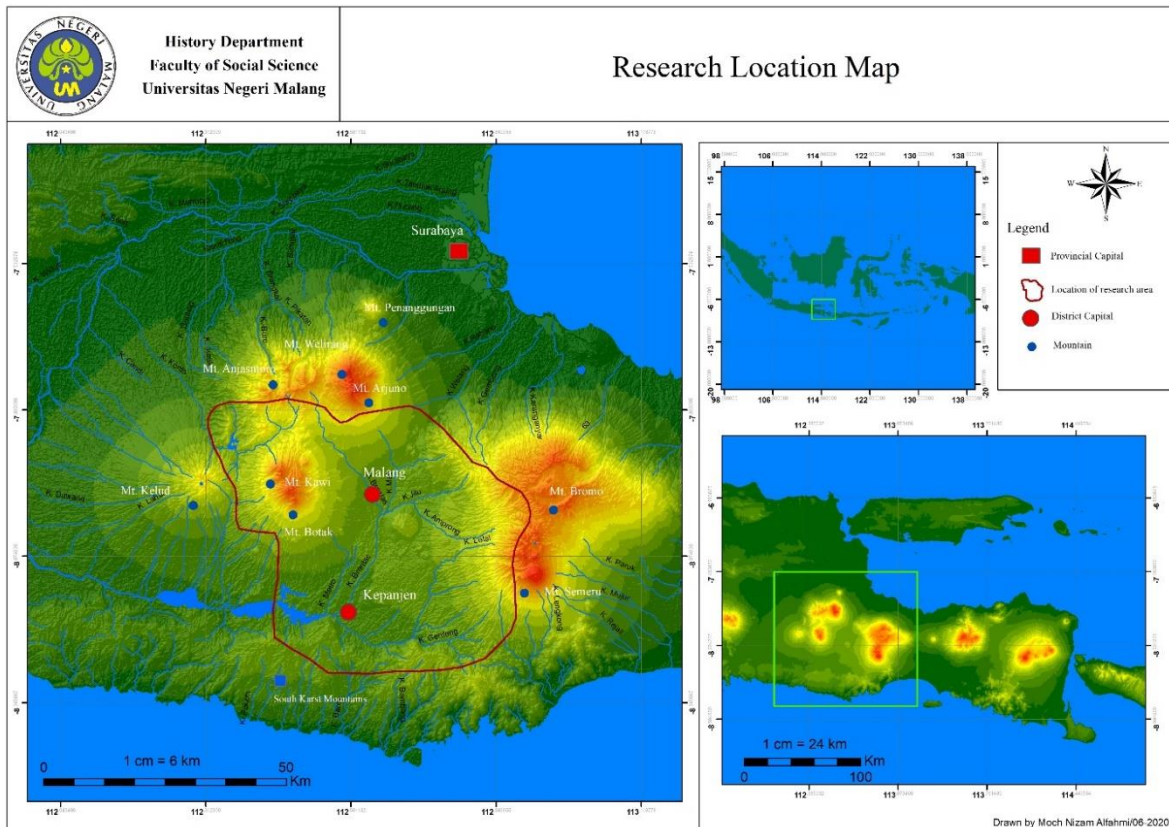


Fig.1. Reseach Location Map in Malang Highlands

The next analysis is zoological analysis through ethnozological, ethnobotany approaches, so that a description of the condition of natural resources is obtained: tropical forest cover in 10 – 14 AD, in the geological area of the Malang Highlands, within the framework of Environmental Archeology (Butzer, 1982).

At the interpretation stage begins by examining the contents of the inscription as a whole, which is related to the purpose of the inscription issued by the king, a study of "forestry" officials in the government structure, a study of the rules issued by state officials written in the inscription, a study of the types of results natural resources and study of prohibitions that cannot be violated by the public or state officials (Boechari, 1985; Buchari, 1968). The results of this study are then examined based on environmental resource management proposed by Vink (1983) namely how it relates to land use, natural resource use and how is its relationship to the

preservation of natural resources or conservation of natural resources? Based on stages of this research, a reconstruction of natural resource management can be arranged in 10- 14 AD, the Hindu-Buddhist era in the geological area of the Malang Highlands (Fellmann et al., 2007).

RESULTS AND DISCUSSION

General Description of the Natural Landscape of the Malang Highlands in 10 - 14 AD

In accordance with the recommendations of Fellman et.al (Fellmann et al., 2007) and Vink (Vink, 1983) before discussing natural resource management it is first described about the natural landscape where the natural resources are located. In this connection, the first general description of the natural landscape of the Malang Highlands around the 10- 14 AD is described first. As previously explained, the geological area of the Malang Plateau according to Mohr (Mohr, 1922) and Bemmelen (Van Bemmelen, 1949) is a former ancient lake that has dried up and turned into a vast, fertile highland.

The highlands which became known as the Malang Highland was surrounded by several groups of volcanoes and limestone mountains. On the western side of the highland surrounded by the Kelud-Butak-Kawi Volcano group and this group of volcanoes was formed since the Middle Pleistocene, then towards the end of the Upper Pleistocene, the Butak-Kawi Volcano rested as a volcano and the emergence of a new volcano namely Gunung Kelud Volcano as an active volcano until now. In the context of the development of Hindu-Buddhist civilization in 10 – 14 AD, based on the Ukir Nagara Inscription (1120Ç) plate II A, recto line 3, 4 the Butak-Kawi Volcano group is referred to as *kĕgĕr* as follows:

II A,recto line 3 and 4

3.*limpā wiñku wakul kakustā denira.mañetan kidul in ūmah tkiñ jurañ pluk sumĕnka tkiñ kĕgĕr we*

4.*taniñ sakrida malang. akalihan wacid lawan mucu pasabhanira deh limpā 20.*

From the source of the inscription, the mention of the toponymy "**kawi**" is unknown. Mount Butak-Kawi is recorded or referred to as *kĕgĕr*, meaning a hilly landscape stretching to the east, starting from the east of Pare, end to the unit area of Malang area: *sakrida malang* (Suhadi & Richadiana K, 1996). The mention of Kawi's toponymy was first recorded in Old Javanese literary sources, namely *Sārāt Pārārāton Atawa Kātuturānira Ken Āngrok* (1535 Ç) and the mention of Kawi toponymy related to the birthplace and wandering territory of Ken Angrok. The area is called *wetaning Kawi* which means an area located east of Mount Kawi (Brandes, 1920). Thus the mention of Kawi's toponymy has been recorded in the memories of human thought since the birth of Ken Angrok around 1104 Ç = 1182 AD, in 12 AD (Pigeaud 1960a). The toponymy of the Kawi Volcano is rethought in the *Kidung Tantu Pānggĕlāran* ((1557 Ç = 1635 AD) along with the toponymy of Mount Kelud is called Gunung Kampud.

On the north side, the Malang Highlands is surrounded by the Anjasmoro-Arjuno-Welirang-Penanggunan Volcano group. The earliest volcano formed, Anjasmoro Volcano was formed at the beginning of the Lower Pleistocene, then the Arjuno Volcano was formed and then the Penanggunan Volcano was formed. In the Middle Pleistocene, Anjasmoro-Arjuno-Penanggunan volcano rested as a volcano and a new volcano was formed, that is, Welirang Volcano as an active volcano until now (Van Bemmelen, 1949). In the context of the development of Hindu-Buddhist civilization in 10 - 14 AD, based on the Cunggurang Inscription (851 Ç) on the *voorzijde*, lines 7 and 9, Penanggunan Volcano was deformed and referred to as pawitra mountain, as follows:

voorzijde, line 7 and 9

7. *susukan sīma apa nakma ri sang hyang dharmmaçrama ing **pāwitra** muang i sang hyang prāsāda silunglung sang siddha dewata rakryān*
 9. *bhu nguniweh sang hyang muang umahayna sang hyang tirtha pañcuran ing **pawitra** wwaya ta sawah, pakarungan elū 2*

The toponymy of Mount Arjuno and Mount Welirang is recorded in the Kidung Tāntu Pānggĕlaran ((1557 Ç = 1635 AD) and referred to as Gunung Arjjuno and Gunung Kemukus (Pigeaud, 1924). The mention of the toponymy of Gunung Kemukus together with Gunung Pawitra is redefined in the Nāgarakĕrtāgama (1365 AD) referred to as Sang Hyang Adri Kumukus and **Acala Pawitra** (Pigeaud, 1960), according to the Cunggurang Inscription the mention of Gunung Penanggunan as **Gunung Pawitra** has been recorded in the memories of human thought since th.851 Ç = 945 AD, in 10 AD and continued until about th .1287 Ç = 1365 AD, in 14 AD.

On the east side, the Malang Highlands are surrounded by the Tengger-Bromo-Semeru Volcano group. The volcano group formed since the Middle Pleistocene began with the formation of Jembangan Volcano, then the Semeru Volcano was formed and then the Jembangan Volcano rested as the volcano continued with the formation of the Tengger caldera and towards the end of the Upper Pleistocene, the young volcano was formed, Bromo Volcano. Mount Bromo and Semeru volcano continue to be active volcanoes to this day (Bemmelen 1949). The toponymy of the Bromo Volcano was first blamed in the Muñcang Inscription (866 Ç = 944 AD) referred to as the hyang swayambhu as follows:

voorzijde, line 14

14. *sahadaladali umijila angkan asujimāsa tan kapūjan **bhatāra i sang hyang swayambhu** i mlandĕt angkan imba yojana*

From the data source of the inscription what is meant by *bhatāra i* the hyang swayambhu is Lord Brahma who is shining at the summit of Mount Bromo. In Hindu cosmology, Lord Brahma is referred to or related to the hyang swayambhu thus the meaning of *bhatāra i* the hyang swayambhu is related to worship of Brahma God who resides on the summit of Mount Brahma.

Thus based on the Muñcang Inscription (866 Ç = 944 AD) the existence of Mount Bromo is believed to be the abode of Lord Brahma, also called the bhatāra i the hyang swayambhu (Sumadio 1993). The toponymy of Mount Bromo is repainted in the Walandit Inscription (1303/1337 Ç = 1381/1405 AD) referred to as **sang hyang gunung brahmā** as follows:

Recto line 3,4

3.nagih titilōman, i rehe kang deça i walandit deça ilahila,hulun
hyangira **sang hyang**

4.**gunung brahmā**, iku ta hawalōra sakwehing wong sakahuban
dening deça i walandit, ta

The toponymy of Mount Semeru is elaborately described in the Tāntu Pānggĕlaran and is called Sang Hyang Mahameru or Giriraja and is the center of worship of the sacred mountains in Java.

On the south side, the Malang Plateau is surrounded by the Southern Mountains, which are coral deposits formed in the Miocene-Pliocene and due to the earth's endogenous movement then lifted up to the surface of the earth, forming a new plain which became known as the Southern Mountains. This event occurred at the beginning of the Lower Plestocene and continued through the Middle Plestocene (Van Bemmelen, 1949). In the part of the valley in the form of a geological plateau that is the Malang Highlands in literary Sĕrat Pārārāton and Kidung Ranggalawe were deformed as Sidhabhawana plains (Berg, 1930; Brandes, 1920); Fig 2). This means that the vast plain is sacred, safe and protected from the threat of natural hazards. In Hindshu-Buddhist cosmology this land is designated as a place to live and live (Zoetmulder & Robson, 1995).

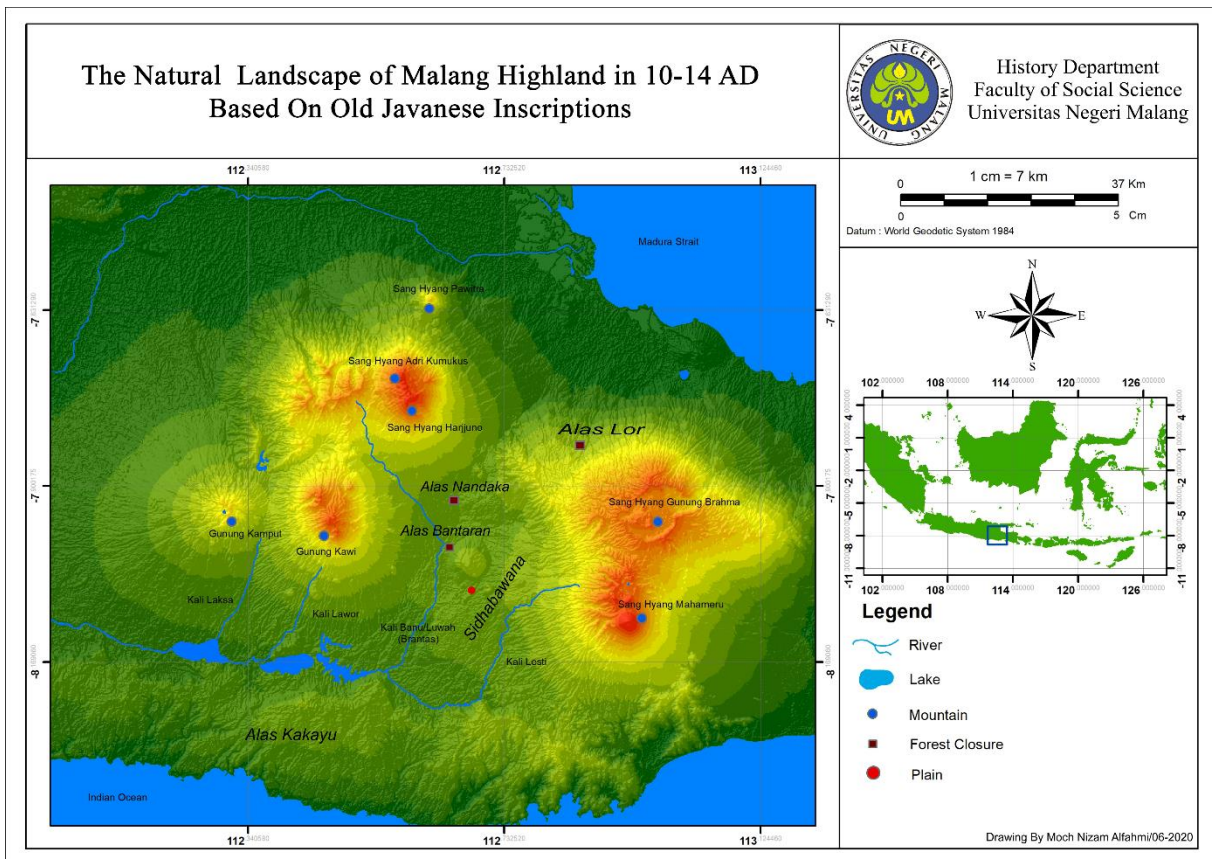


Fig.2. The Natural Landscape of Malang Highland in 10-14 AD based on Old Javanese Inscription

Based on the description above it can be stated that the natural landscape of the Malang Plateau in the context of the development of civilization in 10 -14 AD on the west side consisted of the natural landscape of Gunung Kampud-Gunung Kawi, on the north side of the natural landscape of Gunung Arjjuno-Ardi Kemukus - Gunung Pawitra, on the east side is the natural landscape of Sang Hyang Gunung Brahma-Sang Hyang Gunung Mahameru. On the south side is the Southern Mountains in the form of sea floor coral that is captured to the surface of the earth and then forms a new plain, so that the natural landscape of limestone mountains. In the part of the valley in the form of a geological plateau in the literary *Sērat Pārārāton* and *Kidung Ronggolawe* are referred to as *Sidhabhawana* (Berg, 1930; Brandes, 1920) Fig 2)

Identification of Natural Resources: Tropical Forest Cover Based on Inscription Data Sources

A. Alas i Bantaran: Cover of Tropical Forests in Bantaran

It has been explained beforehand the existence of natural resources namely tropical forest cover in the geological area of the Malang Highlands, one of which is the Alas i Bantaran.

The Alas i Bantaran is recorded in the Gulunggulung Inscription (851 ç = 929 AD) on the voorzijde, line 4 as follows:

*4.gulunggulung, tapak su 7 muang i **alas i bantaran** satngah paknānya
dharmmaksetrā sawahhani kuçala rakryān hujung mahā sang hyang*

The Gulunggulung inscription was issued and determined by the King of Mataram Kuno, based in East Java, namely Śrī Mahārāja Rake Halu Pu Sindok Śrī Īśāwikrama Dharmmottungadewa to establish a plot of rice fields:sawah in Gulunggulung that produced rice as 7 suwarna emas, to be used as sima and also to establish sima half of the forest area: Alas i Bantaran for the purpose of maintaining and sustaining the sacred building of the sang hyang prāsādā in Himad and in Panawan. The inscription was set Śrī Mahārāja, in çaka 851, the month of Baiśakha on the 9th paroterang, Mawulu day, Umanis and Senen sapta wara day (Brandes 1913; Trigangga 2003). The inscription was set by Śrī Mahārāja at the request of the ruler of the Watĕk Hujung namely Rakryān Hujung Pu Madura Lokādurāñjana, and after his request, was granted by Śrī Mahārāja, then the sima land in the forest: Alas i Bantaran, a plot of rice field:sawah in Gulunggulung and the place where the holy building of the sang hyang prāsādā was built, its status as sima swatantra and is exempt from all tax collection by the state.

The problem is where is the geographic spatial toponymy of alas i bantaran, sawah i gulunggulung and the building of the sang hyang prāsādā in Himat? Topnymy alas i bantaran that is tropical forest cover in the Bantaran region and sacred buildings: sang hyang prāsādā in the Himad region, both regions are included in the unit of Watĕk Hujung territory under the authority of Rakryān Hujung Pu Madura Lokādurāñjana. Based on surface surveys based on topographical maps (Bakosurtanal, 1997b, 1997a) it is known that the toponymy of the alas i bantaran is probably the Bantaran area in the Blimbing area, Malang City. Thus the toponymy of the alas i bantaran is the cover of tropical forests in the Bantaran area. As for the toponymy of sawah i gulunggulung and himad, based on the contents of the Gulunggulung Inscription on the achterzijde line 28-30, the area is bounded by surrounding villages, namely on the north bounded by wanua Panawan, on the east bounded by wanua Balandit, on the south side bounded wanua Tampuran and on the west side it is restricted by wanua Kanuruhan. Based on surface surveys based on topographical maps (Bakosurtanal, 1997b), the location of the sima of sawah i gulunggulung and himad is to the west of the villages of Blandit, Wonorejo and east of Singosari. The two names of the ancient village now cannot be found anymore (Casparis, 1940).

The main purpose of the determination of sima by Śrī Mahārāja is that the sawah in Gulunggulung that produce rice as 7 suwarna emas and half of the forest products in the Bantaran forest land can be used to finance the sacred building of the sang hyang prāsādā in Himad which has also been designated as sima swatantra. This was intended so that the worship of the heavenly housed on the hilltop of Gunung Wangkedi (Gunung Wedi) could be carried out in Himat or Panawan (Bagawan) to run smoothly. From the results of this analysis, it can be argued that tropical forests: Alas i Bantaran, the grounds of the half of the area are made into

sima land and become a state matter and should not be managed by the local community, so that half of the results of the management of the tropical forests Alas i Bantaran is intended for financing and maintaining the sacred building of the sang hyang prāsādā in Himad and in Panawān. This was done by Śrī Mahārāja and the ruler of Rakryān Hujung Pu Madura Lokādurāñjana, in order to carry out the religious worship of the sang hyang kahyanan: the worship of Brahma went smoothly. In addition, the worship of the sang hyang kahyanan heaven in Himad was followed by villagers from outside Himad, namely from Panawan, Batwan, Air Gilang, Gapuk and villagers in Sbang who were running smoothly and undisturbed (BRANDES & KROM, 1913; Trigangga, 2003).

In the determination of sima above, it was attended by a number of state officials, watĕk officials, wanua and some officials and craftsmen related to tropical forest management. The officials and artisans in question are wunkudu processors: manūlawungkudu, chicken producers: manganamanam, basketmakers: , agawi kisi, wunkudu traders: madagang wunkudu, bamboo craftsmen: māwi, charcoal buyers: wli harĕng, wood buyers: wli pañjut and officials forest watchdog: pasukaalas (BRANDES & KROM, 1913; Trigangga, 2003)).

Based on the data source of the inscription, it is known that there are about four groups of craftsmen namely manūlawungkudu, manganamanam, agawi kisi, as well as wli harĕng, four merchant groups namely madagang wunkudu, wli harĕng, māwi, and wli pajjut and one royal forest supervisor: pasukaalas relating with conservation of tropical forest cover. Wunkudu craftsmen and wunkudu traders are two professions related to the management of endemic plants which only grow in the ecological area of the Malang Highlands and this profession is possible only in the Malang Highlands area. So that the existence of the two professions is based on the information of the Malang Inscription into the group of spice traders: the people who used it and this profession continued until the time of the Kingdom of Siasarihasari (1170 Ç = 1248 AD) and overseen by the state (Stutterheim, 1928).

Based on ethnozoological studies and surface surveys of topographic maps (Bakosurtanal, 1997b) it is known that Alas i Bantaran are at an altitude of 454 - 488 m above sea level, so they can be classified as lowland tropical forest cover. In the Junghun climate classification it is estimated that the temperature of the forest area is the average range is 22^o - 26.3^o C (Marbun, 1982). According to the analysis of the types of vegetation in the forests of Bromo-Tengger-Semeru National Park and R.Suryo Raya Forest Park, it can be seen that the possibility of forest vegetation growing on the Alas i Bantaran is tamarind tree (*Pithecolobium dulce*), betung bamboo (*Dengrocalamus asper*), tal tree (*Listea* sp), Javanese areca palm (*Pinangan coronata*), coconut tree (*Cocos nifera*), and water guava (*Acymena acuminaissina*). In addition, it may also consist of forest vegetation such as mountain pine (*Cupressus lusidania* Mil), puspo tree (*Schima wallichii* Kort) and some lower plants such as lateng (*Laportea* sp), imperata cylindrica (*Imperata cylindrica*) type of glagahan grass and grass species under wungkudu (Suprpta, 2015).

In some sources of inscriptions, tree species such as the tal tree, the areca palm tree, the coconut tree, the puspo tree and the reeds are considered important in the order of the Hindu-Buddhist civilization. Puspo trees are used for the benefit of the sacred building park and the flowers are used for religious ritual facilities, coconut trees and the like are taken for palm wine, and tal tree leaves are made for palm-leaf making. The tamarind tree as a charcoal ingredient and its fruit is used as a mixture of herbs, herbs and liquor. Young petung bamboo or bamboo petung shoots are used for culinary materials at the founding ceremony of sima and their stems for wicker materials as well as building materials (Riyanto 2016). Javanese areca nut is used for the benefit of whiting and panginangan. The types of plants such as wungkudu are used as high value spices and reeds are used for building roofing materials. Thus the types of vegetation that grow on Alas i Bantaran: the forest in Bantaran is forest vegetation of high economic value, so that half of the forest land vegetation is made sima by Śrī Mahārāja Rake Halu Pu Sindok Śrī Īsāwikrama Dharmmottungadewa for the sake of maintaining the sacred building of the sang hyang prāsādā in Himad and Panawān.

B. Alas lor : Tropical Forest Cover in the Tengger Mountains

The toponymy of alas lor is recorded in the Muñcang Inscription (866 Ç = 944 AD) voorzijde side, line 8, as follows:

Voorzijde, lines 7 and 8

7.pwa.....kumonakan ikanang lmah kidul ning **pkān i muñcang** watĕk
hujung hīnganya wetan sawatĕs la

8.wan ing kamulān kumandi tkeng **alas lor** hīnganya kidul irikang luh
sawatĕs lāwan ing lumbang

The stone inscription was issued and determined by order of the ruler of the Kingdom of Mataran Kuno based in East Java namely Śrī Mahārāja Rake Hino Pu Sindok which was then accepted by Rakryān Mapiñhal i Halu and passed on to Rakai Kanuruhan, so that a piece of land to the south of the Muñcang Market, in the unit territory of Watĕk Hujung, was designated as sima swatantra (Brandes & Krom, 1913; Nastiti, 2003)). The boundaries of the sima swatantra land on the east side of the land are kamulān land to the Alas lor, the southern boundary to the discharge luh to the lumbang-lumbang area, to the west the boundary is luh and the north side of the boundary is to the balkuṅ region to the north of pkān Muñcang. The determination of the sima swatantra land to the south of the pkān Muñcang (Muñcang Market) is also related to the inauguration of the place where the bhatāra i hyang swayambhu is worshiped in Walandit.

Casparis identified the toponymy of Walandit as Blandit Village, Wonorejo, Jabung District, located west of the foot of Mount Bromo. If the toponymy of Walandit is identified as Blandit Village, the location of sima swatantra is south of Muñcang Market not far from Blandit Village, Wonorejo. Based on surface surveys based on topographic maps (Bakosurtanal, 1997a; Casparis, 1940), it is known that to the east of the Blandit Village is the Tengger Mountains region. From this geographic spatial analysis, it can be determined where the Alas lor is the

boundary of the sima swatantra land on the east side. This means the Alas lor in question is the cover of tropical forests that lie along the Tengger Mountains to the Bromo Volcano area. According to the determination of geographical location, the Alas lor is at an altitude of 1,197 - 1,259 m above sea level, so it can be categorized as a low mountain rain forest. Based on the Junghun climate classification, it is estimated, the average temperature of the forest area is around 17.1° - 22° C (Marbun, 1982).

Based on the analysis of forest vegetation references in the Bromo-Tengger-Semeru National Planting Area (Taman Nasional Bromo Tengger Semeru, 1997) in a zone of 1,197 - 1,259 m above sea level, there are vegetation of trees and some vegetation such as betel forest (Piper sp), mrica (Piper retrogractum) coriander (Coriadrin satium), hadas kusumā (Funiculum vulgare), jamuju (Padocarpus inbricatus), pañjlang (Caordyline fruticosa) and wungkudu. The results of TNBTS inventory, species of undergrowth such as forest betel (Piper sp), mrica (Piper restrogractum), coriander (Coriuadrin satium), hadas kusuma (Funiculum vulgare) and pañjlang (Caordyline fruticosa) were only found in the Bromo-Tengger-Semeru forest area. Whereas lower plant species such as jamuju (Padacarpus inbricus) and wungkudu are only found in the Anjasmoro-Arjuno-Welirang forest area, so that these plant types can be included as endemic plants (Soerjo, 2010). From ethnozological analysis, the comparative analysis of Bromo-Tengger-Semeru vegetation type comparison, the Alas lor forest vegetation does not differ much from the forest vegetation in the Bromo-Tengger-Semeru region.

From the results of the analysis mentioned above, the existence of the Alas lor located on the east side of the sima swatantra land is categorized as a lowland mountainous rainforest area. Alas lor overgrown with endemic plant vegetation category of spice plants, so that it can be included as a type of plant that has high economic value. In connection with the endemic plants category of spice plants, based on the Malang Inscription (th.?), On the **8A1** plate, it was mentioned that there was a group of spice traders: traders of rmpah and these traders were cared for by Sri Maharaja especially those related to the spice trade namely mirica, hadas kusuma, jamuju, pangjang, and wungkudu (Stutterheim, 1928). On plate 8A1, lines 3 - 7 Malang Inscription are described as follows:

3. *panisurup adwal.kewalā prih çarintěn nwang wungkalan ikang panahayu banigrāma parawulu ri kanuruhan.kanuruhan parawarga i mannajung.an kapwa mā*
4. *jara ri sapaněnggěk nira samanglāa kasawur kabeh.karuhun **para paněnggěk nira ri rěmpah.** i wulu.samangantěngkai jro thāni kanuruhan. kapwa*
5. *mengět irikang tinadāyakěn an prihěn raksan sāri sāri tan hana deyēm manlēsa **mirica kacang hadas kusumā jamuju pañjlang wungkudu** makadi bras*
6. *s ya ikā inuhutakěn sahtunya ring lāgi yan mirica kulak kati padhawa **mirica** sakul ing sarehan **hadas ati** kulakanya pa*
7. *ñjlang, **jamuju wungkudu** kacang wuyah pasagi kulanya anādin sukat sālarnsnya sowang sowang nwang ikang jasus cinaktan ya ika kātanyakna tum*

Exposing the contents of the Malang inscription 8A1, lines 3-7, it is known that the spice traders: the *paněnggěk nira ri rěmpah* were included as small traders: *parawulu* and most of them resided in Kanuruhan as peasants (Zoetmulder & Robson, 1995). The traders of the spices generally trade *mirica*, *hadas kusumā*, *jamuju*, *pañjlang*, *wungkudu* together with traders of rice, salt and spices. It is known that traders of *hadas kusumā* are distinguished into traders who specialized in selling *hadas kusuma* seeds: *ati hadas* and *hadas kusuma* plants. Even though the spice traders were categorized as low traders or pretraders: *parawulu*, but they were still considered by the state and their existence was regulated by the state, it was evident that the rules of the traders were defaced by the Malang Inscription published by the state (Stutterheim, 1929).

Although in the Muñcang Inscription there is no mention of the relationship between the Alas lor with the sap of ***para paněnggěk nira ri rěmpah***, based on the description of the Malang Inscription (th?) it can be clearly seen the positive relationship between plant vegetation growing in the height zone of the Alas lor with the existence of *paněnggěk nira ri ri rěmpah*. This proves that the management of forest products on the Alas lor is endemic plant vegetation such as betel forest (*Piper sp*), *mrica* (*Piper retrogractum*) coriander (*Coriadrūn satium*), *hadas kusumā* (*Funiculum vulgare*), *jamuju* (*padocarpus inbricatus*), *pañjlang* (*Caordyline fruticosa*) and *wungkudu* runs intensively and regulated by the state.

In the context of the development of Hindhu-Buddhist civilization in 10 AD, when the determination of *sima swatantra* land in the south of the Muñcang Market, besides being attended by royal officials, *watěk officilal* rulers, the *wanua* rulers around surrounding who bordered the *sima* region, were also attended by spice traders: *para peněnggěk ing rěmpah*, craftsmen related to forest management, traders who deal with forest products and state officials who specialize in forest management. The names of the craftsmen and traders can be found on the sides of *voorzijde*, lines 27 and 28. The officials and craftsmen in question are *wunkudu* processors: *manūlawungkudu*, chickenswing artisans: *manganamanam*, basketmaker: *agawi kisi*, *wunkudu* traders: *madagang wunkudu*, bamboo craftsman: *māwi*, charcoal buyer: *wli harěng*, wood buyer: *wli pañjut* and state forest supervisor: *pasukaalas* (Brandes & Krom, 1913; Nastiti, 2003).

Based on the data source of the inscription, it is known that there are about four groups of craftsmen namely *manūlawungkudu*, *manganamanam*, *agawi kisi*, and *wli harěng*, four merchant groups namely *madagang wunkudu*, *wli harěng*, *māwi*, as well as *wli pañjut* and one forest supervisor state: *pasukaalas* relating with conservation of tropical forest cover. *Wunkudu* craftsmen and *wunkudu* traders are two professions related to the management of endemic plants which only grow in the Malang Highlands region and this profession is only possible for the Malang Highlands region. In the Malang Inscription (th?) the traders who bought and sold herbs were called the sword traders: the people who wanted to buy them. This proves the

existence of the Alas lor, in the context of the development of civilization in 10 AD, has become one of the driving forces of the country's economy.

Based on the two inscriptions data sources, the Gulunggulung Inscription and the Muñcang Inscription, the existence of artisans, traders who deal with forest management and state forest supervisors and forest guards officials, were placed by the kingdom as an inseparable part of the government structure at that time. In other words, the existence of tropical forests in the Highlands of Malang in the 10 AD had received the attention of the royal authorities (Vink, 1983) and was managed by the people under royal control to move the wheels of the country's economy and the people's economy.

C. Alas kakayu: Tropical Forest Cover in the Southern Kapur Mountains Region

The toponymy of *Alas kakayu* is recorded in Prasati Katiden (1317 Ç = 1395 AD) verso line 1 and the contents of the entire Katiden Inscription are as follows (Pigeaud, 1960):

Recto, line 1-6:

- 1: *iku wruhe si para sane salurah wetaning kawi sakoloning
bañu, sawetaning bañu, pa-*
- 2: *ra waddhāna, juru, buyut, makanguni pacatanda hi ture, yen
ingong kamagēhakēn ha*
- 3: *ndikanira talampaknira pāduka bhatāra çri parameçwara sira
sang mokta ring wisnubhawana, handikani*
- 4: *ra sira sang mokta ring krṭtabhuwana, dene kapūrwasitine sira
para sane ri katiden*
- 5: *kasawlas deça, i rehe hangraksa halalang i gunung lējar,
luputa ri saprakara luputa*
- 6: *ring jalang lalawan, takēr turun, makanguni rahil sakal-
wiraning titisara luputa, makanguni*

Verso, line 1-3

- 1: *dening **alas kakayu** gaten hantiganing pasiran, tan ananing
anglarangana hi rehi tan wang*
- 2: *larangana, tan ananin aningkah-aningkaha, kang rajamudra
yen uwus kawaca kagona dene*
- 3: *kang deça hi lumpang, titi ka 1,i çaka 1317*

A copy into Indonesian by Yamin, which is as follows:

Recto, line 1-6:

"Notification to all the *para sane* state units in the east of Mount Kawi, both east of in the west of the waterstem (Brantas): to all *Wedana, Djuru, Bujut* especially to *Pantjatanda* in Turén, that we have strengthened the command of your majesty series *Batara Parama-isjwara* which was planted in *Vishnu-bawana* and likewise the order of your majesty planted in *Kerta-buana*, is related to the position of the *Katinden sane* state units covering eleven villages.

Verso, line 1-3

Because the community is obliged to observe the *alang-alang* forest on the slopes of Mount Ledjar, so that it does not burn, it must be freed from all burdens: *jalang, palawang*, and *taker turun*, especially from payment of various points. Furthermore, the community must not be prohibited

from cutting down wood trees from the Kakayu forest and picking up turtle eggs and crap, because the prohibition does not apply to them. Also no one can do there what prohibited rules. If the king's decision has been read, then the Lumpang village must obey him. It was thus held in the first month of Saka in 1317" (Yamin, 1962)

Based on the year the inscription was issued in 1395 AD, the end of the 14 AD, the inscription relates to the power of King Wikramawardana, son of son-in-law of King Hayam Wuruk in the center of the Majapahit state. The main content of the Katiden Inscription is the king's order in the tatanegara unit in the eastern region of Mount Kawi both in the west of the Brantas River and in the east of the Brantas River, especially aimed at Pantjatanda in Turēn to strengthen the order of King Hayam Wuruk who was in the realm of deity, to order so that the villagers of the eleven villages in the Katinden area unit observe the alang-alang forest that grows on Gunung Lēdjar not to catch fire. As a reward for the noble order of the king, villagers in the eleven villages of the Katinden area were exempt from the tax payment obligations, namely jalang, plawang, taker turun jalang, plawang, taker turun and payment for titi-sara. In addition, villagers in eleven villages are not prohibited from cutting down trees from the alas kakayu : Kakayu Forest and are also allowed to collect turtle eggs and collect crabs in the forest area. Nor can anyone make any restrictions on the alas kakayu: Kakayu Forest.

Before we enter the discussion on the management of the alas kakayu : Kakayu Forest, we first carry out a toponymy analysis of the geographical spatial toponymy of the Alas kakayu. In the inscription recorded toponymy Turēn and Gunung Lēdjar. Toponymy Turēn relates to the existence of the Turyyan Inscription (851 Ç) in Dusun Watugudeg, Turen, southern Malang and it is known in situ. Thus the existence of the Alas kakayu : Kakayu tropical forests in a geographical space must be sought in the Turen region, southern Malang. Also noted the toponymy of Gunung Lējar this mountain was first recorded in the Ukir Nagara Inscription II B (1120Ç) on recto line 5 as rēdi Lēgar and included in the unit area of Watēk Kanuruhan. This means that rēdi Lēgar is located east of Mount Kawi according to the contents of the Katiden Inscription. Then it is re-recorded in Sērat Pārārāton [8] line 5-10, called gunung Lējar and precisely to the south of Gunung Pustaka or Gunung Ronggo, Turen.

On the south side of Gunung Ronggo in the context of the Turen regional unit there are several hills, one of which is referred to by local people as the Gunung Layar hill. Based on toponymy analysis, then the toponymy of Gunung Lējar in the Katiden Inscription, rēdi Lējar on the Ukir Nagara Inscription and Gunung Lējar on Sērat Pārārāton are related to the name of the Gunung Layar hill located in the Turēn region, southern Malang. Based on a surface survey based on topographical maps, the location of Gunung Layar is on the southeast side of Turen and to the north of the Southern Mountains (Bakosurtanal, 1997a). Thus the cover of the reeds that grew on the top of Gunung Lējar which was defective in the Katiden Inscription is the reeds that once grew on the Gunung Layar hill and now the Gunung Layar hill is in the Turen Arms Factory area (PINDAT), southern Malang. Based on toponymy analysis, it can be seen the location of the

geographic space of the Alas kakayu : the tropical forest of Alas Kakayu in the Southern Mountains region to the extent of the southern coast of Sendang Biru beach.

In the topographic map and topographical map (Bakosurtanal, 1997a) the existence of the Alas kakayu : the tropical forest of Kakayu is at an altitude of 0 -659 m above sea level. Based on the Junghun climate classification, the estimated temperature of the forest area is around 22^o - 26.3 ^o C (Sujatmiko, 2012). Plant vegetation in the Alas kakayu : Kakayu tropical forest, mostly filled with typical lime mountain vegetation. Among them are root crops, tubers, forest bananas, grain plants such as candlenut, breadfruit tree plants, palm or palm tree plants, petung and apus bamboo plants, banyan plants and possibly teak trees. Because of the area of the alas kakayu to the south coast, mangrove and vevegation is also inhabited by various types of drought and crabs. This is the potential of natural resources on the base of the Alas kakayu: the Kakayu tropical forest recorded in the Katiden Inscription (1317 Ç).

In connection with the development of the 14 AD, Hindhu-Buddhist civilization in the Malang Highlands, the main content was the issuance of the Katiden Inscription (1317 Ç), namely the Majapahit Wikramawardan king's orders to state units in the eastern region of Mount Kawi: Malang Highlands, namely Wedana, Djuru, Bujut especially to Pantjatanda in Turén to order villagers in eleven villages to watch: preserve alang-alang forest on the summit of Gunung Lëjar: Gunung Layar should not be burned. And in return the villagers in eleven Katiden villages were exempt from various tax obligations. In addition, villagers in eleven villages were allowed to cut wood, collect turtle eggs and collect crabs (Pigeaud, 1960). From this information it can be said that the alang-alang forest on the hilltop of Gunung Lëjar was designated by the state as a conservation forest. In order for this determination to be carried out properly, the villagers in the eleven villages of Katiden were told to monitor it so as not to catch fire. As a result of the king's decree, the Alas kakayu, which was previously not allowed to be exploited by the population, was allowed to be exploited by villagers in eleven Katiden villages, including collecting sea turtle eggs and catching crabs, but was not allowed to catch sea turtles. Based on the contents of the Turryan Inscription (851 Ç) Ia, line 37-39, villagers in eleven villages are allowed to manage Alas kakayu and are tasked with observing reeds, possibly villagers who reside in Pakingahan, Bubuda, Padang, Pamwatan, Lahan, Gurunggurung, Gundang, Wuntupuri, Pringpring, Pancuran and Lankid (Casparis 1988; Nastiti 2003). Some villages that can still be identified are Pamwatan (Pamotan village), Gurunggurung (Senguruh village?), Pancuran (Pancuran village), Gundang (Gundang Legi village) and Langkid (Dampit village). The villages are around Gunung Layar, Turen, southern Malang.

Natural Resource Management: Tropical Forest Cover in the 10th-14th Century AD

Based on the results of toponymy analysis Alas i Bantaran, Alas lor and Alas Kakayu geographic spatial analysis on topographical maps, land surface surveys, zoological, ethozoologis analysis, reference of forest vegetation analysis, forest natural resource potentials, and studies of various professions related to with forest management, reconstruction can be

arranged on the management of natural resources of tropical forests in the 10 – 14 AD. Analysis of natural resource management: tropical forest cover is presented in Table 1, as follows:

Table 1: Analysis of Natural Source Management:Tropical Fores Cover in the Malang Highlands in 10 – 14 AD

The elemen of natural resource management	Tropical Fores Cover in 10-14 AD				Infor-mati-on
	<i>alas i Bantaran</i> (851 Ç)	<i>alas Lor</i> (866 Ç)	<i>alas Kakayu</i> (1317 Ç)	<i>alas alang-alang i Gunung Lëjar</i> (1120 -1317 Ç)	
Forest satus	State Forest	State Forest	with the permission of the State managed by people	State Forest	-
Forest potential	Types of production trees and spice plant : <i>wungkudu</i>	Spice plant : <i>sirih , mrica ketumbar, hadas kusumã, jamuju, pañjlang and wungkudu.</i>	Types of production trees,tubers,bread fruit,seedes,turtle eggs and various crabs	<i>alang-alang</i> : plans are very varuable for the building roof and roof of sacret building	-
Land used	<i>sima swatantra</i>	<i>sima swatantra</i> land boundary, endemic plant: : spices plant	fulflmlent of the daily live of villagers and compensation of tax payment obligation	fully state owned	-
Utilization of fotest products	maintanance of sacred building <i>sang hyang prãsãdhã i Himat and Panawan</i>	resource for trade in spices and protected forest	fulfillmet of the daily lives of evelen village	State assets for building material for building and sacret building	-
Forest resource manager	Official of <i>watëk Hujung, sima swatantra of alas i bantaran, sawah i Gulunggukung</i> and official of <i>sang hyang prãsãdhã i Himat and Panawan,</i>	<i>Pasukaalas, manūlawungku du, manganamana m, agawi kisi, wli harëng, mãwi, para wulu: para penënggëk ing rëmpah,</i>	Official of <i>Wedana, Djuru, Bujut</i> and official <i>Pantjatanda</i> in Turën. Villager are eleven village	Official of <i>Wedana, Djuru, Bujut</i> and official <i>Pantjatanda</i> in Turën. Villager are eleven village	-
Fores professi-	<i>manūlawungku du,</i>	<i>manūlawungku du,</i>	?	?	-

onal manager	<i>manganamana m, agawi kisi, madagang wungkudu, wli harĕng, māwi, and wli harĕng,</i>	<i>manganamana m, agawi kisi, wli harĕng, māwi, and para wulu: para penĕnggĕk ing rĕmpah,</i>			
Prohibition of management of forest resources	Community management is prohibited	Excessive management of endemic plants is prohibited by state	It is forbidden for cacth coastal sea turtles and is prohibited from making any prohibitions on the management of forest product	It is forbidden to burn the <i>alang-alang</i> forest	-
Forest conservation	Half of <i>alas i Bantaran</i> is left as natural forest	As protected forest and <i>sima swatantra</i> boundary, forest mangement is limited to endemic plants	Prohibition of caching sea turtle	<i>Alang-alang</i> forest should not get burned and allowed to grow in top of <i>Gunung Lĕjar</i>	-

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Based on the explanation in Table 1, it can be stated that the elements of forest management regarding the status of tropical forest cover on the Alas i Bantaran are state forests and the element of this forest potential is producing tree trees for the manufacture of wood charcoal, plaiting, rope mining, manufacturing materials liquor such as wine and some tree plants related to religious activities. It also produces undergrowth such as reeds and wungkudu. Forest use is half the forest area: the grounds in Alas i Bantaran, used as *sima swatantra* and is intended for the maintenance of the sacred buildings of sang hyang *prāsādhā* in Himad and Panawan. Tropical forest: the grounds in Alas i Bantaran are managed by officials of Watĕk Hujung, the managers of *sima swatantra* Alas i Bantaran, sawah i Gulunggulung and manager of *sima swatantra* sacred buildings of the sang hyang *prāsādhā* in Himad and Panawan. Tropical forests for reasons related to the creation of jobs related to forest management, namely the creation of a group of craftsmen *manūla-wungkudu*, *manganamanam*, *agawi kisi*, as well as *wli harĕng*, merchant groups: *madagang wungkudu*, *wli harĕng*, *māwi*, as well as the forest watchmen kingdom: *pasukaalas*. The element of prohibition on forest management, namely by tropical forest countries, because Alas i Bantaran may not be managed by the surrounding community. The element of tropical forest conservation is that half of the total area of tropical forest on the Alas i Bantaran is left as natural forest (Fellmann et al., 2007; Vink, 1983).

The management element of the Alas Lor low mountain rain forest on the status of Alas Lor is as state forest. Low mountainous rainforest potential of Alas lor produces lower plant resources in the form of betel forest (*Piper sp*), *mrica* (*Piper retrotractum*) coriander (*Coriadrin*

satium), hadas kusuma (*Funiculum vulgare*), jamuju (*Padocarpus inbricatus*), pañjlang (*Caordyline fruticosa*) and wungkudu. This type of plant is a spice plant that has high economic value. Forest land use is as a boundary on the east side of the sima swatantra land area to the south of the Muñcang Market and also as a protected forest. The management of the Alas Lor low mountainous rainforest is under the control of Pasukaalas, Manūlawungkudu, Manganamanam, Agawi kisi, Wli Harěng, Māwi, and the Para Wulu: para peněggěk ing rěmpah. The low mountains of the Alas Lor rainforest are related to job creation, that is, the creation of manganamanam, agawi kisi, wli harěng, māwi, manūlawungkudu and lowly traders: : para wulu: para peněggěk ing rěmpah. The element of the prohibition on natural resource management is controlled exploration of the types of spice plants that only grow in the Alas Lor region. The management element of Alas Lor low mountain rainforest conservation is protected forest, the eastern boundary of the sima swatantra land area to the south of the Muñcang Market and the protection of spices.

The element of Alas Kakayu natural resource management in the Southern Mountains region, the status of the forest is state property and with state permission is managed by villagers in eleven Katiden villages. The potential of Alas Kakayu natural resources is to produce production trees, tubers, bread fruit, seeds, turtle eggs and various crabs. The elements of forest use management are the fulfillment of the daily live of villagers and compensation of tax payment obligations. The elements of Alas Kakayu tropical forest management are official of Wedana, Djuru, Bujut, official Pantjatanda in Turěn and villager are eleven villages: Pakingahan, Bubuda, Padang, Pamwatan, Lahat, Gurunggurung, Gundang, Wuntupuri, Pringpring, Pancuran, and Lankid. The management element of the prohibition of forest management is it is forbidden for cacth coastal sea turtles and is prohibited from making any proposals on the management of forest products. The element of Alas Kakayu's tropical forest conservation management is prohibition of caching sea turtle.

The management of Alas Kakayu's natural resources cannot be separated from the management of the cultural resources of the alang-alang i Gunung Lědjar. The management elements of natural resources on the status of Gunung Lědjar status are state forest and monitored and managed by officials of Wedana, Djuru, Bujut, official Pantjatanda in Turěn and villager are eleven villages: Pakingahan, Bubuda, Padang, Pamwatan, Lahat, Gurunggurung, Gundang, Wuntupuri, Pringpring, Pancuran, and Lankid. The inhabitants of this village by order of the state and under the supervision of official of Wedana, Djuru, Bujut, official Pantjatanda in Turěn to always watch the reeds on the hilltop of Gunung Lědjar so as not to catch fire. In return, villagers in eleven Katiden villages were allowed to exploit Alas Kakayu's natural resources. This relates to the potential of alang-alang i Gunung Lědjar, namely reeds as state assets for building materials for building and sacred buildings. The element of the prohibition on the management of alang alang grass in Gunung Lědjar is that it is forbidden to burn (Fellmann et al., 2007; Vink, 1983).

From the above review it can be stated that the management of natural resources: tropical forest cover and low mountain rain forest in 10 – 14 AD, the Hinhu-Buddha era in the Malang Highlands has been used as *sima swatantra* for the maintenance of sacred buildings, as a state protected forest and *sima swatantra* land boundaries and as a compensation for the eleven Katiden villages for the sake of preserving the *alang-alang* forest on Gunung Lędjar. The thing that needs to be noted is the existence of tropical forest cover in the geological area of the Malang Highlands has a positive relationship with the creation of employment on forest management and has become a wheel of the economy of the country and local people. The research finding is that the preservation of state forests involves all components of state officials: the *para sane* to the east of Gunung Kawi and the villagers around tropical forest cover. In order to preserve the *alang-alang* forest well-protected and not exploited by the population around the forest, local residents are allowed to manage the *Alas Kakayu* forest. This is what needs to be developed in the management of tropical forest natural resources. Thus in the management of preservation of tropical forest cover must be balanced with the fulfillment of the daily needs of people who live around the conservation forest: the base of *alang-alang* i Gunung Lędjar.

CONCLUSION

In accordance with the above explanation, it is known that based on Old Javanese inscription, in 10 – 14 AD, in the geological area of the Malang Highlands, during the Hindhu-Buddha era between three types of tropical forest cover and one low mountain rain cover. Tropical forest cover, namely the *Alas* i Bantaran, the *Alas Kakayu* and the *Alas alang-alang* of Gunung Lędjar and the low mountain rain forest cover, namely *Alas lor*. Based on the study of natural resource management through the Environmental Archeology approach, it is known that the status of tropical forest cover is the property of the state and with state permission its status is managed by the people, so that it can be called a community forest. The land cover for forest cover is as *sima swatantra* namely the *Alas* i Bantaran, as the boundary of the *sima swatantra* area is the *Alas lor*, as the community forest that is the *Alas Kakayu* and as the conservation forest is the *Alas alang-alang* of Gunung Lędjar. All forest cover is managed by the state, *watėk* officials, *sima swatantra* officials, regional government unit officials, namely *para sane*, royal forest supervisors, villagers around the forest cover and traders and payrolls related to forest product management.

In the context of the order of civilization in 10 - 14AD, forest products have been able to move the wheels of the country's economy and the economy in the Malang Highlands. Forest management and monitoring of forest conservation are not dominated by the state, but include the role of local people around the forest by considering aspects of justice and meeting the daily needs of the surrounding population. Thus the conservation of the forest, namely the *alang-alang* i Gunung Lędjar, ran smoothly, did not experience fire and was damaged by the population around the forest. This is a valuable research finding, that since the end of the 14AD there has

been a model for the management of natural resource conservation, namely tropical forest cover by taking into account the aspects of justice of the population around the forest and overseen by units of state officials in the regions.

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