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Indigenous Knowledge of Besemah-Semende's People on Water Conservation Resources

Meilinda, Khoiron Nazip, and Riyanto

Abstract—**Water conservation is faced with three major problems, which include availability, use, and management. This requires a high level of formal education, as well as already existing societal indigenous knowledge. This qualitative research design recognized indigenous knowledge in the aspect of water conservation, and the object of this study included Besemah-Semende's people living in three sub-districts. The result showed the following indigenous knowledge: *tebat*, *calak badawan*, *tambak ayik*, *and bubus tebat*. These result of this study can be deployed as as teaching materials in environmental science education.**

Index Terms—**Indigenous knowledge, water conservation, besemah-semende people.**

I. Introduction

Highlight Despite the fact that Indonesia has not experienced a water deficit at the national level, there has been a shortage in the availability of water at Java Island over the years. For example, an inadequate amount of 43.952 million m^3/year was made available for the demand of 66.336 million m^3/year, in 1990 [1], [2]. This deficit has recently been experienced since 2015 in Bali, NTT and Sulawesi [3], and the phenomenon has been affiliated with several factors. These include damage to the watersheds, changes in the use of plots from agriculture to non-agriculture, deforestation, intensive housing, poor land and water conservation, and also an unclear direction of national water resources development. Furthermore, depletion in water also results from pollution, river sedimentation, global warming, and climate change [3]

One of the solutions to minimize water problems is through the community's involvement as a civil society, to control, maintain and appropriately use the resources. This empowerment is expected to be effective when performed following local conditions and the indigenous knowledge (hereafter as IK) possessed by each community, being directly affected by the water problem [4]. In addition, (IK) refers to the understandings, skills and philosophies develop by societies with long histories of interaction with their natural surroundings, and IK informs decision- making about fundamental aspects of day-to-day life [5] or in the other reference, it is stated that IK refers to customary and traditional knowledge generated from direct and long-term interaction arising from certain community's needs, situation, circumstances, and environment on different occasions [6]. Making use of IK in water conservation has futuristic potential, considering that the hydrological environment without inflicting damage [7].

There has been a long debate in the conservation literature about how traditional societies should be regarded as people who care about conservation [8], [9]. Most people assume that local folks do not support conservation because of their daily needs and due to the perceptions that the conservation area belongs to them as the local folks [10]-[12]. Thus, according to this group, there must be a restriction between the conservation area and the local folks' environment. Meanwhile, other researchers stated that the local community is a community that respects conservation by considering the balance the fulfillment of life's needs and sustainability of the conservation area for a perfectly adequate standard of living and sustainability of the area [13]-[15]. However, the researchers who split between the conservation area and traditional community's life r upon the western scientific view stating that something is useful and valuable in the condition in which we find it and it may become an input into the process of producing something of value [16]. In the meantime in IK, resource are available for exploitation and replenished through the performance of ritual and other socially constituted management activities [17], [18].

Nonetheless people from the west science and IK nowadays try to combine the different view [19]], hence the individuals are no longer viewed as "wild and noble animals" living simple harmony with nature [20], [21]. It is even stated that IK is the foundation of modern science in term of natural resource management and conservation [22]-[26]. Hence, the involvement of IK in restoring and managing conservation ecosystem will make the modern conservation management adaptive and flexible in the long run such as Gam River in Vietnam which brings the value of IK valued as a part of conservation management [27].The community inhabiting a location for a long time depends largely on natural resources. Therefore, management demands the successful development of indigenous knowledge in the form of informal institutions in term of the standardized ethics and mora [28]-[30]. It aligns with Berkes *et al*. [29] who stated that a lesson from traditional ecological knowledge is that values and beliefs are important part of a knowledge system if leading to a moral c or ethics towards the environment. Such a movement combining values and beliefs with ecological concepts is more likely to succeed in making the ecosystem a transforming concept if compare to the use of ecological science alone. Anderson [31] also argued that all traditional societies having succeeded in managing resources well, over time, have done it in a partly through the religious or ritual representation of resource management. The key point is not religion per se but the use of emotionally

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powerful cultural symbols to show particular moral codes and management system. Also Feeny *et al*. [28] argued that the new interest in communal property arrangements is perhaps related to the resurgence of interest in grassroots democracy, public participation, and local level planning, and very often IK exists in the form of an informal institution. The aforesaid arguments are evident in Makate's [32] study on the integration of local institutions and IK adopted to build up innovation in farming at the Sahara desert.

There are numerous studies in IK related to water conservation worldwide. Among them are Kambashe in South Africa which is in the form of a traditional ceremony [33], wells or rainwater reservoir ponds in Borona and Konso of Ethiopia [34]. *Baudi* in the form of precise stone quarrying water absorption, *Nawn* which is water storage made of stones in a large capacity for bathing and washing clothes, *kharits* which is the rainwater reservoir in mountains, *chrudu* channeling water coming from mountain springs through bamboo pipes to homes and *kuhls* which is irrigation in Indian regions [35]. For people from Thailand, it is in the form of Thai people's belief in water as a wealthy resource so they build house closes to the river and choose to place their village in such a way so the river is in front of the village and mountains behind, Thai people also have irrigation system that provide water for agriculture activities, the system include ûθ (a ditch), a dam and û (a water wheel). Thai people have watershed forest (ď û) and sacred forest (called ď) [27]

Some IK in Indonesia having, been known and related to water conservation include *pronoto mongso* (seasonal arrangements), mountain terraces or terraced rice fields, *susuk wangan* or ceremonies respecting water resources, *babat tanah Jawa* or *pamali* culture originating from Java, *awig-awig* or customary rules in interacting with the environment at Balinese and Lombok communities, and also the law *sasi*, governing interaction with nature in Maluku. Furthermore, others include *pahomba*, which is a prohibition on collecting forest resources surrounding the river flow, to maintain the existence of springs in NTT, subak in Bali, pill pasenggiri in Lampung, Maccera Tasi in North Sulawesi, Palia in Lore Lindu and Ibeiya in West Papua [36], [37]

There has no yet been found any research that show indigenous water conservation in the community of Besemah-Semende's tribe. However Martin *et al*. [38], [39] found that there is a close relationship between the existence of *Tunggu Tubang's* rice field and the preservation of *ulu ayik* forest wherein this forest contains a water source for irrigation of fields in Besemah-Semende's community.

Tunggu tubang is a tradition of collective inheritance in Besemah-Semende's tribe wherein the heritage can be in the form of houses, rice fields and pond of fish given to the oldest daughter of a family. With the position as a *tunggu tubang*, she may occupy, take and use the collective inheritance, but she may not sell it. Although she has the right to use such collective inheritance, she nevertheless has obligation to guarantee the availability of food from the inheritance management for the extended family's (*apit jurai*) needs, especially the parents and siblings who are not yet married or the needy.

To guarantee the implementation of this custom, a traditional family named *meraje anak belai* consisting of uncle (an older sibling of *tunggu tubang's* mother), grandfather (an older of the sibling of tunggu tubang's grandmother) and great-grandfather (an older sibling of *tunggu-tubang's* great-grandmother) is obliged to help and supervise the implementation of *tunggu tubang's* duties. In other words, men in *tunggu tubang's* family have responsibility for the continuation of tunggu tubang's tradition implementation.

There are many studies on *tunggu tubang* in Semende [38]-[42], but there is no study on how water conservation is in this area. Guaranteeing the food availability of the extended family (*apit jurai*) necessitates. *Tungu tubang* and *meraje anak belai* to work together to maintain the availability of rice in the field and fish in ponds, or in other word, it also requires a guarantee of sufficient water availability, considering a close relationship between the existence of *tunggu tubang's* rice field and the preservation of *ulu ayik* forest [38], [39] and the existence of dams (*tebats*) in every sub-district in Semende as a legacy from generation to generation. This article aims to analyze the management of water conservation in the community of Besemah-Semende's tribe. Indigenous water conservation knowledge becomes important so that it can be reference for developing better water conservation management in Indonesia's local communities in particular and the world's communities in general.

II. Theoretical Framework

IK is the original knowledge owned by local people that refers to understanding, skills, and philosophy developed along with the long history of interactions with their natural environment. Local knowledge informs about decision making on the fundamental aspects of day-to-day life [5], [6]. This knowledge encompasses the use of resources, social interactions, rituals and spirituality. Recognizing IK is an important aspect of the world's cultural diversity and provides a foundation for the appropriate and effective development of sustainability according to local conditions. IK is an element in the conservation of resources including water therein. Berkes *et al*. [25] and Folkes [26] stated that IK is the foundation of modern science in natural resource management and conservation. Hence, the involvement of IK in restoring and managing natural conservation will make modern conservation management adaptive and flexible in the long run. IK requires a mechanism to be internalized and become part of certain social groups. Such a mechanism depends on the extent to which IK gives values to the culture, ethics, and social norms of society [29]. Thus, in such a way, IK can ultimately last long and can be the foundation of modern natural resource management as desired.

Martin *et al*. [39] found out that there is a close relationship between the existence of *tunggu tubang*'s rice fields and the preservation of *ulu ayik* forest in which this forest contains the source of water for irrigating *tunggu tubang's* rice fields in Besemah-Semende's community. However, if asked randomly and directly to the community, for example, about whether *ulu ayik* forest or *tebat* are part of

water conservation IK of their clans, they will not realize this case, so there needs a study which describes the contexts and authentic perspectives on the culture, ethics, and social norms of Basemah-Semende's indigenous community in terms of water, which are subsequently sorted, grouped, and translated as part of the water conservation IK, and then compared with other indigenous communities' knowledge of water conservation based on the similarities and differences. Anchored in the foregoing description, the framework of this study is as Fig. 1.

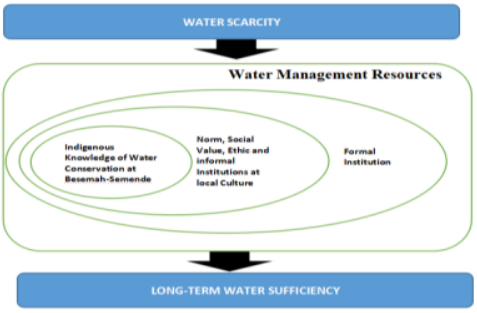

Fig. 1. The theoretical 's framework.

III. Methodology

This is a descriptive qualitative study with the main data collection method in the form of in-depth interviews. Since interviews are interpersonal activities carried out to obtain data naturally, the researchers must build up good relationships with the participants or research objects. The participants who became the sources of information in this study were those considered to have special knowledge about IK as desirable to be explored [43]. The participants were selected in a way of purposive sampling [44] that consisted of elderly people and the heads of the villages where *tebat* were located. It was in the hope that their knowledge of various issues related to *tebat* could be analyzed so that there could be found the Besemah-Semende Community's IK related to water conservation. In garnering the data, the researchers went to the villages where there were either the *tebats* of ancestral inheritance or those of new ones.

Geographically, Besemah-Semende's people live at Muara Enim district, which consists of three zones, including Semende Darat Laut, Tengah and Ulu. The topography is plateau in nature, which passes by the hills of Bukit barisan. In addition, their respective positions are 3° 9' 10"SL-4°21'30"SL and 103° 56' 15" EA - 103° 07' 05"EA; 4°10' 04" SL-4°29'56"SL and 103°31'10"EA-103°63'00"EA, and then 4°17'15"SL-4°37'50"SL 103°35'40"EA-103°62'52"EA. In the three districts, 9Tebats are found with the distribution of 3 Tebats in Semende Darat Laut Sub-district, 3 Tebats in Semende Darat Tengah Sub-district, and 4 Tebats in Semende Darat Ulu Sub-district. The dams categorized as new and not inherited from ancestors are those lying in Yayasan and Tanjung Tiga villages because these are new villages due to regional division in Semende Darat Ulu Sub-district. The area of Muara Enim can be seen on the map of Fig. 2.

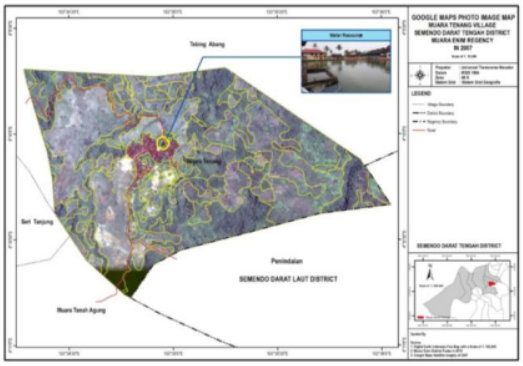

Fig. 2. Topography of old village in Semende Darat Tengah.

After going to the study field, not all of the elderly people and village heads knew about the customs, norms, and values related to *tebats*, let alone water conservation. Some of them regarded that *tebats* were just as ancestral legacy to maintain togetherness by making them places to breed fish and harvest it together. Of 32 people interviewed, 15 people who knew the portions of the indigenous knowledge data concerning the tebat which were later extended to water conservation. All interviews were conducted in the period from March to August, 2019.

The data were then analyzed and compiled. The fifteen people resided in various regions as follows: three people from Pulau Panggung village (Semende Darat Laut), three people from Muara Tenang village (Semende Darat Tengah), and the rest from Semende Darat Ulu sub-district consisting of two people from Tanah Datar village, three people from Danau Gerak village, two people from Tanjung Tiga village, and two people from Yayasan village. The informants or participants in this study were the individuals who had views on the core of the phenomenon (Information-rich) according to Watkins [45] criteria. The minimum number of qualitative study participants in the phenomenology tradition is 8 participants to be interviewed [46]. Thus, 15 participants were of an adequate number.

The researchers designed the interview framework as a general guideline for conversations with the participants, as Bevan [47] suggested, in the framework of phenomenological reduction. The conversation began with the question "Do they know the history of the *tebats'* establishment?" The next question was about whether they knew the purpose of *tebats*." The conversations continued with discourses as regards the flow of the *tebats*' water, the use of water, and so on. Most of the conversations with the participants were held in the areas of *tebats* while they were fishing or were sitting in their home yards not far from the dams. The researchers could combine the techniques of interview and direct observation.

Water conservation is inseparable from the tradition of Besemah-Semende's community with a family leadership system known as *jurai medika*, which means the leader of an extended family, regarding to the mother's sibling (uncle). Meanwhile, the oldest daughter is called *tunggu tubang*, who is expected to preserve and manage the family's property, including houses, rice fields and agriculture. This collective inheritance may not be sold [40]-[42]. The existence of rice

fields and the availability of rice to protect the extended family from food shortages lead to the importance of maintaining water resources to irrigate rice fields and other needs.

The success of Besemah-Semende's community in maintaining food production can be seen from the confirmation given to Semende as one of the rice centers besides the well-known coffee producer in South Sumatra in 2013 [48]. Grounded in the BPS data, the majority of Semende's residents works as farmers, but some works as traders and day laborers. Despite being successful as farmers producing rice and coffee, on average the residents have lower middle income by the price of coffee which is not to good. Meanwhile, the rice produced from their fields is not allowed to be traded unless it is very excessive. This condition leads some residents, especially those who are not obliged to be *tunggu tubang,* to migrated to other area in search better jobs.

Tunggu tubang's tradition, the maintenance of ancestral tebat, and the community's success in maintaining the amount of food production especially rice become an indication that Besemah-Semende's people most likely have IK related to water conservation which is quite successfully preserved although they may not realize that it is part of water conservation.

IV. Result and Discussion

Water conservation is inseparable from the custom of Besemah-Semende's people. This is known as jurai medika, meaning that the leader of an the extended family, with reference to the mother's brother (uncle). Meanwhile, the oldest daughter is called as tunggu tubang, who is customarily expected to preserve and manage the family property, including the house, rice fields, farms, etc. These possessions are not allowed to to be sold [39]-[42], although the cultivation of rice fields is handled by tunggu tubang, if some family members come to visit tunggu tubang at home, they can get a part of the rice harvesting results. That is why the harvesting result are not allowed to be sold for the sake of probable anticipating in case there are some family members in need.. The existence of rice fields and the availability of harvesting result to protect the extended family from food shortages highlight the importance of water resource maintenance, needed to irrigate fields and sustain other interests. Furthermore, there are a several water conservation regulations categorized as IKin Besemah-Semende's community, which include tebat, datuk ayik, bubus tebat, calang badawa, and ayik tambat.

A. Tebat

Based on the Indonesian dictionary, *tebat* is a pond, functioned as to block off obstruct the flow of water, dam, or a place in the river (or swamp) to protect fish [49]. This is usually a commonly owned natural or man-made pool (dam) for the Besemah-Semende tribe, which contains water sourced from mountains or springs. In addition, almost all villages in the locality have this feature with slight differences between those present in the old villages and those of new ones

Tebats in the old villages were originally built by the founding fathers to irrigate the fields for descendants. That is why there are rice fields on the nearby areas of *tebats*. However, the exact year signifying when *tebats* were built up is in unknow. Although *tebats* are owned by a group of t*unggu tubangs* who own rice fields *(tuan sawah)* to irrigate their rice fields, it is also possible for others to use *tebats* breeding and catching fish, taking a bath, and washing clothes.

The water of *tebat* is source from nearby springs or from *ulu ayik forest* located close to *tebats* so that function of tebats is similar to modern dam. A slight different is only that the dams are constructed to hold the flow of water in the river, whereas *tebats* are constructed to collect water from springs in the forest and from rain. This is different from traditional dams called *ndiva* in Kilimanjaro, Tanzania [50], dams in Iran and *Duba* in India, which are used to collect rainwater (Rain Water Harvest) [51], [52].

The role of *tebats,* which was originally as the maun source for irrigating rice fields owned by a group of tunggu tubang,who is lead by *jurai medika* have experienced a shift in function especially in the area where *tunggu tubang's* tradition is not very well preserved, for instance in the area of *damcik tebat* located in Pulau Panggung, the capital of Semende Darat Laut Sub-district. When those of *tunggu tubang* do not take their role, they also lose their ownership of the inherited rice fields. This condition commonly occurs because their domicilies move outside the village so that the rice field are willy-nilly to be sold or taken by other families. When this case happens, then there is no *tuan sawah* as a group of owning tebat for irritating rice fields, but *tebats* are still functioned for other needs such as breeding and catching fish, taking a bath, and washing clothes. To protect *tebats*

Some informal rules are instituted for the public with intent to take advantages of the restrictions. These include the bans on dumping garbage in to *tebats* , and bathing in the middle of *tebats,* especially for menstruating women, except for children. In addition, the sacred value of the old *tebats* is preserved through the placement of ancestral tombs near the area, which includes those of the founding fathers, alongside the complete stories surrounding their emergence on various occasions. The Protection of *tebats* using the values of taboo is know as *calak badawan*

Fig. 3 and 4 are the photos of the *tebats* in old and new villages.

Fig. 3. *Tebat* in old village.

Based on the surveys and interviews with residents, it is know established that despite the expansion of old villages, the Besemah-Semende's tribe sustains the habit of making *tebats* in the new village. However, rather than being built to irrigate rice fields, the new ones were created for communal activities, including fishing or fish breeding to be harvested

annually in a special event called *bubus tebat or others daily activities*.

Fig. 4. *Tebat* in the new village.

B. Calak Badawan

Calak Badawan is the name of a taboo culture in the Besemah-Semende's community, and the term "taboo" originates from the Polynesian language "tabu", meaning prohibition. This regulates the manner of interaction between individuals and the world by banning the use of specific goods, consuming or causing damages in areas considered sacred. This is a form of unwritten social rules, governing behaviors bound by a shared obligation in some traditional societies [53]. Furthermore, taboo is also maintained as an informal institution for regulating the lives of indigenous [54], [55].

Calak Badawan is a belief about at taboo that pervades amid Besemah-Semende's people, stating that tebats and the surrounding area are guarded by supernatural power, originated from the spirits of the founding fathers. Such as belief prompt the community to act and speak carefully around the area, and it also makes them cautious about other prohibited actions include littering, defecating or urinating in the tebats , bathing while menstruating, poisoning fish and uttering inappropriate words while being around tebat. This culture serves as an informal rule regulating human interaction with one another and nature, in addition to the social norms [54]. Previous studies reported that taboo culture and belief in supernatural powers promote people's obedience in a better way compared to the formal laws that apply. For instance thetaboo culture of faddy in Madagascar [29], [30], the taboo culture in Mgbe Oban forrest and others in Uli Illihala of [56], [57], and the taboo culture in Nigeria and Thailand [58], [59].

C. Tambat Ayik

Tambat Ayik is the community'IK, established to promote the utility of water. Therefore, the residents avoid channeling into rivers, as long as the flow is viable. The water movement at Besemah-Semende is shown in Fig. 5.

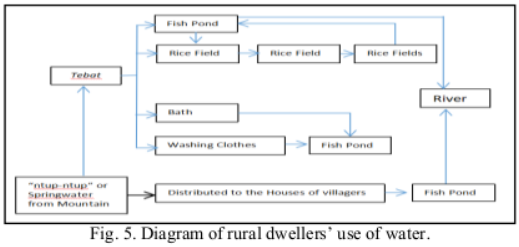

Fig. 5. Diagram of rural dwellers' use of water.

The water flow from t*ebat* and *ntup-ntup* or spring-water to rice fields and their irrigation is regulated by *menteri* and *datuk ayik* who are assigned by the rice field owners and rural dweller villagers to control it. To protect *ntup-ntup* and water drains from damage, the forests *(Ulu ayik)* containing *ntup-ntup* are prohibited from being converted. Those, the so-called *datuk ayik,* also have the duty to control *ntup-ntup* and protect the forest. *Ntup-ntup* for the rural dwellers is a special water resource because its clean and pure. The rural dweller believe that *ntup-ntup* is part of zam-zam water brought by ancestor for household consumption (Interview with villagers).

Water reuse and recycle in rice fields make the contours of the rice fields in Besemah-Semende in the shape of terraces such as *subak* IK of Bali. The shape of terraces provides benefits including 1) Preventing high water levels in a paddy field which can thus reduce the activity of methane-producing methanogen bacteria so that it indirectly reduces the concentration of Greenhouse Gases 2) Reducing the occurrence of landslides and loss of organic matter in the soil; and 3) Water efficiency; in other words not too much water is needed to irrigate the fields [60]. The following are photos of the use of water with the concept of *tambat ayik* by the residents of Besemah-Semende

a. Rice field irrigation b. Bathing&washing dishes c. Terrace rice field

d. Power generator e. Fish pond from *tebat* f. Water from rice field that is used to breed fish

Fig. 6. Rural dwellers use of water.

Tambat ayik is IK related to water reuse and recycle. This bears close similarity with *Tangata Whenua* in New Zealand, which requires the holistic use of water, by returning to the land (*Papatuanuku*) after utilization [61]. Furthermore, the reuse process is highly efficient and has existed for over 500 years. Also, this technique addresses the water needs in areas with scarcity and abundance. There are several a number of triggering mechanisms for reuse, including regions with water deficiency, drought impacts management, high demand (e.g. in agriculture), savings as a result of frequent applications that require high quality, cost-effective utility and the principle of returning water to the environment [62].

The IK in the form of *tambat ayik* of the Besemah-Semende's people subsume the recycling of water for at least three important reasons, including the fulfillment of elevated demands in agriculture, especially in rice fields, high-quality water supply using springs directly from the mountains (*ayik ntup-ntup*). This is channeled directly to the rural dwellers' households through pipes and then returned to the environmental land, or to the river, which is adopted as a water conservation technique in Besemah-Semende.

D. Bubus Tebat

Bubus tebat is an activity performed by residents

surrounding *tebats,* which involves drying *tebat's* water and collecting fish. The rural dweller dry *Tebat* in the following way: a t*ebat* has sluice or in the local language called *pemetung*. *Pemetung* is a waterway leading to canals which, on a daily basis, play a role as the control of *tebat*'s water surface as well as a place to drain water into rice fields or fishponds. On the day of *bubus tebat*, the *pemetung's* door is opened wide, and the water channel at the border of *Pemetung* is given a net until the *Tebat*'s water recedes but all fish inside does not come off. Drying at *tebat* can take 1 until 2 weeks or more. *Pemetung*, the canal, and the condition of Bubus Tebat can be seen in Fig. 7.

a. The Canal of tebat b. *Pementung* or sluice

d.Tebat before bubus tebat d. On-going bubus tebat processes

Fig. 7. Pementung and water condition on bubus tebat processes.

This is an annual event, often conducted after the harvest of rice, or following the qurban holiday, where the villagers slaughter chickens and goats and then have a feast. Furthermore, fishes are sometimes evenly distributed or sold, and the money is then used for communal development and for the reparation of damaged tebat walls (based on the interview with Mr. Tasman). Based on interviews, the structure is an attempt made by the rice field owners to guarantee the availability of water, although some villages having no ancestral heritage prominently use tebats for social functions. This includes the use of tebats as gathering places for harvesting fish after drying the tebats water. Moreover, bubus tebat become the village party event, celebrated with prayers and the slaughtering of livestock, including goats and chickens, followed by meaning-making of tebats to manage community ownership.

The participation of all members of community in maintaining tebats in a way of bubus tebat is categorized as a part of the seasonal maintance to clean sendiments and as major well rehabilitation. As stated by Coppock [63]. there are three things that the community can do in maintaining water sources, namely daily, seasonal, and major well maintain. This manner of IK control in several studies is part of an effort to ensure the sustainability of water and land resources [64], [65], which has also been identified in some Malawi and Botswana communities [66].

Although the water conservation IK in Besemah-Semende's tribe is assumed to be very closely connected with tunggu tubang's tradition mandated to women, based on observation and interviews. No significant women's role is found in water conservation. The role of women is more oriented toward the internal family in managing the result of the collective inheritance. In the meantime, things concerned how to keep water in the fields sufficient; who take charge of managing the field and garden; and who coordinate and engage into communication with fellow owners of rice field to determine *menteri ayik* and *datuk ayik* guarding the condition of the springs and irrigation, are carried out entirely by *meraje anak belai* and *tunggu tubang's* husband. Facilitated by the traditional leader, or in government occupation is know as the village head.

The structure of indigenous community, which was originally held by clan's leader (*pesirah)* [67], who was vary knowledgeable about the existed custom, has been change and held by the village head chosen every five years, wherein he is chosen not because of his ability to lead and understand the existing custom but rather based upon his succeed in gathering the most vote with certain political intrigues. This condition likely has an impact on this conservation although in certain areas this deficiency can be covered by the village heads' awareness to appoint customary leader as the hamlet heads so that the ties of informal customary norms can be maintained and bind the entire community. It is as done in old village, Muara Tenang. However, it still calls for further studies on the relationship between the success of water conservation IK and the level of understanding of *tunggu tubang, meraje anak belai* and those of community's structure vis-a-vis the custom prevailing in the village.

V. Conclusion

Tebat is an indigenous knowledge of the Besemah-Semende's community which a part of water conservation. This water conservation serves to collect water from mountain springs for the irrigation of rice in the fields, to breed fish, and to fulfill household water needs, including bathing, washing clothes and the management of mini power plants. In addition, other components of water conservation in the community include *tambak ayik,* as part of the reuse water cycle, *calak badawan* as a taboo culture to protect *tebat* and springs in forest from detrimental human activities, *bubus tebat* as to dry *tebat's* water to harvest fish. B*ubus tebat,* is part of an effort to maintain a sense of communal ownership, as well as to preserve tebat and repair it if damage occurs.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Meilinda conducted the research and wrote the paper; khoiron nazip analyzed the data; riyanto wrote the paper all authors had approved the final version.

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