Traditional Knowledge of Local Wisdom of Ammatoa Kajang Tribe (South Sulawesi) about Environmental Conservation

H K Surtikanti*, A Syulasmi and N Ramdhani

Departemen Pendidikan Biologi, FPMIPA UPI, Jl. Dr. Setiabudhi no 229 Bandung 40154, Indonesia

*hertien_surtikanti@yahoo.com

Abstract. Education may improve the knowledge how to build the people attitude especially environmental aware surrounding it. The aim was to study about environmental education of the local wisdom people in conserving their environment. The method was qualitative descriptive using second document, questioner/interview instrument and field observation. This research is done in local wisdom of Ammatoa Kajang village (South Sulawesi). The respondens were elderly people (tetua adat), local government and people (15 adult couples and 15 children). The majority of local people was educated at elementary school. Environmental education is studied in school, however informal education is heritated from elderly people. The field study showed that the people keep the environment wisely. It can be proved with the presence of sacred forest, waste recycle, moor (tegalan) maintainance, mutual cooperation, no natural resource exploitation, keep clean, etc. The people submissive customs rules and believe that people will get punishment form environment itself. In conclusion, traditional knowledge from community is implemented in caring the environment.

1. Introduction
The increasing number of people have an increasing number of human activities in exploiting the environment. People exploited the environment in purpose to fulfill their needs. It affected to the living things [1]. People attitude in caring the environment is influenced by their value beliefs. Their beliefs were reflected in environmental ethics which is a guide life for people how to treat the environment. Their understanding and implementation of environmental ethics is valuable in contributing the environmental conservation [2]. Furthermore, environmental education learning in the school may enhance their understanding in environmental conservation.

Environmental ethics in modern people is replenishing. It can be seen with the environmental damage due to human activities. Having benefit from environment was imbalance with saving the environment. Therefore, environment may not supply continuously for future generation [3]. Environmental education play important role for people. Because with education, people may enhance and improve their quality life. Conservation and saving the environment is one example that can be learnt in environmental education.

Since long time ago, local wisdom people sustained culture value and environmental ethics, especially in saving the environment and environmental care. Some studies have been proved it. Other study showed that Aboriginal traditional knowledge influenced in saving the environment in Canada [4]. Mount Salak traditional people have belief in maintaining and preserving the environment [5]. Timorese Community in Timor Island appreciated in environmental management [6]. Anak Dalam people in Jambi get benefit from the environment and save the forest [7]. It showed that the local people still follow their environmental ethic. Mostly local wisdom have traditional knowledge in improving environmental knowledge [8].
There are numerous local wisdom in Indonesia having 34 provinces. Each provinces may have some tradition local wisdom. Some of them were community of Saham village in West Kalimantan [9], community of Anak Dalam in Jambi [6], community of Dompu County in West Nusa Tenggara [10], local wisdom in Karimunjawa, Dayak Tunjung community in East Kalimantan [11], Moronene community in North East Sulawesi [12], and Dukuh wisdom Village in West Jawa [13]. However, there were limited studies investigating about environmental education of local people wisdom in preserving the environment. Therefore, study about Ammatoa Kajang in caring their environment is done.

2. Method
This study is done in Tana Toa, Kecamatan Kajang, Kabupaten Bulukumba, South Sulawesi. Their community is called Ammatoa Kajang people. This research used qualitative method. Collecting data technique is done using secondary document, questionnaire/interview instruments, and field observation (Table 1). Secondary document is provided from local government office. Questionnaire and interview are done at the same time through leader of the community, 15 parents and 15 children. Those number of respondents is obtained using purposive sampling. The number of questionnaire and interview (30) are used to obtain data on environmental knowledge, society, belief, culture, livelihood, education and attitude of Ammatoa community (Table 2). Field observation is done by investigating all activities of the people in their village.

| No | Methods | Data | Source |
|----|---------|------|--------|
| 1  | Secondary data | Geography, people and government system | Local government office and literature studies |
| 2  | Questionnaire and interview | Background Environmental knowledges of people formal and informal | Teacher, parents, children and leader of community |
| 3  | Field observation | People activities related to environmental conservation | Field |

| No | Subject | Data |
|----|---------|------|
| 1  | Environmental knowledge and education | a. Environmental knowledge in school b. Environmental knowledge in society c. People attitude in environmental conservation |
| 2  | Public view in caring environment | a. Society b. Belief c. Culture d. Livelihood e. Education |
| 3  | Attitude of Ammatoa community to environment | a. Attitude of Ammatoa community to environment b. Effort in environmental conservation c. Environmental management Rule and customary law in environmental conservation |
3. Result and Discussion

3.1. Study location
Local wisdom of Kajang is one of the local wisdom in Tana Toa village, Kabupaten Bulukumba, South Sulawesi Province. Kajang sub-district is about 129.1 km², while the area of Tana Toa village is about 5.25 km²[14]. The village of Tana Toa consists of 8 hamlets, including Dusun Sobbu, Benteng, Pangi, Tombolo, Luarayya, and Balimbina located within the Ammatoa custom area.

The location of Tana Toa village is 9°20’ LS dan 120°22’ BT. There are 4 rivers surrounded this village, Limba, Doro, Tulia, and Sangkala river. The distance from the capital city to that village is about 270 km.

3.2. Background of Ammatoa Kajang community (government, religion, culture, social and economy)
The Kajang have their own customary government system. They are led directly by an Ammatoa as a traditional elder. Ammatoa in traditional duties and ceremonies was accompanied by two Anrongs and some traditional leaders called Galla.

Almost the Ammatoa community are Muslim. Although Islam is recognized by the Ammatoa community as the only religion within the adat area, but in their life are still mixing up with the teachings of their ancestors (patuntung). Traditional ceremonies and rituals are widely held in the Kajang tribe. One of the special ceremonies and rituals concerning the environment is the ceremony held after harvest. The ceremony is intended as a form of gratitude to God for what has been given. Rituals of panrobel and tunu passautunas are also performed if there are people who break the rules such as cutting trees without the permission of Ammatoa.

The culture adopted by Kajang society is the culture of kamase-kamasea. The culture teaches the Kajang people to live a simple life. According to them, excessive life can lead to conflicts between communities that will result in disharmony in the community.

Ammatoa’s livelihoods are farming, fishing, weaving, trading in the market. While young people and Ammatoa community generally choose to live outside the area to study and work. Ammatoa food ingredients are generally obtained from farming. The types of plants are tomatoes (Solanum lycopersicum), pepper (Piper nigrum), rice (Oryza sativa), corn (Zea mays), vegetable such as green beans (Vigna radiata), soybean (Glycine max) and others.

As social creatures, family relations among Kajang people are very strong. The Ammatoa community also greatly appreciates and respects to other communities. People know their first name, nickname, occupation, and number of families (children and followers). Houses have a big role in social relationships between neighbors and fellow nuclear families because it is used as a gathering place for community. The good relationship between Ammatoa Kajang community is formed from routine activities in various activities, such as clean up the environment, help each other when planting rice and harvest together and then the result is divided equally to all Ammatoa Kajang community.

3.3. Education process about environment
Education is seen as a lifelong learning process. Learning process may take place anywhere, anytime, for the whole lifelong. The lifelong learning that occurs for every individual in obtaining values, attitudes, skills and knowledge is not only derived from school but also from family, daily experience or from other sources around the environment [6].

Based on the findings in Table 3 it is known that Ammatoa Kajang community environmental science is obtained from parents (60%), traditional elders (56.6%), nature (86.6%), education in schools (63.3%), (53.3%) and the community (80%). The environmental science that Ammatoa communities gain in schools is tailored to the applicable curriculum with a wider and more structured material review of the environment. While the environmental knowledge obtained by the Kajang Tribe community is based on pairs of Kajang and patuntung trust which is more to keep the forest as a natural resource in Kajang custom area. The educational process is largely informal education in which the community at the time of gathering (A'borong) with Ammatoa in Baruga or during routine activities, discussing the Ammatoa Kajang environment, customs and tribes in the Kajang and discussing environmental issues which is rife in the Kajang tribe.
Table 3. Environmental education sources in Amnatoa Kajang

| No | Sources                | Percentages |
|----|------------------------|-------------|
| 1. | Parents                | 60          |
| 2. | Elder people           | 56.6        |
| 3. | Environment            | 86.6        |
| 4. | School                 | 63.3        |
| 5. | Local law              | 53.3        |
| 6. | *Amnatoa* Kajang community | 80          |

*Amnatoa* parents and communities provide environmental science to children by way of lectures, direct practice, demonstrations and story telling. For example, when looking for wood for home making, home furnishings and looking for plants to color the weaving thread, parents will take children and teach them verbally and practice directly. The results also show that parents teach their children not only about cultivating and weaving, but taught little by little about Kajang’s *pasangri* tides to cut trees in the forest indiscriminately without the permission of *Amnatoa*. Types of trees that are felled are also not just any but only certain trees such as *asa, nyato* and *pangi* wood.

The inheritance of knowledge is passed down orally from generation to generation. Their traditional knowledge has formed their attitude in caring the environment [15]. The way of delivering knowledge to the community through lectures is a way considered easily accepted and understood by the community [16]. In this study the results of education from parents and from school, applied in everyday life (Table 4). Similarly, that environmental knowledge obtained by children from their parents, can be understood and implemented to maintain and preserve the environment in Kampung Naga, Tasikmalaya [17].

Table 4. The implementation of environmental education

| No | Statements                                     | Percentages |
|----|------------------------------------------------|-------------|
| 1  | The implementation of environmental education from school | 76.6        |
| 2  | The implementation of environmental education from community | 83.3        |

In the sense of *Amnatoa* society (Table 5) contain more meaning than just a message. Each message conveyed is a mandatory to be obeyed and implemented. When the mandate is not implemented it will lead to negative impact, i.e. there is no balance between social and ecological systems. Meanwhile, *patuntung* trust views the function of the forest ecosystem as a source of rain and water springs (*tumbusu*) [18]. Therefore, the *Amnatoa* society treat the environment in maintaining the function of the ecosystem.
Table 5. Pasang-pasang of the Ammatoa Kajang tribe on forest preservation

| No | Pasang-pasang | Meanings |
|----|---------------|----------|
| 1  | Jagai linoa lollongbonenakammayya tompa langika siangangrupa taua siangang boronga | Keep the earth and its contents (sky, people, and forest) |
| 2  | Nikasipalliangngi ammanra’-man rakia borong | Prohibited (kasipalli) and abstinence |
| 3  | Anjo boronga iya kontaki bosiya nasaba konre mae pangairangga iaminjo boronga nikua pangairang | Destroying the forest |
| 4  | Punna nitabbangngi kajariborongnganga, numipapi rangnga | If the wood in the forest is cut down, the rain will decrease and the spring will disappear (dry up) |
| 5  | Narie’ kaloro battu riborongnga, narie’ timbusu battu rijkua na battu ri kalelengnga | The existence of streams derived forest, the spring comes from trees and lianas |
| 6  | Boronga pangallui nitallasi, erea battu ri kaloro lupayya | Forests need to be conserved because water comes from small rivers |
| 7  | Iyamintu akkiyo bosiy anggenna erea nipake a’lamung pare, ba’do appa’rie’ timbusia Anjo | The forests bring rain water that can be used to plant rice, corn, etc. |
| 8  | Tugasa’nA Ammatoa nolarangngi annabbang kaju ri borongnga | The duty of an Ammatoa people is to prohibit logging in the forest |
| 9  | Iyaminjo nikua ada’na Iyaminjo boronga kunre pusaka Talakuliee nisambei kajua, iyato’mi njo kaju timboa | Thus the law that applies here, that the forest is our heirloom. The wood has to grow and it should not be replaced |
| 10 | Talakuliee nitambai nanikurangi borong karama, nilarangngi tawu a’lamung-lamung riborongnga, nasaba se’re battu larie’ tau angngakui bate lamunna | Not allowed to change the other type of wood in customary forests. That’s all wood grows naturally. It can not be added, reduced, and prohibited the existence of planting in customary forest, because a time will arise recognition of plantation rights |

The ban on cutting timber in the forests is focused on the borongkaramaka (sacred forest) bund, while Ammatoa communities are allowed to cut trees in borong batasaya (border forests). The type of wood that can be cut by the Ammatoa community is limited such as timber (Tamarindus indica), nyatoth, pangi wood (Pangium edulu). The wood harvested by the Ammatoa community for building houses and making furniture. The real condition that is illustrated through the environment of the cool Kajang tribe and the circumstances outside the region gives its own understanding for the Ammatoa community. They are aware that vehicle pollution, household waste and arbitrary acts against forests will destroy the environment.

3.4. The role of education in determining public caring attitude towards environmental conservation. The community realizes that today the environment tends to be increasingly damaged. The environmental degradation is largely due to human activities and human behaviour that are not environmentally sound. However, despite the environmental damage caused by the lack of care of the
community, there is still hope to improve it is by raising human awareness of the importance of maintaining the environment.

The respondents responses in Table 6 indicates that Ammatoa as elders of adat, parents and education in school are equally instrumental in forming the attitude of Kajang society to the environment. Education undertaken by the community at school may increase the insight of the Ammatoa community about the importance of protecting the environment. Findings on other research also known that both education in schools and education in the Aga Medaha and Metruna tribes alike affect the behavior change of Aga Tenganan Bali [19].

Table 6. The Role of Education in Caring attitude towards Environmental Conservation

| No | Statements                                                                 | Percentages |
|----|-----------------------------------------------------------------------------|-------------|
| 1  | Ammatoa community's attitude towards the environment is influenced by parents| 76.6        |
| 2  | Ammatoa community's attitude towards the environment is influenced by education in schools | 56.6        |
| 3  | Kajang's attitude towards the environment is influenced by Ammatoa          | 80          |
| 4  | The attitude of the Ammatoa community to the environment is influenced by people's self-awareness | 40          |

The environmental knowledge that Kajang communities gain from parents and the teachings of the Kajang tide of Ammatoa is supported by the knowledge gained from the school will certainly increase the community's insight and further strengthen the community to care about the environment. Education can be utilized as a means of forming awareness of the environment effectively because through education can be realized mental readiness and tendency to behave positively toward a certain object such as environment [20].

In line with that in the history of human life, education is done through an integrated process of informal in everyday life [21]. Humans learn language, behave, values to become effective members of society and through individuals in society such as parents and community leaders. Therefore education such as informal education through family and environmental education is needed to ensure in the management and conservation of the environment in a certain region or tribe such as Ammatoa Kajang.

3.5. The role of education towards the psychomotor attitude of Ammatoa society to the environment

Based on this research, it is known that polluting the environment and cutting down trees is one form of prohibition that should not be done by the Ammatoa community. Because it is included in custom rules and can cause damage to nature. In addition to the necessities of life, nature is also respected in order to keep the Kajang community from all forms of threat.

The attitude shown by the community in maintaining the environment is reflected in the daily behavior of the community (Table 7). More than 63.33% of the people have done positive activities in managing waste, preserving the forest and utilizing the yard. It is shown that, both traditional and formal education may build their character in caring the environment. Similar study also showed that moral character of Karimunjaya society reflected with the high conservation of wildlife and sacred places [21]. Based on this, it is appropriate if the environment is well managed by the community for the welfare of mankind. The purpose of environmental management is to achieve the harmony of the relationship between humans and the environment as a goal to build a whole human, controlled resource utilization wisely and manifestation of human as environmental coach [22].
Table 7. Psychomotor Attitudes Ammatoa Society Against the Environment in the Kajang Tribe

| No | Statements                                                                 | Percentages |
|----|---------------------------------------------------------------------------|-------------|
| 1  | The Ammatoa Kajang community do not dispose of the garbage                | 83.3        |
| 2  | Ammatoa Kajang people do not justify to dispose of garbage                | 86.6        |
| 3  | The Ammatoa Kajang people do not throw garbage in the river               | 80          |
| 4  | Ammatoa Kajang communities sort out organic and inorganic waste           | 73.3        |
| 5  | The garbage that is in the neighborhood by the Ammatoa Society is collected and then buried | 63.3 |
| 6  | The Ammatoa Kajang community utilizes the surrounding yard for a useful crop | 83.3 |
| 7  | Cut down indiscriminately forest trees is not allowed in the Kajang tribe | 83.3        |
| 8  | The Ammatoa Kajang community replanted after cutting down trees           | 90          |
| 9  | To rebuke people who do not take care of the environment needs by Ammatoa Kajang | 96.6 |


The role of rules and customary law related to environmental conservation in Kajang tribe

Based on the responses of respondents in Table 8 shows that 76.6% of respondents think they do not object to the customary rules applicable in the Kajang. 93.3% of respondents feel the rules to protect the environment and maintain the forest is very beneficial to the life of the community in the sense that the customary rules that notabennya have a purpose to maintain and preserve the environment, especially the forest is not felt burdensome Ammatoa community. They believe that the rule will not bring harm to their lives but to give good luck in the world and in the hereafter.

Table 8. Traditional law related to environmental conservation

| No | Statements                                                                 | Percentages |
|----|---------------------------------------------------------------------------|-------------|
| 1  | The Ammatoa community do not object to customary rules regarding preserving the forests | 76.6        |
| 2  | Rules (preserving the environment and preserving the forest) are beneficial to Ammatoa Kajang community life | 93.3        |

4. Conclusion

Ammatoa people have learnt environmental science from school and community. Young generation received their traditional knowledges mostly from their parents, elderly people and their environment. Their knowledges are heritated through young generations. The learning process took place with giving a lecture and field exercise during routine daily life activities. This learning method was effective and easily to understand. Their knowledges affected to their positif attitudes and efforts in saving the environment and keeping the natural resources (forests) from high exploitation. It is good learning for ordinary people to implement it in their daily life.
Acknowledgements
Thanks to Ammatoa community for their valuable information on this research. This work is supported by UPI through competitive grants (PPKBK-UPI 2017) that funded this research.

References
[1] Affandi R 2013 Integrasi pendidikan lingkungan hidup melalui pembelajaran IPS di sekolah dasar sebagai alternative menciptakan sekolah hijau. Pedagogia, pp 98-108
[2] MKDU PLH  2014 Pendidikan lingkungan hidup. Semarang: Universitas Negeri Semarang
[3] Junianto B 2007 Persepsi, Sikap dan Perilaku Masyarakat Sekitar Terhadap Keberadaan Hutan Penelitian Haurbentes (Studi Kasus di Desa Jugalaya, RPH Jasinga, BKPH Jasinga). Skripsi Fakultas Kehutanan IPB Bogor
[4] Hobson G 1992 Traditional Knowledge is Science. CARC Northern Perspective. 20 (1)
[5] Royyani M F & Wahyo E B 2012 The Perspective Environment Basedon Local Beliefs and Ritual Tradition: A case study of communities in Mount Salak. Journal of Biology Indonesia. 8 (1) pp 71-84
[6] Ardan A, Ardi M, Hala Y, Supu A & Dirawan G D 2015 Needs Assessment to Development of Biology Textbook for High School Class X-Based the local Wisdom of Timor. International Education Studies Vol.8 No.4.
[7] Andhika R R, Hariyadi B, Saudagar F 2015 Etnobotani Penghasil getah oleh Suku Anak Dalam di Taman Nasional Bukit Duabelas Kabupaten Soralangun, Jambi. Jurnal Ilmu Pertanian Indonesia (JIP).
[8] Ardan A S 2016 The Development of Biology Teaching Material Based on the Local Wisdom of Timorese to Improve Students Knowledge and Attitude of Environment in Caring the Perservation of Environment. International Journal of Higher Education 5, No. 3.
[9] Winda G W, Budhi S & Sisillia L 2015 Etnobotani Masyarakat Desa Saham. Jurnal Hutan Lestari. 4 (1) pp 1-8
[10] Nurrahmah N, Zamroni Z & Sumarno S 2016 An Ethnographic Study of Elementary Education in the Rural Area of Dompu County, the Province of West Nusa Tenggara. Research and Evaluation in Education. 2. 1 pp 79-91
[11] Setyowati FM 2010 Etnofarmakologi dan pemakaian tanaman obat Suku Dayak Tanjung di Kalimantan Timur. Media Litbang Kesehatan 20 (3) pp 104-112.
[12] Setiawan H & Qiptiyah M 2014 Kajian Etnobotani Masyarakat Adat Suku Moronene di Taman Nasional Rawa Aopa Watumohai. Jurnal Penelitian Kehutanan Wallacea 3(2) pp 107-117
[13] Hidayat S 2009 Kajian etnobotani masyarakat Kampung Adat Dukuh, Kabupaten Garut Jawa Barat. Skripsi. Institut Pertanian Bogor
[14] Madasir H 2010 Statistik Kabupaten Bulukumba (Statistical yearbook of Bulukumba). Badan Pusat Statistik Kabupaten Bulukumba.
[15] Riggs E M 2004 Indigenous fields based education and knowledge of Essential Companents of Geoscience Education for Native American Community. Wiley Periodicals Inc. Sci (ed) pp 1-18
[16] Saputro FBE 2012 Pelestarian kearifan lokal masyarakat desa pakramantengan pegringsingan dalam pengelolaan hutan,[Online]. Diakses dari http://repository.unej.ac.id/bitstream/handle/123456789/59077/Fajar%20Bagus%20Ekan da%20Saputro.pdf?sequence=1
[17] Pertwi S E 2016 Pendudukan pengetahuan lingkungan masyarakat lokal Kampung Naga Tasikmalaya mengenai konservasi lingkungan. Skripsi. Universitas Pendidikan Indonesia
[18] Istiawati NF 2016 Pendidikan karakter berbasis nilai-nilai kearifan lokal adat ammatoa dalam menumbuhkan karakter konservasi. ISSN. 10 (1), pp 1-17
[19] Fatimah T 2016 Pendidikan Lingkungan masyarakat Suku Aga Tenganan Pegeringsingan Bali mengenai Konservasi Lingkungan. Skripsi Program Studi Pendidikan Biologi FPMIPA UPI.
[20] Hamzah S 2013 *Pendidikan lingkungan*. Bandung: Rafika Aditama.

[21] Sudarmin & Pujiastuti S E 2013 Scientific knowledge based culture and local wisdom in Karimunjaya for growing soft skills conservation. *International Journal of Science and Research* 4, pp 598-604

[22] Pramudya S 2001 *Melindungi lingkungan dengan menerapkan ISO 14001*. Jakarta: PT Grasindo.