

Using Ethnotaxonomy to assess Traditional Knowledge and Language vitality: A case study with the Urang Kanekes (Baduy) of Banten, Indonesia

Syafitri Hidayati¹, Nurul Iman Suansa², Samin³ & F Merlin Franco^{1,4*}

¹Curtin University, Sarawak Malaysia, 98009 Miri, Malaysia;

²King Saud University, PO Box 2460, Riyadh 11451 Saudi Arabia;

³Community Representative, Kaduketug hamlet, Kanekes village, Banten, Java, Indonesia;

⁴Institute of Asian Studies, Universiti Brunei Darussalam, Jalan Tungku Link, BE 1410, Brunei Darussalam

E-mail: tropicalforezt@gmail.com

Received 23 January 2017, revised 13 March 2017

The Urang Kanekes of Banten, Indonesia are culturally divided into two groups, namely *Urang Jero* (inner Kanekes) who follow the traditions and customs strictly, and an *Urang Luar* (outer Kanekes) who tolerate minor deviations from the customs and traditions. The present study looks into the vitality status of the traditional knowledge (TK) and language of the community, comparing trends from the inner and outer Kanekes. Sixteen knowledgeable elders from the *Urang Jero* (inner Kanekes) were interviewed in the first phase, while thirty randomly chosen adult members from the *Urang Luar* (outer Kanekes) and another 30 from the *Urang Jero* (inner Kanekes) were interviewed in the second phase. Interviews followed the methodology stipulated by the TK and Language Vitality Index (TraLaVi) which was used to analyse the vitality of TK and language. The results of the study show that the Urang Kanekes have been successful in maintaining high TK and language vitality, and there is no significant difference in the vitality status of TK and language between the inner and outer Kanekes people.

Keywords: Food plants, Baduy, Vernacular names, Folk taxonomy, Culture

IPC Int. Cl.: A61K 36/00, A23L, A47G 19/26, A47J 39/02, G06F 17/28, G10L 15/183

The Urang Kanekes popularly known as Baduy, inhabit the Kanekes village (*desa*), Leuwidamar sub-district (*kecamatan*), Lebak district (*kabupaten*) of Banten province (*provinsi*), Indonesia. In 2012, approximately 1127 people lived in the 69 hamlets that are culturally and geographically divided into two main groups, viz., Inner and Outer Kanekes referred to as *Urang Jero* and *Urang Luar* respectively by the people¹⁻³. The community believes in the doctrine of *Sunda Wiwitan* that stipulates swidden farming of traditional rice varieties as a customary obligation. Planting and harvesting rice of swidden rice (*huma*) is undertaken according to their ancient calendar maintained by the *puun* who is the shaman as well as the calendar keeper⁴. As the activities connected to the swidden agriculture are initiated by the *puun* from the inner Kanekes, the inner Kanekes would commence the activities first followed by the outer Kanekes. Thus, the flow of cultural information is from the inner to the outer regions. Symbolically, the inner Kanekes are required to always wear white attire to denote 'cultural purity' while the outer Kanekes wear dark blue or black

coloured attire; modern attire are also frequently worn by the Outer Kanekes. The inner Kanekes area consists of three hamlets known as *tangtu* (old), viz. Cikeusik, Cikertawana, and Cibeo. The outer Kanekes area consist of 66 hamlets, along with the two additional hamlets of Baduy Kumpul (non-Kanekes area) and Cicakal Girang (enclave hamlet of Muslim community in the Kanekes village). The hamlets in the outer Kanekes area constantly interact with the non-Kanekes communities, unlike the inner Kanekes people who live in a core where non-Kanekes members are usually not entertained. Inner Kanekes people are permitted to interact with both outer Kanekes and non Kanekes, but outer Kanekes and non-Kanekes people are not allowed to live in inner Kanekes. The language of the Urang Kanekes is often considered as a dialect of the Sundanese language which is known by its etic names of *Badui* and *Baduy*, while the people themselves refer to the language as a dialect of *Sunda*. However, Ethnologue recognizes the language as an individual one with a distinct identity and not as a dialect of *Sunda*⁵. Following Ethnologue, this study treats the language as a distinct one with affinities to the Sundanese group. Likewise, the name *Baduy/ Badui* is

*Corresponding author

an exonym as the people refer to themselves as Urang Kanekes meaning 'People of Kanekes'. As the name *Baduy* accorded both to the people and their language is an exonym, we use the emic term 'Urang Kanekes' to refer to the community. This makes it appropriate to refer to the language spoken by the Urang Kanekes as 'Kanekes language' and not as '*Baduy* or *Badui*'.

Although Indonesia shows enormous diversity in number, size, and vitality of languages, some of the indigenous languages have been experiencing a shift towards Bahasa Indonesia and other foreign languages such as English due to social, political and economic pressures. Languages such as the Kanekes spoken by just 11000 people can thus be considered as prone to language shift. Loss of languages and language vitality often leads to loss of traditional knowledge which in turn can lead to loss of biodiversity⁶. For an indigenous community such as the Urang Kanekes, TK is the foremost factor that enables them to manage their ecosystem sustainably and loss of language would lead to loss of TK and even biodiversity. However, not all trends in language shift can be generalised, as the ground situation might vary. This study, therefore, was conceived to assess the traditional knowledge (TK) and language vitality of the Urang Kanekes community using ethnotaxonomy and nomenclature of food plants as key indicators of TK and language vitality. The prevailing emic hypothesis is that the inner Kanekes (*Urang Jero*) maintain their tradition, culture and language ardently, while the outer Kanekes (*Urang Luar*) are permeable to external influences. Hence, this study assumes that the inner Kanekes are culturally predisposed to show greater language and TK vitality than the outer Kanekes people.

Methodology

This research was conducted in Kanekes village of Banten, Indonesia during May-June 2014. We collaborated with the Urang Kanekes of Desa Kanekes, Leuwidamar Sub-District, Lebak District of Banten, Indonesia. Clearance from the Human Research Ethics Committee of Curtin University Sarawak Malaysia was obtained prior to the commencement of the project, followed by Prior Informed Consents from the *Jaro Dainah* (village headman) as well as the individual knowledge holders. This research conforms to the code of ethics of the International Society of Ethnobiology⁷. The entire research was divided into two phases, the first phase involved purposive sampling where 16 elders above the age of 60 from Cibeo of inner Kanekes (08 male and 08 female)

participated. The interviews were conducted in the Kanekes language, with the help of Mr. Samin of Kaduketug hamlet (*kampung*) who has also been accorded with honorary authorship of this article on behalf of the community. The entire methodology followed Franco *et al.*⁸. We invited the respondents to freelist 25 common food plants, an exercise that yielded names of 31 food plants. From the list, 25 plant species were shortlisted on the basis of salience. The present study takes into consideration only food plants, as food plants unlike medicinal plants is a domain of knowledge common to the entire population. The idea was to generate a list of plants that can be safely assumed to be known by every Urang Kanekes member. Hence, while calculating the salience, the frequency of the listed item alone was taken into consideration and not the priority⁹. Elders from inner Kanekes alone were considered for this phase as they are culturally considered as 'pure' with their TK and culture intact. Specimens and photographs of the shortlisted plants were collected for the next phase and identification purposes. For the second phase, we interviewed 60 adult Urang Kanekes (> 20 yrs.) chosen randomly from Inner (Cibeo hamlet, 30 members) and Outer Kanekes (Kaduketug hamlet, 30 members) with equal gender representation. The questions asked at this stage were: What is your first language (mother tongue, L1)? b) How many languages do you know? c) What is your second language (L2)? These participants were then requested to rate their language proficiency in Kanekes language (L1) and Bahasa Indonesia (L2) using a five point Likert scale as (1) Very poor (2) Poor (3) Moderate (4) Good (5) Very good. However, the respondents found it difficult to express on the basis of the Likert scale, and expressed their proficiency as a percentage, which was then matched to the closest point on the Likert scale. Following this, they were interviewed using a semi-structured questionnaire with leads meant to elicit information required to calculate the Traditional Knowledge and Language Vitality Index (TraLaVi)⁸. Photographs and specimens of the food plants shortlisted during phase 1 were displayed before the participants who were asked to identify and name them in L1. Plants with high salience were shown first, followed by the others. The mean scores from inner and outer Kanekes were then juxtaposed with each other.

Results and discussion

The first phase of the study yielded a list of 31 food plant names that are widely consumed by the Urang Kanekes. From the list, 25 food plants were shortlisted

on the basis of their salience (Table 1). Of the 25 shortlisted plants, 15 were cited by all sixteen participants while *Jahe* and *Kuca*i were cited with the least frequency (11 freelists). The six plants that were excluded were listed by less than seven participants. All sixteen elders who participated in this exercise completed the list

without any difficulty, and no significant difference in pattern was observed between the male and female participants in the freelisting process.

The results for the phase 2 that involved the application of TraLaVi index can be compartmentalised as below, according to the various criteria.

Table 1—Twenty five freelisted food plants

Local name	Scientific name	Meaning behind name	No. of freelists citing the plant
<i>Bonteng</i>	<i>Cucumis sativus</i> L.	<i>Bon</i> : kebon or garden, <i>teng</i> : enteng or easy—easy to find	16
<i>Cau</i>	<i>Musa spp.</i>	-	16
<i>Cikur</i>	<i>Kaempferia galanga</i> L.	<i>Cik</i> : short; plant that cannot grow tall	13
<i>Cokrom</i>	<i>Solanum melongena</i> L.	<i>Cokrom</i> : eaten raw; fruits that can be eaten raw.	14
<i>Hiris</i>	<i>Cajanus cajan</i> (L) Millsp.	<i>Hiris</i> - derived from <i>hiji-hiji</i> meaning pieces: fruits with seeds separated from each other	16
<i>Huwi kelapa</i>	<i>Dioscorea alata</i> L.	<i>Huwi</i> : tuber <i>Kelapa</i> : coconut; tubers that taste good when cooked with coconut	16
<i>Huwi kumbili</i>	<i>Plectranthus rotundifolius</i> (Poir.) Spreng.	<i>Huwi</i> : tuber <i>Kumbili</i> : small, round, uniform and aggregate; tubers small, rounded and aggregate.	16
<i>Huwi mantang</i>	<i>Ipomoea batatas</i> (L.) Poir	<i>Huwi</i> : tuber, <i>Mantang</i> : prohibition; tubers collected and eaten on days when rice grains are prohibited to be eaten	16
<i>Huwi ramo</i>	<i>Dioscorea alata</i> L.	<i>Huwi</i> : tuber, <i>Ramo</i> : fingers; tubers resembling fingers of hand.	16
<i>Jaat</i>	<i>Psophocapus tetragonobulus</i> (L.) DC.	<i>Jaat</i> - derived from <i>jahat</i> : wicked; wicked plant that climbs over rice plants	16
<i>Jahe</i>	<i>Zingiber officinale</i> Roscoe	-	11
<i>Jagong</i>	<i>Zea mays</i> L.	-	14
<i>Kacang panjang</i>	<i>Vigna unguiculata</i> (L.) Walp.	<i>Kacang</i> : bean <i>Panjang</i> : long; long bean	13
<i>Kadu</i>	<i>Durio zibethinus</i> L.	<i>Kadu</i> -derived from <i>kaduhung</i> : regret; one would regret if they did not eat this tasty fruit.	16
<i>Kalapa</i>	<i>Cocos nucifera</i> L.	-	16
<i>Kaweni</i>	<i>Mangifera odorata</i> Griff.	<i>Kawin</i> : marriage; hybrid plant	14
<i>Kokosan</i>	<i>Lansium parasiticum</i> (Osbeck) K. C. Sahi & Bennet	<i>Kokos</i> : suck; fruit content consumed by sucking	15
<i>Koneng</i>	<i>Curcuma domestica</i> Valetton syn. <i>Curcuma longa</i> L.	<i>Koneng</i> : yellow (signifies the yellow tuber)	16
<i>Kuca</i> i	<i>Allium chinense</i> G. Don.	-	11
<i>Pisitan</i>	<i>Lansium parasiticum</i> (Osbeck) K.C. Sahni & Bennet	<i>Pisit</i> or <i>peset</i> : to rip off; rip open the fruit to consume it.	16
<i>Peuteuy</i>	<i>Parkia speciosa</i> Hassk.	-	16
<i>Roway</i>	<i>Phaseolus linatus</i> L.	-	16
<i>Taleus</i>	<i>Colocasia esculenta</i> (L.) Schott.	-	16
<i>Tundun</i>	<i>Nephelium lappaceum</i> L.	-	13
<i>Waluh</i>	<i>Cucurbita moschata</i> Duchesne	<i>Waluh</i> : fruits reserved for guests.	13

Language priority and Retrieval of information (Criteria A&B)

The results of the language proficiency questionnaire administered during phase 2 shows that seven out of 30 people interviewed from Kaduketug hamlet of outer Kanekes declared themselves as highly proficient in Bahasa Indonesia, the state language (L2). On the other hand, none of the 30 respondents interviewed from the inner Kanekes declared themselves as highly proficient in Bahasa Indonesia. This shows the impact of 'accessibility' on language acquisition. The members of outer Kanekes reported to have learnt Bahasa Indonesia from their frequent trade, tourism activity, government policy, people of neighbouring non-Kanekes villages, and also researchers who frequent Kanekes village. All participants declared themselves as highly proficient in Kanekes, their mother tongue (L1). Although the Kanekes people live close to Jakarta, the capital of Indonesia, the Kanekes language is spoken throughout the community in every spheres such as traditional ceremonies, rituals, daily activities at the family and farm, and communication with other Kanekes members. Devoid of script form, Kanekes is transmitted by oral means alone. Community members from hamlets such as Kaduketug, Kadujangkung, Kaduketer, etc., of outer Kanekes speak Bahasa Indonesia fluently as these villages are situated close to major entrances to the Kanekes ecosystem. In addition, Kanekes people from inner Kanekes who are in regular contact with non-Kanekes people could also converse in Bahasa Indonesia, albeit with difficulty. During the interviews, all respondents from inner and outer Kanekes freelisted food plant names in Kanekes language as well as Bahasa Indonesia with various timings. Self-declared language proficiency shows a highly significant correlation (0.832) with Criterion A that compares time taken to mention food plant names in Kanekes (L1) with Bahasa Indonesia (L2). This indicates that the ratio between time taken on mentioning food plant names in L1 and L2 correlates with the level of language proficiency. Although ratings obtained were high for both inner and outer Kanekes, the female group from outer Kanekes were able to mention the food plant names in L1 in relatively lesser time than their men folk. Both clusters returned full scores for criterion B, suggesting that their ability to retrieve information in L1 is intact. The results show that although the outer Kanekes could speak Bahasa Indonesia, they are adept in balancing the use of both the languages which indicates their bilingual competency. It should be noted here that a study by Paniagua- Zambrana *et al.*¹⁰ found bilingualism to be

positively correlated to maintenance of traditional knowledge on palms in the communities of Amazon, Andes, and Chocó of North western South America.

Knowledge erosion (Criterion C)

Generally, lower value obtained for this criteria indicates knowledge erosion where the participants could recollect the name but not the meaning. People from inner Kanekes recorded lower value than those of outer Kanekes for criterion C. Furthermore, women of both inner and outer Kanekes scored lower than their male counterparts. People from inner Kanekes, especially the women of inner Kanekes tend to answer the question as simply as they could, or try to give up saying "iheng", meaning 'don't know'. Based on her collaboration experience with the community since 2009, the lead researcher is of the opinion that the people of inner Kanekes, especially women are known for their extreme shyness and are rarely communicative, often preferring to answer in a word or two.

Thus, the lower scores have to be considered with caution. Providing elaborate responses as required by criterion C poses difficulties to the otherwise shy women folk and it is possible that the women folk of inner Kanekes often withheld the answers for criterion C. The influence of 'shyness' is further corroborated by the fact that the female members of outer Kanekes who interact more frequently with non-Kanekes people scored higher (24.4) than the inner Kanekes women (22.8) for this criterion. The responses for criterion D on the other hand requires the participant to just recollect the names and thus, cultural shyness does not affect the values obtained.

Lexical recognition (Criterion D)

All respondents recognized the photographs and explained the meaning behind the plant names rightly. At times, they were confused between *kokosan* and *pisitan*, the two varieties of *Lansium parasticum* (Osbeck) K. C. Sahi & Bennet as well as *huwi ramo* and *huwi kalapa*, two varieties of (*Dioscorea alata* L.), as these plants are similar in appearance. In such cases, we displayed the fruits and tubers to stimulate visual recognition. *Pisitan* and *kokosan* could be differentiated only from the fruits; *pisitan* fruits have seeds that are detachable from the flesh unlike *kokosan* where the difference between seed and flesh is subtle. *Huwi ramo* and *huwi kalapa* are also quite similar, but the yam (tuber) of *huwi kalapa* is relatively big and spherical while that of *huwi ramo* resembles the fingers of the human hand. Prior researches indicate that the

participants' ability to recognise plants by their folk names and explain their meanings, is suggestive of the traditional knowledge stored in the respective language¹¹.

Social support for exchange of TK (Criterion E)

All respondents declared that knowledge on food plants is transmitted between generations through oral means, scoring 25/25. Grandparents (*nini* and *aki*) and parents (*ambu* and *bapa/ayah*) teach children about plants and plant uses in the Kanekes language. Besides, they also acquire knowledge from their peer group. Learning accompanies farming and household activities. Thus, a Kanekes child who has attained 10 years of age would be knowledgeable in food plants and swidden farming.

Status of language and TK vitality

The results of the TraLaVi assessment yielded a very high overall value of (0.981) indicating that the traditional knowledge and language vitality of the Urang Kanekes is safe (Table 2). Ethnologue too considers the Kanekes language of 'vigorous' use as per the Expanded Graded Intergenerational Disruption Scale (EGIDS). The 'vigorous' status indicates that the Kanekes language neither faces any imminent endangerment nor is it developing⁵. Even when considered separately, the values obtained for both inner (0.99) and outer Kanekes are high (0.97), with a very marginal reduction in the values for outer Kanekes. Thus, the results do not support our initial assumption that the inner Kanekes are culturally predisposed to show greater language and TK vitality than the outer Kanekes people. The Urang Kanekes spend most of the time on swidden farming and related activities from the month of *Kapat* (April-May) to *Katiga* (March-April)¹². This rigorous cycle keeps them occupied throughout the year, giving little opportunity for pursuing formal education. In addition,

formal education is also customarily prohibited for the Urang Kanekes. However, they have a strong informal education system which helps them to keep their customs, culture and TK immune to unsolicited interference. Studies elsewhere have shown that formal education which is not customised to the local settings is negatively correlated with TK^{13,14}, and perhaps the strong informal education system could be a reason why the TK and language vitality scores are quite high for the community. Although the community has culturally classified itself into *Urang Jero* (inner) and *Urang Luar* (outer), the roles and beliefs are same. However, loyalty towards the role might be the reason behind the marginal lower value obtained for outer Kanekes. All Urang Kanekes are prohibited from using electronic devices such as cellular phone, lamp, computer, etc. Yet, usage of cellular phones and flashlight are common in outer Kanekes indicating that people in the outer Kanekes are adapting the contemporary non-Kanekes lifestyle. People of outer Kanekes are also permitted to use transportation such as public bus, motorcycle, and car. Thus, they could reach longer distances than the people of inner Kanekes area.

According to Iskandar & Ellen¹⁵, the Urang Kanekes have been consuming lowland rice varieties cultivated by other communities by bartering produces such as banana (*Musa spp.*), *petai* (*Parkia speciosa*), Durian (*Durio zibethinus*), *rinu* (*Piper rindu*) and palm sugar from *Arenga pinnata*. The traditional swidden system of Urang Kanekes is both a religious obligation as well as an integral component of the Urang Kanekes identity. Thus, although the Urang Kanekes might depend on lowland improvised rice varieties for daily consumption purposes, their religious beliefs and culture require their traditional rice varieties to be cultivated which in turn ensures conservation of traditional rice varieties. Also, the community

Table 2—Results for the Traditional Knowledge and Language Vitality Index (TraLaVi)

Indicator	Urang Jero (Inner Kanekes)			Urang Luar (Outer Kanekes)		
	Female	Male	Mean	Female	Male	Mean
A Freelisting of 25 plants in L2, time taken	25	25	25	24.33	23.67	24
B Freelisting of plants (25 names) in L1	25	25	25	25	25	25
C Explaining the meaning of the names of the freelisted native plants in L1	22.8	24.73	23.77	24.07	24.13	24.1
D Identifying common plants in L1 from a given sample of 25	25	25	25	22.53	24.4	23.47
E Have they received/transmitted traditional information on Folklore, Uses (uses of Cultural/Culinary/Medicinal), Beliefs, etc pertaining to the 25 plants from Criteria (D)	25	25	25	25	25	25
Mean Values	122.8	124.7	123.77	120.93	122.20	121.57
TraLaVi value	0.982	0.998	0.99	0.967	0.978	0.9725

members who do not practice the traditional swidden cultivation cannot be considered as Urang Kanekes anymore and usually move to non-Kanekes areas adopting the Muslim religion. This ardent conservation of the traditional rice varieties due to the customary obligation stipulated by the code of the inner Kanekes, can be considered analogous to the conservation of language and TK in the Kanekes ecosystem.

Changing food strategies and political complexity are two factors which could influence diversity of languages^{16,17}, while shift in traditional occupational preferences negatively affect language vitality. At the first instance, the marginally lower score of outer Kanekes might be considered as a pointer to the beginning of a downward trend in reduction of TK and Language vitality of the outer Kanekes. However, traditional governance is known to play an important role in imposing customary regulations which helps in maintenance of culture¹⁸. Even the outer Kanekes who follow a relaxed custom have to strictly adhere to the inner Kanekes norms such as abstinence from wearing footwear, modern clothes, use of electronic gadgets, and communication in Bahasa Indonesia. Thus, the inner Kanekes continues to act as the custodian of customs and traditions while the outer Kanekes plays the role of buffer, insulating the core from unsolicited interferences. This system that is similar to the concept of zoning in forest management aims which to minimise the negative environmental impacts of forestry while maintaining timber supply^{19,20}, can be expected continue to uphold the TK and language vitality of the Kanekes.

Conclusion

The study shows that the Urang Kanekes retains high TK and language vitality. Language as a part of culture plays important role in storing and transmitting TK which in turn is reflected in the ethnotaxonomy and nomenclature. Although the outer Kanekes are in constant touch with the non-Kanekes world, they have not given up their proficiency in Kanekes their mother tongue, or their TK. There is no knowledge erosion and the participant's ability to recognise plants and recollect TK related to them also remains high. There is strong social support for transmission of knowledge which mainly happens through the hereditary route. The TraLaVi scale thus rates the language and TK vitality of the Kanekes community as 'safe' which is on par with the 'vigorous' status indicated by Ethnologue's EGIDS. As long as the Kanekes people adhere to their customs and traditions under the

guidance of the inner Kanekes who act as the custodian of culture, their TK and language can be expected to be safe. However, it is recommended that the policy makers should provide adequate support to the community in maintaining their culture, language and TK. Giving prominence to the Kanekes language along with Bahasa Indonesia, in the government literacy programmes implemented in the region might be the right step to begin with.

Acknowledgement

We thank Jaro Dainah, the headman who permitted us to carry out this project, Mr Samin's family from Kaduketug hamlet who supported this project, Jaro Sami and Jaro Dami from inner Kanekes, knowledge holders of Urang Kanekes who volunteered to collaborate with us for this study, Prof Ervizal AM Zuhud and Dr. Agus Hikmat from Laboratory of Plants Conservation of Bogor Agricultural University (IPB) for permitting us to use the herbarium, and Lembaga Ilmu Pengetahuan Indonesia (LIPI) for helping us identify the plants sample. We express our sincere gratitude to the Firebird Foundation for Anthropological Research for the generous funding and special thanks to Prof. George N. Appell of the foundation for his constant support and encouragement.

References

- 1 Danasasmita S & Djatisunda A, Kehidupan Masyarakat Kanekes. Bagian Proyek Penelitian dan Pengkajian Kebudayaan Sunda (Sundanologi), (Direktorat Jendral Kebudayaan, Bandung), 1986.
- 2 Garna J, Masyarakat Baduy di Banten, dalam Koetjaraningrat, Jakarta, (Departemen Sosial RI, Dewan Nasional, Jakarta), 1993.
- 3 Iskandar J & Iskandar BS, Ethnoastronomy, The Baduy agricultural calendar and prediction of environmental perturbations, *Biodiversitas*, 17 (2) (2016) 694-703.
- 4 Lembaga Pamarentah Desa Kanekes, Rekapitulasi BukuInduk. Desa Kanekes, (Kecamatan Leuwidamar, Kabupaten Lebak), 2012.
- 5 Lewis MP, Simons GF & Fennig CD, Ethnologue: Languages of the World, Nineteenth edition, (SIL International, Dallas, Texas), 2016, Retrieved from HYPERLINK <http://www.ethnologue.com>
- 6 Maffi L, Linguistic, Cultural, and Biological Diversity, *Annu Rev Anthropol*, 34 (2005) 599-617.
- 7 International Society of Ethnobiology (ISE), The ISE Code of Ethics 2006, Retrieved from HYPERLINK <http://ethnobiology.net/code-of-ethics/>
- 8 Franco FM, Hidayati S, Ghani BAA & Ranaivo-Malancon B, Ethnotaxonomic systems can reflect the vitality status of indigenous languages and traditional knowledge, *Indian J Tradit Knowle*, 14 (2) (2015) 175-182.
- 9 Weller SC & Romney AK, Systematic data collection, (Sage, Newbury Park, CA), 1988.
- 10 Paniagua-Zambrana NY, Camara-Lerét R, Bussmann RW & Macia MJ, The influence of socioeconomic factors on traditional

- knowledge: a cross scale comparison of palm use in northwestern South America, *Ecol Soc*, 19 (4) (2014) 9.
- 11 Franco FM & Narasimhan D, Plant names and uses as Indicators of Knowledge Patterns, *Indian J Tradit Knowle*, 8 (4) (2009) 645-648.
 - 12 Ichwandi I & Shinohara T, Indigenous practices for use of and managing tropical use and managing tropical natural resource: a case study on Baduy community in Banten, Indonesia, *Tropic*, 16 (2) (2007) 87-102.
 - 13 Saynes-Vasquez A, Caballero J, Meave JA & Fernando C, Cultural Change and Loss of Ethnoecological Knowledge among the Isthmus Zapotecs of Mexico, *J Ethnobiol Ethno-med*, 9 (1) (2013) 40.
 - 14 Martínez-Ballesté A, Martorell C & Caballero J, Cultural or ecological sustainability? The effect of cultural change on Sabal palm management among the Lowland Maya of Mexico, *Ecol Soc*, 11 (2) (2006) 27.
 - 15 Iskandar J & Ellen R, In situ conservation of rice land races among the Baduy of West Java, *J Ethnobiol*, 19 (1) (1999) 97-125.
 - Currie TE & Mace R, The Evolution of Ethnolinguistic Diversity, *Adv Complex Syst*, 15 (01n02) (2012).
 - 16 Gavin MC, Botero CA, Bower C, Colwell RK, Dunn M, Dunn RR, Gray RD Kirby KR, McCarter J & Adam Powell A, Toward a Mechanistic Understanding of Linguistic Diversity, *BioScience*, 63 (7) (2013) 524-535.
 - 17 Garna J, Tangtu Tilu Jaro Tujuh: Kajian Struktural Masyarakat Baduy di Banten Selatan Jawa Barat Indonesia, (Ph. D Thesis, University Kebangsaan, Malaysia), 1987.
 - 18 Cote P, Tittler R, Messier C, Kneeshaw DD, Fall A & Fortin MJ, Comparing different forest zoning options for landscape-scale management of the boreal forest: Possible benefits of the TRIAD, *Forest Ecol Manag*, 259 (2010) 418-427.
 - 19 Robinson EJZ, Albers HJ & Busby GM, The Impact of Buffer Zone Size and Management on Illegal Extraction, Park Protection, and Enforcement, *Ecol Econ*, 92 (2013) 96-103.