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Index of Cultural Significance as a Potential Tool for Conservation of Plants Diversity by Communities in The Kerinci Seblat National Park

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Abstract

The Kerinci community is an Indonesian indigenous people who live in Kerinci Regency, Jambi Province. They have local knowledge of the surrounding vegetation that has become a cultural unifying factor within the community. The study reported here aimed to analyze the importance of plants of particular cultural significance and to review efforts to conserve these plants based on Kerinci cultural values. The study was conducted for eight months from October 2013 to May 2014 at three locations chosen purposively, they were Lempur Baru Village, Lama Tamiai Village and Ulu Jernih Village. The data was obtained using a participatory observation approach, based on key informant interviews, while the assessment of plant distribution was based on a whole-of-community viewpoint. The research data consisted of data on the botany of the plants, on the utilization of the plants and on assessment of plant distribution. Analysis of data for 234 plant species used a formula for index of cultural significance (ICS) adopted from Turner (1988). The study showed that rice (Oryza sativa L.) and cinnamon (Cinnamomum burmanni (Nees & T.Nees) Blume) are important plant species with values for the Cultural Index of 59 and 57 respectively, while the species known as 'inggu' (Ruta angustifolia (L). Pers) had the lowest ICS, of 3. The 'Tri-Stimulus Amar' conservation analysis developed by Zuhud (2007) is seen as a useful model for considering the cultural values that motivate the Kerinci community's plant conservation actions.

Keywords: Index of Cultural Significance, Kerinci community, significant plants, Tri-Stimulus Amar Conservation model

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Introduction

Quantitative assessment of the usefulness and management of botanical resources is important in ethnobotanical studies (Martin 1995; Mutheeswaran *et al*. 2011). Quantitative ethnobotany analyzes the types of plants that are important for a community and assesses plant diversity in terms of both social and economic value (Hoffman & Gallaher 2007). The study of quantitative ethnobotany focuses on empirical observation and the analysis of socio-economic value of plant data in terms of various indices, such as 'index of value' (Prance *et al*. 1987), 'index of cultural significance' (Turner 1988; Sukla & Gardner 2006), 'ethnic index of cultural significance' (Stoffle *et al.* 1990), 'cultural significance index' (Silva *et al*. 2006), 'plant taxon index ' (Alexiades & Sheldon 1996; Lykke *et al*. 2004) and others that can be used in accordance with the purpose of the research (Hoffman & Gallaher 2007).

Reyes-Garcia *et al*. (2006) consider that quantitative assesment of ethnobotanic data is complementary to qualitative data, useful to address problems faced in socially important issues regarding plant bio-diversity and the environment. Ethnobotanical quantitative assessment is useful in testing hypotheses, providing statistical validation and in comparative studies. Quantitative analysis also helps to sharpen hypotheses about existing problems placing them in a more accountable, more appropriate scientific framework. Therefore quantitative assesment is an instrument that complements and supports qualitative ethnobotanical research (Hoffman & Gallaher 2007).

One of the quantitative assessments of importance in ethnobotany is the evaluation of the cultural significance of particular species in a community's inventory of plants. Such evaluations provide a useful basis for considering the importance of the particular plant species, their potential for economic purposes (e.g. to increase the income of the local community), and the possible preservation measures

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required (Turner 1988). Parameters of importance in the cultural evaluation of plants are estimates of quality, intensity of use and the exclusivity of each plant of significance to the community. The quality value (q) is estimated using a score of relative value attributed to each plant species; the intensity value (i) describes the intensity of use of the plant species estimated by a score ranging from 'infrequently used' up to 'very frequently used'; while the exclusivity value (e) is a relative score of preference, ranging from 'not preferred' to 'most preferred'.

Turner (1988), Purwanto (2002), and Pei *et al*. (2009) have observed that the cultural importance (index of cultural significance = ICS) of each plant species varies between local communities. This difference is influenced by the level of knowledge, the particular cultural settings and the local conditions.

Based on observations in various regions of Indonesia, local peoples have considerable knowledge both about the diversity of plant species around settlements where they live, and their usefulness. Nevertheless, in general, plants used in everyday life amount to not more than 10% of the total number of species in the environment (Purwanto et *al*. 2011).

The Kerinci community is a local community living in Kerinci Regency, Jambi Province. Aumeeruddy & Bakels (1994) have recorded that the Kerinci community has a detailed knowledge of the plant diversity in their teritory. The unique natural conditions of surrounding hills and volcanoes make Kerinci a fertile area, suitable for agriculture. Almost all of the Kerinci community work in agriculture, and their interaction with the local forest resources is a long inherited tradition.

Pei *et al.* (2009) and Pei (2013) note that local wisdom in the traditional use of natural resources can affect forest sustainability. Traditional communities in and around protected areas have local knowledge which is of great importance in the management of forests for sustainable use (Junior & Sato 2005). "*Local knowledge is not just to be documented but to be understood and integrated, and the problem of power imbalance between the indigenous knowledge system and the scientific knowledge system has to be addressed by integrating it with the scientific knowledge system*" (Ruheza & Kilugwe 2012). Integrating cultural concerns into conservation planning is expected to improve the effectiveness of conservation measures and should be part of conservation policy (Young *et al*. 2014).

To ensure that the local knowledge and culture of plant use is not lost from the Kerinci community, will require effort and real activity. Knowing the cultural significance of plants in local environments is one strategy in the preservation of these plants. Thus the goal of the study reported in this paper was to measure and analyze cultural value of particular plants for the Kerinci people, and to review approaches to conserving plant biodiversity based on this assessment of their cultural value.

Methods

Site Studies Field studies were carried out in October 2013–May 2014 in three sites of Kerinci Regency, Jambi Province, Indonesia; viz Baru Lempur Village of Gunung Raya Subdistrict, Lama Tamiai Village of Batang Mernagin Subdistrict, and Ulu Jernih Village of Gunung Tujuh Subdistrict (Figure 1). These sites are included in the buffer

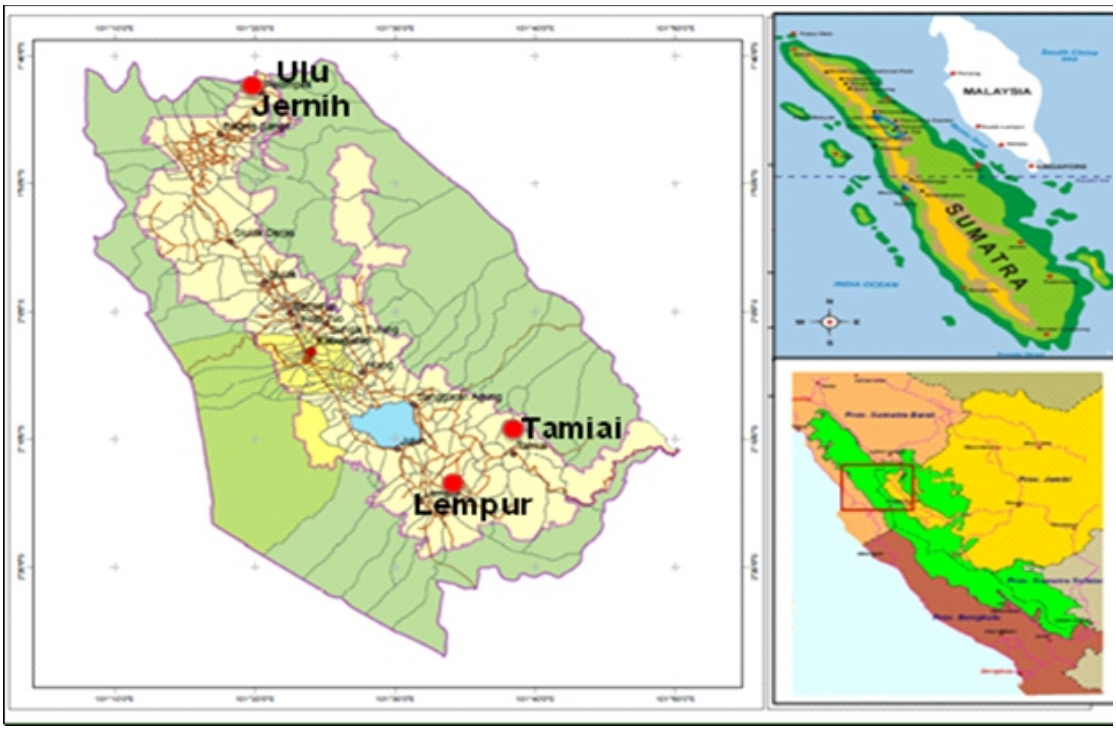

Figure 1 Site Research (Source Office KSNP 2013).

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zone of Kerinci Seblat National Park each has different biophysical characteristics (Table 1).

The data consisted of the botany, distribution, and assessment of utilization of the plants in the local environments of the communities. The botanical data consisted of species names, local and scientific, and the growth habit of the species (tree, shrub, herb, lianas, epiphytes). The utilization data was based on the assessment methods of Turner (1988) modified by Purwanto (2002). The data for the distribution of plant species was based on community observation (using a key informant interview approach). The spatial distribution of each species was assessed using the following scoring system: a score of 1 indicated that the distribution of the plant species is assessed to be very limited because it is naturally rare or only found at a relatively far distance from the residential areas; a score of 2 indicated that the distribution of the plant species is assessed to be limited because they are found in the primary forests and the forest around the settlements (secondary forest and fallow areas); and a score of 3 indicated that the plant species is assessed to be plentiful and easy to find because it is usually widespread and found in the fields close to the settlements.

The approach of the research was qualitative, with: a review of documentation; open and semi-structured interviews guided by an outline of questions; freelisting (Quinlan *et al.* 2002; Irawan 2006; Neuman 2006); individual participant observation; and direct researcher observation (Reyes-Garcia *et al.* 2006). Key informants consisted of people who have a fairly good knowledge of the diversity of plants in each location; such as community leaders, local shamans, and family members who know and

Table 1 Biophysical characteristics of the study site

Biophysical Aspect	Gunung Tujuh District	Batang Merangin District	Gunung raya district
Geomorpho logy	Hilly and mountain	The hills to the valley floor that is flat and	Lowland and hilly
Altitude	>1000 m asl	500–1000 m asl	100 - ≥ 1000 m asl
Rainfall	1500–2000 mm year^{-1}	≤ 1500 mm year^{-1}	2000–5000 mm year^{-1}
Type of soil	Andosol, latosol	Andosol, latosol, podsolic, alluvial	Andosol, latosol, podsolic, litosol
Type of agriculture	The main agricultural cultivation of vegetables and agroforestry Cinnamomun, wetland limited	The main agricultural land paddy rice fields in the hills limited	The main agricultural crops and fields cinnamon especially monoculture and slightly agroforestry
Type of geomorphology	Kayu Aro highland	Valley Kerinci	Lolo-Lempur area

(Source : Aumeeruddy 1992)

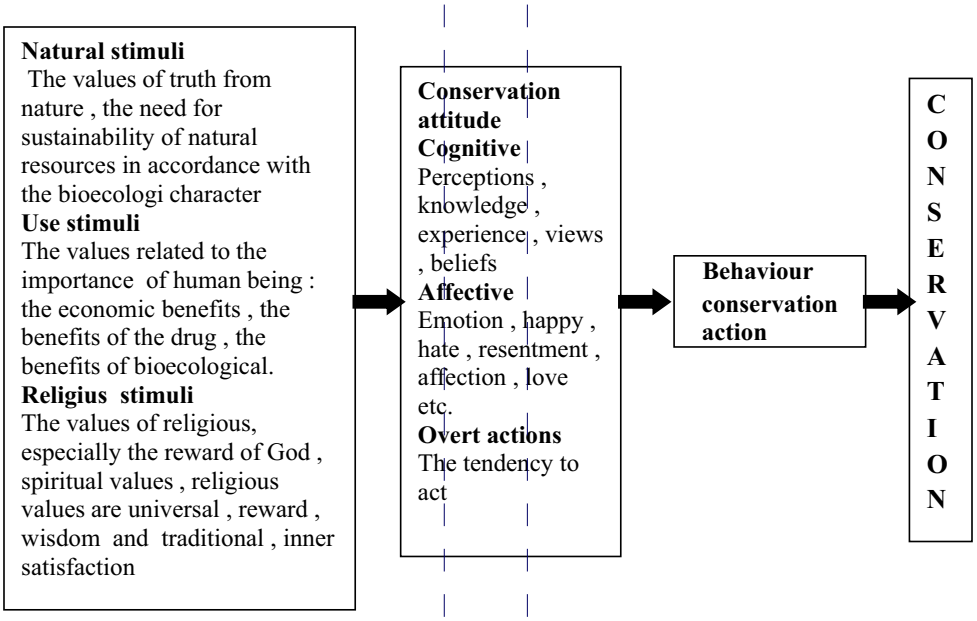

Figure 2 Concept Tri Stimulus AMAR conservation (Zuhud 2007).

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use herbs for everyday purposes and who regularly observe plants in the fields and local environment.

The data was analysized by calculating the value of the Index of Cultural Significance (ICS), using the technique developed by Turner (1988). Assessment of this cultural importance index uses three components namely the quality of use, intensity of use and the exclusivity of use with the following formula:

$$ICS = \sum_{i=1}^{n} (q_1 \times i_1 \subset e_1) n_1$$

Each plant species has several uses, so that the formula unpacks as follows:

$$\mathbf{ICS = (q_1 \text{ x } i_1 \text{ x } e_1)n_1 + (q_2 \text{ x } i_2 \text{ x } e_2)n_2 + \ldots\ldots\ldots + (q_n \text{ x } i_n \text{ x } e_n)n_n}$$

where " *ICS, the Index of Cultural Significance, is equal to the sum of individual "use" values from 1 to n, with n representing the last use described; the subscript i represents the value 1 through n, consecutively. For each "use" given, q = quality value, i = intensity value, e = exclusivity value. The formula allows consideration of plants that are "used" in a variety of ways, and in each instance the intensity and exclusivity of "use" are accounted for. Multiplication of the values for each use, rather than simple addition, results in a weighting of the highest values, which seems to yield results more in keeping with intuitive assessments of a plant's importance. It emphasizes the significance of plant-taxa having a small number of vitally important uses, and "plays down" the significance of plants whose "uses" may be numerous but not particularly vital to the culture in a survival sense*" (Turner 1988).

Then, a plant conservation analysis was carried out for those plant species species determined to be of high cultural sigificance, using the "Tri-Stimulus Amar" conservation approach developed by Zuhud (2007), based on the integration of 3 kinds of motives ('stimuli') leading to effective conservation behaviors-namely, " a natural stimulus", " a benefits stimulus" and "a religious or sacred stimulus" (Figure 2).

Results and Discussion

Utilization of plant biodiversity Based on the results of the qualitative analysis, there were 234 species of plants from 75 botanical families known to the Kerinci community, consising of wild plants and cultivated plants that can be found in the forests, fields, or around the settlements. The plant families most represented in their inventory were the Zingiberaceae family (15 species), Solanaceae family (14 species), Poaceae family (14 species) and Rubiaceae family (12 species). Three plant species are protected; namely kayu taksus (*Taxus sumatrana*), kayu pacat (*Harpullia arborea)* and kayu gaharu (*Aquilaria malaccensis*). The plant part most commonly used across the 234 plant species is the plant leaf (Figure 3). The most common growth habit among the 234 species is herbaceous (62 species, Figure 4). Determination of the usefulness of plants based on the categories of Turner (1988), classified the use of plants by Kerinci community into 15 categories of utilization (Table 2).

Table 2 shows that the largest category of plant utilization was for medicinal uses, with as many as 200 species (85.47%) consisting of 143 wild plants and 57 plants in cultivation. Various types of plants are commonly used to treat ailments suffered by people: such as for reducing the body temperature/fever , especially in infants and children; for headaches; for skin diseases; for diseases related to digestion; and for diseases associated with the digestive track. Similar results were reported by Pieroni *et al*. (2006) i.e. that the majority of plant species known to the local community were identified as having uses in the treatment of diseases, especially related to digestion.

Purwanto *et al.* (2011) records that for those Indonesian people in rural, remote and urban areas residing in localities surrounded by forests, the utilization of medicinal plants for the benefit of health is not new, but has existed for a long time. Each ethnic community has a specificity in the gathering and use of plants for medicinal and herbal uses, depending on their cultural heritage and availability of natural resources in the environment around it. Zuhud (2013) has also noted that in various parts of the world, a disease and its treatment methods are already part of typical systems of

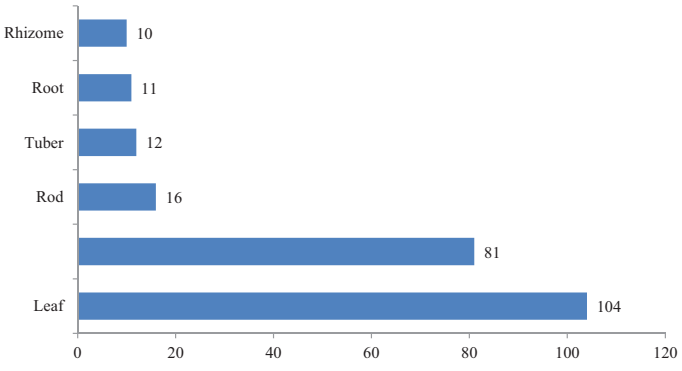

Figure 3 The number of plants based organ in use. Number of species (■)

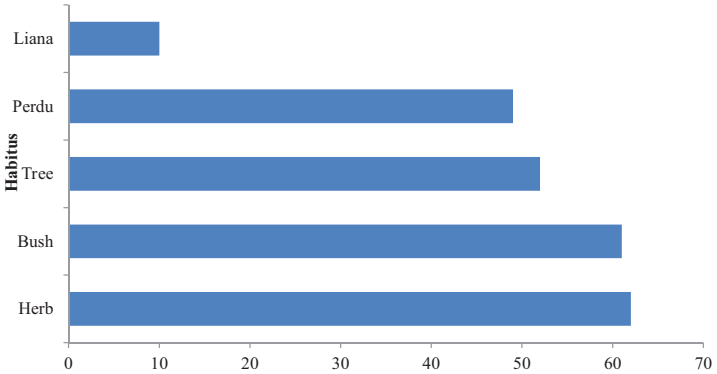

Figure 4 The number of plants spesies based habitus. Number of species (■)

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Table 2 Plant utilization categories for community Kerinci

Type of utilization	Number species		
		Wild	Domestication
Food primary	1	0	1
Food secundary			
Fruit	21	1	20
Vegetable	21	6	15
Carbohydrat	4	0	4
Drink	2	0	2
Other foodstuffs			
Flavoring	12	1	11
Stimulan	3	0	3
Dye	2	0	2
Packaging of food	3	2	1
Material main			
Wooden building	6	6	0
Firewood	1	0	1
Material secondary			
Hair fertilizer material	1	0	1
Cosmetic ingredients	4	2	2
Medicine plant	200	143	57
Ritual and spiritual	3	3	0

local practice, differing from each other according to differences in local knowledge (e.g. of human biology, of cultural norms, and of existing natural resources). The ethos of disease identification and its treatment has been culturally determined to a significant degree within the different nations of the world.

Based on information about the use of plants by the community, there are 4 types of plant used by the people that are known to kill cancer cells; they are mistletoe (*Loranthus* sp.), turmeric (*Curcuma zedoaria*), soursop/durian belando (*Annona muricata*) and betel (*Piper betle*). Hendalastuti (2008) states that the species *Taxus sumatrana* found in Ulu Jernih Village, Gunung Tujuh can be used to treat ovarian cancer and breast cancer, because the bark, leaves, branches, twigs and roots of the genus *Taxus* is a source of paclitaxel (taxol) which can kill cancer cells. Bussmann & Sharon (2006) record that tumor diseases and cancer in Peruvian society can be cured by traditional medicine using herbs.

Other important categories of plant use by the community are the primary resource materials such as timber used as building materials and wood used for other purposes; secondary resource materials; other foodstuffs; cosmetics ingredients; and materials used ritually (Table 3).

The Importance of cultural values for plant biodiversity

Based on analysis of data, Index of Cultural Significance obtained for the 234 plant species useful for the Kerinci people ranged from 3 to 59. The lowest value was for "inggu" (*Ruta angustifolia* Pers.) while the highest ICS value was for rice (*Oryza sativa* L.) and cinnamon (*Cinnamomum burmanni* (Nees & T. Nees) Blume), 59 and 57 respectively. Based on the estimation of the Index of Cultural Significance, the 234 plant species are grouped into 5 categories in Table 4. Grouping was carried out to identify the species of particular cultural importance, with the aim of directing actions to increase people's income and facilitate conservation of high-value species and their habitats. Table 4 shows only 1.7% of species belong to the very high ICS category (i.e. with an ICS value greater than 47). Table 5 records the ICS calculation for the 4 species with the highest cultural value for the people of Kerinci namely, rice (*Oryza sativa*), cinnamon (*Cinnamomum burmanni*), coconut (*Cocus nucifera*) and papaya (*Carica papaya*).

Rice as the main food for the people of Kerinci has a very high intensity of use (i = 5), is used regularly every day (q = 5), and is the preferred over other plant use options (e = 2). Planting of paddy is the main activity of Kerinci community. Apart from its use as food, rice is also useful for the treatment of diarrhea; it is roasted black, mixed with warm water, and then drunk. Cinnamon has several uses, namely as a beverage ingredients and as aromatic material (bark). It is also used for firewood (stems and branches) and the sap is used as a cure for toothache.

Table 5 shows that species with high cultural value generally have more than one purpose. Turner (1988) mentioned that the greater the number of uses there are for a plant, the more likely it is to have high Cultural Significance for a community. The assessment of benefits of plant resources will vary from one culture to another. ICS values for particular plants differ from location to location, because they relate to the evaluation by the local community of the quality, intensity and exclusivity of the plant species within the community. A plant species can have high usability in one location, but not necessarily for people in other locations. Evidence of these differences in ICS values is provided by studies of plant use by different communities in Indonesia:

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Table 3 List of plants by category usability

Fruits	Vegetables	Flavorings
Persea americana MILL	*Amaranthus caudatus* Rumph	*Garcinia sizygiifolia* Pierre
Averhoa carambola Linn.	*Phaseolus vulgaris* Linn.	*Allium cepa* Linn.
Arthocarpus heterophyllus L	*Macaranga rhizinoides* Muell. Arg.	*Allium sativum* Linn
Durio zibethinus Merr	*Limnocharis flava* (L.) Buchenau	*Capsicum annum L*
Syzigium aqueum (Burm.f.)	*Archidendron bubalinum*	*Capsicum frutescens* Linn.
Szygium malaccense	*Vi gna cylindrica* (L.) Skeels	*Zingiber officinale* Roxb
Psidium guajava Linn.	*Uncaria longiflora* Merr.	*Citrus aurantifolia*
Cannarium littorale Blume.	*Ipomea aquatica Forsk.*	*Cinnamomum burmani* Nees.
Citrus reticulata Blanco	*Sauropus androgynus* Merr.	*Alpinia galanga (L.)* Willd
Citrus decumana Linn.	*Cucumis sativus* Linn.	*Solanum lycopersicum* Linn.
Mangifera indica	*Diplazium esculentum* (Retz.) Sw.	Benincasa hispida Cogn
Garcinia mangostana Linn.	*Momordica charantia* Linn.	**Stimulan foods**
Ananas comosus Merr	*Coriandrum sativum* Linn.	*Syzygium aromaticum*
Mangifera sp	*Leucaena leucocephala*	*Cinnamomum burmanii* Nees.
Musa brachycarpa	*Gigantochloa apus* Kurz	*Pandanus immersus* Ridl
Musa sp	*Solanum rudepannum*	**Packaging foods**
Musa sp Linn.	*Nasturtium officinale* L. R. Br.	*Musa paradisiaca* Linn.
Nephelium cuspidatum Blume	*Manihot utilisima* Pohl	*Nephentes sp*
Salacca zalacca (Gaertn) Voss	*Artocarpus altilis* (Parkinson)	*Bamboosa sp*
Carica papaya Linn.	*Solanum sp*	**Dye**
Manilkara zapota Linn	*Daucus carota Linn.*	*Pandanus immersus* Ridl
		Piper betle Linn.

Table 4 The number species plants based scoring ICS

Category	Score ICS	Number of spesies	Percentase
Very height	> 47	4	1,709
Height	35−46	4	1,709
Medium	23−34	41	17,521
Low	11−22	88	37,607
Very low	< 11	97	41,453
		234	100

for example by the Dayak Meratus of Hulu Sungai Tengah (Kartikawati 2004); by the Dayak Kenyah and Dayak Lundayeh of Malinau Regency (Purwanto 2011); by the Dayak Benuaq community (Hendramedi 2009); and by the Samin community in Central Java (Jumari 2012).

The fourth category of species are plants that have been cultivated by Kerinci people. Based on interviews, these species can be found in the yard and surrounding fields. Plant species with a Distribution Score of 3 are those species that are easily found because usually located in fields close to settlements. These results show that plants with a high cultural importance, also have high ecological importance. This is closely connected with a 'stimulus' that motivates people to act ecologically in their own interest. The high cultural significance of a plant will stimulate the public to carry out plantings in order to obtain benefits that are sustainable into the future.

Table 4 records that 88 plant species have low ICS values (11−22) and 97 species very low (<11). Low ICS values indicate that the quality, intensity and exclusivity of use are low. In addition to the lack of perceived quality, the use of these plant species is infrequent and their exclusivity of usefulness low. The 10 species categorized in the very low ICS value group are presented in Table 6.

Based on the results of interviews, these ten species are identified as wild plants by the the Kerinci people. However, it is possible for a community's valuation of the cultural significance of a particular plant to change over time, for example if previous use of the plant many years ago is forgotten, and known to only a few people or none at all, in

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Table 5 The calculation result is very high ICS

Vernaculer name	Scientific name	Detailed calculation	ICS
Padi	*Oryza sativa*	(5×5×2) + (3×3×1)	59
Kayu manis	*Cinnamomum burmani*	(3×3×1) + (3×3×1) + (3×3×1)+(4×3×2)	57
Kelapa	*Cocos nucifera* Linn.	(4×4×1) + (4×4×1) + (4×3×1) + (4×3×1)	56
Sampilo	*Carica papaya* Linn.	(4×4×1) + (4×4×1) + (4×4×1)	48

Table 6 Ten species are very low category ICS

Vernaculer name	Scientific name .	Detailed calculation	ICS
Sadih	*Brassica chinensis* Linn.	(3×2×1)	6
Selasih gunung	*Ocimum basilicum* Linn.	(3×2×1)	6
Temenggi	*Marsilea crenata* Presl	(3×2×1)	6
Temiang abu	*Vitis repens* W.et.A	(3×2×1)	6
Asam pipi/asam susu	*Begonia tuberosa* Lamk	(2×2×1)	4
Bawang api	*Allium ascalonicum* Linn	(2×2×1)	4
Jambu lipo	*Szygium pyenantum*	(2×2×1)	4
Rumput belando	*Paspalum Cocugatum*	(2×2×1)	4
Bawang kayu	*Allium fistudosum* Linn	(3×1×1)	3
Inggu	*Ruta angustifolia* (L.) Pers	(3×1×1)	3

modern times (Thomas *et al.*2009).

Purwanto (2007) considers that the values for ICS and distribution of plants represent an important knowledge resource for developing management strategies for such plants. Species that have low distribution scores but high ICS values ought to be cultivated. While species with high distribution scores high and low ICS, suggest the possibility that they are underexploited by the community. Therefore, it is to society's benefit to develop the existing creativity of the community in order to better exploit the high potential represented in their natural resources.

The importance of culture in plant conservation strategies Our results show that rice (*Oryza sativa*) and cinnamon (*Cinnamomum burmanni*) are species with a very high cultural importance for the Kerinci people. Rice is a staple, food-producing, plant of the Kerinci. Planting of paddy and its cultivation through to harvest is their main activity. In the annual cycle, the Kerinci community work in the paddy fields according to 'cues' from traditional leaders as to when in the season particular activities need to be carried out. This is done, in part, to avoid the occurrence of pests and diseases of the rice that arise if individual planting is done haphazardly. An additional benefit of this practice is to maintain the values of cooperativeness and sharing e.g. of water resources and in the construction of fields.

The main rice variety grown is 'payo' which has a seven month growing season, so that in one year it is harvested only once, and is followed by a 5 month fallow to restore soil fertility. Apart from the cost of care and maintenance, 'payo' is a cheaper rice variety, with a taste preferred by the Kerinci people. The paddy cultivation system carried out by the Kerinci incorporates a form of soil and water conservation. The fallow period is given to the land in order to restore the fertility of the soil, so as to avoid artificial fertilizer, which, after long term use, can actually impoverish the soil of certain nutrients (Soepandi *et al.* 2010).

However, based on observations in the field, there has been a change in the selection of the varieties of rice planted. This is due to various internal and external factors in the Kerinci community. Internal factors include such things as the increase in the population that cause some people to switch to new 'superior' rice types which can be harvested 2−3 times a year. Examples of this are in Hamlet Lama Tamiai, in the district of Batang Merangin and in Dusun Ulu Jernih, in Gunung Tujuh. External factors include the unplanned introduction of new varieties to the people that have required farmers to develop their own knowledge by way of experiment, information exchange, and careful observation of rice grown by their fellow farmers. Because this kind of knowledge acquisition can be fickle, not all farmers in a village have the same access to knowledge and information, nor the same curiosity and ability to learn and actualize benefits from these introduced varieties (Setyawati 1999).

Based on our results, cinnamon is identified as a species with a very high ICS value. Cinnamon is a commodity for the Kerinci community because it produces the best cinnamon bark in the world. Cinnamon cultivation has a long heritage in the area and is of high cultural significance because in addition to being a marketable commodity, cinnamon has several uses, in particular as a beverage ingredients and for its aromtic bark. Its stem and branches can be used as firewood and the sap as a cure for toothache. In addition to their bark,

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Figure 5 Knowldege harvesting and peeling cinnamomun bark by Kerinci community.

cinnamon trunks can be used for timber, while the trunk and branches can be used as firewood. Cinnamon trees can be cut down before harvesting the bark, and can sprout from the stump. The bark can be harvested at the age of 5 years. If farmers do not need the money, they can wait up to 25 years. This allows for flexibility in the management of harvesting practices for the cinnamon tree. Farmers can choose the density of trees, a mix of plant species with seasonal crops, and different rotation times depending on their overall agricultural strategy. Intercropping with coffee plants, trees, or other seasonal crops can provide a source of income while waiting for the cinnamon to be ready for harvest. Cinnamon has long been a feature of the Kerinci community culture, and they already have a deep knowledge of its cultivation (Figure 4).

Cinnamon is a tree that grows in the forests near the foot of mountains, as is found in countries like Malaysia and Vietnam and throughout the Indonesia archipelago. It grows well at altitudes of 800−1500 m asl. According to the Keluru people, cinnamon has long been cultivated on a small scale in Kerinci. Kerinci could take steps to become a major exporter of cinnamon from Indonesia. Cinnamon is mainly used in the wider world for the pharmaceutical, cosmetic, and food industries; especially in the manufacture of beverages, as well as to add flavor to food. Cinnamon bark is harvested before the trunk is cut and a tree can sprout again from the stump. The selling price of cinnamon bark is variable but still has high cultural importance for Kerinci society who widely cultivate the tree on their land. This is because cinnamon cultivation is relatively easy and requires little cost to maintain. Besides that, it is a particularly suitable species to grow on the slopes of mountain foot hills. Knowledge of the factors required in cinnamon cultivation is well understood by the people.

Zuhud (2007) makes the observation that plants, their habitat, and their cultural valuation, cannot be separated when assessing a plant's place in the whole life of a people. Cinnamon and the Kerinci community can be said have a certain dependence one on the other; in other words, the cinnamon plant is a “partner”, benefiting from, and providing benefits to, the lives of the Kerinci.

The cultivation of cinnamon has for generations been part of the local knowledge of the community of Kerinci in the utilization of their natural resources and has played pivotal role in conservation because of its structural importance in traditional community forest use. This shows that the cinnamon crop plants has become an important cultural element for the Kerinci and must continue to be managed effectively for sustained and enhanced use. Pei *et al*. (2009) and Pei (2013) believe that the management of plant resources based on local knowledge held by local communities is a crucial factor in the preservation of the usefulness of the resources for future generations.

Conclusion

The Kerinci community's knowledge of plants in their environment includes identification of at least 234 species from 75 plant families that can be grouped into 15 categories of usability. A deep knowledge of local plant life, of their many uses, and of their connectedness to long established systems of belief are intrinsic to Kerinci culture. Rice (*Oryza sativa*) and cinnamon (*Cinnamomum burmanni*) are plants with high cultural importance because of their perceived 'quality', 'intensity' and 'high exclusivity' as defined by Turner (1980). Rice is a staple food for the Kerinci community, scoring high on each of these three parameters. Likewise, cinnamon is a plant that has become a hallmark of Kerinci culture. The managed cultivation of both plants has been part of the inherited cultural knowledge of the people that has persisted and adapted to change over a very long time period. The Kerinci community's knowledge of how to manage the cultivation of rice and cinnamon can be integrated into conservation efforts so that the crops can be protected and utilized sustainably for future generations. ICS as a measure of a plant's value to society provides an important input into programs aimed at conservation of biodiversity. The high cultural significance of plants, such as rice and cinnamon in the case of the Kerinci community, represent a strong motivation or “stimulus” for conservation action, employing the terminology of Zuhud's (2007) Tri-Stimulus Amar Conservation model. These are plants highly dispersed in the environment of the Kerinci community and are pivotal to any proactive efforts to conserve the local environment's total plant diversity.

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