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To cite this article: IGP Suryadarma 2019 *J. Phys.: Conf. Ser.* **1317** 012183

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Biodiversity and ecological phenomena in *pranatomongso* calendar: basic knowledge and goal for optimizing of crop production in javanese farmers

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Abstract. Human living dynamic is a complex of technology and society system in which science, technology, and also cultural beliefs are developed and have been growing together toward a life sustainability. Hence, cultural beliefs and practices hold by a distinct tribes or society in Indonesia represent their values which could be influenced by their environmental factors. Geophysical characteristics, climatology dynamics and the presence of living organisms mainly plants and animals are some essential sources of their cultural-based scientific knowledge and may represent as an ethno-ecology view. For Javanese farmers, as an example, this cultural-based science knowledge and practice have been developed and well-known implemented for their agriculture system by which the season cyclic (dry and rain) as well as animals ecological dynamics may determine the way of farming they have been carried out. This ethno-ecology view known as *Pranotomongso* which considers the traditional knowledge based on a careful observation on climate dynamics and its factors, such as sun and moon positions, or wind intensity, also their impact on plants and animal interactions in ecosystem. A deep-understanding of *Pranotomongso* leads an effort to optimizing and sustaining the crop production by maintaining and controlling both plants and animal diversity. As a cultural-based calendar, could *Pranotomongso* be utilised for examining the biodiversity information as well as crop sustainability? Regarded to this basic question, this paper provides an insight discourse based on the way *Pranotomongso* is developed in term of scientific perspectives, such as rainy and dry season calculations, and both the plants and animal diversity existence.

1. Introduction

Indonesia is a country which rich of natural and cultural resources in each specific region. The potentials resources of the region are abundant, including the local potential associated with biodiversity, cultural taxonomic and ecological wisdom. It is determined by geological and geographical characteristics as well as climatology dynamic, and manifested as the presence of biodiversity (particularly plants and animals) and ecological dynamic, including animal behaviour. These play a role of knowledge resources and are traditionally utilized as the season determiner and basic knowledge of planting for farmer.[7] [2] This traditional knowledge is obtained from daily life experience as a result of adaptation and abstraction toward the pattern of environmental dynamic with its uniqueness.

The traditional knowledge, termed as the ethno-taxonomy, is an elaborate science which equally relevant to the various 'modern' systems of classifications and biodiversity approach. Berlin and co-



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workers proposed a template for folk classification system, on the basis of their work with the Tzeltal people (Breedlove and Raven 1966). Since then, various studies have been conducted by different ethno-biologists to analyze the ethno-taxonomical systems in various communities, particularly in regard to plant and animal species. Environmental perspectives that underly Javanese people develop their traditional knowledge is basically dominated to fulfil the basic needs. Understanding of its natural environment uniqueness is an initial knowledge on ecological, taxonomic and classification phenomena. However, the understanding cannot only be interpreted as material taxonomic and biodiversity but beyond that, there is perception uniqueness of every ethnic as the essence of bio-cultural diversity approach.

This paper provides an insight discourse based on the way *Pranotomongso* is developed in term of scientific perspectives, such as rainy and dry season calculations, and both the plants and animal diversity existence, classification in dynamic ecological phenomena.

2. Ecological Phenomena in Bio Cultural

Bio-cultural diversity and ethno-ecology approach is relevant with uniqueness and society's perceptions. The praxis and its artefacts are product of society's activity in utilizing their natural resources. The concept of bio-cultural diversity is based on the idea that language, culture, traditional knowledge and biodiversity are linked to each other, and the loss of one entity would naturally lead to the loss of the others [5]. The uniqueness of natural phenomena, the existence of certain plants and animal and culture are linkage. It is understood that in the ecosystems managed by indigenous communities, the traditional knowledge encoded by their languages is primarily responsible for facilitating ecosystem management which in turn results in biodiversity management [13]

This underlines the need for understanding *Pranotomongso* the Javanese traditional farmer's calendar as one of key to explore of biodiversity where biodiversity information based on ecological phenomena. To salvage what exists, it is imperative to know what exists, and this has prompted various researchers to develop methods to assess the vitality of traditional knowledge, particularly *Pranotomongso* Javanese farmer calendar. It is the vitality for community knowledge to explore the taxonomic systems, regarding: (1) classifying the plants and animals were used (2) elucidating *Pranotomongso* as a source of biodiversity and dynamic ecological information.

Pranotomongso as a part of agronomy calendar were supported by interdisciplinary science. Anthropology contributes to the ethnics' behaviour in responding season dynamics, as shown by Javanese and Balinese, as a response to the dry season and rainy season cyclic. Ethno-biology plays a role in revealing phenomena of interactions between human and living creatures, such as presence and dynamics of certain plants and animal as seasons changing identifier [7]. Environmental geography emphasizes on uniqueness of society's traditional knowledge in cultivating their natural resources.

Pranotomongso (or *Kertamasa* in Balinese) knowledge is a useful tool and goal for traditional farmers. It is represented by the calculation and pattern called *Sasi* or month. The first *Sasi* order (Kaesa, Kasa), second month (*Kaloro, Karo*) up to the last twelfth month *Sadha*, with day variation for every *mongso* or month between 23-34 days. Javanese and Balinese community are two particular ethnics who have traditional calendar system to determine the planting season through understanding the nature's sign [5], particularly the presence of plants as well as animals' behaviour. *Pranotomongso* was created by Ronggowarsito, and has been known to the Javanese society since a thousand years ago. The calendar had been used by Sri Susuhunan Pakoe Boewono VII since 22 June 1856 [6]. [15]

2.1. Basic Principles and Construction of *Pranotomongso* Calendar System

2.1.1. The sequence of *Pranotomongso* consists of (Table 1):

- a. The first column is *Sasih* which means month in international calendar
- b. The second column is time period in each month
- c. The third column is Remark, season and weather description

Table 1. Sequence of Pranatomongso calendar

No	Name of month	Period month	Remarks
1	Kaesa First	23 June - 2 Aug.	Dry season. The sun is at the North latitudes, heads to the South
2	Kalro Second	3 Aug - 25 Aug.	Dry season
3	Ketiga Third	26 Aug - 18 Sept.	Dry, the sun is from North and it has entered the equator
4	Kapat Forth	19 Sept. - 13 Oct.	Entering the rainy season, the sun is at the equator
5	Kalima Fithh	14 Oct. - 9 Nov.	Rainy season, the sun is at equator to the South
6	Kanem Sixth	10 Nov. - 22 Dec.	Rainy season, fruit season, time to start flowing field, the sun heads to South latitude
7	Kapitu Sevent	23 Dec. - 3 Feb.	Floods, strong wind, begins to plant paddy, the Sun is at South, strong wind from West aimlessly.
8	Kaulu Eight	4 Feb. - 1 March	Rainy season, paddy is in reproductive stage, the Sun shifts from South to North, Wind from Northwest to East aimlessly.
9	Kasasnga Ninth	2 March - 26 March	Rainy season. The sun is at equator. Strong wind.
10	Kadasa Tenth	27 March - 19 April	Transition from rainy to dry season. The sun shifts to the North
11	Jyestha Eleventh	20 April - 12 May	Dry season, the peak of paddy harvest
12	Sadha Twelve	13 May - 22 June	Cold air, the end of paddy harvest. The season to grow crops

(Daldjoeni, 1997; in Hantoro Tapari, [13] [14] Yulianto, 2012, adapted Suryadarma 2015) [2]

The Pranotomongso calendar system can be clarified with the Christian calendar with a long variation in the days of the month.

2.1.2. The Structure and characteristics of each month (Table2)

Table 2. The Structure and characteristics of each Month

No.	Season	Main Season	Time Period	Candra Description	Marks	Marks for Farmer
1	First month (Kartika)	Ketiga - Terang	June 22 th – Aug 1 st (41 days)	<i>Sesotya murcā ing embanan</i> ("Diamonds fell out of the container/ leaves are falling")	The leaves are falling, the wood becoming dries; locusts into the soil	Time to burn straw; began planting crops
2	Second month (Pusa)	Ketiga – Paceklik	Aug 2 nd – Aug 24 th (23 days)	<i>Bantālā rengkā</i> ("Cracked earth")	Soil becoming dries and cracks, kapok trees and mango trees start to flowering	
3	Third month (Manggasri)	Ketiga – Semplah	Aug 25 th – Sept 18 th (24 days)	<i>Sutā manut ing bāpā</i> ("obedient son to his father")	The vines climb the trellis, bamboo shoots emerging	The Crops began to be harvested
4	Fourth month (Sitra)	Labuh – Semplah	Sept 19 th – Oct 13 th (25 days)	<i>Waspā kumembeng jroning kalbu</i> ("tears welled in heart" / springs start welling out)	Springs began to fill; kapok begin to bear fruit, small birds start nesting and laying eggs	Harvest crops; its time to working the land for planting gaga rice

5	Fifth month (Manggakala)	Labuh – Semplah	Oct 14 th –Nov 9 th (27 days)	<i>Pancuran mas sumawur ing jagad</i> ("golden showers watering the earth")	Rain is going heavy, large tamarind tree leaves begin to grow young, emerging caterpillars is out, moths out of a rut, lempuyang and temukunci begin to sprout	Ditch the improved, and make the flow of water in the rice field, began to planting the gaga rice
6	Sixth month (Naya)	Labuh - Udan	Nov 10 th - Des 22 th (43 days)	<i>Rāsā mulyā kasuciyan</i>	Fruits (durian, rambutan, mangosteen, and others) began to appear, grouse begin to appear in watery places	Farmers sow paddy at hatchery
7	Seventh month (Palguna)	Rendheng – Udan	Dec 23 th – Feb 3 rd (43 days)	<i>Wisā kēntir ing marutā</i> ("poison blows with the wind" / so many diseases)	Lots of rain, rivers flood	Time to move paddy rice seedlings to rice field.
8	Eighth month (Wisaka)	Rendheng - Pangarep-arep	Feb 4 th –Feb 28/29 th (26/27 days)	<i>Anjrah jroning kayun</i> ("the sound of heart voice")	Cats mating season; green rice; uret began to appear on the surface of land	
9	Ninth month (Jita)	Rendheng - Pangarep-arep	Mar 1 st –Mar 25 th (25 days)	<i>Wedharing wacānā mulyā</i> ("advent of the glorious voices "/many animals began to voice out to attract the opposite sex)	Rice flowering; crickets begin to appear; cicadas and the digger began to speak out, the flood still may appear, glagah flowers is falling	
10	Tenth month (Srawana)	Marèng – Pangarep arep	Mar 26 th –Apr 18 th (24 days)	<i>Gedhong mineb jroning kalbu</i> ("Building trapped in conscience"/ The time for pregnant animals)	Rice began to yellowish, many pregnant animals, small birds start hatching eggs.	
11	Eleventh month (Padrawana)	Marèng Panèn	Apr 19 th –May 11 th (23 days)	<i>Sesotyā sinārāwèdi</i> ("Diamond shining glory")	The birds feed their young, kapok fruit is going crack	Its time for harvesting crops.
12	Twelfth month (Asuji)	Marèng Terang	May 12 th –June 21 th (41 days)	<i>Tirtā sah saking sasānā</i> ("water leaving home" /rarely sweats because of the air so cold and dry)	Temperature is going down	Time to plant soybeans, cotton, and it is time to work on the corn plant.

(Suryadarma, 2015)

The structure and order of *Pranotomongso* information is unique including the characteristics of each month, the meaning of climate in general, the length of the day period, the markers that appear, signs on the soil and climatic factors. The last sign is especially that plays an important role for farmers in planting. The uniqueness of information sequence can be used to mark ecological phenomena, uniqueness of weather, biodiversity of plant and animals information as a basis for functional classification and not only taxonomic.

2.1.3. *The structure diagram of Pranatomongso (Figure 1).* The uniqueness of Pranatomongso diagram construction (Figure 1)

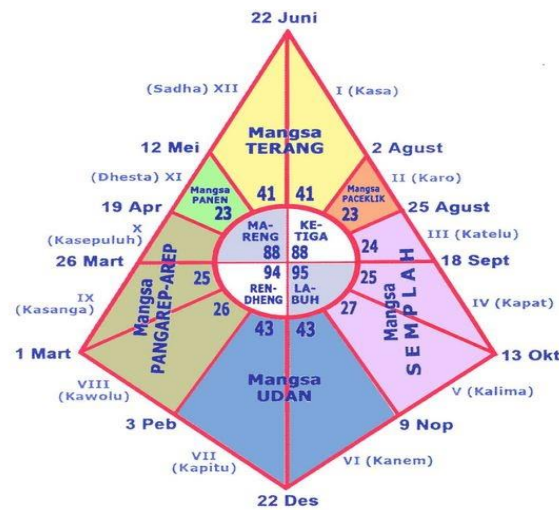


Figure 1. *Pranatamangsa* Scheme
(<http://1001indonesia.net/pranata-mangsa/>)

Diagram construction illustrates the logic pattern of the season, natural signs and plant systems, as a scientific information on the seasonal calendar. The pattern is functional unit of ecological phenomena in fulfilling the needs of life sustainability, which consists of:

1. Every month in the Pranatamangsa calendar is marked by; the uniqueness of the climate, the existence of the dominance of plant species, especially the stages of breeding.
2. The uniqueness of each month is expressed the duration of rain and climatic conditions. The uniqueness of each expression is associated with the uniqueness of human nature and farmers' expectations.[2] [14][15]
3. The farmer's communities who know various types of animals and plants as markers every month and types of plants suitable for planting
4. The who they are knows the existence and breeding stages of various types of marker animals every month.

The special animals sign as season recognition, among others[2]

1. Dogs, in lust, called sasi kesanga, or ninth month
2. Birds are breeding or reproduction, as a dry season
3. Garengpung or Tenggeret nong (Cicada family). The voice of garengpung marks the start of the dry season, namely sasih kapat of rainy season.
4. Termites, are released from the nest as the marker of starting the rainy season
5. Shrimp, in the river is positioned with the Erytina family (cangkring) and palm chewing (jambe) fruit has starts to mature and red.

Table 3. The Existence of animals as indicators

No.	Name of Animals	Reproduction	Sasih	Month Duration	Season	Description
1	Cycada	Voice time Mating Spawn Produce larvae	Kasa First	23 June-2 Aug	Dry	The mating period, the larval phase comes out from the ground and in one night has turned into an adult form.
			Karo Second	3 Aug 25		Garengpung only lives between 2 to 3 months and the marriage process,

				Aug		resulting in ponds and larvae. The larva falls and enters the soil and enters the resting phase in the soil. Larvae are attached to the roots of plants, or are between the root roots, roots as a source of water (Suryadarma, 2016). The mating period, the larval phase comes out from the ground and in one night has turned into an adult form. Tengeret nong only lived between 2 to 3 months and the marital process occurred, resulting in ponds and larvae. larvae and enter the soil and enter the resting phase in the soil.
			Ketiga Third	26 Aug -18 Sept		
2	Tengeret nong Cycada	Voice time Mating Spawn Produce larvae	Kapat (Fith)	19 Sept-13 Oct 19 Sept – 13Oct	Rainy	
3	Laron Termites	Termite colony members start to leave the nest	Kapat (Fith) Kalima (Forth)	19 Sept– 13Oct 14 Oct-9 Nov	Rainy	Sign of the breeding season Reproduction. The type of structure of the function of the larvae The ecological chain built; Larons are eaten by ants, black ants, birds laying laying, bats, chickens
4	Jangkrik (crickets)	Dual crickets start to cricking	Kalima (Fith) Kanem (Sixth)	14 Oct-9 Nop 10 Nov -22 Dec	Rainy	Sign of the breeding season
5	Belalang grasshoppers	Adult grasshoppers begin to ring	Kapat (Forth) Kalima (Fith)	19 Sept– 13Oct 14 Oct-9 Nov	Rainy	Sign of the breeding season
5	Udang kali River shrimp	Decapoda The shrimp is already mature	Kapat (Forth) Kalima (Fith)	19 Sept– 13Oct 14 Oct-9 Nov	Dry	Adult reproductive shrimp The areca nut plants are red and ripe Adult fruit begins to fall
	Burung kedadiah Plaintive	<i>Cacomantis - merulinus</i> Birds of	Kedasa (Tenth)	27March- 19April	Dry	Birds during breeding

6	cuckoo	adulthood begin to sound high-pitched voices	Jyestha (Eleventh)	20April-12 May		
7	Anjing Dog	<i>Canis lupus</i> Adult dogs begin to howl to show matting	Kasanga (Nineth) Kadasa (Tenth)	2March-26 March 27 March- 19 April	Transition	Adult dogs during breeding

The communities who's a particularly farmers know the existence of the breeding stages of various types of plants used as markers every month. Types of plants and stages of breeding and the uniqueness of the climate between seasons, including:

1. Group of Zingiberaceae, grows new buds from the rainy season and when the plants begin to wither, as a sign of the end of the rainy season and start the dry season.
2. Bamboo groups, generally begin to grow saplings or bamboo shoots, as a marker of the beginning of the rainy season and when the shoots are large and the ends of the stem are curved as a dry season marker
3. Tuber plants, begins to grow new plants, buds grow from tubers in the soil in the dormancy phase. The growth of the stem entangles as a marker of the rainy season that rain and plant stems will begin to wither as a marker of the end of the rainy season and start the dry season
4. Gadung, starts growing and twisting rain markers and withered leaves markers of drought.
5. Gembili, starts growing and twisting the rain marker and when the leaves and stems have withered, as a marker of the dry season
6. Suwek, follows the pattern as in the gembili and gembolo plants.
7. Peron plants, include vines or lianas. Platform plants begin to bloom in June to early August and plants begin to bear fruit and fruit until mature in September. In October the fruit was dry and falling, October the peron fell as a marker from the rainy season
8. Mango, begins to bloom in July and have borne fruit in August to September as a dry season. Manga fruit is old before the rainy season, which is in October.
9. Kepuh randu, leaves begin to fall from March to April, and then begin to grow their flower and flower buds starting in June and begin to fall at the end of the dry season, bearing fruit in September October. In October the fruit fell off as a marker of the end of the dry season and the beginning of the rainy season.
10. Ketapang, leaves begin to fall in August, and the leaf tops fall in September and in early November the young buds have grown. October leaves have become open leaves.

The uniqueness of the pranotomomgso calendar as a seasonal marker and the type of production plant will be used as a basis for exploring the understanding of biodiversity in the dynamics of ecological phenomena based on the uniqueness of community knowledge.

Table 4. The existence of plants as the markers in pranatamongso

No.	Nama of Plant	Reproduction	Sasih	Month Duration	Season	Description
1	Mangga	Mango begins to flower in	Katiga (Third)	26Aug-18Sept	Dry	Mango has borne fruit in July, August and at the end of November. The existence of mature manga, results in various caterpillars in the fruit, fruit eaten by certain bats and birds
	(Mango)	June, but leaves do not fall	Kapat (Forth)	19 Sept-13 Oct	Dry–Rainy	
2	Empon Empon	Curcuma group Start to grow	Kalima (Forth)	14 Oct-9 Nov	Rainy	tart growing leaves Already tubing
	Ginger group	Leafy wilt	Kanem (Sixth)	10Nov-22Dec		

3	Gembili	Dioscorea esculenta	Kalima (Forth)	14 Oct-9 Nov	Rainy	Trunk twisted Bulbous
	Lesser Yam	Start to grow Leafy wilt	Kanem (Sixth)	10Nov-22Dec		
4	Gadung	Dioscorea hispida Start to grow Leafy wilt	Kalima (Forth)	14 Oct-9 Nov	Rainy	Trunk twisted Bulbous
	Asiatic better yam		Kanem (Sixth)	10Nov-22Dec		
5	Uwi	Dioscorea alata Start to grow Leafy wilt	Kalima (Forth)	14 Oct-9 Nov	Rainy	Trunk twisted Bulbous
	Purple Yam	Start to grow Leafy wilt	Kanem (Sixth)	10Nov-22Dec		
5	Suwek	Amorphophalus Shots begin to grow Leafy wilt	Kalima (Forth)	14 Oct-9 Nov	Rainy	Grow from old bulbs Tubers are getting bigger and ready to harvest Many types of flies when the it flower is blooming, especially nighttime insects and the type of butterfly or moth group
	Corpse flower Yam group		Kanem (Sixth)	10Nov-22Dec		
6	Peron Yellow fruited moonseed	Arcangelisia flava Plants begin to flower	Jyesta Eleventh Sadha (Twelve)	20april-12 May	Rainy	The plant start flowering and bear fruit The dry and ripe fruit dry season
				13 May-22June		
7	Bambu	Plants grow bamboo shoots	Kalima (Forth)	14 Oct-9 Nov	Rainy	The young bamboo that the tip begin to bend at the end. A sign that it is starting to dry
	Bamboo	Bamboo shoots have grown	Kanem (Sixth)	10Nov-22Dec		
8	Jambe Betel nut Areca nut	Areca catechu The fruit ripen and the color is red	Kaloro (Second) Katiga (Third)	3 Aug-25 Aug	Dry	The fruit mature or red colour The red colour fruit it signs of shrimp are mature and reproductive
				26Aug-18Sept		
10	Ketapang	Terminalia - catappa Mature leaves are red plants and begin to fall in July and August.	Kaloro (Second)	3 Aug-25Aug	Dry	Deciduous leaves start month
	Tropicalalmond Indian almond					
11	Jati Teak	Tectona grandis The mature leaves of begin to fall	Kadasa (Jyesta)	27March-19 April	Dry	Deciduous leaves begin in May June and bear fruit Ginger group (empon empon) Yam group (gadung, gembili gembolo and suwek) has start to grow when the teak leaves begin to bud and will enter the rainy season. Termites live on teak tree trunks, form house lines, and wet soil is lifted from the bottom of the tree. The process of weathering of leaves by various insects, termites in the bottom of dried teak leaves
12	Kepuh randu	Sterculea foetida (malvaceae) The leaves of mature plants begin to fall	Kadasa (Tenth)	27March-19April	Dry	When flowers bloom, the source of nectar is eaten by various birds and insects. At night there are insects and bats looking for nectar
	Cotton tree	At the end of the	Kapat (Forth)	19Sept-13Oct		

13	Kapuk Silk cotton tree	twig the flower buds start	Kadasa (Tenth)	27March-19April		Deciduous leaves start in April Flowering starts in June July September flowers have already fallen October fruit falls Daytime flower fluids are eaten by various nectar-seeking insects and birds Nightly flower fluids are eaten by the type of reckless eaters
		Ceiba petandra Adult leaves begin to fall Start flowering and bear fruit Adult fruit begins to fall	Kapat (Forth)	19Sept-13Oct		
14	Spatodea African tulip tree	Spatodea - campanulata The most dense flowering plants in	Katiga	26Aug-18Sept	Dry	Heavy flowering from June to September Fluid nectar in the flower is eaten by various types of insects and various types of birds.Indonesia colibri (pleci bird, cow starling)
15	Asem Tamarind	Tamarandus - indica Fruit mature Fruiting periode Etc	Kapat (Forth)	19 Sept-13Oct	Dry Rainy	
16	Rambutan					

There are three important types of seasonal dynamics markers in pranotomongso studies.

1. Seasonal Garengpun Noise

Seasonal noise of *garengpun* refers to the noise emergence between rainy season and dry season, or in *sasih* calculation according to *pranatamangso*. *Garengpun* starting noise in April up to September and ends at the end of October, although there some of it that make noise on January up to February. *Garengpun* noise's frequency reaches the highest level on August and September. The distribution was spread evenly and the presence was mostly in dry season. *Garengpun* were mostly found at top high trees, at least seven-meter trees, and commonly on trees with small leaves. It usually chooses the top of the trees when it makes noise. Condition of soil under the trees was commonly not intensively cultivated. *Garengpun* started to make noise in May up to October every year that is between 2014 up to 2015. The possibility was on the different geographical location, which located on eastern part, caused variety on rainy season and dry season so there was different noise response.

2. Presence of Elephant Foot Yam

Growth of Elephant Foot Yam as tubers that undergoes repetitive tubers growing process follows similar pattern. Plant starts to grow as buds until November and at beginning of December the leaves buds start to bloom. In December heavy rain season has started. Balinese society calls it with the *klepat*. The words *nlgepat* and *klepat* refer to start to grow and move, like the growth of *gadung* and *uwi* tubers (*Dioschorea*). Elephant Foot Yam tubers, right after the leaves start to become yellow, the stem dies (*aep*, Balinese language) and the tubers will grow bigger every year. Dry season on *sasih jyestha* (third week of April until second week of May) the tree and stem are invisible and the tubers are kept inside the soil. Elephant Foot Yam plants require soil that is not intensively cultivated for its development. Dry land, river banks land, or under shade of trees such as *teak*, there are the best habitat to grow. Yam were mostly appeared and dominant in rainy season in December 2014 up to February 2015. In the following year, the growth followed similar pattern. Leaves start to turn yellow at the end of April and the stems dry in the end of May.

3. Flowering and Growth Dynamics of Cotton Tree

Dynamics growth of plants are including: the fall of leaves, growth of flower and fruit, and leaf re-growth in every year. The pattern and dynamics growth could be used as reference because it plant has

long lifespan; it could reach hundreds of years in which the pattern could be referenced as a response towards season at that time. The growth pattern is shown in .Cotton Trees flowering at beginning of August and the peak of blossoming flower in September and it ends in the end of October. It plant has started to begin to bloom in beginning of October and the leaves almost cover all branches back in the end of October up to November. The densest top of leaves canopy occurs in the end of February and March, in the beginning of April leaves start to look yellow and it finally fall in May up to July.

Buds growth pattern, maximum leaf canopy, leaf yellowing, leaf fall, buds start to grow, maximum number of flower, fruiting season and fruit fall of Cotton Tree were relevant with pranatamangsa calculation, although there were variations in line with the season condition when the observation took place. The plant growled mostly at cemetery locations, and some of temple area in Bali. But it plant was spread in many area in East Indonesia such as South Sulawesi. Growth dynamics and patterns could be used as ecological information source. It ecological information such as follow. The information of food chain, because many animals were used it nectar when it plant flowering at dry season. Some of animals are many birds, insects, bats. The flowersit plant provide nectar source as well as water during dry season. The dynamics growth showed a pattern that relevant with basic guidance of pranatamangsa. The dynamics show compatibility with ecological phenomena. The ecological phenomena were reviewed from life cycle aspect, food chain, trophic level of the presence of various insects, various birds which were complementary. The complementary presented on the connection of rainy and dry seasons variations because of the sun position at equator, although there was much deviation because of climate changing.

3. Conclusion

Characteristic among distribution and presence of plants and animal, weather, generally were relevant with guideline of Pranatamongso Yogyakarta and Bali areas. The dynamics showed relevancy with ecological phenomena.

The ecological phenomena were reviewed from life cycle aspect, food chain, trophic level of the presence of various insects, various birds which were complementary. The complementary presented on the connection of rainy and dry seasons variations because of the sun position at equator, although there was much deviation because of climate changing. Growth patterns dynamics presented on other seasonal plants. Types of plants such as *gadung* (*Asiatic better Yam*) and *uwi* (purple Yam) showed similar pattern as Elephant Foot Yam. *Kepuh randu* (*Sterculea foetida*) showed similar pattern as Cotton Tree (*Ceiba petandra*). The presence of *tonggeret nong* (Javanese) *nongcret* (Balinese) or known as cicada insects sounds in the afternoon until late morning as indicator that rainy season is coming. Growth pattern as seasonal plants, flowering plants, and plants' leaf fall as well as the presence of sound from *Cicadae* family could be used as a season sign as stated in *pranotomongso* calendar or *kertamasa* of Javanese and Balinese societies

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