

# **Traditional Uses of Plants and Rituals in Turgo Community of Yogyakarta And Possible Link with Biodiversity Conservation in The Merapi National Park**

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The Turgo community in the slope of Merapi Mountain Yogyakarta has long been known to live very closely with the threats of volcano eruption of Merapi Mountain of Yogyakarta. With its unique situation, which lies perfectly in the southern slope of Merapi and in The Merapi National Park, this community develops varieties of local wisdom that helps them survive against the disaster, the increasing land-clearing due to tourism developments, and the challenge of climate change. This research was conducted to understand the traditional uses of plants that are important to Turgo community for their sustainability. In addition, this research aimed at identifying the rituals that have a possible link with conservation of plants of the Merapi National Park. Using several methods of data collections, such as surveys and open-ended interviews, we found that people of Turgo categorize the uses of plants into: medicinal plants, ornamental plants, aromatic plants, cattle-fodder plants, natural-pesticides plants, dye-source plants, building-material plants, edible plants, and plants required for rituals. The Turgo community has been practicing ancient rituals such as *Memetri tuk*, *Ndamel Griyo*, *Ngunduh Mantu*, and *Wiwit*. *Memetri tuk* is a ritual performed to save the water. *Ndamel griyo* is performed when people start developing their houses, and *ngunduh mantu* is one of a wedding rituals. *Wiwit* is the starting ritual before rice-harvesting. All of these rituals uses local plants as their main essence. These rituals, in turn, have been helping the conservation of plants in the Merapi National Park.

## I. INTRODUCTION

Indonesia has long been known to function as a biodiversity reservoir with 16,7 % of the total world's biodiversity. This puts Indonesia only second to Brazil. By geographical classification, 7 major biogeographic regions are mapped, consists of large islands and their surrounding seas. It is no wonder that Indonesia is home for billion hectares of rainforests with unique plants and

animals. In fact, Indonesia gains its attributes as “an emerald of the tropics”. Despite this beautiful story, however, the challenge to the environment has been apparent. In Indonesia, deforestation and land use changes have been the major contributors of climate change (Measey 2010; Sari et al., 2007).

The threat to forest has brings serious implication to local community that lives dependently to the forest and its plants. This potrayal illustrates the conditions of the Turgo community at the Mount Merapi National Park (*Taman Nasional Gunung Merapi*). As a part of Turgo-Plawangan natural reserve, the village of Turgo lies only a few kilometer from the Merapi crater. Before a series of eruption which washed the forest and most part of the village, people of Turgo had been depending on the richness of plants in the forest to sustain their life. This community had lost its natural pine forest due to Merapi eruption in 2004, 2006, and 2010. Dove (2008) reported that villagers have deloped a system of agroecological practices that adapt with disaster and constant changes due to vulcanic activities. But, the disaster -coupled with the intense threat of deforestation- had forced some community members to shift their livelihood (Hastuti, 2006). Some of them turn their living to tourism (Hastuti 2006; Khabibi, 2008). As such opens an opportunity for Turgo to become a ‘tourism-based village’, with many services provided to tourists such as homestays, motels, and lava-tour attraction (Hastuti, 2008). All of these shifts creates a new regime in terms of natural-reserve conservation.

This study aimed at understanding other aspects of villagers life in terms of the uses of plants and rituals contribute to conservation. In addition, with a believe that “forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generation”, as it said in the Forest Principle No 2b (UNCED, 1992), we conducted this research to understand the traditional uses of plants that are important to Turgo people for their sustainability, considering the social, economic, cultural, and spiritual attributes of the community.

## II. METHODS

This research employed several methods. First, a survey was conducted at the village of Turgo to identify species of plants used by villagers. Secondly, open-ended questions were also asked to respondents. All plants’ names cited by respondents were recorded. The names were

then consulted with literatures regarding the plants' biology. The data were analyzed qualitatively to describe the species, the nature of plants' uses and rituals involved in its usage.

### III. RESULTS AND DISCUSSION

Plants used by Turgo people are varied. Listed below, is only some major plants that are used by the community and mostly is taken from the Merapi National Park and home-gardens. Our survey found that there were 66 species commonly used by the community for varieties of needs, including medicine, ornament, aromatic spice, rituals.

Table 1. List of Plants Found in Turgo-Plawangan, Traditionally Used by Turgo Community

Species	Traditional name(s)	Uses	Part-used
<i>Usnea spec. div</i>	Kayu angin	Medicine	
<i>Medinella speciosa</i>	Parijoto	Medicine	
<i>Canangium odoratum</i> Baill	Kenanga	Ornament, ritual	All parts
<i>Anaphalis javanica</i>	Edelweis Jawa	Ornament, dry flowers are sold as souvenirs	Flower
<i>Cycas rhumpii</i> Miq.),	pakis raja	Ornament	All parts
<i>Nepenthes alata</i>	kantong semar	Ornament	All parts
<i>Vanda tricolor</i>	Anggrek pandan	Ornament	All parts
<i>Eulophia spec.</i>	Anggrek tanah	Ornament	All parts
<i>Jasminum Sambac</i> Ait	Melati	Ornament, rituals	Flower
<i>Coix lacryma jobi</i> Linn.	Jali	Ornament, accessories	Seed, all parts
<i>Bambusa multiplex</i> Raeusch	bambu cendani	Ornament	
<i>Rhododendron javanicum</i> Benn.	cepoko geni	Ornament	
<i>Canangium odoratum</i> Baill.	Kenanga	Ornament, aromatic-plants, rituals	Flowers
<i>Alpinia galanga</i> Sw.	Lengkuas	Aromatic plant, medicine, natural-pesticide	Rhizome
<i>Curcuma domestica</i> Val	Kunir	Aromatic plant, medicine, natural-pesticide, natural-dye	Rhizome
<i>Zingiber officinale</i> Rosc.	Jahe	Aromatic spice, medicine	Rhizome
<i>Zingiber aromaticum</i>	Lempuyang	Aromatic spice,	Rhizome
<i>Cinnamomum burmannii</i> Bl	kayu manis	Aromatic spice, medicine	Rhizome
<i>Buchanania arborescens</i> Bl	poh-pohan	Cattle-fodder	Leaves
<i>Ipomoea batatas</i> Poir.	Ketela rambat	Cattle-fodder	Leaves
<i>Manihot utilisima</i> Phol.	Ketela pohon	Cattle-fodder	Leaves
<i>Pennisetum purpureum</i> Schum.	Kulonjono	Cattle-fodder	Leaves
<i>Calliandra calothyrsus</i>	Kaliandra	Cattle-fodder	Leaves
<i>Cyperus rotundus</i> Linn	Rumput teki	Cattle-fodder	Leaves
<i>Panicum distachyum</i> Linn	Rumput gajian	Cattle-fodder	Leaves
<i>Curcuma xanthorrhiza</i>	Temulawak	Medicine, Natural-pesticide	Rhizome
<i>Acacia decurrens</i>	Akasia	Natural-dye	Seeds
<i>Anredera cordifolia</i> (Ten.) Steenis.	Binahong	Rituals	Leaves
<i>Urena lobata</i> Linn	Pulutan	Rituals	Leaves
<i>Alocasia macrorrhiza</i> Schott	Sente	Rituals	Leaves

<i>Corus calamus</i> Linn	Dlingo	Rituals	Seeds
<i>Mussaenda frondosa</i>	Kalik kadep	Rituals	Leaves
<i>Pandanus sp</i>	Pandan	Aromatic plants, rituals, natural dye	Leaves
<i>Rosa sp</i>	Mawar	Aromatic plants, rituals	Flowers
<i>Jasminum sambac</i> Linn	Melati	Aromatic plants, rituals	Flowers
<i>Cocos nucifera</i> Linn.	Kelapa	Rituals, building-materials, food	Leaves (for rituals), All parts
<i>Melia azedarach</i> Linn	Mindi	building-materials, natural pesticides	Stem
<i>Toona sureni</i> Merr.	Suren	building-materials	Stem, log
<i>Swietenia mahagoni</i> (L.) Jacq.	Mahoni	Building-materials	Stem, log
<i>Paraserianthes falcataria</i>	Sengon	Building-materials	Stem, log
<i>Gigantochloa apus</i>	Bambu apus	Building-materials, crafts	Stem
<i>Dendrocalamus asper</i>	Bambu petung	Building-materials, crafts	Stem
<i>Dodonaea viscosa</i> Jacq.	Tesek	Building-materials	
<i>Scoparia dulcis</i> Linn	jaka tua	Building-materials	
<i>Ananas comosus</i> Merr.	Nanas	Vegetables, Rituals (for offerings)	Fruit
<i>Luffa acutangula</i> Roxb.	Oyong	Vegetables, rituals (for offerings)	Fruit
<i>Vigna sinensis</i> Endl.	Kacang panjang	Vegetables , rituals (for offerings)	Fruit
<i>Solanum lycopersicum</i> Linn	Tomat	Vegetables , rituals (for offerings)	Fruit
<i>Solanum melongena</i> Linn.	Terong	Vegetables , rituals (for offerings)	Fruit
<i>Capsicum annum</i> Linn.	Lombok	Vegetables , rituals (for offerings)	Fruit
<i>Daucus carota</i> Linn.	Wortel	Vegetables , rituals (for offerings)	Fruit
<i>Salacca zalacca</i> (Gaertn.) Voss	Salak	Vegetables , rituals (for offerings)	Fruit
<i>Brassica oleracea</i>	Kubis	Vegetables , rituals (for offerings)	Leaves
<i>Allium sativum</i> Linn	bawang putih	Vegetables , rituals (for offerings)	Bulbs
<i>Allium cepa var. aggregatum</i> Linn	bawang merah	Vegetables , rituals (for offerings)	Bulbs
<i>Manihot utilisima</i> Phol.	Ketela	Vegetables , rituals (for offerings)	Bulbs
<i>Sechium edule</i> (Jacq.) Sw	Labu siam	Vegetables , rituals (for offerings)	Bulbs
<i>Musa paradisiaca</i> L var <i>sapientum</i>	Gedhang rojo	Fruits, rituals (for offering)	Fruits
<i>Ficus grossularioides</i> Brum.f	Godhong kebek	Rituals	leaves
<i>Dodonaea viscosa</i> Jacq.	Tesek	Building materials, craft	Leaves
<i>Scoparia dulcis</i> Linn.	jaka tua	Building materials, craft	Leaves
<i>Saccharum officinarum</i> L	Tebu ireng	rituals	stem
<i>Erythrina subumbrams</i> [Hassk.] Mern	Dadap serep	Rituals, vegetables, medicine	leaves
<i>Alocasia macrorrhiza</i> Schott	godhong senthe	rituals	leaves

### Use Practices Among the Community

We defined the uses of plants into medicinal plants, aromatic plants, ornamental plants, cattle-fodder plants, natural-pesticides plants, dye-source plants, building-material plants, and plants required for rituals. This categorization, however, is not absolute, and it is important to note that a species could fall into more than one category.

For medicinal uses, we recorded several major species commonly used (*Usnea spec. Div*, *Medinella speciosa*, *Alpinia galanga* Sw., *Curcuma domestica* Val., *Curcuma xanthorrhiza*, *Zingiber officinale* Rosc., *Cinnamomum burmannii* Bl.). *Usnea spec. Div* were widely used for healing respiratory problem due to influenza (*masuk angin*, local language) and increasing immunity. Interestingly, our study to literatures confirms that usnea is widely known for increasing body immunity (Agar *et al.* 2011; Shah 2014) and healing infections (Madamombe and Afolayan 2003). The uses of *Usnea* was widely cited among respondents. This could be linked to the abundance of *Usnea* in the Merapi National Park. *Usnea* is collected directly from the National Park, and no domestication effort has been taken.

At the Turgo community, medicinal plants were prepared as *simplisia*. Rhizomes, leaves, seeds, and bulbs could be crushed and mixed together to form *jamu*. Traditionally derived from Javanese language, *jamu* is widely known among Indonesian people as a form of traditional medicine (Elfahmi *et al.* n.d.; Hadi *et al.*, 1996). The use of *jamu* among the Turgo community represents indigeneous knowlegde that are shared among Javanese. Commonly, the drink of *jamu* could also be linked with local events and culture. For example, *uyup-uyup*, is a type of *jamu* prepared after a woman gives birth, to increase breast milk. Its main ingredients are *kunir* (*Curcuma domestica* Val), *laos* (*Alpinia galanga* Sw.), *temulawak* (*Curcuma xanthorrhiza*), *jahe* (*Zingiber officinale* Rosc).

Medicinal plants usually also has aromatic properties due to the presence of aromatic compounds in the form of alkaloids, flavonoids, steroids, terpenoids, coumarins, and lignans (Hadi *et al.* n.d). Hence, in this research, we often categorize a plant into two overlapped categories. For example *laos* (*Alpinia galanga* Sw.), is categorized as medicinal plant and aromatic plant. There are also several other plants that have aromatic properties but are not categorized as medicinal plants. This group consists of *Canangium odoratum* Baill. (*kenanga*), *Pandanus sp* (*pandan*), *Rosa sp* (*mawar*), and *Jasminum sambac* Linn. (*melati*).

The reliance of Turgo people to natural medicine, herbs, and aromatic plants indirectly conserves the existence of vegetations. Especially the uses of *jamu* as herbal drink are very common and is a part of people's traditions. This also explains why domesticating these plants is a part of their agroecological tradition.

The uses of aromatic plants are often linked to rituals. The flower of *Canangium odoratum* Baill. (*kenanga*), *Pandanus sp* (*pandan*), *Rosa sp* (*mawar*), *Jasminum sambac* Linn. (*melati*)

forms *kembang pitung rupa* (seven varieties of flowers) that has a symbolic meaning among the Turgo community. It was believed that ancestors and Prophet Muhammad –as the Turgo people are mostly moslems and therefore consider Mohammad as the main prophet- love fragrances. Because of this importance, *kembang pitung rupa* become main essences of rituals. The funeral ritual, for example, require flowers to deliver the death into his/her grave. It is believed that the flowers represent the purity and sacredness (Mustopo 1983).

Ornamental plants are used by people of Turgo to decorate their houses. They were planted in the front and backyard. *Cycas rhumpii* Miq.), *Nepenthes alata* (*kantung semar*), *Coix lacryma jobi* Linn (*jali*), *Bambusa multiplex* Raeusch, *Rhododendron javanicum* Benn were initially taken from the Merapi National Park, and then were domesticated in the home gardens. Sometimes, these are also for sale, catering the tourists who are interested in exotic garden plants. *Kantung semar*, for example, gained its popularity as garden plant and commercialized since 2005 (Mansur , 2006). Despite its economic value, however, this plant is categorized as an endangered species and listed in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES). Thus is protected by the Law No.5 Year 1990 and Law No. 7 Year 1999. Because of this attribute, the exploration of *kantung semar* from the Merapi National Park was regulated. In Turgo, *kantung semar* is domesticated, hence the supply does not depend on the availability of wild reserves.

Beside the structure of law and regulations, fortunately, the people of Turgo has developed their local wisdom that are philosophically aware to the protection of biodiversity. Bukit Turgo – as a part Turgo-Plawangan natural reserve- is considered as a sacred place for Turgo people. It has a status as “*tempat angker*” (sacred place) where the ancestors abode. They believe that Merapi and its surroundings are protected by guardian spirit, *Kanjeng Ratu Sekar Kedhaton* –The Queen of the Palace (Fathkan 2006). *Kanjeng Ratu Sekar Kedhaton* represents Merapi, its fertile soil, fresh water and welfare. If we look back at Geertz’ pictorial on the spirit beliefs, we could agree that the beliefs on such things are systematically found in all Javanese culture (Geertz, 1959).

In addition to the above-mentioned plants, we also recorded species of orchids, that were domesticated, but were initially derived from the wild. Our data suggested that there are 52 orchids normally found in the Merapi National Park, among them some are endemic –such as *Vanda tricolor*. These orchids plays an important role for the community for sustaining their life.

The list of orchids below was from the ‘Alami’ Farmer Group (*Kelompok Tani*). This farmer group consists of 20 members, and mostly sell their orchids to tourists and visitors. The existence of this Farmer Group can also be translated as a formal organization that helps the sustainability of orchid biodiversity at the Merapi National Park.

Table 2. List of Orchids Domesticated by the Farmer Group

<b>Species</b>	<b>Form of life</b>
<i>Acriopsis liliifolia</i> (Koen.) Ormerod	Epiphyte
<i>Aerides odoratus</i> Lour.	Epiphyte
<i>Anoectochilus reinwardtii</i> Bl.	Terrestrial
<i>Appendicula alba</i> Bl.	Terrestrial
<i>Appendicula angustifolia</i> Bl.	Epiphyte
<i>Appendicula reflexa</i> Bl.	Epiphyte
<i>Agrostophyllum stipulatum</i> (Griff.) Schltr. var <i>bicuspidatum</i> (J.J.Sm.) A.Schuit.	Epiphyte
<i>Agrostophyllum laxum</i> J.J.Sm.	Epiphyte
<i>Bulbophyllum absconditum</i> J.J.Sm.	Epiphyte
<i>Bulbophyllum flavescens</i> (Bl.) Lindl.	Epiphyte
<i>Bulbophyllum lemniscatoides</i> Rolfe	Epiphyte
<i>Calanthe triplicate</i> (Willem.) Ames	Terrestrial
<i>Cerastostylis subulata</i> Bl.	Epiphyte
<i>Coelogyne speciosa</i> (Bl.) Lindl.	Epiphyte
<i>Coelogyne longifolia</i> (Bl.) Lindl.	Epiphyte
<i>Corymborkis veratrifolia</i> (Reinw.) Bl.	Terrestrial
<i>Cymbidium bicolor</i> Lindl.	Epiphyte
<i>Cymbidium ensifolium</i> (L.) Sw.	Terrestrial
<i>Cymbidium lancifolium</i> Hook.	Terrestrial
<i>Dendrobium crumenatum</i> Sw.	Epiphyte
<i>Dendrobium heterocarpum</i> Wall. Ex Lindl.	Epiphyte
<i>Dendrobium mutabile</i> (Bl.) Lindl.	Epiphyte
<i>Dendrobium sagittatum</i> J.J.Sm.	Epiphyte
<i>Dendrobium tetraedre</i> (Bl.) Lindl.	Epiphyte
<i>Dendrobium gracile</i> (Hook.f.) J.J.Sm.	Epiphyte
<i>Eria javanica</i> (Sw.) Bl.	Epiphyte
<i>Eria oblitterata</i> (Bl.) Rehb.f.	Epiphyte
<i>Eria retusa</i> (Bl.) Rehb.f.	Epiphyte
<i>Habenaria loerzingii</i> J.J.Sm.	Terrestrial
<i>Liparis pallid</i> (Bl.) Lindl.	Epiphyte
<i>Liparis viridiflora</i> Ridl.	Epiphyte
<i>Macodes petola</i> (Bl.) Lindl.	Terrestrial
<i>Macropodanthus teysmanni</i> (Miq.) H.A. Peders.	Epiphyte
<i>Malaxis kobei</i> (J.J.Sm.) J.B.Comber	Terrestrial
<i>Malaxis ophridis</i>	Terrestrial
<i>Oberonia similis</i> (Bl.) Lindl.	Epiphyte
<i>Oberonia imbricata</i> (Bl.) Lindl.	Epiphyte
<i>Paphiopedilum javanicum</i> (Reinw. ex lindl.) Pfitz.	Terrestrial
<i>Phaius tankervilleae</i> (Banks ex l'Herit) Bl.	Terrestrial

<i>Pholidota carnea</i> (Bl.) Lindl.	Epiphyte
<i>Pholidota imbricata</i> Hook.	Epiphyte
<i>Pholidota ventricosa</i> (Bl.) Rchb.f.	Epiphyte
<i>Phreatia sulcata</i> (Bl.) J.J.Sm.	Epiphyte
<i>Rhomboda velutina</i> (J.J.Sm.) Ormerod	Terrestrial
<i>Spathoglotis plicata</i> Bl.	Terrestrial
<i>Thrixspermum acutilobum</i> (Bl.) Rchb.f.	Epiphyte
<i>Thrixspermum anceps</i> (Bl.) Rchb.f.	Epiphyte
<i>Thrixspermum purpurescens</i> (Bl.) Rchb.f.	Epiphyte
<i>Trichotosia ferox</i> Bl.	Epiphyte
<i>Vanda tricolor</i> Lindl.	Epiphyte
<i>Zeuxine gracilis</i> (Breda) Bl.	Terrestrial
<i>Zeuxine</i> sp.	Terrestrial

The people of Turgo mostly earned their living from farming, although some of them had shifted their livelihood to tourism. Interestingly, they understand that the use of chemicals reduce the quality of their produce, hence they use natural pesticides from plants. *Melia azedarach* Linn. (mind), *Curcuma xanthorrhiza* (temulawak), *Curcuma domestica* Val (kunjir), *Alpinia galanga* Sw. are among plants used as natural pesticide. The preparation of the pesticides usually is very simple, only by crushing the part of plants that contain highest ingredients of active compounds, such as leaves and rhizomes.

Similar to the use of natural pesticides, in preparing foods and beverages, Turgo people depend on natural-dye. *Nasi kuning* (yellow rice) -popular food, usually prepared during celebration such as birth day- gets its yellow colour from *Curcuma domestica*'s rhizome. The leaves of *Pandanus* sp are often extracted to get green colour in some food such as *klepon* (glutinous-rice ball) or *tape* (fermented glutinous-rice). The seed of *Acacia* sp is also extracted to give green colour.

The home-gardens and fields of Turgo people are full of greenery. These vegetation are used for feeding their cattle (mostly cow and goat). *Buchanania arborescens* Bl, *Ipomoea batatas* Poir., *Pennisetum purpureum* Schum., *Panicum distachyum* Linn are among plants used for feeding cattles. These vegetations could be found at home-gardens or fields. However, when absent, people go to the Merapi National Park to fetch some of these greenery. Luckily, people understand that they could not over-exploited plants at the national park.

While the biological data of the species used by locals are important, to understand how the culture of rituals help the Merapi National Park to survive, we had documented several rituals that are involved in the process of conservation of plants at Turgo.



Table 3. Rituals Performed at the Turgo Community

Name(s) of rituals	Notes	Plants involved and/or protected
<i>Memetri Tuk</i>	Aims at protecting the water source at Bukit Turgo (Turgo hill)	<i>Beringin</i> <i>Bambu</i>
<i>Damel griyo</i>	As a form of <i>slametan</i> . Geertz defines <i>slametan</i> as ceremony to pacify local spirits (Geertz 1986)	<i>Pari (Oryza sativa)</i> <i>Godhong dadap</i> <i>Gedhang rojo (Musa domestica)</i>
<i>Ngundhuh mantu</i>	<i>Slametan</i> to welcome bride and groom at the house of parents-in-law	<i>Tebu ireng,</i> <i>dadhap serep,</i> <i>pulutan,</i> <i>godong senthe,</i> <i>gedhang rojo</i>
<i>Wiwitan</i>	A ceremony that marks the beginning of rice harvesting	<i>Lombok abang</i> <i>Dadhap serep</i> <i>Turi</i> <i>Pisang</i> <i>Kembang pitung rupo</i>
<i>Labuhan Gunung Merapi</i>	The biggest ceremony in Merapi, usually held together with other communities around Merapi, including people of Selo at Boyolali District	Vegetables Rice Fruits

### Memetri Tuk

*Memetri Tuk* means protecting the source of water. There are three main sources of water in the Turgo Hill namely *Siraman Lanang*, *Siraman Wadon*, and *Candi*. This ritual is performed by the Turgo people at 1st of *Sura*. *Sura* is a name of month according to Javanese lunar calendar. It is also the beginning of Javanese year which consists of 12 months (*Sura*, *Sapar*, *Mulud*, *Rabiulakir*, *Jumadilawal*, *Jumadilakir*, *Rajab*, *Ruwah*, *Rejeb*, *Ruwah*, *Poso*, *Sawal*, *Longkang*, *Besar*).

The ceremony begins with a *slametan* by a group of men at the house of the elderly, usually the head of the village. Moslems and Cristians hold *slametan* separately. This is due to the different prayer (*do'a*) recited during the procession. After the *slametan*, perople –men, women, and children- will gather at the village's hall and prepare *sesaji* (offerings), consist of rice, meat, goat's liver, *kembang* (flower), and *dupa* (incense). Flowers and incense are essential ingredients of every ceremony at Javanese's ritual, as it said by Geertz (1959) that spiritual beings eat the fragrance of flowers dan *dupa*. All of these offerings are then directed under the trunk of banyan tree, as a symbol of fertility and 'mother of earth'. Banyan tree is believed to be the home of

*danyang* (spirit) that protects water and soil. All of these processions is ended by planting more vegetations around the water sources, cleansing the banyan tree from unwanted weeds, and planting bamboos.

Looking at this process, we could understand why the village of Turgo is widely covered with greenery although they suffer regular challenge from land-clearing when hot lava swept the area. Consistently, this ritual eases the authority in charge of the Merapi National Park in carrying out rehabilitation plan after forest-destruction due to Merapi eruption in 2010. This also explain why water source around Turgo is conserved, and thus villagers have no problem of water-scarcity.

### ***Damel Griyo***

Turgo people build their houses from local materials and *kayu* (wood) of *Paraserianthes falcataria* (*sengon*), *Swietenia mahagoni* (L.) Jacq.(mahoni), *Toona sureni* Merr.(suren), *Gigantochloa apus* (*bambu apus*), *Dendrocalamus asper* (*bambu petung*) and *Melia azedarach* Linn. (*mind*). Previously, these woods were brought from the Merapi National Park, but after 1990s, when people were more aware of the conservation of forest, these plants were domesticated in their home graden or field. Some of them were supplied by local carpenters.

Entering a new house, for Turgo people, requires a slametan. The purpose is to cleanse the house from the evil spirits. This is accomplished by giving the spirits ‘food’ to pacify them. The food (offerings) consist of rice, flowers, incense, *godhong kebek* (*Ficus grossularioides* Brum.f), *kali kadep* (*Mussaenda frondosa*), *suket grinting* (*Cynodon dactylon*), *pulutan* (*Urena lobata* Linn.), *gedhang rojo* (*Musa paradisiaca* L. *Var sapientum*). All of them is then burried at the middle of the house as a symbol that evil spirits had been burried. In addition, people of Turgo often use plants materials to make household objects, such as basket and spoon (made of wood).

### ***Ngunduh Mantu***

The Javanese wedding involves very complex rituals. At the house of the bride, the wedding is started by *malam midodareni*, which means ‘the night when angel and goddes come and bless the bride’. During this night, the prayer is recited to giving the bride the peacefullness in entering a new phase of her life. Fragrances become important at this occasion. *Kembang pitung rupa*

(seven kinds of flowers), incense, and other fragrances are used to decorate the house. This event is then followed by the ceremony *ngunduh mantu*, that is when bride and groom meets for the first time, after 40 days they are separated at following the tradition of *pingitan*. *Pingitan* is the period when the bride-to-be and groom-to-be is separated, thus can not see each other. At the ceremony of *ngunduh mantu*, several important plants are used e.g. *tebu ireng* (*Saccharum officinarum* L), *dadap serep* (*Erythrina subumbrans* [Hassk.] Mern.), *pulutan* (*Urena lobata* Linn.), *godhong senthe* (*Alocasia macrorrhiza* Schott), and *gedang rojo* (*Musa paradisiaca* L. Var *sapientum*). All of them is arranged into a huge bouquet and is used to decorate the house gate. The purpose of this bouquet is to welcome the groom before entering the house of the bride.

### ***Wiwitan***

*Wiwit* literally means start or begin. In the context of Turgo people's ritual, *wiwit* means the beginning of rice harvesting. It aims at showing gratefulness to the 'spirit' of earth and Dewi Sri (The Goddess Sri) for giving fertility to the soil. For the people of Turgo, the earth is considered to be a 'brother' (*sedulur sikep*), and thus the harmony between man and earth plays important role in determining the relationship between human and nature. The plants used for offerings (*sesaji*) consist of *pulutan* (*Urena lobata* Linn.), coconut leaves/*janur* (*Cocos nuiifera*), *salak* (*Salacca zalacca* (Gaertn.) Voss) dan *dadap sirep* (*Erythrina subumbrans* [Hassk.] Mern.).

### ***Labuhan Gunung Merapi***

*Labuhan Gunung Merapi* is held every month of Rajab (according to Javanese lunar calendar). This is the biggest ritual involving people from many communities around Merapi, including the people of Turgo. The rituals begins with the making of *sesaji* (offerings) in the form of *gunungan*. *Gunungan* is a replica of a mountain which is made from a neat arrangement of fruits and vegetables. Depending on the harvested fruits and vegetables, *gunungan* usually consists of local produce of Merapi such as *Ananas comosus* Merr. (nanas), *Luffa acutangula* Roxb. (oyong), *Vigna sinensis* Endl. (kacang panjang), *Solanum lycopersicum* Linn (Tomat), *Solanum melongena* Linn. (lombok), *Capsicum annum* Linn. (terong), *Daucus carota* Linn. (wortel), *Salacca zalacca* (Gaertn.) Voss (salak), *Brassica oleracea* (*kubis*), *Allium sativum* Linn (bawang putih), *Allium cepa* var. *aggregatum* Linn (bawang merah), *Manihot utilisima* Phol.

(ketela) and *Sechium edule* (Jacq.) Sw (labu siam). The *gunungan* then is brought to the top of the mountain, where a *juru kunci* (a person given power to communicate with the spirits of Merapi) performed a prayer. The *juru kunci* then throw (*melarung*) the *gunungan* to the mountain as a symbol of gratefulness that Merapi has given them fertile soil and successful harvests.

### **How Local Wisdom Could Have Possible Link With Conservation**

Geertz in his book *Involusi Pertanian* (Agricultural Involution) (1976) stated that volcanic mountain has given sources to life –the soil fertility due to volcanic materials provides nutrients to agricultural plants. The dependency to the mountain has created a unique relationship between men and the earth. In this research, we noted that the Turgo community has developed a system that helps conserving plants at the Merapi National Park.

First, our finding regarding traditional uses of plants have showed that people of Turgo rely on plants from their home gardens and from the National Park. Not only is for supporting their livelihood, but also is for maintaining the relationship between the people and the earth. The increase of tourism could potentially give a pressure to plant biodiversity in the village. The increasing economic benefits of tourism have converted some areas at the village into tourist attraction areas and homestays, and thus disturb the natural habitat of most vegetations, including exotic and endemic species. In recent years, people opt for domestication of exotic plants, such as *kantung semar* and orchids for fulfilling the increase of demands of the tourists. This has been showed by the activity of ‘Alami’ Farmer Group that breeds endemic orchids at their nursery. However, when domestication is difficult, for example at the case of *Anaphalis javanica* (edelweiss) and *Usnea sp*, people of Turgo rely on the Merapi National Park for collecting the specimens. This shows a great reliance to the Merapi National park.

Second, our findings show that plants and ritual are two complementary aspect that shape the culture of Turgo. The belief that Merapi is inhabited by *danyang*, *Ratu Sekar Kedhaton*, and other spiritual beings shows that Merapi is respected. It is given a special entity as a ‘brother’. This kind of traditional knowledge has created a wisdom (Pranowo and Adi, 1985) that is meaningful for the sustainability of Turgo ecosystem. The sacredness of Merapi is a value which is manifested into rituals. These rituals are accepted and celebrated by people of Turgo – regardless their religion. This value, in our analysis, has been a foundation for conservation.

Lastly, we observed that successfulness of conservation of Merapi National Park is supported by the cultural system of people of Turgo. Turgo people believe that Merapi is their 'brother', hence they always support the conservation programmes launched by the authority of the Merapi National Park. For example, the forest rehabilitation project after Merapi eruption in 2010 was fully supported by the villagers, that they helped the authority planting plants in the forest.

#### IV. CONCLUSION

Based on the results carried out in this study, major risks for the conservation of plants in Turgo and the Merapi National Park came from tourisms that convert some areas of the village into resorts and tourist attraction. In addition, the needs of exotic plant contribute to reduction of the supply. Luckily, people of Turgo has developed a value system -based on traditional knowledge and uses of plant- which helps them conserve the natural resources. Rituals are major aspects in helping the conservation. And thus is also protecting the sustainability of the Turgo village as a part of the Merapi National Park.

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