

## **Be Kind With Nature: A Case of Terrace Farming in Dieng Plateau, Wonosobo, Central Java, Indonesia**

*Sea amigable con la Naturaleza: Estudio de caso de la agricultura en terrazas en la meseta de Dieng, Wonosobo, Java Central, Indonesia*

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### **Abstract**

“Be kind to nature” is a prescription describing how the peasants practising terrace farming in the Dieng plateau in Central Java, Indonesia, might overcome and even halt the processes of heavy soil erosion in the mountainous landscape. The Dieng Plateau was originally a vast, ancient caldera of a semi-active volcano that now constitutes fertile terrain endangered by modern farming. Our question is: based upon the wisdom of our ancestors, could the old but more nature-friendly methods of farming represent a new, wise and sustainable solution? Two communities, Sikunang and Upper Wadaslintang, are analysed to provide us with prompts for tackling this question.

**Key words:** Ancestral Wisdom, Ecological Farming, Biodiversity Piracy, Community Empowerment, Conscientization.

### **Resumen**

«Sea amable con la naturaleza» es una prescripción de cómo los campesinos cultivando en terrazas del altiplano de Dieng en Indonesia (Java) pueden frenar los procesos de erosión del suelos en el

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paisaje de montañas. El Altiplano de Dieng originalmente fue una caldera amplia ancestral de un volcán semi-activo que ahora forma un terreno fértil amenazado por la tecnología de la agroindustria. Nuestra pregunta es -aprendiendo de la sabiduría de los ancestros- si las técnicas agrícolas antiguas y mas amables con la naturaleza pueden ser la nueva solución sostenible y sabia?. Dos comunidades, Sikunang y Wadaslinang Alto, nos brindan elementos para iluminar el caso.

**Palabras clave:** Sabiduría ancestral, agricultura ecológica, biopiratería, empoderamiento de la comunidad, concienzación.

## 1. INTRODUCTION

This article is based on a field experience of providing facilitation in community empowerment in Tambi, Sikunang, in Dieng Plateau, and Upper Wadaslintang communities, Regency of Wonosobo, Central Java, Indonesia, from 2001-2004, and a bird eyes view research in March 2017.

The Regency of Wonosobo is 984.68 square kilometers with a population of some 700,000 inhabitants, and the population density is 710 people per square kilometer. One fifth of the area is made up of the Dieng Plateau. The average height of Dieng Plateau is 2.060 meters above sea level. The average temperature is 14 degrees Celsius, however from July to August it sometimes drops to 2 degrees Celsius. Two volcanoes, Sindoro and Sumbing, are located along the circumference of Dieng Plateau. The area is an ancient caldera of a volcano. The original name, "Di Hyang" means "Abode of Gods". Thus the soil is fertile and hilly, mostly of terraced slopes. The population is mostly Javanese. Before the arrival of Islam, its majority religion was animism or dynamism. This was replaced by Hinduism, which then mingled with Buddhism. Islam came and took hold in the time of the Kingdom of Mataram, in the middle of the seventeenth century. Yet some of the Islamic cultural expressions of the region include syncretism. According to a popular parlance: whatever religion is adhered to by the populace, the true religion is "the Religion of Java" (GEERTZ, 1960). One such syncretism is the ceremony of shaving "gimbal" hair. This hair is rather curly, sticky and dirty. From birth to the teenage years, it remains unshaven and unclean. Until the time comes, the parents must save enough money to run a lucrative ceremony. Though Dieng Plateau is the most exotic and beautiful destination for tourism, a great number of its populace is depend on agriculture for their livelihood.

When we were about to make the finishing strokes of this article we came across two conflicting news stories in Indonesia's well known daily newspaper *Kompas* (17/07/06). The first news story was sad. The second news story was good. The sad news we read was in the Business and Financial page, which ran as follows: "Transgenic products have entered Indonesia". The good news, was in the Figure page: "Someone called Sumardi has found an herbal method for preventing bird influenza". The first case had been such sad news, because it was not reported by the Indonesian Trade or Agriculture Department, but by the USA Agriculture Department (USDA), reporting that in 2005, some 600 million dollars of transgenic products had been imported by Indonesia. In the very report entitled

«Agricultural Biotechnology Report» the USDA reported about the transgenic product such as Bt-corn (its chromosome being replaced by the chromosome of Bt - *Bacillus thuringiensis*), and soya bean which is tolerant to herbicide, its dried soya, and other transgenic food product.

Food import of transgenic plants into the Indonesian market can be compared to entering a toll road. Albeit the law on food no. 7 year 1996 and the government rule of no. 69 year 1999, has strictly warned that any transgenic product should be scrutinized under prudent principles and should be given the label «transgenic product, beware», but in practice there are still many leaks. The Biodiversity Commission, due to be formed with 15 membership, still has not been realized. Criteria for the prudent measures has not yet been formulated. It is a pity that such a menacing product for the sustainable rich endemic tropical biodiversity is being taken lightly.

Contrary to that, there is good news from Soegijopranata Catholic University, Semarang. A researcher, Sumardi, M.Sc., has found an herbal anti-birth influenza. The herbs are an extract of endemic root called “temu lawak” (*curcuma xanthorissa Roxb*), “temu ireng” (*curcuma aeruginosa Roxb*), and “mojo” fruit (*aegle marmelos, L.Corr*). The extract would be stronger if it was added, for example, to a Javanese “cabe” (*piper retrofractum Vahl*), “lempuyang wangi” (*zingiber aromaticum, Val*), pure honey and sugar cane (*saccharum officinarum, L.*). Sumardi’s extract has been patented. He turned down Rp 6 billion or roughly, 400,000 dollars, against an offer by a big company. He said: I am afraid, shall it be sold to a big company, the poor breeder cannot afford the price. As a replacement, he and his friends founded a small limited holding company, PT Indoverb Sains Medika. They showed a very different attitude to the public than the character of some government bureaucracy.

## 2. BIODIVERSITY QUESTION

The biodiversity question is not free from the politico-cultural problem. It depends on government policy and planning. For example the Indonesian government, is financed by the taxpayers, however its practice is like most developing and lower income countries: it is very weak concerning the trade of biodiversity and international transactions. They are so tolerant towards what is called a biodiversity piracy (WIBOWO and WAHONO, 2003; WAHONO, 2013).

The watershed was started by the fall of the Berlin wall and the Russian glasnost of Michael Gorbachev. It began with the rise of the World Trade Organization (WTO), resuscitating the once General Agreement on Tariff and Trade (GATT), in the middle of 1990s to its stardom in the form of several binding global rules, surpassing the UN covenants. They are in the form of the global rules called Trade Related Intellectual Property Rights (TRIPs), Trade Related Investment Measures (TRIMs), Agreement on Agriculture (AOA), and General Agreement on Trade Services (GATs) (WIBOWO and WAHONO, 2003). One of those international rules, TRIPs, cuts right across that of biodiversity, especially those

clausal on trade of microorganisms, and the possibility to patent for 20 years. As a pull of genetics country, together with Brazil and Central Africa, Indonesia became a prey and piracy zone of world biodiversity, with less defense. As a consequence imported and smuggled transgenic produce and seeds have pushed to the brink of extinction the endemic germ plasm at all costs. Some of them, conventionally and traditionally have been used effectively as hedge and brake or hold plants against erosion caused by a terrace agricultural system.

### 3. THE CASE OF WONOSOBO: TERRACE LANDSCAPES IN DIENG PLATEAU

The unceasing earthquake in Dieng Plateau in April 2013, reminds the first writer of his visit many decades ago. It was 36 years ago, when the first writer was still a high school graduate. In those days the first writer, together with 5 friends, found that the road was not sealed with asphalt yet, the private cars were very rare, and even public transport was not available yet. To get to Dieng Plateau, we should go early in the morning, riding in an empty truck, back from selling vegetables in the market in the town of Wonosobo below. We visited many attractive places of interest, walked from one place to another and when the night came, we set up a tent. In 1976, we managed to visit Semar cave, Pengilon and Merdada lakes, Sikidang and Sinila volcano craters, and Bimasuci springwater. We missed Jalatunda well, for it was too far (Figures 1 & 2).

After returning to Wonosobo, including Dieng Plateau, in 2001 until 2004, 17 to 15 years ago, we were involved in local social economic community empowerment in Tambi, a tea tree plant area, in Upper Wadaslintang Dam, a social community forestry initiative, and in Sikunang, an organic farming endeavour by planting purwoceng (*pimpinella pruatjan*/ local ginseng) and carica (*vasconcellea pubescens*). All are planted on terrace landscapes, with local wisdom, and using animal manure.

The statistical data of Wonosobo, in 2011, showed us that out of 15 subdistricts, 8 are terrace landscapes, at least 800 meters above sea level.<sup>1</sup> So they are either hilly or in the form of extreme slopes, or even plateaus, like Dieng. So every day, especially during monsoon season, these areas are exposed to landslides, erosion, floods, and deforestation. Terrace landscapes is beautiful, ornamented with ancient remnants of non-active volcanoes, small Hindhu temples of Ancient Mataram Kingdom of the 8th century, the Bima and Harjuna, combined with various green vegetable gardens, all is suitable for tourism and entertaining the eyes longing for a break from the busy urban chores. However the blessing of nature should be managed wisely (Figures 3 & 4).

For that purpose, apart from the local wisdom available at hand, a few instruments should be considered. Several among them, which have been put

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1 *Wonosobo dalam Angka* [Wonosobo in Figures], 2012. Badan Pusat Statistik Kabupaten Wonosobo. Retrieved from: <https://wonosobokab.bps.go.id/publication/2013/01/21/c2557c41a7acd0a95a464160/kabupaten-wonosobo-dalam-angka-2012.html>

into practice in Indonesia, are organic farming from Father Agato from Bogor, natural farming from Dr. Cho Han Kyu (BATARA and KRISHNAYANTI, 2010) from South Korea, introduced in Indonesia by Bina Desa, sustainable farming from Fukuoka, Japan (FUKUOKA, 1985), Low External Inputs Sustainable Agriculture (LEISA) from the Netherlands (REIJNTJES *et al.*, 1999), and permaculture from Bill Mollison, from Australia (MOLLISON, 1988). All are in the same spirit as «Buddhist Economics» of «small is beautiful» of E.F.Schumacher (1973), back to the family farming (*nordics*) tradition of the neo-populist, A.V. CHAYANOV (1966), from Russia.

Chayanov was killed by Joseph Stalin, because he chose to promote and defend family farming as opposed to collective farming of the then communist party. Farms were collected, planned, and executed under and by the communist cadres. The traditional small farmers, precisely, peasants, with a private land ownership, as defended by CHAYANOV, were violently and collectively restructured by the communist cadres.

On the other side of the road is Capitalistic corporate farming. Essentially the difference lays in the person in the centre of power. From the communist perspective, it is the cadre, while for corporate farming it is the Capitalist. Both have the same impact, that the general populace are neglected. The small family peasants have no room to exist. The same phenomenon, more than in Russia then, is the same as in Java, Madura, Lombok, and Bali. So, Chayanov's theory on family farming is suitable for most peasants in Indonesia, including in Wonosobo and its Dieng plateau.

#### 4. LOOKING CLOSELY THE NATURAL RESOURCES CONDITION OF WONOSOBO

We start with the sources of livelihood for most of the populace, land use in Wonosobo: the wet rice field, the dry field for planting tobacco, tea, coffee, potatoes, vegetable, cassava, corn, peanut and soya bean. The wet rice field is very low, no more than 19% (18,564 hectare) from the total available land. The rest are dry land, 81% (79,904 hectare), mostly in the form of terrace landscapes. The dry land yield, in average per annum, tea 149.48 tons, coffee 689.00 tons, fruits 106,925 tons, varieties of cassava, peanuts, bean and corn, 195,812, and varieties of vegetables including potatoes, 191,238 tons. In 2009, especially, tobacco was planted in the areas of 998.40 hectare, numbered 19,767,000 piece of plant, and yielded 419.3 tons dry tobacco.<sup>2</sup>

The villages which produce a lot of tobacco are Reco, Kapencar, Butuh, and Candiyanan in the areas of Anggrang-Gondok; Krinjing and Serang in the areas of Dieng; and Surenggede and Buntu in the areas of Sigedang. The villages that produce potatoes, are Dieng Wetan and Sikunang, a slightly lower production can be found in Parikesit and Patak Banteng. Potatoes, in small number, are also

<sup>2</sup> *Wonosobo dalam Angka* [Wonosobo in Figures], 2010. Badan Pusat Stastitik Kabupaten Wonosobo. Retrieved from: <https://wonosobokab.bps.go.id/publication/2010/04/20/0c17a0859c2bbe6bf3f005fe/wonosobo-dalam-angka-2010.html>

planted in the villages Surenggede, Kejajar, Sigedang and Tambi, in Sigedang areas (Figure 5).

Looking from the ownership of the land, most of the wet rice is owned privately. From all the 79,904.15 dry land, the common land for animal herding was the lowest, 5.8 hectares, privately owned, for fishpond is 219.7 hectares, common and government controlled, is 1,497.6 hectares, state company, plantation, is 2,681.4 hectares, state owned forest, 18,888.1 hectares, privately owned forest, is 19,481.6 hectares, and privately owned garden, is 46,221 hectares. From the state owned forest, 3,953.6 hectares is for conservation, 43.7 hectares for tourism, 11,148.98 hectares for commercial production, and 4,546.08 hectares for special products. The poorest products are log, sown milled wood, finishing wood, and by product of forest, godorukem (*resina colophonium*) and terpentin (turpentine, pine sap).<sup>3</sup>

Land use and entitlement is very much determined by the various responsibilities one has for conserving the land, for the most in Wonosobo, including the Dieng terrace landscapes. Since the state controlled a great percentage of land, it should be at the forefront.

As an example of the relationship between human beings and nature, there is the case of a tobacco plantation controlled by a private company, cigarette makers. The land entitlement for the tobacco plantation, which is terracing landscapes, is fully in the hands of cigarette makers' companies, which are also the second and third quality-class tobacco importers. The domestic first class tobaccos are exported, the second and third ones are imported for the domestic popular market. For the purpose of the domestic popular market, they mixed up heavily with inorganic chemical juices. The land has lost its social and cultural functions; it is predominantly becoming a mere economic function to be exploited to the fullest. Social and cultural perspectives are an important aspect of terrace landscape conservation. On the other hand, economic exploitation on terrace landscapes causes heavy degradation. Organic farming and natural farming, for instance, in the case of tobacco and potato plantations, are more useful from social and cultural perspectives as well as ecological considerations (Figure 6).

Economic exploitation, without social, cultural, and ecological considerations, would only sharpen the unproductive conflict between human beings and nature, to the loss of both.

## 5. SYMBIOTIC RELATIONSHIP BETWEEN HUMAN BEINGS AND NATURE

The truth is that human beings and nature should not be in conflict. From a biological perspective it is a symbiotic relation. So it should include beneficial management for both. There are at least 8 models of conservation-relationship between human beings and nature. They are gradually as follows:

- 1) Inorganic chemicals coupled with biological transgenic engineering,

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<sup>3</sup> Ibid.

«modern farming», «the conventional way» of farming; these are what creates the unwelcoming degradation of nature to the detriment of human beings.

2) The rest are the welcoming types of farming, starting from the management of flora and fauna cycle or «mixed farming».

3) The seasonal management of cultural traditional farming, “Pranata Mangsa” (Javanese season calendar) (INDROWURYATNO, 1997).

4) The management of methods of farming, which is geared with ecology, “ecofarming” (METZNER and DALDJOENI, 1987).

5) The management that applies a complex of elements of nature based on Agronomy science, “Organic” farming, semi organic (WANGSIT, 2003; VEERESH *et al.* (eds), 1997), that is “Lower External Inputs of Sustainable Agriculture” (LEISA).

6) The management of totally natural farming.

7) The management of natural farming which is combined with plot arrangement, “permaculture”.

8) The “Holistic Sustainable Agriculture” farming, to apply no. 2 to no. 7, a mix-farming arranged in permaculture styles, like the one in Upper Wadaslintang, Wonosobo, as conditions are allowed.

For limited space and time, we are not able to explore all the seven sustainable types of farming, we are only able to highlight the «organic» farming and the “permaculture” in two communities where we have had an experience of facilitating local NGOs working there, in 2001-2004, which were Sikunang in Dieng Plateau and Upper Wadaslintang, an ex-abandoned forest landscape in Wonosobo areas.

### 5.1. Organic Farming or LEISA, in Sikunang, Dieng Plateau

The essence of organic farming, the LEISA genre (Lower External Inputs for Sustainable Agriculture) is a series of agronomic processes: working on soil, from putting manure, weeding, ploughing, using and applying organic inputs such as manure, compost, bio fungicide, and bio pesticide. Compost, bio-fungicide and pesticide are made from local leaves and herbs.

Cerica papaya / pawpaw / papayuelo (*vasconcellea pubescens*) and purwoceng (*pimpinella pruatjan*) were two vegetables needing a subtropic climate like in Dieng Plateau, Carica is a homeopathic medicine. Its leaf juice is useful for strengthening dengue survival. Whereas, the roots of purwoceng are very useful for having an aphrodisiac effect. Since all were organic, to get a better price, they were both domestically bottled. To last long longer, they were bottled with their syrup juice.

### 5.2. “Permaculture” in Upper Wadaslintang, a Terraced Landscape in Wonosobo

The essence of permanent agriculture (permaculture) is the management of soil and landscapes. The terrace sharing landscape is divided into plots. Each plot can be planted with varieties of plans and herbs. One upon the other



are supportive to the point of being symbiotic. The management of water is of paramount importance. With Upper Wadaslintang terrace landscapes, the food plants and herbs are dominant.

Terrace landscapes were distributed equally into the number of the peasants who participated in the land reclamation, 76 households. Each got 1,200 m<sup>2</sup>. They were planted with food staples and trees. They were corn, cassava, and sorghum in the centre main landscapes. Planted trees were in the corner. In between the planted trees were bananas. In between bananas were sweet potatoes. At the ground were peanuts or soybeans. All were organic, using manure and compost, as well as bio-pesticides, bio-herbicides, and fungicides. Apart from the product excess for sale, the rest for food sustainability stock of livelihood.

## 6. CONSERVING THE TERRACE SLOPES

Conserving the terrace slopes endangered by land water erosion was, and still is a real challenge. From the perspective of popular reeducation, it can be described simply as a “conscientization” (FREIRE, 1972: 15). This was what we encountered from the beginning. Especially in the earlier phase of educating the local people as a part of community empowerment, it was a challenging endeavor that almost led us to the point of frustration. Scientifically we had to explain the reasons why sustainable farming was superior to working, hoeing, and applying fertilizer in a conventional, albeit modern way. After long sessions of listening and talking with some elders, through many long nights in cold temperatures, before the fire came from the wood burning earthen stove, in between a few sips of coffee and the curling smoke of pipes and self-made cigarettes, we would finally introduce the farmers to our seemingly brilliant ideas about why and how we should conserve the terrace slopes. We employed the anthropological approach, so to speak. In gently reeducating the farmers, we had to use the symbolic language and the metaphors that were very akin to them. For example, we referenced the existence of temples, which are resistant throughout time, in very labile old lava land and unfriendly weather, for one. Secondly, the customs, for example, shaving the “gimbal” hair of a teenager with a merry feast (probably the only such tradition in Indonesia).

By employing these two local metaphors and referencing the wisdom of the ancestors, we explained the reasons why and how the farmers had to manage the terrace slopes. We encouraged them to relate to the wisdom of the ancestors, who built the temples by caring, placing, and calculating every quadrant millimeter of the square and every gram of the weight of every piece of stone. We explained that they have to hoe by backing the slope, and first making an array of soil at a lower level in order to create a sturdy wall in which the roots of the plant could prevent erosion from the rain water and soil.

The farmers also had to think about the custom of the gimbal hair when they treated the sloppy land, by applying manure to it, despite the dirty and smelly experience of using dried dung and compost. The manure is better and healthier



for the growth of plants compared to the fertilizer. This was just like the «*gimbal*» hair of the children; although it was kept unshaved and dirty until the teenage years, it was thought to foster the kids to grow prosperously afterwards. It is traditionally believed that unshaved “gimbal” hair in the period of childhood would bring prosperity.

That was the popular and soft heartfelt way, the intricate scientific way to make the farmers understand the concept of permaculture and LEISA farming. Not too idealistic, but rather adaptable to environment of culture and working as an action movement.

## 7. CONCLUSION

Organic farming and permaculture, both are more or less sustainable agriculture. They express the friendly relation and to a point the symbiotic relation between human beings and nature. Those are determined not only by economy and technology, but in a prerequisite way, by political and cultural factors. Political factors are the entitlement of nature, namely land, water, and biodiversity. Nature entitlement which is geared toward workers or peasants, usually is much better for conservation. Cultural factors are the approach for management and technology choice. And for the entitlement over nature, it needs agrarian reform, by leverage or by state authority. Whereas for the cultural change of attitude, we need a process of awareness education or Freire’s terminology, “conscientization”.

All need the political will of the government supported by the people’s movement. From early years in life children must be educated informally and formally about increasing and saving the means of livelihood through sustainable production and just distribution, as well as consumption of sufficient nutrition and healthy food (Figure 7).

Development of Wonosobo, including Dieng Plateau, which promotes ecology must be as holistic as possible. Terrace landscapes are beautiful, but they are also fragile if we fail to conserve them. So also when business interests enter into the scene, without local wisdom and sound ecological science, it could be catastrophic. We do not want the *branding* of Wonosobo, especially Dieng Plateau as a beautiful and fertile green terrace landscapes which has survived since ancient times, to be replaced by bolt and barren grey hills, in coming years. In line with Kate Raworth’s *Doughnut Economics* (2017), while promoting the well beings of the populace, we should thrive for the use of the nature. We should all fight, for friendly use and conserve it.

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Figure 1. Merdada Lake and Sikidang Crater. Photograph: Haryadi Noe & Th. Puspitawati.



Figure 2. Merdada Lake and Sikidang Crater. Photograph: Haryadi Noe & Th. Puspitawati.





Figure 3. Harjuna Temple amidst Vegetable Garden, and its close up.  
Photograph: Haryanto R. & Th. Puspitawati.



Figure 4. Harjuna Temple amidst Vegetable Garden, and its close up.  
Photograph: Haryanto R. & Th. Puspitawati.



Figure 5. Stripes and Patches of Terraced Landscape Vegetables.  
Photograph: Haryadi Noe & Th. Puspitawati.



Figure 6. A Peasant's Planting Potatoes. Photograph: Haryanto R & Th.Puspitawati.





Figure 7. Villages of Dieng Plateau. Photograph: Haryadi Noe & Th. Puspitawati.



