Wacana, Journal of the Humanities of Indonesia

Volume 19
Number 1 *Language and culture in Java and its environs*

Article 10

4-30-2018

# Behind the eco-friendliness of "batik *warna alam*"; Discovering the motives behind the production of batik in Jarum village, Klaten

Widhi Handayani
*Universitas Kristen Satya Wacana*, widhyandayani@gmail.com

Augustinus Ign Kristijanto
*Universitas Kristen Satya Wacana*, gus_ign111@yahoo.co.id

Arianti Ina Restiani Hunga
*Universitas Kristen Satya Wacana*, inahunga@gmail.com



## Recommended Citation

Handayani, Widhi; Kristijanto, Augustinus Ign; and Hunga, Arianti Ina Restiani (2018) "Behind the eco-friendliness of "batik *warna alam*"; Discovering the motives behind the production of batik in Jarum village, Klaten," *Wacana, Journal of the Humanities of Indonesia*: Vol. 19: No. 1, Article 10.
DOI: 10.17510/wacana.v19i1.673
Available at: https://scholarhub.ui.ac.id/wacana/vol19/iss1/10

*Wacana* Vol. 19 No. 1 (2018): 235-256

# Behind the eco-friendliness of "batik *warna alam*"

## Discovering the motives behind the production of batik in Jarum village, Klaten

Widhi Handayani, Augustinus Ign. Kristijanto, and Arianti Ina Restiani Hunga

Abstract

The policy of sustainable production has encouraged small batik businesses to shift to natural dyes as these are considered eco-friendly. However, the motivation behind *juragan* batiks' embracing natural dyes still has some question marks attached. This qualitative study explains the motivation of the *juragan* batik*s* in using natural colourants in their production of batik *warna alam* and explores the significance of batik *warna alam* to *juragan* batik. We found the production of batik *warna alam* tended to be triggered by economic reasons not environmental consciousness. This related to the meaning of batik *warna alam* to maintaining the economic survival of the *juragan*s. *Juragan*s are convinced that batik *warna alam* is eco-friendly according to the indicators to which they subscribe: (1) the materials are found in their immediate surroundings; (2) the process causes no pollution or environmental destruction; and (3) the production does not pose a health threat to people, including workers. This study provides the insight that an eco-friendly-labelled production might not necessarily be motivated by a high level of environmental consciousness.

Keywords

Batik *warna alam;* eco-friendly; motivation; natural colourants; sustainable production.

## Introduction

Batik is one of the cultural riches of Indonesia and has been part of the Javanese community for at least five hundred years, as the word "*tulis*" which means "writing" was firstly appeared in 1518 (Elliott, 2004). It is worn on many

The authors can be reached at: widhyandayani@gmail.com (Widhi Handayani), gus_ign111@yahoo.co.id (Augustinus. Ign. Kristijanto), inahunga@gmail.com (Arianti Ina Restiani Hunga). More information about authors can be found at the end of the article.

occasions, particularly in ritual ceremonies such as Javanese wedding, the seventh month of pregnancy celebration or *mitoni*, and funeral rituals. A Javanese mother usually carries her baby in a *selendang*, a long narrow strip of batik cloth, while a dead person is usually covered with batik cloth about 2.5 m long. Batik is also worn in sacred rituals in which some offerings are made to the earth or to the sea. The Labuhan and Sedekah Bumi are usually observed by the royal families of Yogyakarta and Surakarta and their entourages to maintain harmony between human beings as a microcosm and the universe as the macrocosm at which they make some offerings in the form of food, fruit, and a buffalo head to Mount Merapi or to the Segara Kidul (Southern Ocean).


Figure 1a. *Canthing* (Picture source: Hamzuri 1981).

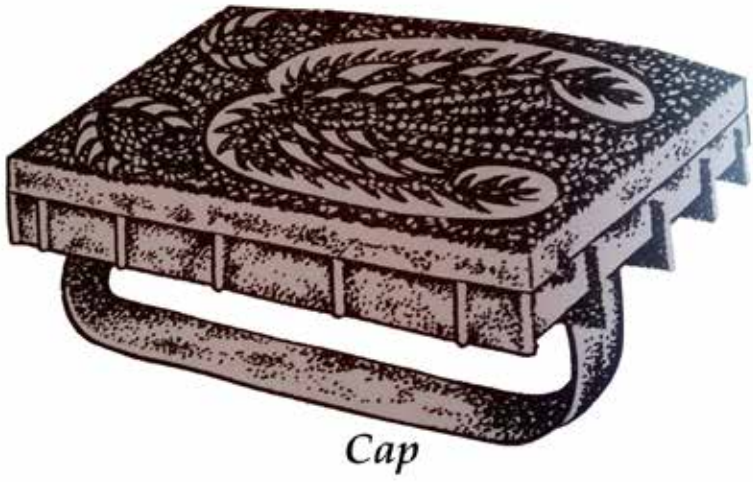


Figure 1b. *Cap* (Picture source: Hamzuri 1981).

Technically, batik can be defined as a technique of drawing patterns on a cloth with a tool called a *canthing* (Hamzuri 1981). This tool resembles a pencil and its body made of wood with copper container as its head (Figure 1a.). The head of *canthing* is used to contain the melted wax from which then flows out onto the cloth to outline the drawn pattern (UNESCO 2013). This

traditional technique of making batik is called *tulis*, and the batik produced by this technique is called batik *tulis* or hand-drawn batik. In addition to this *tulis*, another technique for making batik involves the use of a stamp (Figure 1b.). A batik stamp is made of copper which is dipped into a melted wax and then stamped on the cloth, producing a batik *cap* or stamped batik. However, hand-drawn batik is still considered to be the "original" batik and superior to the stamped batik as the former has unique features revealed in the talent for using the *canthing* which affirms that it is a handmade artwork.

Batik *tulis* and batik *cap*, both combine together lines and dots to create a pattern which will form a certain motif. In order to bring the motif to life, dyes are usually applied to the cloth. Importantly, the colours usually indicate the region in which a batik has been produced (Soebaryo 2012). Inland batik tends to be covered with a combination of dark colours, like black, a dark brown colour called *sogan*, dark blue, or a combination of those, with some areas of white. This kind of batik is found in Surakarta (Solo) and Yogyakarta. However, attractive bright colours are the trade-mark of the coastal batiks found along the north coast of Java, mainly in Pekalongan and Lasem. Elliott (2004) writes that a combination of colours can be found in Batik Tiga Negeri, which is composed of the blue of Pekalongan, the red of Lasem, and the *sogan* of Surakarta.

The production of batik in Java is reported by Raffles (1817). His book explains that in eighteenth century, batik was coloured by using natural dyes extracted from plants. Fermented indigo leaves and the palm wine sap of the *aren* (sugar palm), as well as various vegetable acids, were used to form a blue colour. Tingi wood, mango peel, and rice husks were used to obtain a blackish colour, while Tegeran wood and jackfruit produced yellow shades. Red hues were obtained by the application of the *noni* fruit and *annatto*.

However, the invention of synthetic dyes in the middle of the nineteenth century replaced the application of natural dyes (Saxena and Raja 2014). Since the invention of these chemical colourants, textiles all over the world, including Indonesian batik, have been coloured using synthetic dyes. Among these synthetic dyes, Naphtol and Vat are commonly used in textile dyeing as they can easily be applied to the cloth (Maulik, Bhowmik, and Agarwal 2014). At present, the use of synthetic dyes is predicted to reach 10 million tons per year (Saravanan, Chandramohan, and Saivaraj 2012).

Recently, the rise in environmental awareness and pollution control has re-encouraged the use of natural dyes in developed countries, since these are considered to be non-allergenic, non-carcinogenic, less toxic, and more bio-degradable than synthetic dyes (Saravanan, Chandramohan, and Saivaraj 2012; Maulik, Bhowmik, and Agarwal 2014). This has given the method a renewed impetus as it is considered to be more eco-friendly (Saxena and Raja 2014). This trend has spread worldwide and has influenced textile production, including batik.

While the initial shift from synthetic dyes to natural dyes in global textile industries was triggered by environmental concerns, we have found that the

production of batik *warna alam* or naturally coloured batik makes excessive use of water and has certainly contributed to pollution (Handayani, Kristijanto, and Hunga 2018). Hence, the motivation behind the decision of *juragan* batik (the owners of a batik business) to apply natural dyes in batik production, provides a thought-provoking topic to explore. This paper will explain the motivation behind the *juragan* batiks' espousal of natural dyes in batik *warna alam* production and explores the significance of batik *warna alam* to different *juragan* batik.

## Batik *warna alam* and cleaner production

The 1992 Earth Summit concluded that global environmental degradation had risen as a result of an unsustainable pattern of consumption and production and this finding raised the important issue of sustainable production (Veleva and Ellenbecker 2001). In Indonesia, the policy of implementing sustainable production and consumption was launched in 2013 by The Ministry of Environment of Republic of Indonesia, which encouraged businesses to move to cleaner production. It was suggested that businesses both big and small, including Small and Medium Enterprises (SME's), should implement this policy to ensure cleaner production.

Mostly, batik is produced by SMEs on the basis of a Putting-Out System, a production system which employs home-workers (Hunga 2014). Despite the important role of SMEs in forming a strong basis in the economy and in transition economics, they do contribute significantly to environmental degradation, even in developed countries (Pimenova and Vorst 2004). Instances of pollution have been increasing as the batik businesses discharge their waste-water directly into the soil or nearby rivers, and this is usually correlated with the synthetic dyes and heavy metals contained in the effluent of batik industries (EKONID 2012; Subki, Hashim, and Muslim 2014). Furthermore, the application of synthetic dyes has been reported to have had an adverse effect on the health of batik workers (Soebaryo 2012).

Cleaner production was introduced to batik businesses by the German-Indonesian Chamber of Commerce (EKONID) through the implementation of the Clean Batik Initiative programme. This programme was designed to initiate the implementation of sustainable production and the concept of sustainable consumption set out in the Sustainable Development Goals, to batik industries. The application of natural dyes is one of the programmes introduced by EKONID to batik businesses in Indonesia, alongside other programmes aimed to reduce the use of energy and natural resources (EKONID 2012). Although not all batik businesses are yet moving towards a production using natural dyes, this programme has made an important contribution towards initiating cleaner production in the Indonesian batik industry.

This sustainable production involves the introduction of environmental factors (eco-design) and takes an account for all the stages in the life-cycle, from the procurement of resources up to the final treatment and recycling at the end of its useful life (Otero et al. 2011). The supply side of the Sustainable

Consumption and Production challenge requires that attention be paid to the following objectives: 1) the sustainable provision of natural resources which are key to human survival, such as water, food, energy and productive/habitable land; 2) sustainability of the provision of the factors of production for economic development, which implies measuring and managing key renewable and non-renewable resources (such as timber, fibres, metals, and minerals); and 3) reducing pollution associated with human and economic activity—such as greenhouse-gas emissions, toxic chemicals, particulates, and excess nutrient release—which can damage human health or degrade eco-systems (UNEP 2015). Veleva and Ellenbecker (2001) highlighted six indicators of sustainable production, namely: the proper use of materials and energy, social justice and community development, economic performance, workers, and products. This means that sustainable production should use materials and energy in the production process effectively; ensure proper waste management; reduce the use of harmful chemicals or other substances and replace them with safer materials; focus on a long-term economic performance; ensure the protection and well-being of employees, as well as respecting and enhancing the life of the communities around the workplace economically, culturally, and socially (Veleva and Ellenbecker 2001). Swisher (2006) indicates four ways by which industries can achieve long-term sustainability: increasing materials recycling, minimizing waste, sustaining life-supporting system such as national parks, forests, and other natural eco-systems, and reducing the level of resource extraction.

Nowadays, batik *warna alam* is attracting attention as an eco-friendly batik, particularly in the village of Jarum, Klaten. This image has strongly influenced the people of the village and gradually general mindset that batik *warna alam* is eco-friendly has developed among them. Our previous study has shown that a *juragan* batik who applies natural dyes also tends to have adopted an environmental-friendly production process, for instance, collecting rainwater instead of using groundwater for production, reusing solid waste and so forth, actions which are in tune with the sustainable production concept (Handayani, Hunga, and Kristijanto 2016). However, the explanation of the motivations and the meanings behind batik *warna alam* production from the *juragan*s' point of view has not been explored yet. Hence, it will be discussed in this paper.

## EXPLORING THE MOTIVATION BEHIND THE PRODUCTION OF BATIK *WARNA ALAM*

The study was conducted in the village of Jarum, Bayat sub-district of Klaten Regency, Central Java. Jarum is an important batik centre as it has been producing hand-drawn batik since the 1960s for many years. Now, it has been capturing the market as the batik producer for batik markets in Surakarta (Solo) and Yogyakarta. Although the use of synthetic dyes is preferred by the majority of batik businesses in this region, those which use natural dyes do exist and this section of the batik industry which works with a natural dyeing process has been receiving growing attention as an eco-friendly batik product.

Two batik businesses which use natural dyes were selected as the

subject of this study. In accordance with the ethics of keeping an informant's identity secret, they have been given the pseudonyms Batik Sarwo Adi and Batik Puspanyidra. The production process was recorded in interviews, observations, and photographic documentation, while the motivation behind the *juragan* batiks' choice to use natural dyes was explored in in-depth interviews. The first interview consisted of questions about the backgrounds and profiles of the *juragan*s and the history of their businesses. Information on the production was collected in the second round of interviews, followed by direct observation of the process of making batik *warna alam*. Finally, the third interview consisted of questions pertinent to the concept of eco-friendly batik, the eco-friendliness of the industries, and the motivation of *juragan* batik in developing the production of batik using natural dyes. To complement the *juragan*s' answers, we also collected data about the concept of eco-friendly batik from the people who lived in the vicinity of the businesses, female batik home-workers, and a *juragan* batik who uses synthetic dyes for batik production. The interviews with the *juragan* batiks lasted one to two hours, while those with the other respondents took between 30–60 minutes. In accordance with the ethics of keeping an informant's identity secret, all respondents have been given different pseudonyms. Data were analysed manually and then presented in narrative form.

## The process of making batik *warna alam*

We found that a growing number of small businesses were usually begun by two persons; often a married couple who had different jobs. Generally, the male was responsible for drawing the pattern directly onto the cloth. This initial process in making batik is called *nggambar*, *nyorek*, or *ngrining*. Prior to the drawing, the fabric has to be boiled or soaked in a Turkey Red Oil solution to remove the starch and thereafter dried in the sunlight. When this process has been completed, the fabric, a cotton cloth measuring 2.5 m by 1.15 m, is ready to be drawn on. As drawing is a time-consuming process, a *juragan* also has the option if making the pattern by making a copy from a printed pattern on the cloth. If this is his or her choice, the process is called *ngeblat*. Once the business has been established and the *juragan* can pay more employees, usually he or she can pay a *tukang gambar* – a person whose job is to draw the pattern– to relieve him of this job.

The next step, called *mutih* or *ngengreng,* is to cover the pattern with a melted wax. As the business expands, some *juragan*s might involve their neighbours to do *mutih* or *ngengreng*, a task usually done at home by female batik workers (Figure 2). *Mutih* or *ngengreng* is a time-consuming process, as it needs at least a week to finish a piece of batik cloth. Consistency and detail are both prerequisites in making a good *putihan (*the cloth which results from *mutih)*. However, it was difficult for female batik workers to finish this job quickly as they had other domestic responsibilities such as cooking, taking care of children, and cleaning the house.

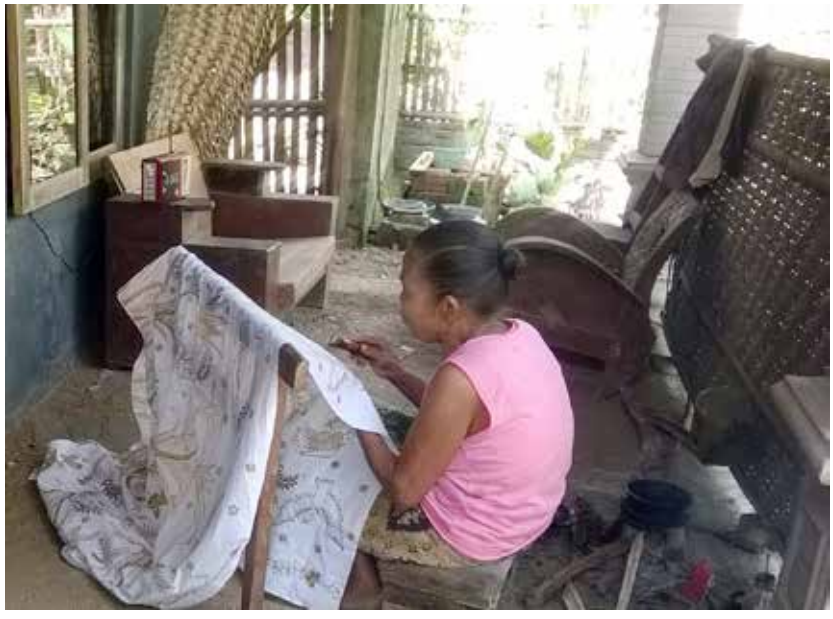

Figure 2. A female batik home-worker doing *mutih* (Picture source: Handayani 2016).

Even when the female workers have no household responsibilities and have no children to take care of, *mutih* is a boring job. Aware of this, *juragan*s do not set a deadline by which the *putihan* should be returned to them. Nakabayashi (2016) notes that this risk is the weakness of Putting-out System based-industries. The other main one is the lack of production monitoring.

Ibu Susanti is a forty-seven-year-old woman. Her husband is a fried-food vendor in Madiun. She makes batik because she does not want to be dependent on her husband for money. She usually collects the cloths from a *juragan* and does the *mutih* process at home because she has to take care of her elderly mother. She thinks that *mutih* is a boring job because she has to do it alone at home. She thinks that it would be better to work at the *juragan*'s house because she could meet her friends there. When she feels bored, she often leaves her work to do something else. She counts herself lucky because the *juragan* never sets her a deadline. Nevertheless, she always tries to finish her task quickly, because she wants to earn some money.

> I always hand-draw batik at home so that I can keep my mother accompanied and I can earn my income without having to ask my husband for money. Actually, it would be better to work at the *juragan*'s house as I could meet my friends there. Hand-drawing batik at home is boring. When I am bored, I leave the cloth to do something else. Fortunately, there is no deadline to finish the hand-drawing, but, if you want to earn money quickly, you have to get it over and done with.[1]

[1] Interview with Susanti, not her real name (47 years), Klaten, 23 August 2016.

When the *mutih* process is finished, the *putihan* is returned to the *juragan* and the workers are paid for their work. The money they earn ranges from IDR 40,000 to IDR 150,000 per piece of *putihan*, depending on the quality of their drawing, the intricacy of the motifs, and the *juragan*'s standard of wages. After the *putihan* has been returned, it will be subjected to the first dyeing process. Figure 3 presents a picture of *putihan*. As indicated by its name, the term *putihan* is derived from the word *putih* which means white. Hence the dominant colour of *putihan* is white, and some parts covered by wax will take on a yellowish tinge.

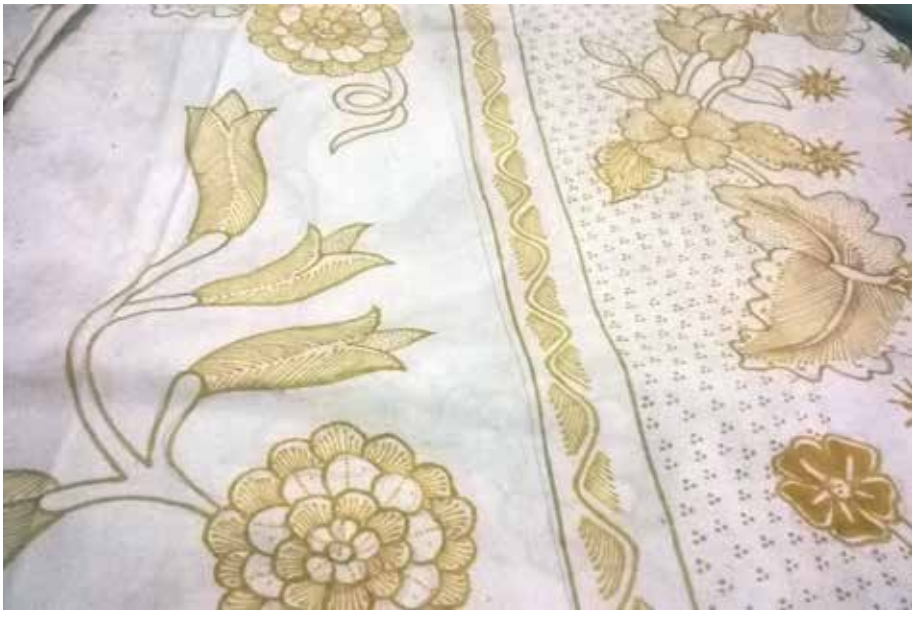

Figure 3. A sample of *putihan* (Picture source: Handayani 2016).

*Ngobati* or dyeing is usually done by male workers and a business decides on a policy about whether it will use natural or synthetic dyes for this purpose. Generally, batik businesses in Jarum work with the synthetic dyes, but there are a handful which opt for natural dyes. The application of natural dyes usually takes longer to process than that of synthetic dyes. This is one reason batik production using natural dyes is usually limited. The dyes are obtained by extracting them from local natural resources, such as the bark of mahogany, *tingi*, *tegeran*, and *soga jambal*, fermented leaves of indigo, and the fruit of the myrobalan (*jolawe*). The extraction of the dye is carried out by boiling the bark or the fruit in the water, which gradually changes from clear water to reddish brown or dark brown liquid (Figure 4.)

Figure 4. Extract of myrobalan or *jolawe* fruit (Picture source: Handayani 2016).

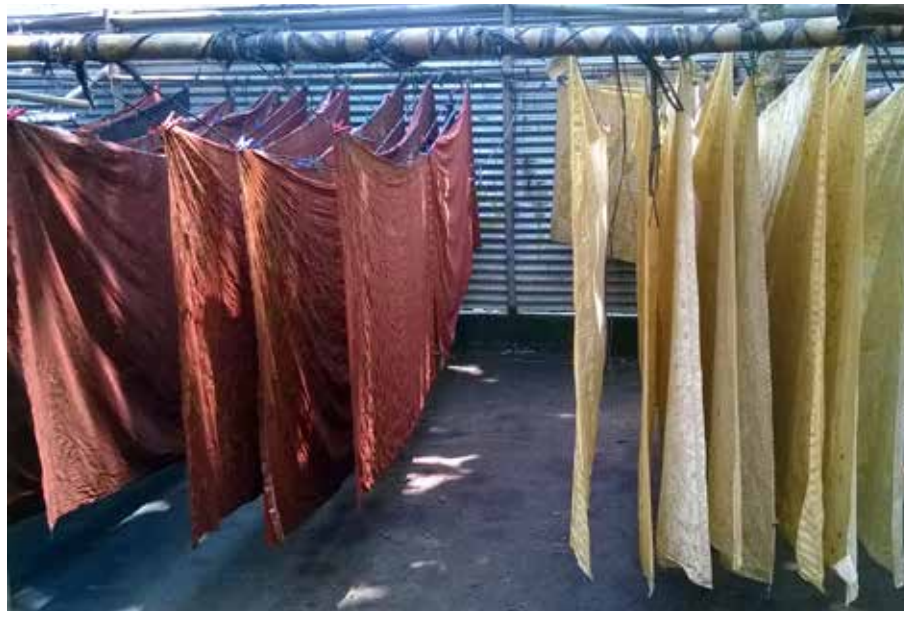

Figure 5. Colour resulted from natural dyeing (Picture source: Handayani 2016).

The *putihan* is immersed in the natural dye extract for about 3-5 minutes and then dried in the shade (Figure 5.). This combination of soaking and drying is repeated for two to three times in order to obtain the expected hue. The reddish-brown colour is obtained by using mahogany bark, while the yellow or cream colours are obtained from the myrobalan. The application

of indigo results in a blue or dark blue colour, depending on the intensity of the soaking process. *Tingi*, *tegeran*, and *jambal* are boiled together to produce a brownish hue.

After dyeing, the cloth is batiked again, and this process is called *mbironi*. The batik workers apply wax to cover parts of the cloth with certain motifs. This is done to protect the colours already applied to the cloth. *Mbironi* is done alternately with *ngobati*. While *ngobati* is done by the male workers, *mbironi* is finished by female workers (Figure 6.).

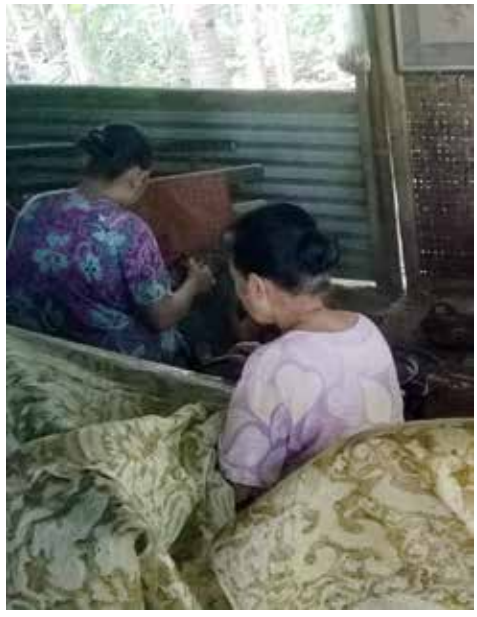

Figure 6. Female batik workers doing *mbironi* at *juragan*'s house (Picture source: Handayani 2016).

The batik workers can choose to work at home or at the *juragan*'s house. If the workers want to work at home, they have to prepare the equipment they will need to make batik themselves. This includes *gawangan* (racks) to put the cloth on, a stove, a frying-pan to melt the wax, and kerosene. If they want to work at the *juragan*'s house they do not have to bother with all this, but they will have to spend the time outside their homes. We found that female workers who have children tend to make batik at home, while those who worked at *juragan*'s were usually older women who no longer had the responsibility of caring for children.

After the *mbironi* is complete, the fabric is prepared for the final dyeing and mordants are used to fix the colour in the cloth. The mordants used for natural-dyed batik are lime, copperas, and alum. *Nglorod* is the final process in making batik and is done by boiling the cloth in order to remove the wax. Although starch is commonly used for *nglorod*, some *juragan*s prefer to add soda ash in order to fasten the wax removal. After *nglorod*, the cloth, which is

then called batik, is washed and dried in the sunlight (Figure 7.).

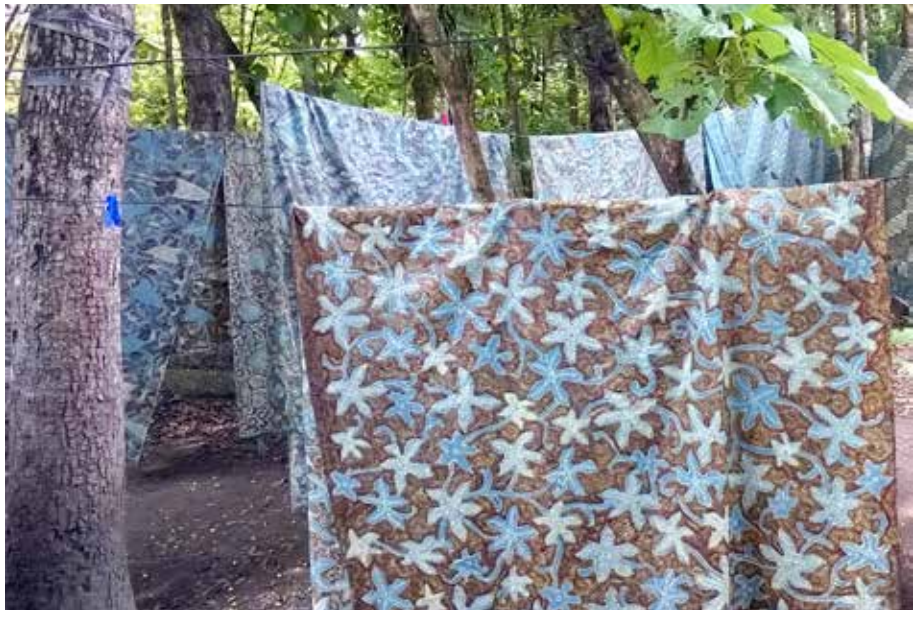

Figure 7. Natural dyed-batik under drying process (Picture source: Handayani 2016).

## WHY NATURAL DYES?

### THE CASE OF BATIK SARWO ADI

Sarwo Adi SME has been producing batik since 2006. Its owner is Bapak Ardi, a forty-seven-year-old man with three children, whose eldest child has died. His second child is a student at senior high school, and his third child –a boy– attends junior high school. He was a pedicab driver in Yogyakarta and had gained experience as a worker in another batik business in which he was a *buruh pewarnaan*, the person responsible for the dyeing process. It was while he was working as a *buruh pewarnaan* that his eldest child died of an illness as he was not financially able to pay for proper treatment.

As it happened shortly thereafter, an opportunity to join a training on natural dye application, in which he was interested opened at his work. He seized the opportunity to participate in the training conducted by JICA, Japan. The training really caught his interest and he began to make experiments with natural dyes for batik. To acquire the finance he needed to pursue his efforts, he sold his two pedicabs for IDR 950,000. He asked his wife to hand-draw the cloth, and he took on the responsibility for the dyeing. Now, his business is developing nicely. His products have been sold to some galleries in Yogyakarta, Bali, and in some foreign countries. When he was asked the reason he is pursuing the art of batik using natural dyes, even though his earlier experience was with synthetic dyes, he replied:

> At that time, synthetic dyeing was the common technique used for batik dyeing. In 1989, I worked for Pak Suprayitno (not his real name) using synthetic dyes and was paid from IDR 6,500 at first, rising to IDR 12,000 after several years. I worked with synthetic dyes for about eight years, and I was the champion at this kind of dyeing. This was the reason I moved to natural dyes, as this is so different from the general run-of-the-mill batik made in Jarum. I was aware that natural dyeing has the potential to develop as it is unique form, different from anything else. In 2006, about four months after the earthquake, there was a four-day workshop and training on batik production using natural dyes, facilitated by the JICA in the Balai Besar Yogyakarta. It was a good workshop, when we ran across problems to do with natural dyes, we were provided with information on what we had to do, and this really aroused my interest in natural dyes. This happened about two months after the workshop. As you know, I did not have an opportunity to have a proper education myself and I want my children to have an education. Therefore, I decided to sell my two pedicabs for IDR 950,000 and use the money to make batik using natural dyes. I usually did my experiments with natural dyes at night and my wife helped me to hand-draw the batik. I did not even tell my wife where I got the money from and about the pedicabs. However, I still had to find other side jobs during the day as I could not yet rely on the batik. I gave my wife money for each piece of batik she hand-drew. At that time, I worked during the day until the late afternoon and began experimenting at Maghrib. I pushed myself to make naturally dyed batik which matched the profiles at the Balai Besar. Finally, after two years I told my wife about the pedicab and the business. I just did not want her to worry. That's why I withheld all information about the pedicabs as we were financially at a low ebb. Oh, my past was full of bitterness. I lost my first child because I could not cover our living costs. I was too late in taking him to the doctor, to tell you the truth. Now when we meet me today, my situation is very different to what it was when I began my business.[2]

Our study reports that this SME produces approximately fifty pieces of batik cloth per day. Some of his productions are labelled with his own brand-mark, while some others are sold under different brand names. Bapak Ardi has been producing batik using natural dyes obtained from mahogany, indigo, and myrobalan, and the mordants he prefers are alum, copperas, and quicklime (Handayani, Hunga, and Kristijanto 2016).

All sorts of materials and resources used in the production, have provided Bapak Ardi with new ideas, for instance, used wax to make a special pattern known as *remekan*, which seems criss-crossed with cracks. Bapak Ardi also collects rainwater in the wet season. This measure means he does not need to pump groundwater, thereby reducing his electricity costs. Water is used for dyeing as efficiently as possible, although the washing does require a lot of water. The bark not required to extract dye is used as fuel. These he feels are his production savings and can only be done because he has exercised his own ingenuity (Handayani, Hunga, and Kristijanto 2016).

Bapak Ardi is convinced his business is eco-friendly. In his opinion, eco-friendly means (1) the resource or materials for making batik are obtained

[2] Interview with Ardi, not his real name (47 years), Klaten, 3 March 2016.

from the immediate surroundings, and (2) the waste does not pollute the environment; and (3) the production is safe for people, including his workers. He says that when solid wastes are disposed near a tree, it does not wither or show signs of dying. He also explained all his dyers are healthy; different from the synthetic dye production whose workers often suffers from work-related illnesses.

> The characteristics of eco-friendly batik are: first, the colourants are collected from the immediate environment. The solid waste of the bark and leaves should be collected from places around us, and it is our task to explore and make experiments in the coloration process. Second, the production does not pollute the environment. This means, the waste produced by dyeing which is disposed into the environment, or into our garden, causes no damage. The bark used as a dyeing material can be used as a green manure which is safe for our surroundings. As an example, take the teak tree which grows at the place where dyeing process is carried out. Every day we usually dispose of the unused waste in the garden in which it will act as an organic fertilizer. If we dye batik using chemicals [synthetic dyes], the environment tends to become barren and the tree would die because of the dyes. You see, all of my dyers are healthy, right? How many years have they been working for me? Fifteen years, since 2006. They have not been replaced by other workers. Check their hands! I am sure that my production is eco-friendly. Actually, I do not even need to use waste-water treatment plant, because the pH of the dyes I use in my batik is almost 7.0.[3]

These are the examples Bapak Ardi claims are the indicators he uses to delineate his eco-friendliness. Although he and his neighbour were granted a shared waste-water treatment plant by the government, he actually says that he does not need it as he is sure that that the waste-water generated by his business will not pollute the river. However, there are people living near the river who complain that the waste-water gives off an unpleasant odor.

### The case of a member of Batik Puspanyidra

Puspanyidra is a business group established in 2011. It consists of nineteen members who were interested in launching a batik business. The group began by collecting a personal contribution of IDR 60,000 from each member. The money was used to buy white fabric which was distributed to all members; each member receiving a piece of cloth. The money was also used to buy natural dyes.

An active member of this group is Ibu Rahayu, a forty-eight-year-old woman who has two adult sons. Her husband was a pedicab driver in Yogyakarta but he now helps her in the batik business. One of her sons has been working in a printing business, while the younger is a student at a vocational high school. She had learned hand-drawing batik when she was in primary school. Her father passed away while she was still a child, and she had to help her mother to keep her family. Making batik was the only way she

[3] Interview with Ardi, not his real name (47 years), Klaten, 3 March 2016.

could support her family. After school she took care of her younger sister and at night she hand-drew batik. The money she earned from making batik was mainly used to buy daily necessities, but she bought her own bicycle from the money she earned from making batik and she was proud of it.

After finishing primary school, she went to work in Solo, where she was paid IDR 2500,00 per piece of batik she made. In addition to hand-drawing, at night she also learned to draw batik designs. After six years, she moved to Yogyakarta where she became a *buruh* batik (batik worker) in the production of batik paintings. In Yogyakarta, she was paid daily instead of on a piece-work basis. In 1991, she got married and went back to Jarum. Since her husband did not allow her to work outside Jarum, she became a *tukang gambar* for some *juragan*s in the village. She thought this job was easier and more comfortable than that of a batik worker, because using a carbonized paper she could draw batik designs on five pieces of fabric at once, and she was paid per fabric, just as the batik workers. Here, she explains that drawing batik designs was more a question of practice than talent.

> The most important thing in making batik – including drawing – is practice. Although he or she might not have a talent for drawing, if they practice, they will be able to do it. A good example of this case is my brother. Formerly, his drawing was not good, but I kept giving him exercises to practice with and finally he could make a good drawing. Now today, he has become my *tukang gambar*.[4]

In 2010, some lecturers from a university in Yogyakarta came to the village and gave a workshop on natural dyes. She was interested and joined the workshop. The workshop participants received some materials, fun games for relaxation, and they were taken to Girilaya village in order to learn how to make batik using natural dyes. After about a year, she and her friends participated in more follow-up workshops and they made plans to begin a business group named Puspanyidra.

After her training, she became a dyer for Puspanyidra. She has mastered all the technical knowledge needed for the process of batik, such as drawing by hand, sketching out the batik design, and dyeing. However, her greatest interest is in how to sell her products and her interest has led her to become a marketing co-ordinator for the group. However, she harbours no ambitions to become the chairperson of the group. In her eyes, being a marketing co-ordinator is more interesting than being a chairperson. It seems that all a chairperson does is handle organisational affairs, while being a marketing co-ordinator gives her an opportunity to learn about marketing strategies. Her batik production has been multiplying and she is paid for the dyeing she does for members of the group. She has even decided that her husband should help her dyeing batik at home instead of being a pedicab driver. The products, both of hers and those of the group members, are exhibited in her showroom.

[4] Interview with Rahayu, not her real name (48 years), Klaten, 1 September 2016.

When she was asked her reason of using natural dyes, she answered that it was because she loved to use natural dyes and that her mentor suggested she do so. Moreover, batik coloured by natural dyes is valued more highly than that made with synthetic dyes. Making batik has given her an opportunity to earn money and to obtain many of the things she wants to buy without having to depend on other people such as her parents and her husband. As she was explaining this, she recalled her own experience in helping her mother and being able to buy a bicycle and some jewellery with her own money she had earned from making batik.

As the orders pour in, in the production of her own batik, Ibu Rahayu has asked her younger brother to draw the designs and he is paid for IDR 10,000 – IDR 25,000 per piece. She has also asked some people to *mutih* and *mbironi*, and she pays them IDR 40,000 per piece for *mutih* and IDR 10,000 per piece for *mbironi*. She used myrobalan, indigo, *tingi-tegeran-jambal*, mahogany, and sappanwood for dyeing. Quicklime, copperas, and alum are used as mordants to fix the colours. At one point, she used the juice of the lime fruit as a fixative, but she had difficulty in finding large amounts of the fruit. After she discovered that her colleagues were using alum as a fixative, she also took up using alum instead of limes. Ibu Rahayu stated that the specialty of her dyeing is in the use of fixatives. While other businesses make this the last step after the dyeing process has been completed, she does after each three times of dyeing process. She believes that her business is eco-friendly. When she was asked her opinion about eco-friendly batik, she said that eco-friendly batik was batik *warna alam*. She added that eco-friendly batik did not pollute the environment and did not cause skin irritation.

> Why do I use natural dyes? I genuinely do love to use them. My mentor taught me to use natural dyes. She produced batik with natural dyeing and suggested I do the same. Batik produced by this process is more expensive than that using synthetic dyes. And it is eco-friendly, I am sure, because it does not cause pollution or skin irritation.

Initially she thought she would need a waste-water treatment plant. She was to have been granted a shared waste-water treatment plant with Bapak Ardi and Bapak Sugiharto, but it was cancelled. Only Bapak Ardi and Bapak Sugiharto were given the grant. However, she was hoping that in few days she would get a shared waste-water treatment with the owner of another batik business, Ibu Pertiwi. When she was asked why she wanted a waste-water treatment plant, she answered that the waste-water should be discharged properly. She said that her neighbour had asked her to treat the waste-water to avoid groundwater pollution Although she was still hoping to be given a grant in the form of a shared waste-water treatment plant, she was planning to make her own if she could earn some more and if the grant did not materialise.

### Making batik in order to preserve physical and psychological existence

Our results are derived from the two cases of Bapak Ardi and Ibu Rahayu. Both have a similar life history in which batik has become an important part. They have both suffered economic difficulties, hence economic security is the most important factor in their lives. Ricoeur (1966) argues that motivation is mainly a product of human needs in order to maintain existence, both physical and psychological. When this need is unfulfilled it will threaten the existence of the subject. Therefore, a need relates to the survival of a human being in terms of his or her physical and psychological survival. In the case of Bapak Ardi, the turning-point which prompted him to start his own business was when he lost his eldest child as a result of the economic deprivations faced by his family.

The loss of his child formed his perception that his family was in need and, as Ricoeur (1966) argues, this perception motivated the role of the will to pursue the production of batik *warna alam* in the village of Jarum. In the past, economic difficulties were the trigger for him to pursue the production of batik *warna alam*. Now, maintaining his business is not only to maintain his physical survival but also to ensure his psychological existence.

Although the problems Ibu Rahayu experienced were not as drastic, her childhood was also coloured by economic problems. She had to help her parents to meet her family's daily needs. Making batik became an important way for her to maintain the physical survival of her family. Her experience of being able to buy a bicycle and some jewellery from her income earned by making batik seems to have made her conscious that she does exist and her existence is required by her family.

Marriage was a point at which she might have temporarily stopped making batik, as her husband refused to allow her to work outside the village. However, she did not let this stop her. Therefore, she participated in workshops and created a business group to produce batik *warna alam*. When the earnings of her husband as a pedicab driver proved insufficient, she showed that by making batik she could help her husband, and even become the main breadwinner for her family. As her business grew, she began to make the big decisions in her family. When she first married, her husband was the decision maker, but later as situation changed, she has assumed this role for the entire family.

Nevertheless, this change puts her in an awkward situation. She feels that her husband has not adapted to working at home or to batik very well. She has a feeling that she has to be both mother and father for her family. It seems that her conflict is rooted in social construction in Javanese community, in which men are the head of the family and they are responsible for being the main breadwinner. Some of them might work outside home, in the paddy-fields or being a driver, but some of them might work at home as businessmen like Bapak Ardi and other *juragan*s. However, Ibu Rahayu's husband does not have the skills needed to produce batik and this has made him dependent on Ibu Rahayu. The responsibility as the head of the family and the main

breadwinner constructed by the community would have been on a collision course with the fact that his earnings as a pedicab driver were not enough to fulfill his family needs. However, the fact that batik offers better opportunities to improve the economic situation of his family was impossible to ignore. Finally, he decided to agree to his wife's suggestion: work at home to dye batik for her wife's business, which then became their business.

Making batik has been an inter-generational activity in Jarum, particularly for women. In the past, they became batik workers when they were teenagers or even younger and their activities were to help their parents to earn money to support the family. However, the experiences of Ibu Susanti and Ibu Rahayu show that what motivated them to work was their own need to be independent. They did not want to depend on their husband earning an income. This might have had something to do with the fact that their husbands were working outside the village, in larger town or cities such as Madiun, Yogyakarta, Semarang, or other places. Ibu Rahayu was daring enough to work outside her village, and this is where she built up her experience by learning to *nggambar* instead of merely hand-drawn batik. Furthermore, she was willing to learn something new. Her participation in workshops offered by a university in Yogyakarta proved this. The combination of independence, willingness to learn something new, and creativity laid the foundation for her success in launching the production of batik *warna alam*.

## BEHIND THE LABLE "ECO-FRIENDLY"

Our results show that both businesses use natural dyes obtained from plants for batik dyeing. According to Saxena and Raja (2014), natural dyes are considered to be eco-friendly as they are bio-degradable and derived from renewable resources. However, if renewability is an indicator of eco-friendliness was questioned by Bapak Supriyatno, another *juragan*.

> The only eco-friendly batik is that produced by natural dyeing, but for me, this is just pie in the sky. At first, of course, it attracts many customers, but not for a long. Now, only a limited number of customers order batik by natural dye. Moreover, batik coloured with natural dyes also destroys the environment. The materials derived from parts of plants and this means some plants have to be cut to provide the dye stuffs.[5]

Bapak Suprayitno's statement is in line with the claims made by Bhattacharjee and Reid (2011). They have also noted that it would impossible to meet the global demand for textiles using natural dyes, because this would require a continuous supply of a tremendous amount of bark and leaves. Another consideration is the use of arable land to grow the dye-yielding plants. This will clash with the world's concern about meeting global food requirements. Our study has revealed that, although the natural dyes can be considered eco-friendly, the use of metallic mordants such as copperas and

[5] Interview with Suprayitno, not her real name (51 years), Klaten, 11 June 2016.

alum calls its eco-friendliness into question. However, Roy (2011) suggests that natural dyes of vegetable origin are safe and environmentally friendly as they are virtually free of any harmful chemicals. The use of metallic mordants should be avoided or applied only within a permissible limit. Nonetheless, the eco-friendliness of the use of natural dyes in batik production must be assessed and applied if the label eco-friendly is to be used. Eco-parameters, such as non-use of toxic heavy metals, pesticides, formaldehyde, and pentachlorophenol should be assessed to determine the eco-friendliness of natural dyes alongside any Life cycle assessment (Roy 2011).

Handayani, Hunga, and Kristijanto (2016) argue that *juragan* batik *warna alam* can save natural resource like water, and cut back on waste. Bapak Ardi collects wax waste to sell, collects rainwater, and uses dried unused barks for fuel. Those actions comply with those set out by Swisher (2006) as ways to achieve sustainable production. In a nutshell, the industry has implemented the sustainable production concept in some ways, but has swerved around in the opposite direction in others.

Pertinently we have established that the "eco-friendly" actions of *juragan* tend to be motivated by economic reasons. The sale of wax waste was prompted by a need to buy new wax. Rainwater was collected to reduce the use of groundwater, but so that he can reduce the electricity costs normally expended to pump groundwater. Unused bark left over from dyeing is collected and dried to reduce fuel expenditure. In short, these measures were taken in order to reduce production costs. Environmental awareness is questionable in this context, as indicated by Bapak Ardi's ignorance of the fact that waste-water from his business has been polluting the river and causing unpleasant odours which impinge on the comfort of his neighbours.

The mindset which says "*natural dyes are eco-friendly*" is strongly attracted to these *juragan*s. However, it must be remembered that they have been informed about the eco-friendliness of natural dyeing by the workshops. While wastewater treatment plant is used by *juragan* to claim the eco-friendliness of the production, Ibu Rahayu's desire to have a waste-water treatment plant has been prompted by the warnings of her neighbour. Hence, environmental awareness is not the real motivation behind the ambition to acquire a waste-water treatment plant. It is a motive caused by pressure or a situation which forces a person to make a certain decision, as Ricoeur (1966) argues, and is not inspired by any particular awareness of a particular environmental situation. The *juragan*s' past experiences of having to deal with their economic difficulties can also be counted a strong reason behind their decisions, hence environmental awareness is certainly not the one and only reason behind the process of making this decision.

Bapak Suhargo is a seventy-year-old man who lives in Jarum with his wife. He is a farmer and his wife is a batik home-worker. As he lives near the river into which the waste-water from batik businesses is discharged, he is well aware of the issues generated by this environmental problem.

> If I were to have the opportunity, I would choose batik made with natural dyes as this is the tried and tested method. Its colours and quality are better [than the synthetic ones], however, it is of course expensive. Now to the matter of the waste-water, it comes from two businesses, Pak A and Pak P. Although it did cause an unpleasant odour, I have now grown accustomed to the situation. However, I do not know what my neighbours think about it all. Actually, those *juragan*s have received support from the government in the form of a treatment tank similar to a septic tank. I can say this with certainty because I saw the process of its construction; it consists of various compartments. As to the unpleasant odour, I do not understand why it persists even though it is in the treatment plant? However, haven't they received information from the government officials about what should they do?[6]

Although Bapak Ardi does have access to the use of a waste-water treatment plant, it seems that the plant does not work as it should. Our observations showed that the plant was buried underground and only seemed to collect the waste-water rather than treating it. Hence it is important to note that, although this *juragan* might have access to the use of a waste-water treatment plant, he does not have the know-how the manage this sort of technology properly.

Hence the question posed by Bapak Suhargo is still difficult to answer. A waste-water treatment plant is a specialised piece of equipment and it needs a special knowledge and skills to operate, therefore not all people can operate and manage it. This problem also came to light in our previous research in Sragen (Handayani and Kristijanto 2014). In addition, it is possible that the *juragan*s were not involved in designing the technology because they are already considered to possess the knowledge of how it should be used and hence they were effectively prevented from participating in the design/building process (Williams and Edge 1996; Klein and Kleinman 2002). While *juragan*s have no appropriate knowledge of the technology and they are not competent to manage the waste-water treatment plant, the technology will continue to make a very limited contribution to cleaner production.

Nevertheless, the fact that the production of batik has undeniably raised the standard of living of the *juragan*s, it has been their willingness to become batik workers, either *buruh pewarnaan* or batik hand-drawers, which has endowed them with their experience, creativity, and knowledge about batik. Finally, batik has given them opportunities to develop themselves and achieve the position of *juragan*.

## Conclusion

The lessons learned from this study are that the production of batik *warna alam* has been principally triggered by economic reasons. The *juragan*s were able to overcome the straightened circumstances they had to face when they were growing up by embracing the opportunities to pursue their livelihoods by the batik industry. Turning to the environmental issues, the *juragan*s were

[6] Interview with Suhargo, not his real name (70 years), Klaten, 24 August 2016.

convinced that batik *warna alam* was eco-friendly on the basis of the following indicators: (1) the materials are obtained from their immediate surroundings; (2) they seem to have no pollutant or environmentally harmful effects; and (3) the process seems safe or does not cause any health problems among the workers. However, some actions which might seem to be eco-friendly were actually prompted by economic reasons such reducing production costs and not because of sustaining the environment. This study provides the insight that an eco-friendly labelled production might not necessarily have been motivated by a high level of environmental consciousness.

Acknowledgements

The authors would gratefully acknowledge Biro Perencanaan dan Kerjasama Luar Negeri (BPKLN) – Kementerian Pendidikan and Kebudayaan Republik Indonesia, who supported this research by Beasiswa Unggulan Program Mandiri 2015 scholarship. We would also like to acknowledge Maria Rosalia Ulina Sri Handayani Beru Bukit who helped us with the manuscript corrections.

References

Bhattacharjee, J. and M. L. Reid. 2011. "Revolution of colors; Impact on our fragile environment", in: Sri Ashis Mitra and Arabinda Mondal (eds), *National workshop and seminar on vegetable dyes and its application on the textiles*, pp. 117-121. India: Visva Bharati.

EKONID (German-Indonesian Chamber of Commerce). 2012. "EU-switch Asia program; Clean batik initiative" [Report.]

Elliott, I. M. 2004. *Batik; Fabled cloth of Java*. New York, NY: Periplus.

Hamzuri. 1981. *Classical batik*. Jakarta: Djambatan.

Handayani, W. and A.I. Kristijanto. 2014. "Narasi air dan perempuan dalam teknologi daur ulang limbah batik di Masaran, Sragen", in: Dewi Candraningrum (ed.), *Ekofeminisme II; Narasi iman, mitos, air*, dan *tanah*, pp. 251-268. Yogyakarta: Jalasutra.

Handayani, W., A.I.R. Hunga, and A.I. Kristijanto. 2016. "Potret batik ramah lingkungan dalam bingkai produksi berkelanjutan", in: Arianti I. R. Hunga and Dewi Candraningrum (eds). *Matra SDG's (Sustainable Development Goals) dalam penghapusan kekerasan, trafficking, dan pemberdayaan ekonomi,* pp. 231-253. Palembang: Kementerian Pemberdayaan Perempuan dan Perlindungan Anak.

Handayani, W., A. I. Kristijanto, and A. I. R. Hunga. 2018. "A water footprint case study in Jarum village, Klaten, Indonesia; The production of natural-colored batik", Environ Dev Sustain (2018). [Retrieved from: https://doi.org/10.1007/s10668-018-0111-5].

Hunga, A. I. R. 2014. Protecting women's domestic area and environment; Study on eco-friendly batik, *Indonesian Feminist Journal* 2: 82-105.

Klein, H. K. and D. L. Kleinman. 2002. "The social construction of technology; Structural considerations", *Science, Technology, Human Values* 27(1): 28-52.

Maulik, R., L. Bhowmik and K. Agarwal. 2014. "Batik on handloom cotton fabric with natural dye", *Indian Journal of Traditional Knowledge* 13(4): 788-794.

Otero, M. et al. 2011. "Methods of analysis for a sustainable production system", in: Juan A. Blanco and H. Kheradmand (eds), *Climate change; Research and technology for adaptation and mitigation.* [DOI: 10.5772/24237. Retrieved from: http://www.intechopen.com/books/climate-change-research-and-technology-for-adaptation-and-mitigation/methods-of-analysis-for-a-sustainable-production-system, accessed on 27-5-2015].

Pimenova, P. and R. Van der Vorst. 2004. "The role of support programmes and policies in improving SMEs environmental performance in developed and transition economics", *Journal of Cleaner Production*, 12: 549-559.

Raffles, T. S. 1817. *The history of Java* (*Volume 1*). Kuala Lumpur: Oxford University Press.

Ricoeur, P. 1966. *Freedom and nature; The voluntary and involuntary* (Translated by E.V. Kohak). USA: Northwestern University Press.

Roy, T. K. G. 2011. "Eco-friendliness of natural dyes", in: Sri Ashis Mitra and Arabinda Mondal (eds), *National workshop and seminar on vegetable dyes and its application on the textiles*, pp. 65-69. India: Visva Bharati.

Saravanan, P., G. Chandramohan, and S. Saivaraj. 2012. "A study on eco-friendly dye obtained from barks of Ficus Religiosa. L on cotton fabric, *World Journal of Applied Environmental Chemistry* 1(1): 30-34.

Saxena, S. and A. S. M. Raja. 2014. "Natural Dyes: Sources, Application, Chemistry, and Sustainability Issues", in: Subramanian S. Muthu (ed.), *Roadmap to sustainable textiles and clothing* pp. 37-80. Singapore: Springer Science and Business Media.

Soebaryo, R. W. 2012. "Batik manufacturing workers", in: Thomas Rustemeyer et al. (eds). *Kanerva's occupational dermatology*, pp. 1289-1295. Heidelberg: Springer Verlag.

Subki, N. S., R. Hashim, and N. Z. Muslim. 2014. "Heavy metals analysis of batik industry wastewater, plant, and soil samples; A comparison study of FAAS and HACH colorimeter analytical capabilities", in: Aris A.Z et al. (eds), *From sources to solution* pp. 285-289. Singapore: Springer Science and Business Media.

Swisher, S. 2006. "Sustainable production; Definition, comparison, and application". *The Park Place Economist* 14(1): 88-95.

UNESCO. 2013. "Education and training in Indonesian batik intangible cultural heritage in Pekalongan, Indonesia". [Retrieved from: http://www.unesco.org/cilture/ich, accessed on 27-8-2015].

United Nations for Environmental Program. 2015. "Sustainable consumption and production and the SDG's. *UNEP Post 2015#2.* [Retrieved from http://www.unep.org/post2015/Portals/ 50240/Documents/unep_post_2015_note_2.pdf, accessed 29-6-2015].

Veleva, V. and M. Ellenbecker. 2001. Indicators of sustainable production; framework and methodology. *Journal of Cleaner Production* 9: 519-549.

## About the authors

Widhi Handayani got her doctoral degree from Interdisciplinary Graduate Faculty, Universitas Kristen Satya Wacana, Salatiga in 2017. She got her Master's degree in Environmental Biology at 2005 from Universitas Kristen Satya Wacana. She was a recipient of a Beasiswa Unggulan granted by BPKLN-Kementerian Pendidikan dan Kebudayaan Republik Indonesia. In 2016, she was awarded a scholarship from DAAD, Germany to write an article in a co-operation with Philipps Universität Marburg, Germany. She can be contacted at: widhyandayani@gmail.com.

Augustinus Ign. Kristijanto is a limnologist and researcher in environmental sciences. He teaches environmental chemistry in Faculty of Science and Mathematics, Universitas Kristen Satya Wacana, Salatiga. He holds his doctoral degree in limnology from Universiteit Wien, Austria in 1997. He may be contacted at: gus_ign111@yahoo.co.id.

Arianti Ina Restiani Hunga teaches and does research in sociology and gender perspective in Interdisciplinary Development Studies Graduate Faculty, Universitas Kristen Satya Wacana, Salatiga. She got her doctoral degree in 2013 from Universitas Kristen Satya Wacana, Salatiga. She can be contacted at: inahunga@gmail.com.