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Henna Art in Global Era: From Traditional to Popular Culture

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Abstract— In the last decade, the use of henna has been the trend of fashion, not only for people in Indonesia, but also throughout the world. The art of Henna, which is the art of painting some part of the body by using henna leaves plant, has been recognized for many centuries to the communities in Asia and Africa. In Indonesia, the art of henna was brought by the Indians and Arabs which have rooted in many of Indonesian regional cultures. The use of henna is closely with traditional ceremonies, marriages. In the recent time, the use of henna has reemerged and become current fashion. With this background, the research focuses its analysis on the reemergence of this painting tradition of henna. By conducting field research, namely through observation and interview, both to the artists and the users of henna, the research aims at explaining the transformation of henna art, from traditional into pop culture. In this globalization era, henna art which originates from the eastern culture can also be accepted as a global culture. However, the use of henna is not only in its traditional meaning, but as a popular culture.

Keywords— Henna Art, Ritual, Global Ara, Traditional Culture, Popular Culture

I. INTRODUCTION

The research discusses the trend of the use of henna art among women of the young generation in Indonesia, and to explain how modern lifestyle is expressed through traditional cultural resources. Henna art, which is also known in Indonesia as 'inai' or 'pacar', is the art of painting the body, especially painting the hand and the foot, which is so attractive for young women in Indonesia [1]. In fact, Henna painting has become the trend of fashion around the world [2] [3].

The art of henna painting is not a newly emerged culture. Various societies in Indonesian regions have known henna painting as a traditionalized culture, especially in the wedding traditions. The essence of the tradition is the use of 'henna', which is generally applied on the prospective bride before the wedding is done.

Henna is in fact a name of a plant, Lawsonia Inermis, which is a plant that produces a natural color. The color which is produced by henna leaves can be used to beautify and decorate the nails, hands and other human parts. The use of henna to paint the nails becomes an alternative for Muslim women, as the use

of nail polish is forbidden in Islam. Different from nail polish which causes the nail to be covered and therefore prevent the ablution from watering it, the paint in henna is from natural plant and does not cover the nail's surface. It is for that reason; the use of henna becomes the choice for Muslim women who want to paint their nails. In fact, in some Muslim societies, the use of henna is considered as an act of worship and is part of the Sunnah.

In Indonesia's tradition, the use of henna is often done by the communities of Arab descents, and therefore it is often associated with the symbol of Arab cultures [4]. There are many families in the communities of Arab descents in Indonesia who still preserve the tradition of 'Laylat al-henna' or henna night. The tradition is like the 'rite of passage' which also exists in the culture of some other societies. The only difference is, in the 'Laylat al-henna' practiced by the communities of Arab descents in Indonesia, it is limited to the prospective bride, whose hand was painted henna on that night.

As an old tradition, the use of henna, as in other old cultures, is only done by women who still want to preserve the old tradition in a ritual ceremony, especially in the ritual of marriage. Using henna is often considered conservative and traditional. Some Muslim women use it in order to perform the Sunnah. However, in the last decade, the use of henna has become a trend among teenage girls. In many cultural festivals, there is always open or more counters that provide henna painting which is generally crowded by consumers who want to be painted in their hands. The trend of henna painting became *booming*.

The art of henna painting, of course by using natural plant of henna later develops in line with the invention of various henna decoration having esthetical value. The use of henna is no longer limited to painting the nails or palms in simple way, but it is also applied on the back of the hand, parts of hand and foot, as well as other parts of the body.

The use of henna which has become a trend of fashion is not only performed among the communities of Arab descents or considered as a traditional culture. Someone who is interested in using henna, from any group of people, can paint or request painting on the hand, foot, or any other parts of the body from a henna artist or painter. The use of henna



is not only limited to beautifying oneself on a wedding, however, it can also be used for various kind of programs, such as graduation, birthdays, or without relating its use from any kind if special programs. There are many teenagers who use henna simply for entertainment only, and for mere accessories.

In short, the use of henna has reemerged and become a trend of fashion, it is no longer a traditional culture but has developed into a popular culture. Further, this research is interested in raising the phenomenon of the popular use of henna among young women in Indonesia. The research would like to explain how modern trend of fashion can be taken from a traditional culture. By analyzing the use of henna in the modern time, this research would like to explain how a traditional culture is transformed in a popular culture. What characteristics that can be identified in the use of henna these days as a popular culture will also be analyzed by using the concept of popular culture.

II. LITERATURE REVIEW

The trend of henna painting art which is happening in Indonesia is, in fact, not of Indonesian origin. The booming of henna painting art is also happening in many countries. It does not only develop in the regions of countries in Asia and Africa, which are the origins of henna painting art, its development spread throughout communities in Europe and the United States.

A. A Performing the Tradition with Modern Taste

Rachel Sharaby, [6], discusses the ritual henna tradition, which is still preserved by the women migrants of Yaman. Sharaby raised an interesting phenomenon about the use of henna as the last ritual of women toward the family life within the scope of the husband's family. Sharaby discusses how Yemen women, who were originally considered to be within the chain of inferiority of men in the framework of western feminism, became exposed to the egalitarian views and were not dependent to the superiority of men anymore. However, they still preserved a tradition which was not related with gender inequality, which was the henna ritual tradition. Sharaby conducted her research on the Yemen women communities who migrated to Israel. In an atmosphere of Israelian thoughts who attempted to remove the hierarchy of men on women, it became interesting to see how henna ritual, which consists of the ideology of men's hierarchy ever women, were revived by the Yemen women in Israel who were exposed to the ideology of gender equality. Sharaby explained that reviving the ritual of henna in the women community of Yemen in Israel was a facility to preserve social structure, increasing social cohesion, and strengthening the main social values, and it is in fact legitimizing the status and role based on the values of the old culture. However, on the

other side, the social meeting had enabled the introduction of new cultural elements. Through ethnographic research on the Arab Yemen communities in Israel between 1970—1980s, Sharaby saw a form of syncretism or the integration of old values within the henna ritual with the values that are present in Israel. In this regard, there was a shifting and symbolic change, as well as the meaning of ritual henna in the Arab Yaman communities in Israel.

Tuba Ustuner [7], explained how the ritual 'Henna Night' becomes the expression of the communities of Urban Turkey. Ustuner said that 'Henna Night' as a ceremony, with the historical values and folklore, where the family of the prospective bride gives the girl to the family of the bridegroom. Henna Night (in Turkish is called: Kina Gecesi) is the most colorful part of the marriage. The ritual of Henna Night in Turkey is, in fact, a ritual that has developed for centuries, as a part of the "transition rite". The ritual was so alive in the period of the Turkish Ottoman Empire. However, the ritual was abandoned by the urban middle class after the establishment of the Republic of Turkey in 1923. During the period of building a secular nation, the urban indeed experienced secularization and was separated ideologically from their religious traditions. For modern Turkey, 'Henna Night' was considered as a prominent ritual of the communities of Ottoman. Therefore, in line with the propaganda of the Republic of Turkey, various rituals and traditions of the Ottomans was labelled as "traditional" ritual which was related to the village class, "outdated", and the tradition of the farmers group.

Ustuner raised a very surprising phenomenon and asked the readers to witness the rebirth of the ritual 'henna night' in the last several years within the communities of urban middle class. The rebirth became a paradox of truth that was raised by Tuba Ustuner. The Henna Night that was performed by the urban communities emerged framing the traditional ritual which uses symbolism of religion in reproducing patriarchal relation into a pleasing consumption activity. The tradition of 'Henna Night' described more about identity negotiation of the new modern Turkey rather than transferring the traditional meaning. In her study, Ustuner demonstrates that ritual is not only a social phenomenon through which culture is applied and reproduced, but it could also be used as a cultural resource in determining a new Ustuner highlights social limit. the communicative' signs which play an important role in reconstructing the ritual of 'Henna Night'. The reframing process enabled ritual performance not to tie up traditional relation with religion. In addition, the framing not only resulted in the shifting of religious symbols from sacred to esthetics, but also destroyed patriarchal function as the traditional thoughts. In this regard, 'Henna Night' transformed the gender role in ritual. In other words, 'Henna



Night' in this urban space prayers are said, but with a new spirit, setting aside conflict with secularization; 'henna' is used with a new spirit by setting aside henna rejection. The meeting in henna ritual is also not a women solidarity, but middle-class solidarity that gives group community feeling. It is not symbolling or meaning that area attached to them but a new pleasing frame that builds solidarity.

With new framing, urban 'henna-night' has become a place where the tension of religiosity versus secularism, lifestyles of urban versus rural, modernity versus traditional patriarchy is uncovered through a pleasing way. In other words, 'Henna-Night' became a reconstructing space for two paradoxical elements that are unique of ideological conflict in Turkey. In this regard, ritual is, in fact, prepared as a meeting between anti-religious and anti-patriarchy. All symbols are removed from the symbols that have been rejected and are turned into a facility of this new frame. 'Henna Night' is still seen as a ritual, a place where social solidarity is established. However, ritualization happens through a creative retooling of old meanings, not their simple reconstruction. The reemergence of henna night ritual cannot be explained with ritual ideas as a culture reproduction, east-west, local-global, rural-city, or opposition of traditionalmodern, or pastiches of mixed form.

The new ritual can be understood better as an experiment act which is framed by meta communicative signs; this is authority area where various modernity tension is negotiated, and meanings are transformed. The new Henna-night is a perfect example to show how ritual expresses changes, how they inform the shifting that emerges in the form of culture and the temporary limits of society in preserving continuity. Exploring the slice between ritual and consumption increases understanding on how new consumption pattern which is paradoxically logical, and how consumers create new identity, is the focus of the research of henna conducted by Ustuner, and the discussions that were developed were unique discussions of Turkey, which dichotomize east and west, Islam and secularization, traditional and modern. Henna became a facility for urban communities in proposing views that synthesize both, as an answer toward the dichotomy which is continuously in tension.

Further, in line with the previous two researches, Novruz explained the reemergence of henna tradition in marriages in Azerbaijan communities [5]. The tradition of henna had exited centuries ago in Azerbaijan. In the beginning, this tradition, was a celebration which had a spiritual nuance and had a deep meaning, especially to pray for fortune and blessings for the prospective brides that will marry. However, in the recent time, the tradition of henna was used to leave the single period that was done in a modern nuance. Novruz also said that the tradition had become an expensive and prestigious as it was

not done in modesty and sacred in the house of the prospective bride. In recent time in Azerbaijan, the execution of henna night cost very high, used for building rent, inviting henna artist that will do the painting, not only to the prospective bride, but also the hands guests and the bride's family.

In Indonesia, the use of henna became widely spread, not only as a tradition which is part of a traditional marriage but has developed into the art of painting body parts which attracted a variety groups of people, for the sake of consumption in various programs. The massive phenomenon of the presence of henna painting booths in various cultural events and trading, and the crowd of customers that are eager to have henna painting, shows that there is a popular culture in the Indonesian society, especially among the urban young generation, from an old tradition. The great interest of consumers toward the painting art of henna enables this culture to cross borders, ethnics and identities. Using henna has become a young generation trend and has brought henna to a category of pop culture, or popular culture [8].

B. Understanding of Popular Culture

Popular culture represents a mass culture [9] [10], which is born with the help of industry and capitalization, as it stresses more on the economic side rather than the esthetics. The meaning of popular culture is often narrowed by the assumption that is inferior/second class, cheap and other terminologies that can be contrasted with a piece of art which is considered high and having esthetics of high value.

In this globalization context, the art of henna painting becomes one of the popular cultures consumed by the world's societies. Not only in societies in Asia, Africa, and Middle East, which have already practiced in the past, but also by societies in the western world. In the West, there are many famous artists such as Madonna, Beyonce, and many others, who also use henna as the art of alternative temporary tattoo.

Popular culture is not a certain and firmed terminology. Very often, this terminology is used in a *peyoratif* meaning, especially when take a definition of popular culture as a culture that represents mass culture, as explained by Strinati [9] and Macdonald [10]. Popular culture which is born by the help of industry and capitalization, emphasizes more on the economic side rather than esthetics, and is therefore lowered, often assumed as lower-class culture, or market culture. The term popular culture is often contrasted with a culture that is considered high due to its esthetical values.

Popular culture, in the dimension of economy and culture, is also often considered keeping a meaning which tends to fight or resist. The presence of popular culture describes a respond in the form of resistance toward globalization, already understood in westernization and Americanization biased. The



influence of foreign culture, especially Western and American cultures are considered as a new form of imperialism which utilizes cultural institutions. The presence of popular culture is considered as a representation from local society's expression which is not passive, the way it is considered by the modernists. In the view of postmodernist group, local society is a dynamic and creative society to consume global culture [11].

III. MATERIAL & METHODOLOGY

This is a qualitative research. The data was obtained through field study by using interviews and observation technique, conducted between April until the end of August 2018. Observation was done in places where henna painting art is practiced in temporary events and at henna painting art studios in Jakarta. Observation was also done by tracing the activities of henna painting artists in the social media such as website, Instagram, and Facebook.

The researcher interviewed nine informants, consisting of four henna artists, who have the skill of painting henna, and five people who frequently use henna by using the service of henna artists. The questions were directed to elaborate how far henna artists understand the practice of the culture they are involved in, not only as a hobby or an economic activity, but also relating it with the meanings of henna.

IV. RESULTS AND DISCUSSION

The trend of henna, in this contemporary modern life, shows that a fashion trend does not only come from European and American cultures, in the way globalization and modernization terminology is understood in a modern perspective. The emergence of henna use has become one of the proofs that fashion trend can also come from the Eastern culture. This way, as stated by Giddens [11], global trend in this globalization era, has changed the direction of modernization which is always considered to be coming from the West, and it therefore seems to be a westernization. The presence of henna art in today's fashion trend, demonstrates that Eastern culture can also like universally. In addition, the trend of henna use is not only occurring in Indonesia, but also in other parts of the world, including countries in Europe and the United States.

The concept of popular culture, in the case of henna trend in Indonesia, is also difficult to be placed in the context of discussion between local culture and global culture. By using example of Japanese culinary culture and Korean pop dances (K-pop), people then assume that a culture which is considered as a global culture is, in fact, a local culture that has globalized. In other words, a global culture is a local culture which has been accepted as a taste that is consumed globally. Indeed, this is a problematic dichotomy in modern prospective which has been abandoned by the

postmodern followers. It is due to that reason; popular culture does not question about local and global anymore.

Especially, in the example of henna painting art, it cannot be simply categorized to which community group the culture belongs to. Since the past, henna painting culture had crossed geographical boundary, ethnic, as well as religion. In other words, henna had become a global culture since the past which experienced locality and became a tradition of the past in modern time. Later, in this postmodern time, the traditional henna culture is reconstructed again as a world culture through the stream of globalization.

A. Henna art in Indonesia

In Indonesia, the use of henna was brought to Indonesia almost at the same time with the entrance of India and Arab cultures. In its development, the use of henna has deeply rooted in many regional cultures in Indonesia. By referring to the history of the relations of Indonesian culture with Indian and Arab cultures, Indian people seem to have started the internation and inter-culture relation with Indonesian people and is the initial carrier of this henna culture. However, the development of henna in Indonesia rooted from the Arab tradition which was brought by Islam missionaries. Moreover, the use of henna in the marriage ritual in Malay culture and the ritual of 'henna night' preserved by the Arab descent communities in Indonesia, shows simplicity of motifs, which is the characteristic Arab motifs.

One of the factors which preserve the tradition of henna use in Indonesia is the recommendation of the Prophet which is considered as Sunnah. Meanwhile, the artistic henna design is generally adopted from contemporary culture abroad, mainly from Arab countries and India.

The phenomenon of the use of henna in Indonesia in the last decade is the phenomenon of the artistic henna. The presence of henna as a popular culture in Indonesia has raised the tradition of henna use which has been known long ago but was abandoned by the societies. Henna culture has experienced localization before experiencing globalization. Localization of henna as a process of adapting global product into local culture has been going on in thousands of years. Later, henna global culture unites with regional locality, and in line with modernization which marginalizes local culture, henna tradition was also abandoned and marginalized due to the strong western modernization flow.

B. Motifs of Henna

Discussion on the trend of henna painting art refers to the presence of motifs which are practiced. Generally, people read meaning of Henna motifs in the social media. Social media, such as YouTube, Facebook, and Instagram, become the promotion



media of henna culture which can be easily accessed and free of charges. The most well-known henna motifs are Arab and Indian motifs. However, being a product of creativity and freedom, henna painting artists are actors that create motifs which are not limited to certain type or characteristic. The most well-known henna motifs are Arab and Indian motifs.

Arab motifs do not cover all the hands, but leave some empty space. Meanwhile, in Arab countries in Africa, henna depicts thick lines and geometric designs. The simplicity of Arab motifs makes it quick to make, between seven to ten minutes. Other than that, Arab styles or motifs which are simple makes the service fee of henna painting less costly and affordable by the society.

Indian henna designs are known due to its coverage and quality of narration. In Indian motifs, there is an attempt to mix story in the design. marriage scenario or musical instrument. Indian motifs are also marked by human or animal figures.

However, henna tradition in Indonesia is not in the form of art or motifs like Arab and Indian henna which are on trend. Sacred and simple, becomes the character of henna tradition in Indonesia. In various 'henna night' ritual, or 'bainai night', etc., 'henna' or 'pacar', is only put at the finger and feet nails, or simply put in the palm.

Sabika made henna painting in the form of flowers and leaves. That was all she knows. Then, she realized that flowers and leaves are Arab's unique motifs. Generally, Indian motifs are more complex and denser. Indian motifs also show the shape of human or animal. Usually, Indian motifs are done by Barbie_Ima (mentioning the name of Instagram belonging to a well-known Indonesian Henna artist). Sabika sometimes mix Arab and Indian motifs, not by drawing human or animal, but still drawing flower and leave, only it more dense, smaller, covering the entire back of the hand.

Indeed, for a Muslimah, there is a belief to abandon the use of human and animal in painting. Besides Sabika, Fahny and Fatma also do not develop the motifs of human and animal. Creation and innovation are more directed toward originality and the complexity level of the motif being painted, even it is around the motifs of leaves and flower. Therefore, the henna painter informants were not rigid on patterns and rules. Their products are based on their imagination and creativity.

C. The Colours of Henna

Besides motifs which are continuously growing, colors become an element that shows the proliferation of henna's appearance. The naming of 'henna' tradition is taken from the main ingredient/material of this tradition, which is "henna" leaves, a Latin name. The original color that appears from henna's blend is orange, brick red, or maroon (light dark). If henna's

blend is from the mix of mashed henna leaves added by oil or water, the use of henna barely gives negative effect on the skin exposed by henna. However, the desire to add the thickness of the color and even to create other colors such as white, black, blue and other colors, gives birth to improvisation on the making of henna's blend. Henna leaves are no longer made traditionally with original ingredient, but added by other ingredients, such as coffee, black tea, synthetic coloring hair, and even animal urine. There has been reports that this improvisation results in skin allergy toward the users of henna [13].

The durability of henna's color is around 12 hours, if instant henna in the form of paste is used. Henna in this form is, according to Sabika, is relatively easy for use. Henna painters do not need to blend henna ingredients, as the henna is ready for use, in fact, can give immediate red color effect shortly after it is used. However, as this instant henna has been added by synthetic additives, the safety of this henna in the form of paste can no longer be guaranteed.

However, there are many people who want to extend the durability of the henna or shorten it. Sometimes, both artists and the users of henna want the duration of henna shorter than its normal duration, which is between two to three hours. This demand gives birth to improvisation in shortening the duration of henna by adding additives, which in turn result in side effect, dermatitis. The temporary appearance of this painting art makes henna an alternative body painting as compared to tattoo. It is due to its temporary in nature which makes henna known by the western societies as temporary body painting (tattoo).

Henna is the art of hand painting by using color which is produced by henna plant. For this reason, according to some henna artists, henna painting art must be red orange or brick red. A painting on the hand, even if it draws a motif known as henna motif but does not use natural color produced by henna leaves, is not the art of henna. Therefore, the use of henna motifs with ingredient other than henna leaves are more suitable if categorized as the art of body painting.

At the present time, the use of white color henna becomes the most preferred choice, especially for the use of wedding. This type is like the one not using natural color of the leaves and contains chemical ingredients. Therefore, it must be ensured that the users do not have any problems with this type of henna. Henna with synthetic color like this can be erased easily, if the users do not want it again after the program is over.

In Indonesia, the presence of henna as a popular culture rises again the use of henna tradition which has long been known but was abandoned by the society. Henna culture unites within the regional locality and, in line with the modernization process which marginalizes local culture, henna tradition has been



abandoned and marginalized by the strong flow of western modernization. However, the return of henna culture in the context of contemporary globalization, shows how globalization becomes a positive factor in revitalizing henna culture in Indonesia.

V. CONCLUSIONS

In Indonesia, henna global culture has been adapted locally or experienced localization. In recent time, the use of henna or henna painting art has become a fashion trend. The henna tradition which is local in character has been ignored for a long time. In the contemporary time, with the force of globalization, this local tradition has become a popular culture. Henna is known in the imagination as a tradition of the past but is transformed into a popular culture. As a popular culture, the phenomenon of henna painting art is pushed by the global market and consumerism behavior.

In the discussions about the presence of popular culture that is considered as inferior culture in contrast with the past culture, which is considered superior, the research saw that the presence of henna as popular culture did not make this painting art in the category of inferior culture. It requires talent and skill that needs continuous practice and esthetics of the artists. This esthetic value does not have to be confronted with religiosity or economic value.

The use of henna is no longer related with symbolic meanings and sacred, the way it was constructed in the old traditions. Henna users would come to the henna painting booth, or studios for a more profound purpose, which is for beauty, accessories, or for a mere enjoyment following the trend of fashion and today's lifestyle. The fashion trend is getting viral by the internet based social media. It is indeed through this internet-based information, henna painting art becomes the consumption of the world. In this regard, globalization force has revitalized old tradition and spread it to become a universally accepted culture. Therefore, the reemergence of henna culture in the context of contemporary globalization shows that globalization is a positive factor in the revitalization of henna culture in Indonesia.

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REFERENCES

- Arifin, Choirul, ed. "Henna, Tradisi Lukis Tangan yang Makin Digilai Kaum Perempuan", Tribun, http://www.tribunnews.com/lifestyle/2017/10/22, quoted June 20, 2018.
- [2] Packard, Mary, "Henna Sourcebook: Over 1,000 traditional designs and modern interpretations for body decorating", Race Point Publishing, 2012.
- [3] Lodi, Hafsa, Trendy tradition: the rise of henna in fashion. https://www.thenational.ae/arts-culture/, published on December 04, 2014.
- [4] Lesmana, Maman. Menelusuri Jejak Budaya Arab dan Islam di Indonesia. Depok: FIB UI, 2012.
- [5] Novruz, Nurana, 'The Revival and Modern Feel of the Henna Party' https://chai-khana.org, quoted on June 13, 2018.
- [6] Sharaby, R., "The Bride's Henna Ritual: Symbols, Meanings and Changes," Journal of Yemenite Jewish Women, vol. 5766, Jewish Women's Studies & Gender Issues, No. 11, 2006, pp. 22.
- [7] Ustuner, T, Ger, G., and Holt, D.B., "Consuming Ritual:
- [8] Reframing the Turkish Henna-Night Ceremony", in NA-Advances in Consumer Research Volume 27, eds. Stephen J. Hoch and Robert J. Meyer, Provo, UT: Association for Consumer Research, 2000, pp. 209-214.
- [9] Hammond, A., Popular Culture in The Contemporary World Pop Culture Arab World!: Media, Arts, and Lifestyle, California: ABC-CLIO, 2005.
- [10] Strinati, D., An Introduction to Theories of Popular Culture, Routledge, 2004.
- [11] Mcdonald, Ruth, "What is Cultural Competency?" *British Journal of Occupational Therapy*, http://www.journals.sagepub.com., July 01, 1998.
- [12] Giddens, A., "The Consequences of Modernity", http://www.ewclass.lecture.ub.ac.id, Polity Press, 1990.
- [13] Thussu, DK., International Communication: Continuity and Change (A Hodder Arnold Publication. 2nd editions. Bloomsbury Academic, 2006.
- [14] Wang, Mindy X., et.al., "Henna—A Temporary Body of Art". Article in JAMA Dermatology, Volume 152, No. 3, March 2016, https://www.researchgate.net/publication August 10, 2018.