



Industrial Waste: The Strategic Role of Indonesian Women in the Challenge of Climate Change

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Abstract. Today, the global community lives based on a linear economy, with producers producing products and people as consumers of these products and then throwing them away. The FMCG industry, or Fast-Moving Consumer Goods, is an industry that is growing in the field of providing products for consumers' daily needs, such as packaged food, toiletries, cleaning products, and others. Products that are discarded by society without recycling then produce waste. In 2019, Indonesia produced 64 million tons of waste. The increase in the amount of waste produced affects the world's ecosystems that have an impact on the role of women in life because of the "experienced" condition women. This qualitative research uses the ecofeminism view, which is an object affected by climate change. The results of the study indicate that no industrial management is in line with the development of a linear economy. Using content analysis, in the view of Ecofeminism, the role of women is very much needed in minimizing waste that results in changes because there is no special handling related to industrial waste.

Keywords: Indonesia · Ecofeminism · Industrial waste

1 Introduction

Recently, the change issue has become a significant challenge; the impact of climate change in various parts of the world, such as natural disasters and extreme weather, results in losses in multiple countries. Regarding the response to climate change, waste is the most important aspect of paying attention. According to data from SIPSN, household waste in 2018 is the largest source of waste in Indonesia, around 81.15% (SIPSN, 2021). It is undoubtedly a serious concern for our society. Regarding climate change's impact, waste, especially those generated from household needs, significantly impacts women.

Based on data from UN WOMEN, women are more vulnerable to the impacts of climate change than men. Mainly women's livelihoods depend on local natural resources. Apart from being affected by climate change, women's role is crucial in creating a conducive climate. In Indonesia, the term housewife is synonymous with women who do not have work at home. Women are very close to nature.

Waste in Indonesia, especially household waste, is the focus of the author's attention because this problem has not been effectively resolved. Coupled with the emphasis

on funding climate change, waste and other sectors must be met with limited funds. According to Indonesian Ministry of Finance calculations, the need for climate change funding reaches IDR 3.779 trillion if we follow the National Contribution Document (NDC) roadmap. It means that every year, the budget is 200 trillion- 300 trillion. This amount is equivalent to 7–11% of the 2022 state budget (Indrawarsari, 2022). Based on the NDC, funding for dealing with climate change is divided into five sectors. The five are forestry and land, agriculture, energy and transportation, waste and industrial processes, and product use.

In the NDC document that contains the commitment of each country in efforts to reduce the impact of climate change, the cumulative total for the 2020–2030 period if it is accumulated with Refuse-Derived Fuel (RDF) fuel produced from various types of waste such as municipal solid waste, industrial waste or commercial waste then the cumulative total in the 2020–2030 period is IDR 3,776.52 trillion.

As with the issue of global climate finance, the need for funding is not commensurate with the available funds. From funding from the national budget (APBN), in 2020, the budget allocation for climate change mitigation and adaptation is IDR 77.81 trillion. Previously in 2018 and 2019, the government budgeted IDR 132.47 trillion and IDR 97.66 trillion. This budget is certainly not sufficient for the need for climate finance, which reaches an average of IDR 200 trillion- IDR 300 trillion every year (Indrawarsari, 2022). It is another challenge for Indonesia in dealing with climate change.

If funding needs are not met, programs to reduce and address the impacts of climate change will not be optimal. As a result, climate change's impact is worsening and causing more significant losses.

Based on the explanation above, the amount of funds in mitigating climate change is a challenge for Indonesia, especially women as the creatures most affected by climate change; besides being involved, women are also considered agents of change in mitigating change.

This paper will search for women who are not only vulnerable to climate change but also as effective actors or agents of change related to climate change mitigation and adaptation.

Environmental activist and Kartini Next Generation, Wilda Yanti, Puteri Indonesia Lingkungan, Ayu Saraswati, Practitioner and founder of Bank Sampah Garuda namely Wastu Lestari, Ni Wayan Riawati. The four speakers explained how to increase the role of women in mitigating climate change. In addition, encouragement for household waste management is intensified because it will impact the empowerment of women's entrepreneurship.

Waste management cannot be separated from its management system for the community. The amount of household waste during a pandemic can be used positively; for example, organic waste can be processed into compost, while organic waste can be processed into creative items, which has been done by many people who are members of waste bank associations. Waste banks can also be economic or increase people's income.

This paper uses qualitative research; the data obtained from this study are sourced from journals, news, and websites supported by the Mendeley library to find other relevant sources in analysing the role of women in mitigating climate change through

household waste products. Look at the role of women affected by climate change but who become pioneer agents of climate change mitigation.

2 Women in the View of Ecofeminism: Theoretical Foundation

Regarding the meaning of ecofeminism, two roots stand out because the word ecofeminism itself is taken from two words, ecology and feminism. Ecology studies the inter-relationships, whether life or just an ecosystem, and the environment, such as nature, animals, and plants. At the scientific level, ecology is very thick; the relationship between one species and another can form an ecosystem.

At the same time, the concept of feminism cannot be generalized because the concept of feminism constantly changes according to the socio-cultural reality behind it and the actions taken by feminists themselves. According to Kamla Bhasin Ahmad Euis Emilia, feminism is an awareness of the oppression and exploitation of women in society at work and home and the conscious actions of women and men to change this awareness (Astuti, 2012).

Meanwhile, Gadiz Arivia defines feminism as a theory developed by feminist fighters who advocate the oppression of women by increasing their quality and femininity in various fields (Foster, 2021).

Many factors led to the adoption of feminist theory rather than masculinist theory. Issues of oppression against women can relate to sexuality, family, work, law, politics, culture, art, and other forms. Initially, this basic assumption underlies their views on women's issues. Feminists believe that unequal and unfair social systems and structures need to be rebuilt to realize equality and justice in people's lives.

The theory of ecofeminism originated from the environmental conservation movement that is rife in the West, such as the destruction of human ecosystems by focusing more on nature. On a practical level, there are predictions that women in society experience injustices. Injustice to women in this environment is raised first of all from the notion of injustice done by humans to nature.

Because women are always associated with nature, conceptually, symbolically, and linguistically there is a link between feminist and ecological issues. Looking at the mindset above, feminists must be aware of the relationship between women and nature. Ecofeminism invites women to rise to preserve the quality of femininity so that the masculine system's dominance can be balanced and damage to the natural environment and moral decadence that is increasingly worrying can be reduced.

Among the actions taken by Western ecofeminists as a manifestation of their concern for nature, namely; The Chipko Andolan movement in India is a women's movement to protect forest damage by hugging trees to be cut down, women's movements that are members of the New Age, Moral Majority, HOW (Happiness of Womanhood) in the US, also in America some women organize local efforts to clean up landfills.

While in Indonesia, women are also active in contributing to climate change mitigation through communities such as the green wheel community, clear zones, or participating in the Climate Environment policy (ProKlim). The community is dominated and founded by women who care about the sustainability of the ecological space.

Ecofeminism theory by Vandana Shiva is used as the basis of analysis in this study because the ecofeminism movement is a benchmark that there is the awareness that can be spread to the public about the importance of maintaining and caring for environmental sustainability which supports humans to blend with nature (Shiva, 2010), so as to form harmonization between nature and humans in accordance with the concept of balance.

Ecofeminism theory put forward by Vandana Shiva sees that the relationship between humans and nature (Shiva, 2010) cannot be separated, because humans and nature have a close relationship, namely caring for each other, not being separated from humans dominating nature.

A law between humans and nature cannot be separated, and this applies to the human gender between men and women. The idea put forward by Shiva between the relationship between humans and nature can provide a general picture that nature and humans are an inseparable unit, which can be called equilibrium or balance. The concept of balance between humans and nature shows that there is a power relation between the two and does not harm either party.

In overcoming the ecological crisis that is increasing being eroded, it is necessary to change the mind set to change the way humans behave towards the environment. Women are the most appropriate subject and object because so far women have had a close relationship as consumers of plastic waste. This started from the attachment of women to the concept of mother earth and women were able to take over a large part in the environmental care movement.

Ecofeminism sees women's relationship with nature because women directly experience ecological crisis problems, and women are considered to have better skills and knowledge about ecology than men. Therefore, women can be dubbed as the frontline who are ready to overcome ecological crises, with an innate instinct that women are more concerned with and have a high level of sensitivity to the environment so that they can form communities without violence. The occurrence of environmental damage due to exploitation has ignored the rights of citizens to get a healthy environment. Women and children are part of the citizens who directly impact pollution. Women whose health is disturbed due to an unhealthy environment will indirectly impact children's health as the nation's next-generation people believe that not caring about the environment will endanger their safety.

According to Putnam Thong (Manchón, 2000), it is used as the material goods and lifestyles that come from industrialization, and we must create ways to deal with its toxic waste as a by-product. If we are to preserve biodiversity and the potential richness that lies within it, then we must protect all forms of life and refuse to jeopardize its existence. Women are the main characters in the household, trying to protect the earth by paying attention to small things to save the environment. Even with simple actions and actions, feminist values have developed into an addition to the family economy. Such managing waste through a waste bank certainly provides economic benefits for the community.

Women and households are inseparable because most waste comes from household activities. Family members, especially women, are expected to have a role in controlling the environment. The commitment of the Indonesian government and global commitments related to improving environmental management through women's participation has been stated explicitly in various policy documents.

Surmaini et al. show that climate change harms various livelihoods and development sectors, especially the agricultural sector. It is feared that climate change will pose new challenges to agricultural sustainability, including a decrease in productivity (Surmaini et al., 2015), soil degradation and fertility reduction, pollution, floods and droughts, and conversion of agricultural land. Therefore, an effective adaptation strategy is needed to manage and predict the impacts of climate change.

According to Kisauzi et al. (Crop et al., 2012), one of the main contributors to finding effective adaptation strategies for climate change is understanding the gender aspect of climate and knowledge of climate change itself. Knowledge of climate and weather is climate change. The broad knowledge of men and women regarding protecting the environment and natural resources should be taken into account.

Their potential contribution to climate change mitigation as part of an adaptation strategy should be investigated further. Like men, women have essential knowledge to help them plan interventions and adaptation to climate strategies and develop strategies to address climate change impacts related to food security and the well-being family (Surmaini et al., 2015).

3 Role of Women in Mitigating Climate Change

Indonesia is a country with natural beauty and multicultural peoples who live together and have many cultures. Indonesia has 34 provinces with the majority adherents of Islam. Indonesia, the country that has tourism potential, does not escape problems regarding waste, both domestic and industrial. The flow of globalization causes people to start using a consumptive lifestyle. Like individuals in this global system, Indonesia enjoys instant lifestyles such as buying fast food and using packaged products such as household needs. Large industries that do not yet have terracing or waste screening are a problem that must be addressed immediately.

Based on data from SIPSN (National Waste Management Information System), household waste originating from 205 regencies/cities throughout Indonesia is still tricky to handle (SIPSN, 2021), and the number of waste generation is still higher than waste reduction and handling. It can be noticed in Fig. 1.

In Indonesia, the waste generated from the consumption of domestic products is dominated by household products. This lifestyle is the lifestyle of modern society today; people buy products and throw them away. If this is done continuously, it can impact environmental pollution, and waste also results in environmental changes in climate due to piles of waste produce methane gas which contributes to global warming (Garthwaite Josie, 2021) (Fig. 2).

The data above shows that household waste is in the first place, namely 42% (SIPSN, 2021), including waste that dominates and has not been handled optimally, then in the second position of commercial center waste (office), followed by traditional market waste and others. Household waste is a problem that is quite difficult to solve.

Humans currently live with the flow of globalization; namely, needs can be easily obtained, and the existence of Fast Moving Consumer Goods (FMCG) are “non-durable” goods needed for daily use (Putlia & Alphin, 2021). Consumers usually buy this category of products at least once a month. In all countries, consumers spend the most in this sector.

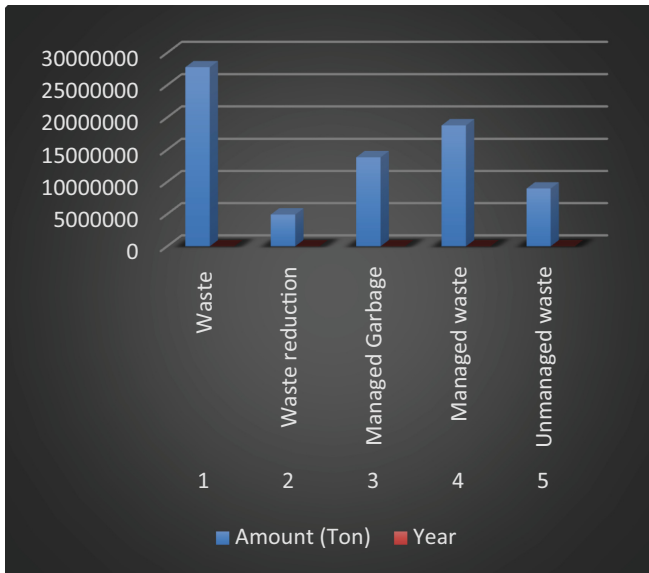


Fig. 1. Source: “Waste Management Performance Achievements” by SIPSN.

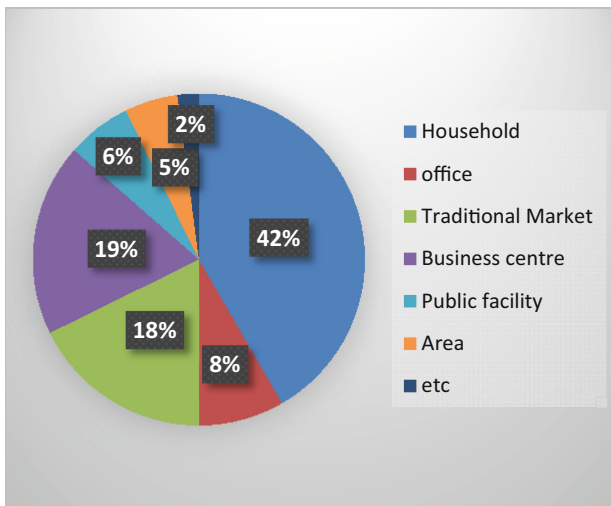


Fig. 2. Source: “Composition of Waste” by SIPSN.

FMCG products can be grouped into three categories: personal care, household care, and food & beverages. Personal care products include toothpaste, shampoo, cosmetics, perfume, and others. Household supplies such as laundry soap, insect repellent, and

others. Food & beverages, such as soft drinks, tea, coffee, vegetables, Etc. The COVID-19 pandemic condition makes it easier for the public to obtain FMCG products due to the online marketing of these products.

Women are the creatures most affected by climate change, Thompson in his writing entitled *Ecofeminism: The Path towards Healing the Earth* reveals that there is a social relationship between women and nature (Thompson, 2017), and because of this relationship, women begin to recognize the relationship between women's oppression and earth oppression. Women are creatures who are responsive in voicing actions or actions to prevent natural damage.

According to Ukeles, in her writing entitled *Touch Sanitation: Maintenance Art as Ecofeminism*, she argues that creating a correlation between femininity and waste maintenance is a means to unite two isolated groups (Drake, 2020). The premise is also rooted in the feminist phenomenon that connects the existence of women with waste and materials—recycling as a point of ecological activism.

In line with Ukeles' statement, Siti Nurbaya as the Minister of Environment and Forestry (KLHK) said that the role of women is expected to be a pioneer and turn the issue of climate change from a problem into an opportunity, one of which is through the Climate Village Program (ProKlim) which encourages active community participation in controlling climate change (Nunu, 2021).

"I want to give an overview of the role of women in the community at the RT/RW level, for example. At the site and front level, women in groups can encourage the initiation of the formation of the Climate Village Program community groups," said "Minister of Environment and Forestry Siti Nurbaya while giving a virtual speech at the 75th Anniversary of the Perwita Wana Kencana Organization, Wednesday (29/29/2011)".

Minister Siti continued that there are many activities that women can do at ProKlim, such as planting trees and agroforestry farming (Nunu, 2021) and recycling waste to help reduce pollution and also build a circular economy. Such activities are included in climate change adaptation and mitigation efforts. The Ministry of Environment and Forestry targets that by 2024 there will be 20,000 climate villages throughout Indonesia. Of course, this big target requires support from all parties, especially women.

In its implementation, the ProKlim program applies the concept of community empowerment (Community Based Development villages are directed to strengthen adaptation and mitigation), where the activities carried out by the community and its institutions in mobilizing and managing human resources and natural resources within the village as well as those from outside the n efforts to the impact of change climate (Albar et al., 2017). The principle of community empowerment in the implementation of ProKlim is community-based, resource-based, and sustainable.

Community capacity through empowerment efforts so that community members can participate in the ongoing process or support institutions in the production process, equity without distinguishing status and expertise, security, sustainability, and cooperation run simultaneously. Conceptually, a climate village consists of the community and its environment, which are expected to have resilience to ongoing and future climate change (Albar et al., 2017). In this urgent situation, a climate village should have efforts to adapt to and mitigate climate change so that the impacts of climate change can be minimized while reducing greenhouse gas emissions at the site scale.

Of the total number of ProKlim locations registered with the Ministry of Environment and Forestry, 121 locations have been designated as recipients of the ProKlim award in the form of trophies and certificates (Albar et al., 2017). The recipients of the ProKlim award have begun to spread to several regions. In the ProKlim program launched by KLKH, every Climate Village (ProKlim) receives a socialization program and technical guidance in implementing the ProKlim.

Women often carry out movements related to climate change mitigation; apart from the proKlim, there is a community in Medan, North Sumatra, with the community name “Roda Hijau.” The founder of the roda hijau community is Christella Suwongso (MyEduSolve Indonesia, 2019). The background for establishing the green wheel is based on the condition of the city of Medan, which is not good enough to handle the sustainable waste. The founders of the roda hijau want to realize the city of Medan has sustainable waste management; although, at this time, the green wheel community is still limited to a small community and is non-formal; at least this activity helps people realize the importance of sustainable waste management.

As public relations officer for the roda hijau, Nona revealed that the waste management system that still ends up in the landfill limits the use of recycled waste. The roda hijau then answers complaints from the public regarding “where will the segregated waste be taken?” then, roda hijau provides a recycling waste pick-up program (Sari Kartika, 2020).

The roda hijau as a community can contribute or play a role in mitigating climate change. Educating the culture of sorting in the community is hoped to reduce the waste circulating in the community. However, roda hijau is an informal community. The Roda Hijau community tries to educate by collaborating or promoting to schools and campuses and participating in every event themed on climate change. In addition, the waste sorting education program is accompanied by a recycling waste pick-up program with transportation routes starting from S. Parman road, Imam Bonjol road, Juanda road, Sutrisno road, and ending at Bromo road (Fig. 3).

In addition to educating students about the green wheel waste sorting, they also contribute to distributing waste sorting education to residents or the public regarding trash in the North Sumatra province of Medan, and household waste reach 2000 tons per day (Stepanus, 2021). Of course, this is a fantastic amount. The data is based on calculations from the Final Disposal Site (TPA), not to mention some people still throw waste in rivers or by burning waste.

The presence of the roda hijau is an embodiment of awareness of the role of women in dealing with climate change. The contribution of women in the form of the roda hijau in the field is a form of awareness of women’s concern for nature. Women are considered capable of overcoming problems related to nature.

Buckingham argues in his writing entitled *Ecofeminism in the twenty-first century* (Buckingham, 2004). The ecofeminist literature suggests that women may be more capable of making these changes than men. Therefore, it is not simply a question of equality within existing structures but of changing systems to reflect this way of thinking, a point to be developed when considering future trajectories of ecofeminism.

In the SDGs (Sustainable Development Goals) guidebook, one of the objectives of the SDGs is to prevent the impacts of climate change (INFID, 2015); in handling climate



Fig. 3. Waste pick-up routes and schedules.

change, climate change mitigation efforts must be carried out at the bottom-up level, these efforts are following the role of women in carrying out educating the public on the importance of tackling climate change together. The non-optimal institutions in handling waste in Indonesia can be helped by the role of women as agents of change. Several women's empowerment institutions have shown their actions in building creativity, such as utilizing household waste for economic value.

The government's attention regarding plastic waste should be further increased, especially the impacts felt due to climate change, such as decreasing forest quality and quantity, increasing greenhouse gases due to deforestation, decreasing water quantity, decreasing water quality, sinking remote islands and coastal islands, changing habitats. Species extinction (Aditya, 2015). The existence of consolidation between the government and the community in handling waste is expected to reduce Indonesia's realization of zero-emissions following the mission of the G20 presidency.

Kisauzi et al., in his article entitled "gender dimensions of farmers' perceptions and knowledge on climate change in Teso sub-region, eastern Uganda (Crop et al., 2012)", one of the main contributors to finding effective adaptation strategies for climate change is an understanding of gender aspects in climate and knowledge about climate change itself. Knowledge of climate and weather is climate change. The broad knowledge of men and women regarding the protection of the environment and natural resources should be taken into account. Their potential contribution to climate change mitigation as part of an adaptation strategy should be further investigated.

According to Assan, in his article entitled "Gender Differentiated Climate Change Discourse in Rural Communities in Developing Countries," Like men, women have the essential knowledge to help them plan interventions and adaptation to climate strategies

and develop strategies to address the impacts of climate change-related to food security and family well-being (McGovern & Fortin, 2020).

According to Capitza, in her writing entitled “Women empowerment and economic development-an exploratory study in Pakistan.” (Manchón, 2000). Community empowerment means the power to make a difference in society by mobilizing existing resources and taking advantage of opportunities for change. Participation in environmental protection is the whole community’s responsibility, so there are no gender-specific requirements for ecological protection.

This participation can be carried out by women who are part of the community and are responsible for their commitment to the environment. The environmental management program is well implemented with the joint participation of the community as a whole. Community involvement is needed so that people have priority in living in the environment where they live.

In this generation, women have a crucial role in mitigating climate change; expert presentations have mentioned the role of women as agents who can help the government, the presence of communities such as the *roda hijau* and *Proklim* that made by minister policy who can minimalize impact about climate change, base on these communities the efficiency about people who don’t throw waste in some area but peoples can recycle own waste with that communities. Or the climate environment proposed by the Minister of Environment and Forestry is a manifestation that women Have a significant role as an agent of growth. Ecofeminism theory views that awareness is disseminated to the public about the importance of maintaining and caring for environmental sustainability, which supports humans can be integrated with nature.

Women are always connected to nature, so conceptually there is a link between feminist and ecological issues. Seeing the pattern above, feminists must be aware of the relationship between women and nature. Based on data by SIPSAN, the role of women is essential in climate change mitigation. Indonesia has many provinces that with a waste problem with collaboration among women. Ecofeminism theory shows the relationship between all forms of human oppression, especially women, and nature. Ecofeminism views that women are culturally associated with nature.

4 Conclusion

Ecofeminism explores how women become agents in mitigating climate change. This study’s main aim is to understand better how women recognize and implement sustainable action. What we found is that in their daily lives, most women make similar consumer-based choices regarding sustainability in their food choices. However, the way they perceive or rationalize their choices is very different and their own agency or perceived control is what seems to drive women’s attitudes towards sustainability and the environment.

The significant role of women as soft power that is mobilized to realize the importance of mitigating climate change, if this is not immediately addressed, it will become a ticking time bomb for the world. Household waste is the most significant contributor to waste compared to the role of women in mitigating climate change.

In improving the practical results, there should be assistance and funding for the community who want to be serious in building a sustainable waste system. Women

contribute in the smallest unit, namely the household, the presence of climate change communities should be more supported and appreciated by citizens and society.

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