

M.A. Moshkal^{1,*} , E.A. Akhaporov¹ , A. Ogihara² 

¹Al-Farabi Kazakh National University, Kazakhstan, Almaty

²Waseda University, Japan, Saitama

*e-mail: madina.moshkal@gmail.com

SUSTAINABLE DEVELOPMENT IN JAPAN: ENVIRONMENTAL AWARENESS AND ATTITUDES TOWARDS WASTE

Sustainable development is a global issue aimed at solving environmental problems such as climate change caused by poor waste management. Although the problem affects all communities and countries, its effects differ depending on the management strategies. The study's primary purpose was to investigate the impact of environmental awareness and education to solve waste problems. It is significant since it provides detailed information that might be used to develop environmental strategies to contain the menace. The authors approached the investigation using a systematic literature review, which involved gathering and synthesizing information about the research title and concluding based on insights gained. The results indicate that Japan has a long history of protecting the environment through various initiatives, such as law enactment and incorporating environmental education into the school curriculum. Although Japanese culture encourages individuals, organizations, and communities to respect the environment, the government should introduce robust measures, such as subsidizing recycling to encourage waste reduction. The findings are significant since the information is useful to integrate appropriate environmental programs in domestic schools to encourage innovation and ensure everyone makes waste management a personal responsibility.

Key words: sustainability, environmental awareness / conscious / responsibility, climate change, mottainai.

М.А. Мошқал^{1,*}, Е.А. Ахапов¹, А. Огихара²

¹Әл-Фараби атындағы Қазақ ұлттық университеті, Қазақстан, Алматы қ.

²Васеда университеті, Жапония, Сайтама қ.

*e-mail: madina.moshkal@gmail.com

Жапондық тұрақты даму: экологиялық хабардарлық және қалдықтарға көзқарас

Тұрақты даму – қалдықтарды тиімсіз басқару нәтижесіндегі климаттың өзгеруі сияқты қоршаған орта проблемаларын шешуге бағытталған жаһандық мәселе. Бұл мәселе барлық қауымдастықтар мен елдерге әсер еткенімен, оның салдары қолданылатын басқару стратегияларына байланысты ерекшеленеді. Зерттеудің негізгі мақсаты – қалдықтарды басқаруға экологиялық хабардарлық пен білім беру жүйесінің әсерін зерттеу. Зерттеудің маңыздылығы қоршаған ортаны қорғау стратегияларын әзірлеу үшін пайдаланылуы мүмкін егжей-тегжейлі ақпаратты береді. Авторлар зерттеу тақырыбына сәйкес ақпаратты жинақтау және алынған мәліметтер негізінде қорытынды жасау арықылы әдебиеттерге жүйелі шолу жүргізді. Нәтижелер Жапонияда заң шығару және экологиялық білім беруді мектеп бағдарламасына енгізу сияқты әртүрлі бастамалар арқылы қоршаған ортаны қорғаудың терең тарихы бар екенін көрсетеді. Жапон мәдениеті жеке адамдарды, ұйымдарды және қауымдастықтарды қоршаған ортаны құрметтеуге шақырғанымен, үкімет қалдықтарды азайтуды ынталандыру үшін қайта өңдеуді субсидиялау сияқты қатаң шараларды қабылдау керек. Алынған нәтижелер отандық мектептерде инновацияны ынталандыру және қалдықтарды басқаруды әркімнің жеке жауапкершілігі ретінде қарастыру үшін тиісті экологиялық бағдарламаларды жүзеге асыру үшін маңызды.

Түйін сөздер: тұрақтылық, экологиялық хабардарлық / сана / жауапкершілік, климаттың өзгеруі, mottainai.

М.А. Мошкaл^{1,*}, Е.А. Ахапов¹, А. Огихара²

¹Казахский национальный университет имени аль-Фараби, Казахстан, г. Алматы

²Университет Васеда, Япония, г. Сайтама

*e-mail: madina.moshkal@gmail.com

Устойчивое развитие в Японии: экологическая осведомленность и отношение к отходам

Устойчивое развитие – это глобальный подход к решению проблем окружающей среды, одной из которых является изменение климата, вызванное неэффективным управлением отходами. Хотя эта проблема затрагивает все сообщества и страны, ее последствия различаются в зависимости от используемых стратегий управления. Основная цель исследования заключается в том, чтобы изучить влияние экологической осведомленности и образования на решение проблем с отходами. Важность заключается в том, что исследование предоставляет подробную информацию, которая может быть использована для разработки экологических стратегий по сдерживанию угрозы. Авторы провели исследование, используя систематический обзор литературы, который включал сбор, обобщение информации по теме исследования и заключение на основе полученных сведений. Результаты показывают, что Япония имеет глубокую историю защиты окружающей среды посредством различных инициатив, таких как принятие законов и включение экологического образования в школьную программу. Хотя японская культура поощряет отдельных лиц, организации и сообщества уважать окружающую среду, правительству Японии следует принять решительные меры, такие как субсидирование вторичной переработки, чтобы стимулировать сокращение отходов. Полученные результаты важны для внедрения соответствующих экологических программ в отечественных школах, чтобы стимулировать инновации и гарантировать, что управление отходами рассматривается как личная ответственность каждого члена общества.

Ключевые слова: устойчивость, экологическая осведомленность/сознание/ответственность, изменение климата, моттайнай.

Introduction

In 2015, at the UN summit, the document “Agenda for Sustainable Development” was developed and agreed upon with 17 sustainable development goals aimed at balanced satisfaction of human needs and improving the quality of life of the current and next generation, while preserving the environment, not depleting resources and supporting social harmony (UN, 2015). Since then, each participating country has been pursuing its own policy to achieve a common goal, however, it is worth noting that not all sustainable development goals are equally relevant for each individual country, priorities may vary, but absolutely all goals are affected and taken into account in one way or another in order to solve issues of humanity at the global level.

A key feature of sustainable development is the balance in three aspects: economic growth, social responsibility and environmental balance, which are also highly interdependent. For example, the thoughtless use of natural resources in production for economic growth has a negative impact on the environment. This example is a simple reference to all three dimensions of sustainable development and although it is worth noting that the 17 goals are much broader and deeper to understand and achieve.

Economic development without harming the environment involves a number of actions on the part of the state and enterprises, but it only the conscious and responsible participation of all members of society can solve global problems. Environmental awareness and culture are the undisputed key to achieving sustainable and environmentally friendly social development. Because they will be the engine of social impact in environmental well-being. Such simple steps as buying only as many products (food, clothes, appliances, etc.) as you can use, not throwing garbage where there are no appropriate baskets, sorting waste for further reuse, etc., are small, but an extremely productive step of mankind in the development of a sustainable society. However, not everything that is simple is equally easy to do, therefore human behavior in relation to the environment is actively studied as part of environmental awareness in environmental sociology, characterized by the absence of opposition between man and nature.

The formation of ecological consciousness, its fundamental features, is influenced by a number of factors: geographical, cultural, historical, political and social. In this context, the authors are interested in studying the development and characteristics of the ecological consciousness of the Japanese. Japan is an example of a highly developed post-industrial

economy, with a deep culture and history that often emphasizes the connection between humanity and nature.

Japanese sustainable development is an essential and trending topic because of the global challenges, including scarcity of natural resources. The growing population's demands are increasingly becoming extensive, implying that the government should make appropriate decisions for sustainable development. Therefore, the topic is necessary since the research results inform policymakers on areas to focus on to ensure available resources sustain the current population's needs without compromising the future. Additionally, sustainable development in Japan is necessary for the natural resources to meet the needs of the current and future population. With the growing population, the country will not meet its people's needs without upholding best practices to address global challenges, such as climate change. Many studies focus on the role of the government and non-governmental organizations in addressing climate change issues (Perron et al., 2006). However, few studies investigate the impact of environmental awareness on human behavior and attitude toward the environment. Therefore, there is an urgent need to research the topic and recommend appropriate strategies to promote public education to change individual attitudes for the better. Also, the subject is relevant to address emerging challenges, including waste management.

Environmental awareness is acquiring education and knowledge about the impact of human behavior and activities on the environment (Perron et al., 2006). Acknowledging that human activities contribute to environmental sustainability is the first step toward solving ecological problems. Unsustainable practices contribute to adverse societal effects, including depletion of natural resources and environmental pollution (Perron et al., 2006). Eventually, they lead to issues, such as health problems, and the planet will not sustain the future population's needs because of the current practices. Therefore, environmental awareness is acquiring knowledge about the impact of human behavior on natural resources, considering the needs of the current population. Similarly, ecological awareness is critical since it changes individual attitudes and behaviors to solve waste problems.

Although waste management is a global issue, it requires changing personal values and attitudes to address the problem. However, individuals cannot behave responsibly without environmental awareness; hence, it helps to solve waste problems

in Japan since they lack knowledge on their responsibility toward waste management (Mulyadi, 2020). As a result, it directly and indirectly, affects human survival. The world will not sustain the growing population if the authorities cannot prevent and control human activities through awareness. Therefore, environmental awareness is the fundamental step toward solving issues, such as waste management, that eventually influence ecological sustainability.

The authors organize the article into four sections, including introduction, methodology, literature review and discussion. The study is meaningful to various stakeholders, including the government, non-governmental organizations, and individuals. The findings help understand and develop appropriate environmental awareness programs and education to change individual attitudes toward waste management (Mezghenni and Zouari, 2016). Therefore, the study's purpose of the study is to investigate the impact of environmental awareness in solving ecological problems.

The research investigates the impact of the Japanese's attitude to waste management on the environment. Environmental awareness influences individual attitudes and behaviors toward the environment; hence, the need to promote education. Although the government and non-governmental organizations are responsible for implementing measures to address environmental challenges, individual responsibility is paramount (Miyake, 2004). The institutions must change personal attitudes and instill commitment among communities to support government efforts to address the waste problem. Through this awareness, Japan will realize the United Nations' sustainable development goals. On the same note, the government will conserve its natural resources from exploitation, enhancing sustainability.

Materials and Methods

The study investigates environmental awareness toward waste attitude and management in Japan. Policymakers will use the information to make informed decisions to change individual attitudes and awareness of environmental sustainability. The primary objective is to examine the contribution of educational awareness toward waste management through historical and cultural perspectives. In this regard, the following hypothesis "Environmental education and awareness helps in solving environmental issues in Japan" and research question guides the study process:

1. How does environmental awareness help in solving environmental problems in Japan?
2. What is the extent of environmental awareness in Japan?
3. How can the government and environmental agencies improve education and awareness in Japan?

The authors completed the investigation in five stages: the first step was identifying a research topic and title, which is to investigate how environmental awareness and attitude solve environmental challenges in Japan. Establishing a coherent and realistic research title influences research questions formulation, thus defining the effectiveness of subsequent research steps (Jien et al., 2019). Preliminary research was the second step and this involved validating the ideas and establishing the research protocol based on the components of the research question. At this stage, the authors identified the research method and search strategy. Thirdly, the authors conducted a preliminary review in form of a literature review to understand other scholars' arguments regarding how environmental awareness and education solve environmental and sustainability problems in Japan. The fourth step was presenting and discussing the results focusing on the research objective. The step was crucial in completing the investigation since it critically analyzed how environmental awareness contributes to solving environmental challenges in Japan (Jien et al., 2019). The last stage was discussing the findings and recommending strategies to solve the challenges. Eventually, the report summarized the findings in the conclusion section.

Secondary research is the method applied in this investigation. The study does not collect primary data but relies on existing information to explore the research title, focusing on research objectives. Specifically, the research adopted a systematic literature review to answer the research questions and deliver project outcomes (Williams, 2007).

The authors presented the results in narration form and critical analysis. Most importantly, the discussion section provides a detailed examination of the results to determine the relationship between environmental awareness and solutions to challenges in Japan with specific reference to waste management. Fundamentally, the authors used the content analysis method to assess the results and conclusions. Content analysis is the most appropriate method for this investigation since it uses qualitative study (Chee and Tan, 2017). Additionally, the method helps to incorporate historical and cultural insights into the investigation. In this context, the authors investigate historical and cultural components of environmental

awareness in Japan, how it has changed, and future implications. Therefore, content analysis is the most appropriate analysis method for this investigation.

Literature Review

Environmental awareness has been expanding worldwide because climate change affects all people. Governments and non-governmental organizations encourage people and communities to engage in sustainable practices to preserve the environment (Mitsuyuki, 2017). Environmental protection is a collective responsibility engaging all stakeholders. Statistics indicate that more people are increasingly becoming aware of their environment and are taking measures to address challenges. According to Statista (2022), 77.9% of shoppers try not to purchase plastic bags, while 70% are careful not to waste food. Additionally, 64.1% said they engage in the best practices to save energy, while 47% stated environmental awareness has increased steadily in the last few years (Statista, 2022). 42.5% said they want to use materials and places that consider the environment and its sustainability. Figure 1 shows environmental awareness statistics in Japan:

The findings indicate that many people are increasingly becoming aware of their environment and are willing to implement the best practices to address the challenges. However, the government is responsible for taking appropriate actions and encouraging local communities to uphold the best methods to address environmental challenges (Mitsuyuki, 2017). For example, they should engage in environmental conservation policies, including waste minimization. However, the Japanese government cannot achieve this without promoting public education to ensure everyone understands their contribution to the environment.

Japan is one of the leading economies worldwide due to its industrial development. However, the government has made progress in addressing the challenges through awareness and engaging different stakeholders in implementing sustainable strategies. Waste management is one of the greatest environmental challenges in Japan (McCloy, 2019). It remains the most significant challenge considering the amount of waste produced and its disposal methods. The country disposes of about 2/3 of its waste using industrial incinerators (McCloy, 2019). Although the technique reduces waste on land, it increases atmospheric pollution due to its dioxin components. The trash level in the country is the biggest threat to environmental protection.

Conversely, burning them poses more problems. Inadequate waste management in the country leads to various challenges, including landfill scarcity

and illegal dumping (Mitsuyuki, 2017). Therefore, environmental agencies should collaborate with nongovernmental agencies to address the problem.

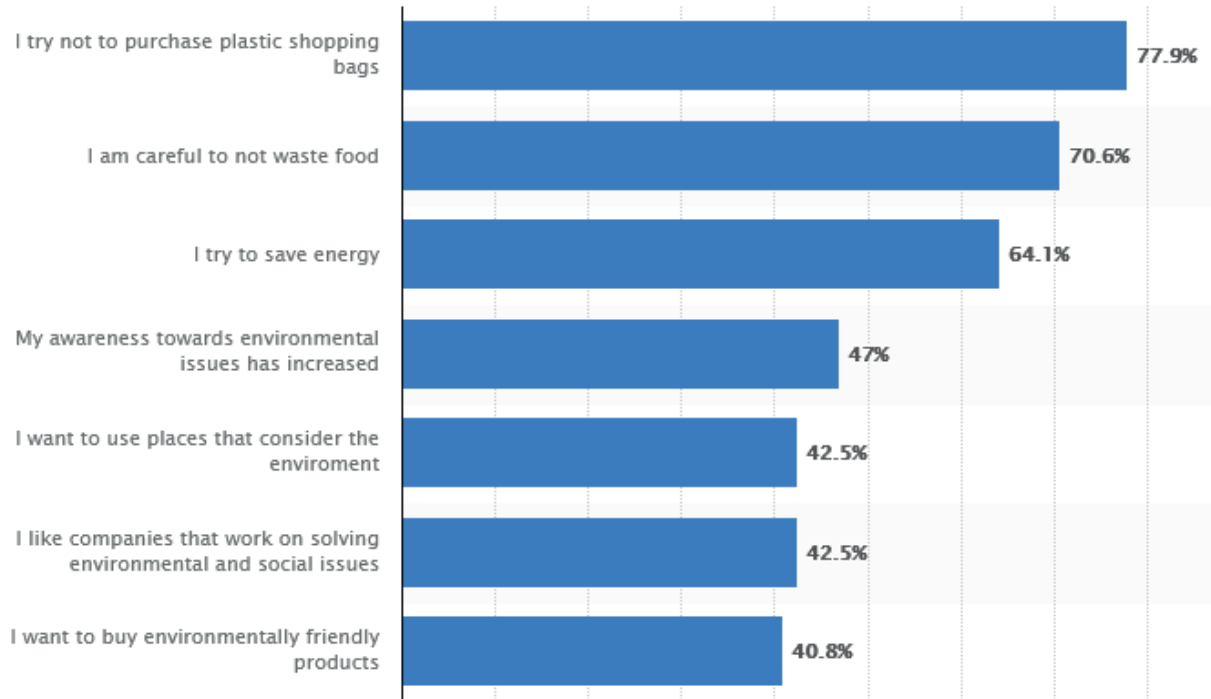


Figure 1 – Environmental Awareness Statistics in Japan (Klein, 2022)

Waste pollution is one of the persistent problems in Japan contributes to environmental issues. Although the government has implemented various policies and programs to address the problem, it has not solved the problems. The increasing challenges involved in managing waste continue to pose challenges to ecosystems, including human health (Luk, 2021). Modernization is one of the primary factors causing the problem in Japan. Being one of the developed economies, the government should implement appropriate policies and regulations to manage waste for sustainability. According to Mezghenni and Zouari (2016), population growth and modernization contribute to increased waste production, although many households hardly engage in the best practices. Modernization is associated with rapid waste composition, implying that the government should develop appropriate policies to address the challenges to sustain the growing population and economic development. Failing to solve the problem will not sustain economic growth.

Fundamentally, waste management skyrocketed in the 20th century, following industrial growth (Luk, 2021). Waste produced in Japan has increased by 35 million tons in the last 20 years (Luk, 2021). The most common types of waste generated include construction, manufacturing, and household. Tokyo's 23 wards generate more than 3 million tons of municipal waste annually with more than 70% coming from households and the remaining 30% coming from other sectors, including the business sector (Luk, 2021). Although waste has reduced significantly after the 21st century, the government should collaborate with different partners to address the problem since it persists due to economic growth and development. Waste management is a collaborative responsibility that requires all stakeholders to change their perceptions (Perron et al., 2006).

Japanese shopping culture emphasizes packaging importance implying that manufacturers should empower communities and households to employ the best practices to address the problem (Luk,

2021). Since the COVID-19 pandemic, household waste production increased steadily, while industrial waste decreased since many businesses slowed down their operations during the pandemic. As a result, the government should collaborate with nongovernmental agencies to implement policies and programs to address the challenge. The programs should focus on reducing household waste, which is the biggest problem in the country. Notably, Japan is part of the Kyoto Protocol, implying that it is under obligation to implement strategies to reduce greenhouse gas emissions to about 6% of what it used to emit in the 1990s (McCloy, 2019). Japan is the fifth-largest emitter of greenhouse gases. On the same note, Japan is known to have beautiful coral reefs. For example, Sekisei lagoon is known to be a tropical paradise with more than 400 different types of corals. Japanese environment ministry reported that more than 70% of coral reef had been destroyed (McCloy, 2019). Environmental challenges include radio waste from nuclear plants, fishery, and whaling, and urban planning.

Japanese total waste production stood at 437 million tons in 2014 (Amemiya, 2018). Industrial waste accounted for 89.9%, while municipal waste accounted for 10.1% (Amemiya, 2018). The country recycles some of the waste while others end up in landfills. Japan's current home disposal strategy is not sustainable in the long run because it is inconvenient and many households are not aware of their roles and responsibilities (Tsukui et al., 2015). Since the government cannot control mass consumption and production, the best way to handle the challenge is to use technology to recycle waste materials and encourage recycling.

Environmental education is one of the factors that influence sustainable acceleration toward sustainable development goals. Crossley-Baxter (2020) supported the findings that governments and nongovernmental organizations are working toward promoting awareness to change individual behaviors and values toward the environment. As one of the developed countries, it produces mass waste polluting the environment, and making the environment unsustainable if authorities cannot manage waste effectively. Additionally, the country records positive population growth, and Tokyo reached 3.75 million in 2019 (Ito and Igano, 2020). Its population growth and urban development contribute to the deteriorating environment.

The government works with other stakeholders, including developed countries to address the problem. For example, the government introduced

the G-20 program in 2003, aiming to reduce garbage by 30% by 2010 (Ito and Igano, 2020). Although the program improved waste management, the problem persists because of industrial development. However, Tokyo reduced waste by 43% during the period (Ito and Igano, 2020). Despite the progress, the government should embark on educational awareness to improve responsiveness among communities and households to uphold the best practices to address environmental challenges.

The Japanese government and environmental companies are working toward improving environmental awareness. However, it is impossible to achieve environmental awareness without building a responsibility culture. In this regard, Japan introduced an eco-picture diaries program, aiming to raise environmental awareness among students and communities, empowering them with information to make appropriate decisions to manage waste. Recycle Design introduced the program in 2000 and 250,000 students enrolled in the program between 2001 and 2018 (Ito and Igano, 2020). Although the program focused on reducing, recycling, and reusing strategy, it expanded its scope to reducing the emission of greenhouse gases (Ito and Igano, 2020). The findings indicate that environmental awareness is essential to addressing environmental challenges. The best way to change an individual's behavior is by changing their mindset. With the program, children grow as responsible citizens.

Environmental responsibility is the right of every individual in society. Creating awareness and environmental education influences individual attitudes toward the environment. The Japanese government introduced the eco-picture diary and incorporates it into the education system to address climate change issues by changing individual behaviors and attitudes. McCloy (2019) supported the findings that the government should partner with nongovernmental organizations to create environmental awareness through government-sponsored programs. The programs influence people's attitude and behavior toward waste management. Notably, eco-picture diary program focused on empowering communities to change their attitudes and behaviors by engaging them in planning and implementing environmental sustainability policies and programs. According to the Ministry of the Environment (n.d), waste management requires collaboration with the private sector, including household responsibilities to minimize waste. Consequently, environmental awareness is vital to sustainability.

The place-based strategies programs allow citizens to interact with the environment to develop a belonging sense, linking communities and the environment (Iwasaki, 2022). The place-based program nurtures students and communities to emotionally connect with the environment, implying that they make responsible decisions. Eventually, it fosters environmental citizenship. Since its implementation, many people have changed their attitude toward the environment due to emotional connectedness. However, various agencies and institutions should mobilize more resources to overcome to address environmental complexities.

According to Kodama (2017), environmental education in Japan is becoming mandatory with the introduction of environmental education in schools. The education viewpoint is to change individual values and attitudes toward the environment. Climate change and environmental sustainability are deeply rooted in available systems and policies, implying that the government should embed them in the education system. Moral education includes environmental conservation, making students become responsible citizens (Iwasaki, 2022). In this regard, environmental education is top-notch with the introduction of various measures and policies to change individual values. Nevertheless, the government should create online platforms where people interact and learn about environmental and moral values and network with local and international organizations to support sustainability programs (Perron et al., 2006). Therefore, environmental education in Japan is becoming mandatory for all students and communities since the government will not achieve its environmental goals without building partnerships.

Despite the government's efforts to create environmental awareness, it must be aware of some reforms needed to make them effective. Solving environmental issues means that educators should understand the educational reforms needed to formulate appropriate programs in line with environmental trends (Iwasaki, 2022). It implies that they must partner with environmental experts to educate them about the necessary reforms to tackle climate change. Also, they must develop realistic environmental problem definitions and ensure all stakeholders understand it intends to solve environmental problems through education (Mulyadi, 2020). In this regard, the business environment requires the integration of various stakeholders and allocate mobilize more resources to address the challenges.

Results and Discussion

Waste management and climate change issues have a long history in Japan. It implies that the problem has persisted in the country for many years in line with economic growth, industrialization, and globalization. Although the problem has a long history, it has evolved with time, implying that the government and environmental organizations are working toward solving the problem. The government enacted Public Cleaning Act in 1954 to solve waste management issues in Japan and maintain a clean and healthy living environment (JESC, 2014). However, the amount of waste produced increased steadily since the 1960s due to economic growth and industrialization, prompting the government to enact an Act on Emergency measures influencing the development of living environment facilities.

On the other hand, waste generation increased in the 1990s due to the industrial revolution, population, and economic growth (JESC, 2014). Major issues during the period include waste generation and the developing of recycling systems to address the problem. However, the government could not achieve environmental goals and objectives without public education to change individual behaviors. As a result, the government introduced the 3Rs (recycle, reduce, reuse) and public awareness in the 2000s to change the individual attitudes toward the environment (JESC, 2014). The government enacted various policies and regulations, including Construction Recycling Act 2000, the Food Recycling Act 2000, and the Revision of the Waste Management Act 2000 (JESC, 2014). The statistics indicate that environmental awareness has a long history and many people are aware of their rights toward the environment. Stakeholders in different sectors, including construction and households are aware of the environment because of government efforts to create awareness and engage different stakeholders to solve the problem.

The enactment of environmental policies and programs in Japan indicates that the country is on the right track to solving the problem. Culturally, Japan is one of the countries where consumers value packaging, implying that manufacturers use appropriate and recyclable packaging materials to entice consumers (JESC, 2014). Its culture indicates that the country is environmental-conscious with the enactment of environmental policies and programs. Additionally, the presence of national heritage sites and cultural activities indicates that Japanese culture is rich in environmental consciousness. Japanese

people recognize and appreciate the presence of life in nature from different backgrounds, including the presence of freshwater and natural habitats. Culture is essential since it supports efforts to conserve the environment (JESC, 2014). However, environmental challenges keep evolving, implying that the government and non-governmental organizations integrate their resources and knowledge to counter the problem. For example, the government should empower environmental organizations to enhance public awareness and participate in developing environmental programs in schools.

On the same note, Japanese culture encourages people to respect the environment by taking appropriate measures to address the challenges through the *mottainai* concept. *Mottainai* is a Japanese Buddhist name that means respect for the environment by maximizing available resources and heaving responsibly (Crossley-Baxter, 2020). The concept has been detrimental in addressing environmental challenges in Japan since it builds a responsibility culture. Fundamentally, culture represents the meaningful connection between people, items, and natural resources. The culture encourages and motivates people to look beyond through-away culture and treat each item independently. With the culture, people and communities use items and natural resources respectfully on top of recycling, reusing, and reducing.

Considering the current environmental challenges, Japanese people are using the *mottainai* concept to address the waste problem in Japan. For example, many consumers are aware of the effectiveness of packaging materials in conserving and polluting the environment. For example, they buy products with recyclable packaging materials. Fundamentally, the culture creates a responsible and positive culture where people make informed decisions. The culture is appropriate for addressing environmental challenges by managing waste (Crossley-Baxter, 2020). Worth noting is that Japan is the second-largest plastic waste producer globally. However, its culture helps to reduce wastage through reusing. The culture's prevalence in Japan is one of the powerful environmental conservation tools. Therefore, the country has a positive attitude toward the environment and this helps to solve current problems.

On the other hand, Japanese fans received overwhelming support and praise in the 2022 World Cup for cleaning the stadium after a match (Adil, 2022). Their culture seems to be uniquely embedded into their behavior, showing how responsible they are toward the environment. It increasingly becomes

common that Japanese fans remind behind to clean the stadium by taking off disposable waste, including plastic bags. Japanese media did not cover the incident comprehensively because it is a normal culture (Adil, 2022). However, the gesture received massive coverage globally due to its unique culture. It shows that the country's culture is responsive. It is appropriate since Japan is the second-largest producer of plastic waste. Therefore, culture positively influences efforts to address environmental changes.

Community social responsibility is another cultural component influencing environmental attitudes in Japan. Japan's unique culture, such as cleaning the stadium is linked with traditional practices of teaching children morals, including responsible behavior (Powell and Cabello, 2019). It teaches children to be responsible from childhood, implying that they translate the action into adulthood. For example, students clean classrooms daily without supervision, implying that they conserve the environment through responsible behavior. The culture empowers communities and individuals to clean the environment and reduce wastage. For example, they buy materials packaged with recyclable materials, compelling manufacturers to employ the best practices.

Education has been detrimental to addressing environmental challenges in Japan. Although the government has consistently implemented strategies to contain the problem it keeps evolving, implying that the government should upscale its efforts by integrating the policies into the education system (Mitsuyuki, 2017). Having realized that, the government introduced education for nature conservations education in learning institutions to change people's attitudes and ensure emotional attachment, making them responsible. Introduced in the 1960s, the program has been creating environmental awareness ensuring people behave responsibly (Mitsuyuki, 2017). The program encourages people to be responsible and love nature by changing their lifestyle behaviors. Although the initial focus was landscape conservation, it expanded its scope to conserving ecosystems through effective waste management. The idea has expanded profoundly and currently; it includes outdoor education.

Since the 1960s, Japan held many environmental meetings in many places, aiming to consolidate strategies and resources to contain the problem. The primary objective of the program was to enhance environmental awareness whereby communities and people learn through nature experience. Many

scholars consider the education for environment as consummator education since it did not have express social aims and programs to address environmental problems (Mitsuyuki, 2017). From the educational context, communities and students in Japan are aware of the ecological roles and responsibilities due to public education. Although it has not achieved its goals and objectives, it was one of the pioneer environmental programs promoting public education. Additionally, it has changed the attitude of many citizens toward the environment, making them responsible for their actions.

Introducing the education department introduced eco-picture diaries to transform the environment through education. The program raises environmental awareness through education to change the attitude of children, their family members, and other stakeholders toward the environment. Introduced in 2000, more than 250,000 learners participated in the program (Ito and Igano, 2020). In recent years, more than 20,000 students from almost 300 schools submit their diaries annually (Ito and Igano, 2020). Figure 2 demonstrates the number of students enrolled in eco-diaries.

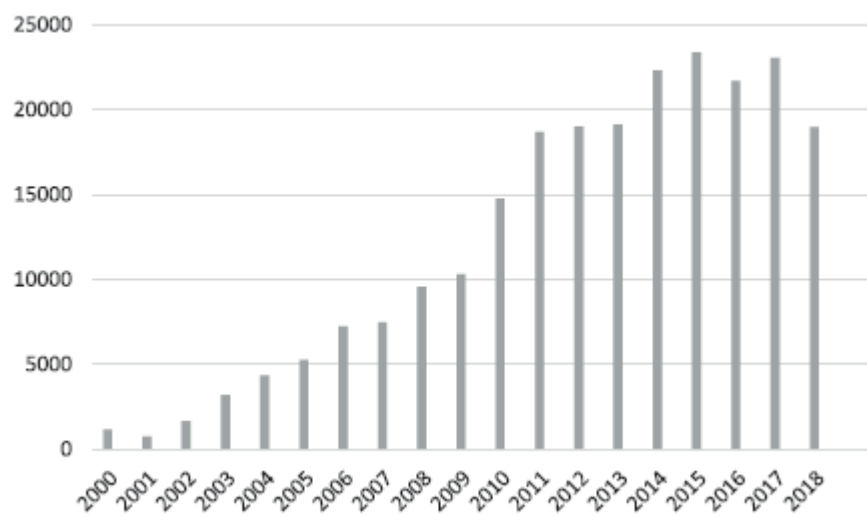


Figure 2 – Number of Students Who Participated in Eco-Diaries (Ito and Igano, 2020)

On the other hand, the eco-picture diary is another program, improves and integrates environmental education in society. The program focuses on sustainable development practices in societies. The program is unique since it enables people to interact with communities and develop a belonging sense. Environmental education focuses on experiences connecting communities with the environment (Iwasaki, 2022). Understandably, community actions are more effective than individual efforts since climate change is a collective responsibility. It shows that the Japanese education system is critical to addressing climate change by building a responsible society where all individuals behave responsibly. Since the government cannot monitor all citizens and ensure they behave responsibly, creating a responsible culture is critical since it influences it cultivates the principle of collaborative working and decision-making (Iwasaki, 2022).

However, the government through the education department should integrate environmental experts into the education system to help in formulating realistic environmental education programs.

Conclusion

The paper investigated the impact of environmental awareness to address environmental challenges with specific reference to waste management. Japan is one of the industrialized countries contributing to global environmental challenges. With the systematic literature review, the report found that many people in Japan are conscious of their environment; hence, they take appropriate measures and initiatives to protect the environment. Also, the study found that environmental awareness changes people's attitudes and values toward the environment. Japanese people educate their children

about the importance of conserving the environment and supporting government initiatives to solve the challenges. However, conserving the environment is not an individual responsibility. As a result, public education programs influence individual behaviors toward the environment. The government

through the trade department should regulate their consumption of non-renewable products and materials to minimize waste production. Also, enhancing educational programs improves people's response to sustainability challenges by promoting responsible behavior.

References

- Adil, H. (2022). *Japan fans win praise for stadium cleaning at World Cup 2022*. Al-jazeera. <https://www.aljazeera.com/sports/2022/11/24/japanese-fans-win-praise-for-stadium-cleaning-at-world-cup-2022>
- Amemiya, T. (2018). Current state and trend of waste and recycling in Japan. *International Journal of Earth and Environmental Sciences*, 3(155), 1-11. DOI: <https://doi.org/10.15344/2456-351X/2018/155>
- Chee, W., and Tan, K. (2017). *Research methods: A practical guide for students and researchers*. World Scientific.
- Crossley-Baxter, L. (2020). *Japan's ancient way to save the planet*. BBC News. <https://www.bbc.com/travel/article/20200308-japans-ancient-way-to-save-the-planet>.
- Iwasaki, S. (2022). Effects of environmental education on young children's water-saving behaviors in Japan. *Sustainability*, 14(3382), 1-15. DOI: <https://doi.org/10.3390/su14063382>
- Ito, H., and Igano, C. (2020). Place-based environmental education to promote Eco initiatives: the case of Yokohama, Japan. *Regional Studies, Regional Science*, 7(1), 292-308. DOI: <https://doi.org/10.1080/21681376.2020.1794950>
- JESC (Japan Environmental Sanitation Center). (2014). *History and Current State of Waste Management in Japan*, 32.
- Jien, T, N., Ahmed, A., and Huy, N. (2019). A step by step guide for conducting a systematic review and meta-analysis with simulation data. *Tropical Medicine and Health*, 47(46), 1-9. DOI: <https://doi.org/10.1186/s41182-019-0165-6>
- Klein, C. (2022). *Environmental awareness and leading efforts to be environmentally friendly Japan 2022*. Statista. <https://www.statista.com/statistics/1313249/japan-environmental-awareness-leading-efforts-be-environment>
- Kodama, T. (2017). Environmental education in formal education in Japan. *Japanese Journal of Environmental Education*, 26, 1-6.
- Luk, K. (2021). *How strict waste management in Japan alleviated its environmental impact*. <https://earth.org/japan-waste-management/>
- McCloy, J. (2019). *6 key environmental issues in Japan you should know*. <https://greencoast.org/environmental-issues-in-japan/>
- Mezghenni, R., and Zouari, S. (2016). Concern for the environment in terms of waste sorting behavior: concepts and profiles. *Sage Open*, 1-8. DOI: <https://doi.org/10.1177/2158244016657140>
- Miyake, H. (2004). *Public participation in environmental education. Prospects of Asian countries through Japanese experience*. Proceedings of Kitakyushu Initiative Seminar on Public Participation, Kitakyushu.
- Mitsuyuki, I. (2017). *Beyond the limitations of environmental education in Japan*. Educational Studies in Japan: International Yearbook, 11, 3-14.
- Mulyadi, B. (2020). ENIS model of environmental education for elementary school students in Japan. *E3S Web of Conferences*, 202, 1-7.
- Perron, G., Cote, R., Duffy, J. (2006). Improving environmental awareness training in business. *Journal of Cleaner Production*, 14(6), 551-562. DOI: <https://doi.org/10.1016/j.jclepro.2005.07.006>
- Powell, S.J., and Cabello, A.M. (2019). What Japan can teach us about cleanliness. <https://www.bbc.com/travel/article/20191006-what-japan-can-teach-us-about-cleanliness>
- Tsukui, M., Kagawa, S., and Kondo, Y. (2015). Measuring the waste footprint of cities in Japan: an interregional waste input-output analysis. *Journal of Economic Structures*, 4(18), 1-24. DOI: <https://doi.org/10.1186/s40008-015-0027-2>
- UN. (September, 2015). *United Nations Summit on Sustainable Development*. New York. <https://www.un.org/en/conferences/environment/newyork2015>
- Williams, C. (2007). Research methods. *Journal of Business and Economic Research*, 5(3), 1-8. DOI: <https://doi.org/10.19030/jber.v5i3.2532>