

Mitigating Climate Change: A Study of the University of the South Pacific and the State University of Malang

Ravinesh Rohit Prasad¹

¹*Fiji National University, Fiji, ORCID ID: 0000-0002-5006-1173*

ABSTRACT

One of the most pressing problems for today's global community is climate change and its impact on human health and well-being. Education for the youth is one of the most effective tools to combat the destructive potential impacts of climate change. This study aims to investigate the student's actions towards climate change mitigation, identify student activities aimed at climate change mitigation and explore the obstacles faced by students at the State University of Malang, and The University of the South Pacific. A qualitative approach was used to gather data on students' actions towards climate change mitigation. This paper uses the case study method to examine students' actions towards climate change mitigation at two different student organizations at The University of the South Pacific, Fiji, and the State University of Malang, Indonesia. The data was collected using in-depth interviews, observation, and documentation. The results showed that the actions of students at the State University of Malang are centered around on-campus activities while students at The University of the South Pacific boast broader participation such as policy-making. Barriers to climate change mitigation at both Universities include lack of funds, information, involvement, insufficient time, and seriousness towards climate change mitigation.

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Introduction

Climate change activism transpires in numerous spaces, with people and gatherings seeking after various techniques, stretching from customary sorted-out practices to moderately new online inclusion. As indicated by Jessica. E. McLean and Sara Fuller (2016), there are numerous avenues where environmental change activism and engagements can happen. These include 1) "Organized spaces of environmental change activism," 2) "the emergence and implications of climate activism in digital spaces," and 3) "With(out) organization-organic, spontaneous networks". Climate activism is presently an enormous and different development worldwide, as indicated by the Global Climate March in November 2015 before the Paris COP21 gathering. More than 2,300 processions were booked worldwide in more than 175 nations comprising more than 785,000 individuals (McLean & Fuller, 2016). Similarly, in Fiji, students from the Econesian Society held a parade to create awareness of climate change. In contrast, the emergence and implications of climate activism in the digital space are prevalent at the State University of Malang, where members of the HMJ Geography and Jonggriing Salaka Student Association (2019) created a Facebook page as a medium for sharing information about climate change. This serves as an educational tool for awareness-raising on climate change issues.

The Director-General of Higher Education of Indonesia, Professor Fasli Jalal, stated that education is one of the strategic doors in responding to climate change, as well as the main pillar of climate change adaptation for the younger generation (Marwati, 2010). According to the Head of the Indonesian Center for Curriculum and Bookkeeping of the Ministry of Education and Culture

(Ministry of National Education, 2011), the issue of climate change will be integrated into the national education curriculum. The goal is for students to understand and know about whether and how it impacts life. Education in schools can provide awareness to students about the threats of climate change, the consequences of which have resulted in increased flooding, droughts, and landslides. The inclusion of climate change in the 2013 curriculum hoped that the younger generation understands the causes of climate change and its impacts on the environment (Ministry of National Education, 2011).

Moreover, the Fiji government's verdict to incorporate climate change issues in the primary, secondary, and tertiary training educational program is envisioned to generate prominent consciousness and contribution to diminish and adjust to this universal occurrence. This was uncovered after Fiji engaged in a Memorandum of Understanding with the German Society for International Cooperation, subsidizing the amalgamation of the climate change syllabus into the educational program. According to Saipora Mataikabara (Permanent Secretary for the Ministry of Foreign Affairs and International Cooperation), the Ministry of Education has affirmed a work plan intended to support the Education and Training program's execution in Fiji alongside several Pacific nations (The Fiji Government, 2012). These nations are at the forefront of climate change and worldwide weather warming. This initiative involves reviewing and updating primary, secondary, and tertiary curricula, as well as vocational education courses, to ensure that local, reliable, and up-to-date climate change information is included, as well as encouraging and involving student research on climate change issues. (Bulu, 2013). On campus, the forms of student-led projects vary greatly and can be implemented in a variety of ways. Students can participate in these initiatives in a variety of ways, such as being leaders or volunteers in an on-campus club, coordinating or participating in a multi-stakeholder committee, engaging their student union or association and/or serving as a leader within it, initiating campus climate-related coursework with a faculty member, working with an administrative or student union sustainability office, or initiating campus climate-related coursework with a faculty member. These various roles can collide and create new opportunities – for example, a student may meet a supportive faculty member through a multi-stakeholder committee and then conduct an independent study in coursework supervised by that faculty member to evaluate the campus. Faculty, staff, and administrators play an important role in providing resources for students and promoting student-led initiatives, in addition to students creating their own on-campus positions. These more permanent members of the campus community will play a key role in institutionalizing the student-led initiative and ensuring that it survives student turnover (Helferty & Clarke, 2009).

Since the planet we live on faces serious environmental problems, it is becoming increasingly important to educate citizens to be environmentally literate. As a result, environmental education (EE) has been added to curricula from early grades to higher grades of education (Saribas et al., 2016). The main objectives for environmental education and their respective actions are awareness, knowledge, skills, and participation (Hassan & Pudín, 2011). According to Anderson (2010), relevant content knowledge, critical thinking skills, safe and adaptive schools, and green schools can help education systems build the capacity to integrate risk reduction while also providing learners with the knowledge base and critical thinking skills to help shape and sustain future action and policymaking on climate change and other uncertainties. Education has been identified as a cost-effective and ethical strategy to addressing climate change and promoting sustainable development (UNICEF, 2012). Climate change comes at a high price in terms of both human and economic damage. Through its multiplier impact, integrating Climate change into the entire educational system is one of the most effective and cost-effective ways to address the climate catastrophe. Education has the potential to play a significant role in strengthening 'bottom-up' solutions to Climate change that cannot be addressed by 'elites.' When individuals share what they have learned, the multiplier effect of education benefits entire families and communities. Because the knowledge learners gain about Climate change adaptation and mitigation may be passed on to others and future generations, education provides a long-term source of local capacity and solutions. Citizens are better equipped to participate in civil society and influence decision-making in areas that concern them once they are informed, especially at the local level (Mochizuki & Bryan, 2015). Feinstein and Mach (2019) stated

that education has three roles in climate change adaptation: (1) protecting and deploying education infrastructure to reduce vulnerability and build resilience, (2) improving general education to improve adaptive capacity, and (3) using adaptation learning support to prepare for and maximize learning in adaptation practices. Education infrastructure, defined as a socio-ecological system's ability to bounce back or reorganize after a disturbance while maintaining its core functions and capacity for future transformation, is a major societal investment that can exaggerate vulnerability or increase resilience, defined here as a socio-ecological system's capacity to bounce back or reorganize after a disturbance while maintaining its core functions and capacity for future transformation (Feinstein & Mach, 2019).

According to research on sustainable development, bettering schools boosts adaptive capacity and the ability to adapt to climate change by reducing damages, seizing opportunities, and dealing with the consequences (Intergovernmental Panel on Climate Change [IPCC], 2014). These studies concentrate on the adaptation-related benefits of enhancing general education, as measured by basic literacy and total school years, rather than climate change-specific education (Lutz et al., 2014). Improved general education minimizes multi-dimensional vulnerability and promotes proactive risk mitigation and disaster recovery on shorter timescales (Frankenberg et al., 2013; UNICEF, 2012). The sustainability approach in education has also been discussed at the international level in an effort to increase public awareness of the need for environmental care in solving present global problems such as climate change, and sometimes education is both parts of the problem and the solution (Mahat et al., 2020). The ability of education to help people prepare for and learn from climate effects is its greatest potential contribution to effective climate change adaptation. Albright and Crow (2015), Chaffin et al. (2016), and Sakurai et al. (2018) describe learning as a result of adaptation or disaster response activities. Societies do, in fact, learn from their experiences with climate change consequences.

Colleges and universities are at the forefront of climate mitigation. Through the American College and University Presidents' Climate Commitment (ACUPCC), more than 665 foundations have vowed to chase climate impartiality in their maneuvers and deliver the education, research, and civic rendezvous desired for the rest of the society. Until this point in time, more than 600 ACUPCC foundations have openly revealed their ozone-harming substance inventories, and more than 400 have announced their climate action plans. In the last 5-10 years, there has been a perfect drift in the higher education sector of sustainability moving from the domain of discrete, secluded projects to that of a center, dynamic necessity for schools and colleges concerning (1) training and preparation; (2) investigation; (3) community engagement; and (4) campus procedures. (Presidents' Climate Commitment American College & University, 2011). Fortunately, some universities are engaging in efforts to contribute to sustainable development. In many cases, they are doing this by recognizing that they educate future societal leaders, decision-makers, and intellectuals. Still, they should be learning organizations and practice sustainability in their education, research, outreach, and campus facilities management (Ferrer-Balas et al., 2010).

Without question, universities are making considerable efforts to address climate change by incorporating the issue into educational programs and research. Universities alter academic curricula, create research centers, and provide funding for research teams. Addressing climate change through campus greening is another popular activity. The following is a compilation of several climate action experiences in universities from various realities. In China, Shenyang University has implemented several initiatives aimed at improving environmental performance, raising public awareness, and lowering campus maintenance costs. These initiatives include water recycling, ground source heat pumps, source separation for solid wastes, green education, and increased research on environmental protection (Geng et al., 2013).

The American College is another example of university cooperation on climate change and ACUPCC, which was founded in 2006 as a collaborative effort by higher education institutions (HEI) to achieve climate neutrality in campus operations and integrate climate issues into their education, research, and community engagement activities (Dyer & Dyer, 2017). In 2015, 318 colleges and institutions (including Harvard University, Massachusetts Institute of Technology, and Yale

University) signed the President Obama Administration's American Campuses Act on Climate Pledge (Filho et al., 2019). Universities that signed the pledge showed their support for intense international climate action and hastened the transition to low-carbon energy while also boosting sustainable and resilient practices on campus. Investment in competitions and activities encourages people to take action on climate change (Senbel et al., 2014). The Campus Conservation Nationals, for example, is the world's largest short-term electricity reduction competition, with more than 130 universities and colleges competing in 2015. Cornell University has launched the Cornell Climate Change Program Work Team (PWT), which connects faculty and extension educators with stakeholders to identify needs related to climate change impacts and opportunities in New York State, develop educational materials, and create learning experiences that address these needs (Cornell University, 2017).

The University of Winchester in England announced a Climate Change Education Five-Year Strategy for 2016–2021. The paper contains objectives, strategic priorities, and methods for achieving them. Embedded Education, Research, Shared Vision, and Strong Partnerships are the four strategic priority areas identified by the university. It aims to make climate change education accessible, relevant, and available to all undergraduates, regardless of their major; to build a Research Centre for Climate Change Education and Communications; and to offer a fully supported Ph.D. studentship in the field (University of Winchester, 2016). The Universities and Colleges Climate Commitment for Scotland (UCCCFs) established a framework for universities and colleges to demonstrate their commitment to reducing carbon emissions and combating climate change. Signatories create and publish a five-year Climate Change Action Plan (CCAP) that will be integrated into existing improvement processes to achieve significant emissions reductions (Universities and Colleges Climate Commitment for Scotland, 2017). The Hamburg University of Applied Sciences Research and Transfer Centre "Sustainable Development and Climate Change Management" performs multidisciplinary research and hosts various climate change adaptation training activities. It also manages the International Climate Change Information Programme, a key supplier of climate change education and training with a variety of events held worldwide (ICCIRP, 2019).

Although some experts admit that African universities' potential to address climate change isn't being fully realized, the four-day forum "Education, Capacity Building, and Climate Change: A Strategy for Collective Action in Africa," organized by the International START Secretariat and held in Salaam in June 2010, was one example of a successful climate change-related initiative. Participants in the Forum indicated several areas in which short- and long-term activities may be taken to improve curricula development (Padgham et al., 2013). Another project is the Southern African Universities Association (SARUA) and member universities' Programme for Climate Change Capacity Development (PCCCD), which was launched in 2010. The initiative is a direct response to the adverse effects of climate change in southern Africa. Seven universities formed a consortium to design a regional master's program in climate change and sustainable development based on the ideas of inter- and trans-disciplinary learning, relevance, new knowledge, and innovation (SARUA, 2017).

The United Nations Framework Convention on Climate Change (UNFCCC) and The Constituency of Non-Government Youth Organizations (YOUNGO) have formed a dynamic youth activist system. Young people make their voices heard and effectively augment climate change strategies at the UNFCCC meeting. The Constituency of Non-Government Youth Organizations (YOUNGO) made official expressions, gave specialized and input approaches to arranging gatherings, and steered with decision-makers through elevated levels of gatherings and casual courses of action expanded cognizance through different support exercises. Youth cooperation has brought moral, intergenerational, and parity-centered qualities and positive practical and course of action for consultations (United Nations Joint Framework Initiative on Children, Youth, and Climate Change, 2013). This paper addresses three research questions:

- (1) What is the role of education in climate change adaptation and mitigation?
- (2) What are the roles of university students' in climate change adaptation and mitigation?
- (3) What are the limiting factors that affect climate change action at the university level?

Methods

Research Design

Four students' organizations aimed at environmental conservation, namely Econesian Society and Wantok Moana from the University of the South Pacific, Fiji, and Jonggring Salaka and HMJ Geography from the State University of Malang, Indonesia, were chosen for this study to identify the behavior of university students towards climate change adaptation and mitigation. Using a series of guiding questions that are commonly used in decision-making policy connected to climate change, the focus group approach was chosen to investigate interrelationships within the group about the respondents' activities on certain issues (Peterson, 2004).

This study uses a qualitative multicase-study approach to understand the similarities and differences between the students' actions towards climate change adaptation and mitigation at the University of the South Pacific in Suva, Fiji, and the State University of Malang in Indonesia. The data in this study consists of the results of the field survey conducted in June-November 2017. The data are gathered from existing statistical data, observations, structured interviews, and documentation. The triangulation technique was used to maintain the validity of the findings. Observation and in-depth interviews were the two main data collection techniques in this study. To enhance the validity and reliability of the results, data from observations and interviews were elaborated. The data are compared with the existing documents to improve their validity.

This research used a case study approach since case studies usually analyze all variables' interactions to provide a full understanding of an event/situation (Colorado State University, 2009). Researchers have previously presented findings on climate change risk perception using a case study approach (Vedwan & Rhoades, 2001; Grothmann & Patt, 2005). The case study area (The University of the South Pacific and the State University of Malang) was chosen for this study based on several factors. The length of the survey, the location of the site, and the area's accessibility were all considered. Various primary research techniques for data collection were used to make the case study possible. To begin with, the field research required a preliminary visit to examine the area and identify potential interview subjects. The study's intent was then explained to key informants over the phone, and a suitable date and time for an interview were set up. Several visits to the study area were made over a two-to-eight-week period to collect research data. Secondly, at both universities, sampling was used to choose a smaller portion of the total population. It was made certain that the racial composition of the sample was fairly distributed. Snowball sampling (Mack et al., 2005) was used on a few occasions. Participants were asked to refer the researcher to other people who would be ideal for the analysis.

Participants

Participants in the focus groups were chosen at random from a population that included a lecturer, a graduate assistant, and students ranging from first-year students to students in their final year (3rd year) of study at the University of the South Pacific. Students majoring in Geography, Land-use Planning, and Real Estate, as well as a climate change lecturer and a graduate assistant in Marine Science, were among the Econesian Society respondents. Respondents from Wantok Moana, on the other hand, were Bachelor of Science students majoring in Marine Science. Native Fijians, Fijians of Indian ancestry, and regional students from Vanuatu and the Solomon Islands were among the respondents. The responders from the two student organizations at the State University of Malang in Indonesia, on the other hand, ranged from first-year students to those in their fourth (final) year of study. Students in the Bachelor of Education degree majoring in Geography, History, or Economics, as well as students in the Bachelor of Engineering program, were among the responders. Local students from different islands in the Indonesian Archipelago served as respondents.

Data Collection Tools

Structured interviews with respondents who had time for a 30-45-minute interview were also performed. In this segment, open-ended questions were used to gather information about climate change and its adaptation and mitigation. The interviews used 10 open-ended questions that encouraged respondents to openly respond to the questions, allowing the interviewer to learn more about the respondents' perspectives on climate change and the adaptation and mitigation measures taken by the students' organizations at the two universities. Unstructured observations were made in order to gauge students' awareness and behavior towards environmental protection for climate change adaptation and mitigation. Since English and Bahasa Indonesia are the official languages in Fiji and Indonesia and the medium of instruction at universities, the interviews were conducted in English and Bahasa Indonesia. A smartphone was used to document the interviews. The recordings were then transcribed to make data processing easier. The content of the interviews was used to create themes, relationships between variables, and trends in the data, which were then analyzed to draw conclusions. The underlying significance of the interviews was determined by analyzing the quality of the interview transcript. Finally, the data was sorted and retrieved using the coding scheme.

During June-November 2017, field data and structured interviews were conducted at two student organizations at the State University of Malang, Indonesia, and two student organizations at the University of the South Pacific in Suva, Fiji. The interviews were conducted at Jongrring Salaka and Himpunan Mahasiswa Jurusan Geografi (State University of Malang), Econsian Society, and Wantok Moana (University of the South Pacific). Structured interviews were conducted in order to obtain information about the activities, programs, and roles of students towards climate change mitigation (Table 2). The interviews used open-ended questions that allowed the informants to freely answer the questions so that the interviewer could obtain more information about the informants' experiences related to the activities and actions related to climate change mitigation. The interviews were conducted in Bahasa Indonesia and English. The interviews were recorded with a smartphone.

Data Analysis

The recordings were transcribed in order to facilitate data analysis. The author used content analysis to analyze the data collected during the interviews. The interviews' data were analyzed to draw conclusions, which is by constructing the themes, relationship between variables, and patterns in the data based on the content. Analysis of the interview transcript's content was carried out to determine the underlying meaning of the interviews. Finally, the coding system was used to sort and retrieve data.

Findings or data can be declared valid in qualitative research if there are no differences between what was reported and what actually happened to the object under study. Data reality in qualitative research is not singular, but plural and depends on human construction, shaped in a person as a result of the mental processes of each individual with various backgrounds. Furthermore, reliability in qualitative research is different from quantitative research and it occurs because reality is multiple, dynamic, so that nothing is consistent and repetitive as before. In addition, the process of research reporting is idiosyncratic and individualistic, and different for each person. The data validity test in qualitative research includes internal validity (credibility), external validity (transferability), reliability (dependability), and objectivity (confirmability). Data validity and reliability of the test were carried out for the purpose of this research. In qualitative research, several analysis methods can be used, for example, phenomenology, hermeneutics, grounded theory, ethnography, phenomenography, and content analysis (Burnard, 1995). In contrast to qualitative research methods, qualitative content analysis is not linked to any particular science, and there are fewer rules to follow. Therefore, the risk of confusion in matters concerning philosophical concepts and discussions is reduced. During the entire process, the researcher must adhere to a qualitative perspective, and the main issue is to achieve the rigor and credibility that make the results as trustworthy as possible. However, in content analysis, different concepts of credibility can be chosen in the discussion of

trustworthiness. It is possible for the researcher to use the same concepts as in quantitative studies, an option that is not accepted when performing analysis using other qualitative methods (Long & Johnson, 2000).

Table 1

Survey Method at the State University of Malang and The University of the South Pacific

Organization	Jongrring Salaka	Himpunan Mahasiswa Jurusan Geografi	Econesian Society	Wantok Moana
Justification of surveyed organisations	-organisations aimed at environmental protection -nature loving students			
Technical survey approach	Secondary Data collection, structured interviews			
Data of survey (month/year)	June –November 2017			
Informants and their function	Mohammed Lukman (Head of organization) Virna Hariani (Member) Asty Aprelia (Head of Recruitment and Training) Arik Anggara (Member) Imam Aminudin (Vice Head)	Ahmad Sholihuddin (Head) Virna Hariani (Member) Aqilah Kusuma Wardhani (Member-talent group) Muhammad Al-Farisy (Member) Agustinus Slamet (Chairman of the Entrepreneurship Division)	Richard (Founding member) Kunal Singh (Member) Dr. Tammy Tabe (Founding Member)	Reapi Dilokoloko (Member) Joycinnette Botleg (Member) Knight Teison (Member)
Duration of interviews	20-30 minutes for members 30-60 minutes for Heads and Founding members			

Note. A total of sixteen informants, including the heads of the organizations, current and former members, were interviewed as shown by the table above. The members comprise nature-loving students who actively organize and participate in various activities and programs aimed at climate change adaptation and mitigation.

Table 2

Questions Asked during Structured Interviews

Questions	Rationale
Personal details (Name, Age, Education level, gender, rank in the organization, Membership details)	Socio-demographic
Students role in climate change adaptation and mitigation	Environmental knowledge
Motivating factors for climate change adaptation and mitigation	Source of Motivation (internal/external)
Realization of climate change (seriousness)	Value of environment
Individual contribution to climate change adaptation and mitigation	Self-realization
Effectiveness of individual contribution	Individual care
Improvements needed for climate change adaptation and mitigation	Self -evaluation

Note. Structured interviews were conducted to gather information about the respondents' socio-demographic background, their role towards environmental protection for climate change adaptation and mitigation, perception on the seriousness of climate change, individual contribution towards climate change adaptation and mitigation, sources of motivation, and efforts needed to improve on climate change adaptation and mitigation.

It was ensured that the interview questions collected data to answer all aims and objectives of the study. Participant behavior towards environment protection for climate change adaptation and mitigation was taken into consideration for this survey. The secondary sources of information are

mainly composed of archival research. These sources included books, government documents, conference papers, and reports from the University of the South Pacific library from both the general and Pacific collections. Online thesis collection of universities was also a useful resource in the compilation of this article. A wide range of environmental science journal articles was consulted for the review. Most of these were obtained from online databases. Finally, the World Wide Web was utilized to download essential reports and articles on the topic. The websites of various NGOs, both regional and international, were visited to obtain background to the issue.

Characteristics of Student Organizations for Environment Protection at UM and USP

Jonggring Salaka is a pro-environment student organization at the State University of Malang engaged in outdoor sports and environment care and protection. This organization was established on October 14, 1979. It has five divisions, including Mountain Forestry, Conservation, Rock Climbing, Caving, and Heavy Sports. Conservation is one of the divisions engaged in nature conservation efforts. Preservation of nature with all the increasingly complex problems in this modern era is the driver of this division (Universitas Negeri Malang).

The Geography Department Student Association is a student activity unit in the Geography Department at the Faculty of Social Sciences at the State University of Malang. This student organization serves as a facilitator for the academic community's aspirations, especially students of the Department of Geography, to advance the Department of Geography. The work programs in this organization are: 1) Coordination of Meetings (Work Meeting), 2) Upgrading, 3) Forsigo (Geographic Communication Forum), 4) Village Partnerships, 5) Web GIS Workshops, 6) Earth Day Celebration, 7) LKTIN "VOSICO", 8) Disaster Mitigation, 9) Introduction to Geography Lectures, 10) National Seminars, 11) National GEO Olympiad, 12) Geography Management Training (GMT), 13) Natural Landscape Training, 14) Volcano Intelligent Science and Art (VISA), 15) Geocentric and 16) Student Council of the Geography Department (Universitas Negeri Malang, 2019).

The Econesian Society is a charitable organization under the School of Geography, Earth Sciences, and Environment at the University of the South Pacific, Suva, Fiji. The main emphasis is to promote awareness of environmental protection in the South Pacific region and beyond. This organization also authorizes youths to preserve and protect their Pacific identity. Wantok Moana is the name given to the Marine Science Students Association. Wantok means tribe, and Moana is the ocean. The organization consists of undergraduate and graduate students. It also involves Senior Management staff, former staff, and alumni. The team is tasked with aiding students academically and engrossing their members in events and environmental causes. Affiliates are occupied in Marine Conservation and Awareness and have undertaken activities and impacted the goals of the Association (Wantok Moana, 2011).

Campus-led Student Activities For Climate Change Adaptation And Mitigation at Jonggring Salaka and HMJ Geography

Table 3

Small and Large Scale Climate Change Mitigation Activities at the State University of Malang

Activities	Jonggring Salaka	Himpunan Mahasiswa Jurusan (HMJ) Geography
Small scale (campus-based)	<ol style="list-style-type: none"> 1. Earth day 2. Talk shows 3. Car-free day 	<ol style="list-style-type: none"> 1. Tree planting (collaboration HMJ & JS) 2. Earth day 3. Seminars 4. Disaster mitigation simulation 5. Essay writing competition 6. GIS workshop

Large scale (community-based)	1. Community service	1. Village Partnerships (<i>Desa Mitra</i>)
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Note. Table 3 presents a summary of the student-led climate change mitigative activities by Jonggring Salaka and Himpunan Mahasiswa Jurusan (HMJ) Geography at the State University of Malang, Indonesia. Activities range from talk shows, community service and awareness, seminars, tree planting, competitions, workshops, car-free day, village partnerships, and the celebration of Earth day.

The climate change mitigative activities of Jonggring Salaka range from Earth Day celebrations to talk shows, Car-free Day, and Community service. Jonggring Salaka conducts small and large-scale programs on environmental preservation annually. An example of a small-scale activity is tree nurseries on campus. In contrast, large-scale activities yield nurseries in coastal areas, rivers, and conservation activities that have been carried out in Pasuruan to cope up with abrasion and improve the coastal temperature. The dominant program at Jonggring Salaka for climate change mitigation is Earth Day's celebration, as most activities focus on tree planting and emissions as a consideration for the ozone layer. Based on the interviews with *Mas* Lukman, the Head of the Jonggring Salaka organization at the State University of Malang:

'... every year there is an earth day work program. For this year (2019), there is a talk show about facilitators' role in climate change. In previous years, every Friday was allocated for Car Free Day, which began in 2011. Furthermore, the new education and training program in the subcategory of specialized education in free sports is community service. Usually, the theme of community service is based on the community and the environment...'

Small-scale programs implemented to mitigate climate change are tree planting on campus, Earth Day celebrations, and Car Free Day (CFD). According to *Mas* Anggara, the Car-free day was initiated by Jonggring Salaka and adapted by the State University of Malang in 2013. As per the reports in the local dailies, *Ngalam.com* published on the 18th of January, 2017, this Car Free Day stems from the idea of Wisnu Saputra, chairman of the Jonggring Salaka Nature Lover Student Activity Unit at the State University of Malang in 2013. The first Car Free Day at the State University of Malang was held to commemorate Earth Day on April 22, 2013. The initial stipulation of the CFD did require the university academic *community* to adapt. Currently, lecturers, staff, and students are no longer allowed to use motorized vehicles on campus. Only walking and cycling are permitted. However, since May 2016, UM has provided pedal bikes in each work unit to facilitate staff mobility, such as delivering letters and others (Sifak, 2017).

To implement the Geography Department Student Association's vision, mission, and goals at the State University of Malang, the Himpunan Mahasiswa Jurusan (HMJ) Geography organization conducts various programs and activities. Such activities range from disaster mitigation simulations, collaboration with Jonggring Salaka to plant trees on campus, the celebration of Earth Day organized by HMJ Geography in Batu city in 2017, where a thousand trees were planted to control the impacts of climate change. Seminars on the theme of disaster mitigation were held in 2019, where climate change issues were discussed. According to Muhammad Al-Farisy, the essay writing competition with the theme of disaster mitigation in May 2017 discussed climate change. Participants of this program created several tools as well as ideas for tackling climate change.

Additionally, GIS Workshop was organized by HMJ Geography as GIS is an application that can be used to manage and plan extreme climatic catastrophes. The focus of this workshop aimed at climate change mitigation are described as follows: a) map construction depicting weather and climatic changes in an area over time, b) map projection of sites to be planted with vegetation for climate change mitigation, c) collaboration with Culungkup Mangrove Conservation (CMC) located in Sumbermachung Wetan District, Sidoarjo Village for mangrove conservation. From October 22 - October 23, 2016, the "Volcano" division of HMJ Geography, Faculty of Social Sciences (FIS) at the State University of Malang (UM) initiated the Village Partnership (*Desa Mitra*) work program themed "*Empowering the Brau Hamlet Community to Improve the Economy to Create an Independent Community.*" The activity aimed to create an independent and synergistic village in collaboration with the Department of Geography at the State University of Malang and the development of two Geography

study programs for community empowerment to create an environment-based village. These courses would empower students to apply the knowledge gained in the classroom to the community, instill values, tenacity, work ethics, and responsibility, enhance national character building based on Pancasila, and foster student empathy and concern for the environment.

In November 2017, HMJ Geography systematized socialization and learning an introduction to the environment activity Village Partnerships (Desa Mitra) work program. In the Village Partnership program framework, HMJ Geography conducted socialization and learning and introduction to disaster mitigation in the Brau Hamlet in Batu. This village is predominantly a cattle-raising community where cattle breeding produces methane gas, which impacts Global Warming. During the Village Partnership program, the community was briefed on untreated cow dung and methane gas's impacts on environmental damage.

Table 4

Campus-led Student Activities for Climate Change Adaptation and Mitigation at Econesian Society and Wantok Moana at the University of The South Pacific

Activities	Econesian Society	Wantok Moana
Small scale (campus-based)	<ol style="list-style-type: none"> 1. Beach clean-up campaigns 2. Ocean/Environment day 3. Creation of song encouraging conservation and sustainable development 	<ol style="list-style-type: none"> 1. Clean up campaigns 2. Guest lectures
Large scale (community-based)	<ol style="list-style-type: none"> 1. Regional workshops 2. Participation in WWF organized events 3. Study programs 4. Awareness campaigns 	<ol style="list-style-type: none"> 1. Study programs

Note. Table 4 presents a summary of different efforts to address climate change at the University of the South Pacific, Suva, Fiji. Students at the two organizations are engaged in activities ranging from awareness and clean-up campaigns, workshops, creative displays and the commemoration of environment day as well as taking up study programs that focus on environment protection for climate change adaptation and mitigation.

To fulfill the vision, mission, and goals of the Econesian Society, members execute stand-up marches, clean-up campaigns, awareness campaigns, workshops, collaboration with related stakeholders, and community service. Based on the results of the interview, Mr. Singh's response is analyzed as follows:

"... We organized the march first during large-scale meetings that are very common today. So at that time, we held a parade which was attended by students who marched onto Albert Park with banners to emphasize that the issue of climate change was an important one. We conduct cleanup campaigns throughout the campus and prioritize Suva areas such as Nasese and the Suva Lagoon. This is the main activity, and as I said before, we also hold awareness campaigns for college and high school students....". Moreover, Richard mentioned that: '.... one of the activities he still remembers from 2008 was the workshop. We held a regional workshop where members of the Econesian Society and personnel from Tonga, Hawaii, Samoa, Papua New Guinea (PNG), Solomon Islands, and regional students from campus also participated. This workshop was part of the 350.org awareness campaign. The aftermath of this workshop produced a network that allowed participants to stay in touch and liaise on climate change-related issues..."

The opinions of Ms. Tabe, an expert in the field of climate change as well as one of the founding members of the Econesian Society, shared the following sentiments:

"... we are in a Live and Learn collaboration. We participate in most awareness programs in Suva, such as Ocean Day and Environment Day, to help with facilitation and appearance. During the government meeting on the environment, we were invited to sing. So the songs composed by Ron Simpson, one of the founding members were sung. These songs specifically invite people towards

conservation and sustainable development. This is one way to increase awareness. We participate and help WWF. Because this is a student body that works sincerely instead of working 24 hours, we understand that each person has their busy schedule. So we create activities that will get students involved and interested and become passionate about the environment. So we do lots of random things...”

According to Ms. Tabe, the University of the South Pacific has an independent structure that focuses on climate change adaptation and mitigation efforts in the Pacific region. In implementing programs and reducing climate change, the University of the South Pacific has set up a division that focuses on this. The campus climate change initiative division is under the Pacific Center for Climate Change and Sustainable Development (PACESD). All climate change-related programs are carried out through PACESD. Existing programs related to tackling climate change at the University of the South Pacific are classified as follows: 1) Study by coursework whereby a Postgraduate Diploma in Climate Change has been designed for professionals engaged in planning for natural resources, economic and social development, and/or the natural environment. It is relevant for graduates working for governments or NGOs looking to enhance their understanding of climate-related issues. This Postgraduate Diploma in Climate change has a Science stream, Adaptation, and Management stream, and the Disaster and Resilience stream. A study by research program offers both Master's and Ph.D. research degrees in climate change-related areas. The Master of Science in Climate Change consists of some coursework and an individual research project on a topic negotiated in consultation with supervisors. In contrast, a Ph.D. on climate change is entirely research-based, and a thesis is submitted on completion (PaCE-SD, n.d.).

In practical terms, integrating quality environmental learning into existing education systems represents both immediate and longer-term challenges for responding to climate change. The direct challenge is to climate-proof education systems (adaptation). The longer and more challenging task is to develop education systems that equip learners with the requisite skills, knowledge and attributes to deal with future challenges (Bangay & Blum, 2010).

The roles and responsibilities of the members of Wantok Moana are guided by the principles of improvement in student performance at the university according to the organization's vision, mission, and goals. The members' underlying role is to limit the use of tools that contribute to climate change, conduct community service, study and implement strategies for climate change adaptation and mitigation, advocate for and share information about climate change with the general public.

According to Ms. Botleg and Dilokoloko, Wantok Moana has undertaken minor environmental protection activities aimed at climate change adaptation and mitigation.

“...most of the cleanup campaigns are related to marine pollution, but there have been speakers who came and talked about climate change. There is practically nothing. We do not carry out any activities aimed at mitigating or adapting to climate change. There is nothing in this group, but in Vanuatu, I have attended one of the reef check club activities. We have carried out several adaptation programs, such as how Vanuatu will adapt later to any climate changes. We live on a tiny island faced with all this, and how will we adapt to it...”

Wantok Moana, however, has study programs that either focus on or incorporate aspects of climate change. A Bachelor of Science degree in Marine Science has a 100 level course on climate change, three 200 level courses on climate change, and one 300 level course. Mr. Teison confirmed the following:

“...yes, we do have a study program focusing on climate change. For example, Oceanography incorporates climate change and ENSO. We have lectures related to climate change too. This is some aspect of climate change that is incorporated into several marine science courses. This is not a course in itself but is combined with other courses. So climate change is like a little knowledge in each of the courses we take. Climate change issues are mostly taught in Oceanography, where ocean pollution and oceanography are involved. MS 312 Marine Pollution and MS 213 Physical Oceanography courses mostly focus on this. Elective courses such as environment education (EV) are mostly related to climate change...”

Challenges for the Student Organizations for Climate Change Adaptation and Mitigation Individual Barriers

There are many obstacles faced in the adaptation and mitigation efforts relating to climate change. The first obstacle comes from the organization, especially the campus community-led student organizations responsible for environmental protection and climate change mitigation. Members lack interest in environmental protection and climate change adaptation and mitigation activities outside the campus periphery. The interviews with the members' reveal that students' prioritize academics over extra-curricular activities. Our mindsets of obligation are molded by our morals and opinions and are shaped by our locus of control. We rank our responsibilities. The most important thing for people is their well-being and the well-being of their family. When pro-environmental behaviors are in coalition with these particular urgencies, the enthusiasm to do them increases (e.g., buying organic food). If they conflict with the priorities, the activities will less likely be taken (e.g., living in a smaller house, even though one could afford to live in a big one) (Lorenzoni et al., 2007). Moreover, community support and participation in such activities tend to be unsatisfactory. Here are the results of the interview related to lack of support, enthusiasm, and participation:

"...saya kira salah satunya adalah keterlibatan siswa karena seperti yang saya katakana sebelumnya, mereka ke kampus untuk pendidikan. Pendidikan adalah prioritas utama jadi dari jadwal mereka yang padat, mereka mungkin tidak bebas untuk melaksanakan. Itu adalah hal utama untuk melibatkan siswa secara teratur. Pendanaan mungkin juga menjadi masalah..."

(Translation: I think one of the problems is student involvement because they come to campus for education, as I said before. Education is their top priority, so they may not be free to engage in any activities from their busy schedule. That is the main challenge to involve students regularly) (Mbak Kusuma)

".... Kami bergabung tetapi ingin mengakses orang yang memiliki pengetahuan tentang perubahan iklim untuk bergabung dengan kami. Kami juga tidak memiliki komitmen dan keseriusan dari para anggota dalam melaksanakan kegiatan mitigasi perubahan iklim..."

(Translation: We participate in the activities, but it's better to have people who are knowledgeable about climate change join us, which does not happen. We lack commitment and seriousness from members in climate change mitigation activities) (Miss. Dilokoloko)

One of the most effortlessly identifiable barriers to commitment is a lack of basic knowledge about causes, impacts, and resolutions to climate change. While there is existing evidence, it is not automatically taken up or transformed into knowledge or action. A lack of awareness about where to find information, lack of craving to seek information, apparent information overload, misunderstanding about contradictory information, limited evidence, and apparent lack of locally-pertinent information are the contributing factors. For example, the presentation of information about the effects and solutions to climate change is inaccessible to non-experts. The information source is unreliable or untrustworthy, particularly mass media, misperception about links between environmental issues and their corresponding solutions and information clashes with ethics or encounter and is therefore disregarded (Lorenzoni et al., 2007). Since the results of climate change adaptation and mitigation activities are only visible in the long run, participants who take part in such activities perceive their time and energy as waste. This could be a genuine risk that involves planning and adopting the new course of action; the time invested might fail to produce the desired benefits, and if so, the time spent would be wasted. According to cultural theory (CT), the opinion of risk may be restrained by one's social group or culture, and according to the social amplification of risk framework (SARF), the perception of risk can be amplified (or attenuated) through consultation among individuals, groups, or the media. Cultural Theory recommends that people possess one of four world-views: hierarchical, individualist, egalitarian, or fatalist. These worldviews are said to intensely manipulate how those who hold them face and comprehend risk. SARF's central thesis is that the kind and power of perceived risk are adjustable, depending on amplifiers or filters that operate as information about a hazard makes its way along with a series of communication links

(persons, groups, or media). Cultural Theory and SARF help foresee the extent of risk sensed by an individual (Gifford et al., 2011). Hurdles to a commitment to climate change also include lack of knowledge about the causes, outcomes, probable solutions, ambiguity and disbelief about the causes of climate change, urgency, compulsion, and efficiency of actions (international to individual level) (Lorenzoni et al., 2007).

Social and Institutional Barriers

Blake states social and institutional restrictions that thwart people from behaving pro-environmentally irrespective of their attitudes or intentions. He lists such limitations as lack of time, lack of money, and lack of information (Kollmuss & Agyeman, 2002). Lack of funds for programs and activities is another factor limiting the frequency and magnitude of climate change-related activities. As the student organizations are purely dependent on the University for their finances, the latter prioritizes structural developments over student activities. The following is an excerpt of the interview with one of the members:

“...again, the first thing is finance. So finance is a problem everywhere. If you look at the community level, regional level, or national level. Finance is one thing that will always be a barrier to climate change adaptation and mitigation, and no matter how much money we put in this, it will always be less than what we need...” (Mr. Singh).

Ignorance on the part of the University might be playing a role in fund allocation towards climate change adaptation and mitigation. “Many people remain simply unaware of the realities of climate change, and therefore are unlikely to act. Others, who are more aware, are paralyzed by their lack of knowledge about which specific mitigative behaviors to engage in, how to undertake those behaviors, and the relative benefits of various mitigation behaviors” (Gifford, Kormos and McIntyre, 2011).

The time factor plays a vital role in the frequency and effectiveness of climate change mitigation activities organized. Approval for such activities is a time-consuming task which propagates laxity amongst the members of the organization. According to the interview, the time factor limits member participation in climate change-related activities:

“... one of the challenges is that sometimes when we are called for the clean-up campaigns, it is only a few of us. Only a few of us out of hundreds of students. Only a few of us always come, and students tend to lose interest because it all depends on how they run the organization, it all depends on how creative they are and how time is managed...” (Mr. Richard)

Many programs to boost climate-friendly behavior alternatives have been executed by policymakers. However, most programs are voluntary. Thus, citizens can choose whether to join and often agree that the program is not their priority (Gifford et al., 2011). This might be another cause for the lack of required numbers for climate change activities on campus.

Conclusion

In general, student programs and activities related to environmental improvement for climate change mitigation at Jonggring Salaka and HMJ Geography at the State University of Malang and the Econesian Society and Wantok Moana at the University of the South Pacific are not as frequent as they ought to be. Such activities are 2-3 times per semester, which can be classified as insignificant compared to the magnitude of the risks of climate change. Furthermore, student programs and activities related to environmental improvement for climate change mitigation at the two student organizations at the State University of Malang are usually carried out within the campus vicinity. On the other hand, the Econesian Society and Wantok Moana promote greater community involvement. The interview results at Jonggring Salaka revealed that students' efforts to mitigate climate change are limited to scientific writing, research, and knowledge dissemination on climate change to the community. In contrast, students at HMJ Geography strive for pro-environment behavior. Econesian Society members attempt to change their approaches to climate change ranging from stand-up

marches to policymaking involvement. On the contrary, Wantok Moana members minimize the use of electronic tools, hold community service, and advocate for and share climate change information with the general public.

The results of the in-depth interviews, observations, and documentation revealed several similarities and differences relating to the four student organizations. Some significant differences occur in the organizational structure, vision, mission, and objectives, and activities carried out by its members; meanwhile, the similarities include the common goal of environmental protection. For Fiji and Indonesia, climate change actions also occur in various ways. The similarity in climate change actions in both countries involves research on this topic to increase public awareness, reduction in the use of tools that fuel climate change, and public awareness through campaigns. Similarities in motivational factors for climate change mitigation and adaptation in both universities include self-realization and lessons in schools and higher education related to climate change.

The differences are that students at the University of the South Pacific are given more power and opportunity to fight this problem. In contrast, students at the State University of Malang were mostly passive actors. Secondly, climate change research was carried out in detail and on a larger scale at the University of the South Pacific. In contrast, the State University of Malang has not provided any such facility. Students at the State University of Malang are encouraged by external factors to act on climate change, while internal factors are more dominant at the University of the South Pacific.

Finally, to conserve the environment and adapt and mitigate climate change, many obstacles have been faced, among others, from the organization members and the community at large. Awareness of the issue of climate change is generally lacking. Therefore, behavior change is required by the community. In contrast, from the University side, obstacles can be seen from the lack of funding and commitment to climate change adaptation and mitigation efforts. Therefore, it is recommended that climate change be treated as an immediate life-threatening phenomenon that needs to be nipped in the bud.

Universities have the capacity to assist in managing and bridging the diverse barriers that are often encountered when addressing sustainability issues (Cash et al. 2003, Clark et al. 2011). Research universities, in particular, have an exceptional range of expertise—in the natural and social sciences, engineering, industry, and the arts and humanities—that is needed to investigate the causes and implications of complex sustainability issues. They also have the organizational capacity to create and share new knowledge, resources, and practices that can be applied to help solve pressing social issues. Researchers in the fields of community involvement and higher education are increasingly seeing universities as "anchor organizations" that provide large frameworks for education, workforce growth, and engagement while also providing cohesion within a community (CEOs for Cities, 2010, Kingma, 2011). Given the critical role of education in developing the expertise, skills, perspectives, and value systems needed for SD – and in fulfillment of the World Summit on Sustainable Development commitments – the United Nations (2005) established a Decade of Education for Sustainable Development from 2005 to 2014 (UN DESD). Following this, on June 28, 2005, at the United Nations University and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) International Conference in Nagoya, Japan, a UN DESD for Asia-Pacific was initiated. There have been many new projects in the Pacific region since the decade began. The Pacific Education for Sustainable Development Framework (Framework) and its Action Plan for Sustainable Development in the Pacific Islands 2008-2014 (Action Plan) are the most important initiatives (UNESCO, 2006, 2007, 2009). Formal education and training, community-based education, and policy and innovation are the Framework's three main focus areas. This research reinforces the idea that higher education institutes play a crucial role in promoting pro-environment behavior.

The Climate Change Education for Sustainable Development program was launched by UNESCO in 2010 in an effort to promote 'climate literacy' among students (UNESCO 2010). Climate science and awareness, climate change education, climate change, cultural and biological diversity, and cultural heritage, and climate change, ethics, social and human sciences aspects were all part of the project. Interest in a broader range of goals beyond knowledge, as well as student-centered,

interactive, cross-disciplinary, and multidimensional approaches, grew as the field of climate science education, and education for sustainability, matured. The UNESCO guide for whole-school climate change education emphasizes a six-step approach and is light on content and instruction. Creating a school climate action team, incorporating sustainable development into all subjects, teaching innovative and future thinking, encouraging students to take action, addressing facilities and operations, and forming community partnerships are all part of the process. In terms of curriculum, the guide provides two examples of activities that could be incorporated into each of eleven different subjects, such as planning and preserving a school garden and compost, making maps depicting regions of the world most vulnerable to climate change, and exploring how communities have resolved conflicts and reacted to environmental challenges throughout history (Gibb, 2016).

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Conflict of Interest

The author declares no conflict of interest.

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