

Green University Model – World Trend and Policy Implications for Vietnam



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ABSTRACT: Green university model is now developing dramatically, spreading and becoming a mainstream trend in world higher education. Main features of this trend are universities integrating sustainable development goals into their operations, implementing their mission in building a prosperous and safe society. With key solutions using modern technology and techniques, universities strive to develop smart educational ecosystems, explore natural resources to improve quality of life, and participate in combating climate change, solving ecological problems of resources and human health. A number of green university rankings have been created, becoming a place to encourage the trend of developing green university model as a breakthrough solution for smart universities. Based on the approach of content and trend of green university development, the article presents some recommendations for green development in Vietnamese universities.

KEYWORDS: green education, sustainable, universities, Vietnamese

1. INTRODUCTION

In recent years, green education has been viewed as a revolution in the education business, serving as the primary respond to promote the global sustainable development trend. International organizations (United Nations Educational, Scientific and Cultural Organization - UNESCO, United Nations Economic Commission for Europe - UNECE) recognize and emphasize the relevance of green education, implementing a variety of special action plans to promote green education for sustainable development (UN, 2022; UNECO 2023). Green education is established in Europe as a comprehensive program that equips students with the knowledge and skills required to solve the world's environmental problems (EEA). Many higher education institutions have changed their vision, mission, and philosophy to ensure that students graduate with compassion and concern for the environment. An annual global ranking of colleges based on green criteria (Green Metric) was proposed in 2010 and has received encouraging feedback from higher education institutions on various continents (Riri Fitri Sari, Nyoman Suwartha, Jun Junaidi (2019). On the academic sphere, the topic of research on colleges implementing green education missions has received a lot of attention. Some researches investigate the concepts, tactics, and models of green education in universities (Rao and Aithal, 2016). Some researches examine the relationship between green and smart education in sustainable development (Nataliya, Natalya, Viacheslav, Irina, Alexandra, Nadezhda, 2018); higher education, technological innovation, and green development challenges (Zhang, Ma, & Shang, 2023). There have been a number of green education projects associated with smart education at a number of higher education institutions that have been summarized as a model for green education development in higher education (Abeyrathna, 2021; Falsini, Gentilini, Santioli, Bagnoli, Pacini, Giovannetti, Pierini, 2022), etc.

In Vietnam, green education in general, and green universities in particular, are of interest in terms of research and implementation. According to research, green education is a Vietnamese educational "concept" that encompasses the meaning of harmonious development of intelligence, personality, and energy in a civilized world, tend to live closer to nature" (Nguyen Viet Thinh, 2017). The Vietnam Association of Psychological and Educational Sciences (2022) event also featured many heated talks about green philosophy in education and measure to build green schools that successfully execute the Millennium Development Goals. On the practical level, the green university research project from international experience and proposed applications for Hanoi National University surveyed three green universities in the UK, Germany, and Korea, assessing the current situation of Hanoi National University and making recommendations on governance, policy, operations, training, research, social responsibility, and community participation in establishing a green university model for Hanoi National University (Pham Vu Thang, 2017).

The examination of the publications described above, as well as many other publications and studies on green education and green university development trends, will be the focus of many future research projects designed and produced in Vietnam. In this essay, we synthesize and analyze the substance of green education in higher education, as well as evaluate the global trend of green university

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development by studying various existing green university models. Following that, the paper suggests policies for Vietnamese higher education.

2. CONCEPT AND MODEL OF GREEN UNIVERSITY

Green education in higher education refers to universities including sustainable activities into the growth process, so fulfilling their role in creating a green society. These activities include a wide range of topics, but all are relevant to the four pillars of sustainable development: education, society, economy, and environment. According to Fissi, Romolini, Gori, and Contri (2021), green education in higher education means that schools play an important role in creating a more sustainable society in two ways: 1) minimizing negative impacts caused by their activities on the economy, society, and environment; and 2) promoting sustainable practices in curricula and research. More precisely, a “green university” practices sustainability in all different aspects of its operations (institutional framework, school operations, teaching, research, community engagement, and accountability, etc).

Rao and Aithal (2016) defined green education as the cultivation of environmental knowledge, skills, attitudes, and values by universities. Rao and Aithal define green education as having environmental benefits as well as being sustainable. The green university development model will prioritize environmentally friendly educational services. Lecturers, administrators, and students work together to raise awareness and implement environmentally responsible activities during the learning process. Conservation culture is regarded a vital aspect of the curriculum. The tools and spatial infrastructure used in the educational process are all eco-friendly. Generations of graduating students must understand and protect natural resources and human health through environmental activities.

Green education in higher education is predicted to undergo a transformation, with the training field becoming increasingly linked to economic growth trends. The green economy is now a mainstream trend, with a focus on resolving the interaction between the natural and social environments. The green economy is more than just a tool for solving the challenge of sustainable growth; it also addresses issues of finance, technology, investment, and macroeconomic policy. As a result, the green economy has a significant impact on the labor and employment sectors, generating new jobs. This has a direct impact on how universities function. Universities will provide training programs in information, skills, and attitudes that will aid in the gradual development of national policies and goals for transitioning to a green economy and a sustainable future. The United Nations Educational, Scientific, and Cultural Organization emphasizes the importance of university graduates having relevant knowledge and skills to address environmental and social issues such as raw material consumption, environmental degradation, and inequality at all spatial scales in order to drive global change. Human resources training at colleges consider not only the economic perspective of organizations and how to suit their needs, but also the social element. Demand for green jobs is increasing. Solar and wind energy will become increasingly popular in the future, necessitating the implementation of skilled green managers. There is a need to establish a sustainable future in all sectors of management, including construction, which implies that more green-oriented graduates are required. Universities must work to execute particular programs and action plans that promote green development in order to achieve the aim of sustainable development (UN, 2022; UNECO 2023).

Also, from a sustainable standpoint, some Chinese researchers have demonstrated that higher education is an essential component of green development. Higher education actively promotes technological innovation by preparing students to produce and transform knowledge in their daily lives and workplaces. According to Zhang, Ma, and Shang (2023), higher education in China considerably fosters green growth, and there is tremendous variability between regions with varying levels of technical innovation development. Higher education's favorable influence on green development in provinces with education development is steadily declining, whereas it is increasing in provinces with education development. The study proposed specific measures to enhance green education in higher education, such as further balancing investment in higher education, coordinating higher education development, and technology innovation. Green education in higher education also includes increasing students' knowledge of green technology. Computer and information technology have been referred to as green technology because of its role in environmental cleanup in many industrial automation processes. Universities in China aim to do research, training, and learning for the green economy, as well as community outreach for a sustainable society.

When researching green education, concepts and strategies in universities, Rao and Aithal (2016) compared traditional education and green education and showed that green education has many advantages such as content oriented to human happiness and the future of humanity, modern teaching methods, increasing demand for green jobs, and constantly improving technology. Green education content consists of three essential components: raising public awareness about the importance of achieving sustainable development and the consequences of failing to do so; focusing on green education curriculum by incorporating current industry knowledge and skills; and applying green concepts to all processes in industry and society to ensure sustainability. These contents are completely consistent with the principles of smart education, such as: sustainable socioeconomic development in response to changing environments; creating a competitive educational environment by acquiring knowledge and skills required in modern society; forming a personality capable of continuous development; and evaluating the impact of decisions made in multivariate and uncertain environments. Green education in higher education, like smart education, brings together relevant aspects that are considered as a whole and are part of a higher level in the education system, generating educational space enables students to gain

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the necessary knowledge, skills, and abilities based on information and communication technologies. The human factor plays an important role in smart education.

In Vietnam, Pham Vu Thang (2017) created an overall concept of a green university that included four components and four stakeholders (Figure 1). This overall model contains four components and four stakeholders for a green university. These components and stakeholders are based on the United Nations' Sustainable Development Goals.

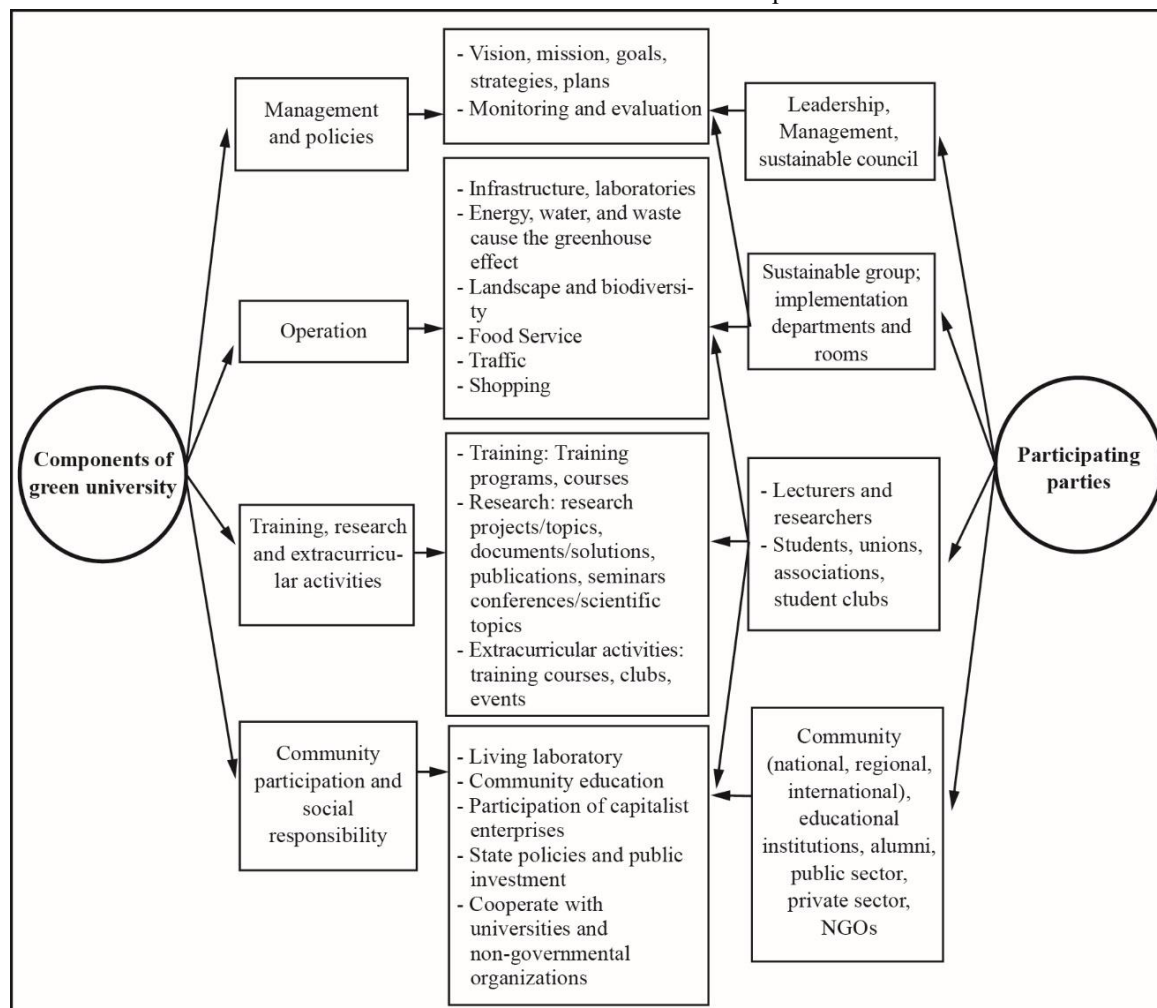


Figure 1. Overall model of green university (Pham Vu Thang, 2017)

The research used the overall model to investigate three foreign universities in the Federal Republic of Germany, the United Kingdom, and South Korea. Umwelt University-Campus Birkenfeld (Germany), which has been included in the Green Metric rating since 2016, is now the top green university in the Federal Republic of Germany, according to the Utoppia Green University ranking. In terms of policy and administration, Umwelt-Campus Birkenfeld creates a plan to implement the German government's general roadmap for reducing greenhouse gases and eliminating nuclear energy; it assigns the task of creating a sustainable campus with zero emissions. Umwelt-Campus Birkenfeld's operational component employs zero-emission technological solutions, 100% renewable energy, and energy production from trash generated at the school and in adjacent communities. Regarding training and research, the school's activities closely follow the direction of sustainable development. Umwelt-Campus Birkenfeld provides environmental and sustainable development courses for students, equipping them with thinking and solutions to solve environmental problems through majors. Both curricular and extracurricular activities aim to raise awareness and change behavior for students about the environment and sustainable development. About community participation and social responsibility, Umwelt-Campus Birkenfeld combined with local partners to build a thermal plant using campus and residential waste, providing clean energy for the campus and the region; Umwelt-Campus Birkenfeld also takes the initiative to build an Association of Universities and Friends, including schools, people and businesses that jointly carry out projects on climate change.

3. TRENDS IN GREEN EDUCATION DEVELOPMENT IN UNIVERSITIES AROUND THE WORLD

In the last ten years, there has been a growing trend toward green education in colleges. In 2010, an international university ranking based on green criteria (Green Metric) was developed, however only 95 training and research institutions participated. By 2022, the ranking will include 1,050 universities and research institutes from around the world, with 594 facilities in Asia, 271 in Europe, 29

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in Africa, 29 in North America, and 2 in Oceania (UI, 2022). The green university rankings employ a set of evaluation measures closely aligned with the United Nations' sustainable development objectives, consisting of 39 variables and six criteria: environment and infrastructure, energy and climate change, waste, water, transportation, training, and research. The green university rankings promote and develop ideas and technologies, believing that universities play an essential role in collaborative efforts between stakeholders and communities to tackle climate change. Advances in energy and water conservation, trash recycling, and green transportation are discussed, as well as recommendations for behavioral change and economic and social sustainability challenges. Green university rankings enable institutions to serve as role models for society by supporting sustainable behaviors, delivering sustainability-related services, and generating favorable international partnership on sustainability around the world.

Reviewing the top ten higher education institutions in the 2022 green university rankings, it is clear that they are committed to the United Nations' 17 sustainable development objectives, with a particular emphasis on sustainable development practices. Promoting environmental conservation while assuring people's access to education, equality, and prosperity. Universities prioritize the integration of social, environmental, and economic concerns into their learning and teaching. Green and sustainable development priorities are consistently prioritized in both strategy and operational plans. Green universities' vision, mission, and aims all strive to provide graduates with the necessary knowledge and abilities to contribute to a brighter future, committing graduates to global citizenship ideals.

Wageningen University and Research (WRU, Netherlands) is an example. As a university ranked first in the green university rankings (2022), WUR sets a mission and goal to strive to solve problems and shape a sustainable future. This is not only a well-established theme in the university's training and research but also a common theme in university administration at WUR. The university has adopted an interdisciplinary, science-based approach to address the major global challenges identified in the United Nations' sustainable development goals. WRU's strategic plan invites sharing and doing this together, both nationally and locally. Through close collaboration with partners, students, alumni and citizens, WRU scientifically proves that green universities are the most sustainable universities in the world.

To address the worldwide concerns of climate change and sustainable development, WUR has defined its mission as "exploring nature's potential to improve the quality of life" through training, research, and creation of new values. WUR's core activities center on healthy eating and the living environment, with three focus areas: 1) Society and welfare; 2) Organic food and animal feed production; and 3) Natural resources and living conditions. WUR's goal is to prepare students to become reputable experts and scientists who will solve and contribute sustainable solutions to complex problems in the field of healthy food and living environment, both now and in the future in the world, seriously care about society, social responsibility, and social ethics.

Mission and goals are set by WUR based on real life that requires university graduates to have many abilities to complete their jobs in a rapidly changing world. To meet the changing realities of life, learners need to be trained in modern knowledge, consistent with the advancement of science and real life. Graduates can develop and apply the knowledge gained from school into practice and further develop that block of knowledge. The needs of a sustainable development society require learners to be equipped with academic skills and high-level skills of the 21st century, such as critical and creative thinking, the ability to observe and judge, political and market sensitivity, flexibility and ability to analyze and report, literacy and intercultural - multicultural cooperation, argumentative writing and debate, etc. The knowledge and skills trained helps learners combine with practical requirements to design solutions for problems that need to be solved and become "creative entrepreneurs". These knowledge and skills enable learners to analyze and evaluate the impacts of sustainable solutions on human life, the planet and economic prosperity. The excellent social qualities of learners help them apply knowledge and skills in an interdisciplinary, cross-disciplinary, and multicultural environment.

WUR deeply embraces the concept of sustainable development by encouraging students to become scientific experts and responsible citizens, valuing social responsibility and personal ethics, applying and sharing learning skills lifelong, and collaborating with other stakeholders to create economic and social value. The training program is focused at strengthening individual leadership skills, particularly those that will play an important role in creating future society. To attain this aim, WUR establishes the principle of building training programs with three categories of knowledge: 1) high-quality scientific knowledge; 2) a diverse learning environment; and 3) an adaptable and personalized learning path.

WUR prioritizes training, research, and the production of new value to ensure high-quality scientific knowledge. Graduates will have a strong foundation in at least one scientific area, as well as basic knowledge of a variety of other disciplines. Students are also taught scientific research procedures by renowned researchers, and they can participate in expert research processes to enhance their own research capacity. WUR not only emphasizes the coupling of training and scientific research, but it is also regarded as a crucial principle: preparing students to comprehend and apply research methodologies, as well as acquiring skills of analysis, criticism, and packaging in order to generate new knowledge.

In terms of a rich learning environment, WUR emphasizes on developing independent, self-study attitudes and abilities, as well as fostering personalization to meet each student's uniqueness and background potential. The training curriculum focuses on real-life circumstances in which students can apply their scientific and practical skills to address complicated and interdisciplinary

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challenges. The real-world environment can help students build attitudes, behaviors, social responsibility, inter-disciplinary, cross-disciplinary, and cross-cultural collaboration skills, as well as the ability to adapt to varied stakeholders and social influences.

In terms of personalized learning routes, WUR creates a full-time training program that is supplemented by part-time classes; this allows each student to design their own path and learning plan based on their capabilities, interests, and abilities. The school gives students freedom of choice while also providing flexible supervision, feedback, and control. Creative learning and research can occur in school, out of school, and online. The school promotes courses and study periods created and recommended by students (Nguyen Van Hiep, 2023).

Similar to WRU, the University of Nottingham, which is ranked in the top 20 best institutions in the UK and the top 100 in the world (QS Rankings 2023), outlines its goal and vision as a university. A lifelong dedication to enhancing health and well-being through discovery, enterprise, and advancement. The University of Nottingham has created a culture of not accepting the ordinary; the school's courses are designed to assist students expand their skills and knowledge, allowing them to succeed in their jobs. The University of Nottingham is among the top five UK universities most sought after by businesses.

Several research and assessments of the success of green education in higher education have been published in academic forums. Falsini and colleagues (2023) examined green progress at the University of Florence (UniFi, Italy) using data from the green university rankings. UniFi began participating in the UI GreenMetric rankings in 2018, which assess colleges' approaches to sustainability. Since then, several efforts have been made to increase achievement across the six league table categories, ranging from high-quality classroom environments to student well-being initiatives. UniFi regards sustainability as a philosophy that pervades all activities in various ways (welfare, campus structure, energy efficiency, climate change responsibilities, waste management, and water conservation). UniFi's superiority is demonstrated in the field of training. The total number of courses relevant to the 17 Sustainable Development Goals in the 2020-2021 academic year is increasing, accounting for 26% of all courses. These services provide UniFi students with several opportunities to flourish while also raising awareness of current challenges and equipping them with tools for the future. This is also due to the cultural events that UniFi hosts each year, despite the challenges posed by Covid-19. As a result of UniFi researchers' remarkable effort, almost 3,700 scholarly articles on the theme of sustainable development were published over the course of three years. The outcomes of scientific study on sustainability have also been translated to the industrial sector via the school's startups.

A recent study on green development in higher education in Arab countries investigated the link between green education and sustainable development in Palestinian educational institutions, utilizing a descriptive approach to present theoretical materials relevant to the research topic. The study's findings reveal that the Palestinian Ministry of Education has consistently worked to improve the curriculum, keeping it in line with the level of development and change in various disciplines. Most notable among these efforts is Palestine's ratification of the 2030 Sustainable Development Plan and the inclusion of standards in the curriculum framework document for learners, including quality, equity, dignity and equality, by ensuring the development of sustainable cities, providing a clean environment and protecting various resources from pollution. These standards can meet a wide range of goals of the 2030 Agenda for sustainable development. The study also recommends that the Palestinian Ministry of Education direct the inclusion of Green School educational lessons in various educational programs, including math, science, arts, computer science and other subjects, aims to improve students' positive attitudes towards environmental concepts by developing an approach that includes the integration of environmental issues in the educational curriculum.

In China, Zhang, Ma, and Shang (2023) use a mixed effect model to analyze the direct and indirect benefits of higher education on green development using provincial-level data from 2003 to 2020. The findings suggest that higher education considerably fosters green development in the region, with technological innovation acting as a mediating factor in the aforementioned influence linkages. There is significant diversity among regions with varying levels of technological innovation development, and the positive impact of higher education on green development in educationally developed provinces gradually declines. This pole in provinces that are developing education is increasing. Specific policy recommendations to promote regional green development for higher education mainly include further balancing investment in higher education, coordinating higher education development and technological innovation, while enhancing the circulation of resources between provinces.

Egypt has the highest number of schools participating in the green university rankings, both regionally and nationally, with 17 out of 29 in Africa. Ten Egyptian universities, including American University in Cairo, Cairo University, Benha University, Kafrelsheikh University, Alexandria University, Ain Shams University, October 6 University, Sohag University, Beni-Suef University, and Misr University of Science and Technology, are at the top of the African region's green university rankings for 2022. Among these, Cairo University is one of the typical schools that aspires to be a model green university and has implemented numerous measures to promote a sustainable environment. Based on Egypt's vision and strategy for national development until 2030, the goals of the United Nations climate change conference (COP27) held in Egypt in 2022 and other national development projects approved by the Egyptian government, Cairo University strives to apply sustainable resource management measures, promote sustainable culture and implement programs to reduce energy consumption and water use and campus waste, integrating sustainability into every aspect of university life. With the initiative to establish the Office of Sustainability, Cairo University strives to train staff to identify and implement solutions that are ethical, socially responsible and economically sound; The school has organized events and initiatives

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to raise awareness about sustainability, contributing to reducing energy, water and waste usage on campus, and promoting a culture of social responsibility. The university has also decided to establish Green Offices in all its faculties and institutes, with 10 faculties already doing so as an extension of this office. To integrate sustainability into its educational and research programs, Cairo University has focused on aligning its teaching and research plans with the sustainable development vision and goals of the country and the world. The university's efforts towards environmental sustainability have been recognized globally, with the university achieving first place among public universities in Egypt and second place in Africa, after the American University in Cairo, in the UI GreenMetric rankings for environmentally friendly green universities in 2022-2023 (Hamed Abdelreheem Ead, 2023).

4. CONCLUSION

Green education in higher education has become a global trend. Most governments and many international organizations have encouraged the education system to take action to contribute to the green transition process, thereby strengthening the sustainable development capacity of both organizations and learners. Green development in higher education has been emphasized in both academic and practical settings. There have been numerous successful programs and projects aimed at building green universities, universities that solve ecological problems, and boosting learners' and people's awareness, attitudes, and knowledge of sustainable development challenges. On the academic level, green concepts, strategies and frameworks in higher education have been clearly defined. In general, green education content in higher education aims to promote an environmentally friendly mindset, which can contribute to protecting the environment and preventing climate change; Equipping learners and people with knowledge and capacity to solve environmental problems and challenges, improving skills, methods and teaching tools so that learners and communities can contribute to protecting environment; develop the knowledge, abilities, values and attitudes needed to live in sustainable communities.

The trend of establishing green education demonstrates that universities have realized their critical role in collaborative efforts between stakeholders and the community to tackle climate change. A number of pioneering schools have designed curriculum with different topics and instructional resources that are produced and developed expressly for the twenty-first century. A cutting-edge thinking that defies format and current knowledge theory, as well as new thinking on the role of green education, has been established toward a learning social transformation in which future generations must be able to understand and protect natural resources, nature, and human health by becoming environmental champions. A curriculum that works for individuals of all streams so they can engage in problem solving that helps people and the planet. Instilling education in graduate and postgraduate students to build their professional careers as decision makers in green education will be a game changer. Traditional education is no longer relevant at the present time. This is also the way for universities to become a model for society and an important partner of the government.

5. POLICY IMPLICATIONS FOR VIETNAM

Sustainable development and climate change mitigation have long been priorities for the Vietnamese government. Vietnam has accepted the United Nations Convention on Climate Change since 1994, as well as the Kyoto Protocol in 2002. In 2004, the Prime Minister of Vietnam published a strategic orientation for sustainable development (Vietnam's Agenda 21), as well as a number of policies linked to sustainable development. Currently, Vietnam is working to innovate its growth model, green economy, and circular economy, which has received attention from the state, government, corporations, social organizations, and citizens. In 2021, the Prime Minister approved the national green growth strategy for 2021-2030, known as Vision 2050. With higher education, universities in Vietnam have the status of direct and indirect impact to the national program and strategy on sustainable development. Universities can have a negative impact on the environment through operational activities, but at the same time can also have a positive impact on developing awareness, motivation, behavior, building attitudes, act, capacity, spreading the trend of sustainable development. The university is also a place to research and transfer science on sustainable development solutions, green economy, and green education. Starting from the mission, goals, vision and management capacity, universities can be role models in green development both within the school and in society, influencing the awareness and behavior of the community for a prosperous, safe and sustainable society. To become this model, several policies are recommended below.

Firstly, create policies, strategies, and national action programs for green education in higher education that establish general and specific targets, with a strategic orientation for state management agencies and higher education institutes. Policies and strategies must aim to form and develop a generation of sustainable universities as part of the national sustainable development strategy and national green growth strategy; innovate, build a system of quality assurance, accreditation of higher education quality, and supervision to ensure that higher education institutions follow the national direction on green growth and sustainable development.

Secondly, develop a mechanism to encourage universities to transform green development models, develop and implement training programs, and integrate green growth content into all training, research, and university management activities; Raise awareness of teachers and educational managers about the role, meaning and orientation of green development activities, strengthen coordination between schools, localities, businesses and communities to form awareness and green living skills in school and society.

Thirdly, promote media information to raise awareness about the role and impact of universities on the country's sustainable development and green growth; forming green development trends as an advantage in competition and development of higher

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education institutions; Associations of universities and colleges, university clubs, non-governmental organizations cooperate to promote green development trends in higher education, initiatives to organize green university clubs, Green University Day, establishing a university commitment document on clean energy consumption and renewable energy, launching a movement and promoting green lifestyle in universities.

The fourth, Vietnamese universities need to build transformation strategies according to green development trends from planning, master plans, design, construction and operation processes associated with green growth and sustainable development strategies; Green development needs to be reflected in the school's mission, vision, and core values; Green development needs to be integrated into every aspect of university life, towards a greener and more sustainable future for students, faculty and the community.

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