United Nations Educational, Scientific and Cultural Organization

Sustainable Development Goals

Southeast Asian Ministers of Education Organization

UN HABITAT
FOR A BETTER URBAN FUTURE

UNESCO GREEN ACADEMIES

Guidelines for Climate-Resilient Buildings

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Introducing Natural Sciences at UNESCO Bangkok

The Natural Sciences Team serves the six cluster countries: Cambodia, Lao PDR, Myanmar, Singapore, Thailand and Viet Nam. UNESCO Bangkok also assists the Regional Bureau for Sciences in Asia and the Pacific, located in Jakarta.

UNESCO Green Academies Guidelines for Climate-Resilient Schools

This brochure encourages capacity building in communities to transition towards climate resilience. It is based on scientific knowledge to improve the relationship between people and the environment as prescribed by the Man and Biosphere Programme. Relevant technical information for implementation is accessible in "Nature-based solutions for Water (2018)", " Better Buildings. Enhanced Water, Energy- and Waste-Management in Arab Urban Ecosystems-Globally Applicable", Schwarze et al. (2010) and "Guidelines for UNESCO Green Academies in Africa - Globally Applicable", Calisesi et al. (2016).

Foreword

By Shigeru Aoyagi[1] and Shabaz Khan[2]

In 2019, global youth powerfully expressed their concerns that not enough was being done to keep the planet's ecosystems in balance. Those voices have been heard, plain and simple.

Environmental science is taught in schools using theory and laboratory sessions. This approach leaves a gap between school work and real life. In UNESCO Green Academies, students experience practical action and learn how they can contribute to improving their own living conditions.

The first UNESCO Green Academy was inaugurated in 2016 in Ethiopia. Since then, UNESCO has put even more effort into environmental education. The Green Academies focus on practical and replicable action. The inter-sectoral initiative touches on biodiversity, climate, water and capacity augmentation via education for sustainable development. The Green Academies are simply arranged with a mix of puzzle pieces that, when put together logically, will provide climate resilience based on science and education. The initiative benefits from a multiplier effect by providing training and communicating knowledge from schools to communities, so that large numbers of people will learn and apply their new skills. We encourage all schools to modify their buildings and premises as Green Academies.

1. Director, UNESCO Bangkok Asia and Pacific Regional Bureau for Education

2. Director, UNESCO Jakarta Regional Science Bureau for Asia and the Pacific

By Ethel Agnes Pascua-Valenzuela[3]

The Southeast Asian Ministers of Education Organization (SEAMEO) has collaborated with UNESCO as a global partner to support and promote Education for Sustainable Development (ESD) in the Southeast Asian region for decades.

In response to the proposed SEAMEO Strategic Plan 2021–2030 on Science Agenda, in particular, priority no 2 "Natural Resources and Environmental Management/ Circular Economy"; no 3 "Climate Change Adaptation", and no 4 "Biodiversity and Biotechnology", the SEAMEO Secretariat has developed partnership with UNESCO Asia and Pacific Regional Bureau for Education (UNESCO Bangkok) by supporting the UNESCO Programmes in Natural Science, particularly Plastic Initiatives, UNESCO Green Academies, and various online learning sessions in relation to biodiversity and environment.

To improve our planet's ecosystem, we must support the UNESCO's Green Academies to take actions on critical environmental issues that will ultimately pave the way for a future of green economy. Green Academies can provide a platform where environmental change begins.

3. Director, SEAMEO Secretariat

By Atsushi Koresawa[4]

To address the increasing challenge of waste management in cities, UN-Habitat on World Habitat Day 2018 launched Waste Wise Cities, a call for action to local governments and municipalities to tackle the global waste crisis.

On the ground, UN-Habitat has been collaborating with local government and communities in improving waste management applying "People's process" as evidenced in cases such as the Clean and Green Cities Programme implemented in Afghanistan. Through this approach and its initiatives, UN-Habitat is providing technical expertise, raising people's awareness and causing behaviour changes.

Education is key to trigger the behavioural changes necessary to improve municipal solid waste management in our cities and UN-Habitat looks forward to working with UNESCO's The Plastic Initiative and Green Academies. These initiatives share common goals and create synergies to boost each other's work for a more sustainable and resilient future. I believe together we can work effectively to promote more sustainable patterns of consumption and resources management leading to waste reduction and a better future.

4. UN-Habitat Regional Representative for Asia and the Pacific

Introducing UNESCO Green Academies

Why Green Academies?

Climate change is real and climate resilience is a global issue that needs local communities' involvement. Recently youth worldwide visibly demonstrated to governments and the United Nations the urgent need to do more on climate change in order to protect their future. It is time to take action based on the scientific knowledge that is currently available. UNESCO Green Academies will provide environmental knowledge and climate-resilience skills to achieve this goal.

What is a Green Academy?

UNESCO Green Academies engage young people and their communities to transform existing buildings, for example schools, into climate-resilient structures, equipped with simple, affordable and replicable changes.

Green Academies foster active youth participation to achieve a sustainable lifestyle in their schools feeding back into their communities. Students will be empowered to identify their specific needs, focusing on four pillars: **Water security**, **Clean energy**, **Biomass production** and **Waste management**. Students, together with their teachers, will develop and implement their own "Sustainability Plan".

Who should participate?

The Natural Sciences Unit at UNESCO Bangkok promotes UNESCO Green Academies in Asia-Pacific. Our prime focus is on schools located in cities as well as in UNESCO Biosphere Reserves in the following countries: Cambodia, Lao PDR, Myanmar, Singapore, Thailand and Viet Nam. We also suggest the UNESCO Associated School Network (ASPnet) make use of these guidelines.

Since climate change is a global issue, any educational institution (kindergartens, schools, colleges and universities) and other buildings worldwide can be retrofitted as prescribed in these guidelines to enhance their climate, biodiversity, water and waste footprints. These guidelines are globally applicable.

Youth Clubs

The foundation of a Green Academy

4 QUALITY EDUCATION

5 GENDER EQUALITY

Young people are often agents of change, promoting better environmental performance, peace, democracy, gender equality, human rights and climate resilience.

The foundation of any UNESCO Green Academy is an extracurricular youth club involved in the continuous improvement of their own "Green Academy" and systematically fostering environmental performance, democracy, gender equality, peace and respect of human rights.

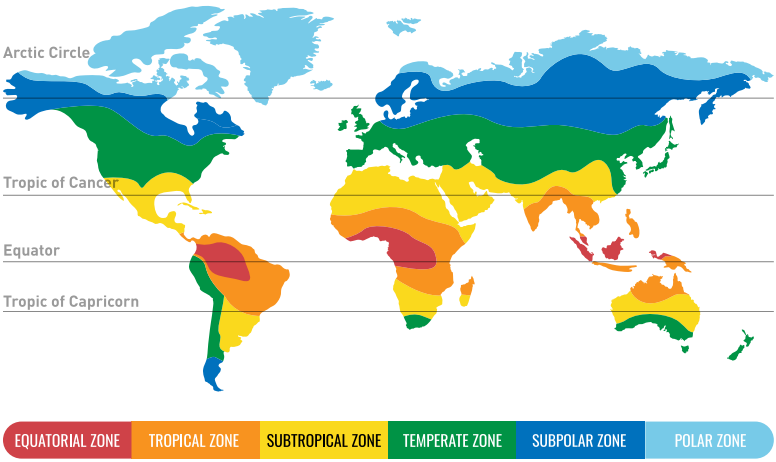
Theoretical science-based knowledge will be directly applied with hands-on activities to turn rhetoric into action. Best practices for a sustainable lifestyle in support of the United Nations Sustainable Development Goals will be implemented.

Educational Programme

Environmental sciences and sustainable development education will enable young people to gain a comprehensive understanding of the causes and consequences of climate change through theory and hands-on activities.

Theoretical content will include climate zones and patterns, understanding standardized climate diagrams, ecology, waste and water management, as well as biodiversity and gardening. This scientific knowledge will enable youth clubs and their teachers to identify the changes that are relevant to their communities to be implemented based on the four pillars:

- **Water security**
- **Biomass production**
- **Clean energy**
- **Waste management** (reduce, reuse, recycle)



Simplified map of climate zones

Water Security

6 CLEAN WATER AND SANITATION

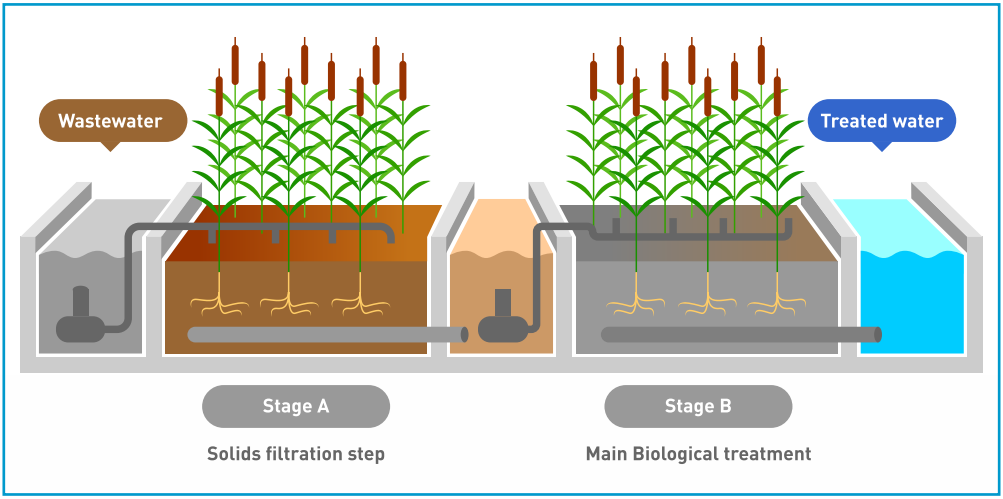
The availability of clean freshwater is a human right. In some locations, this vital resource is scarce, in particular in dry-desert areas.

Poor water quality and inadequate sanitation are threats to water security and have adverse impacts on food security, health, educational opportunities and the environment.

Improving sanitation and access to drinking water requires investing in both freshwater-ecosystem management and sanitation facilities, including nature-based solutions.

Water Availability

Rainwater harvesting on school rooftops and storage in tanks enhances water availability. The collected water can be used for showers, sanitation facilities, washing and irrigation. Water flow can be handled by hand pumps and gravity.



Reed-bed technology for the treatment of greywater

Water Sanitation

Significantly improved sanitation can be achieved by turning black and greywater into valuable resources.

Blackwater can be recycled into biogas to provide clean energy for cooking. This contributes to human health by significantly reducing pathogen-polluted water released into the environment. Dry-composting toilets are an alternative when avoiding blackwater management is desirable.

Greywater from showers and kitchens can be treated using reed-bed technology and septic tanks. Although it cannot be used for drinking and food crop irrigation, reed-bed treated water is safe to use for general irrigation and cleaning purposes as well as flushing toilets.

Properly and safely managed wastewater used as source of energy or fertilizer benefits local communities and the environment.

Clean Energy

7 AFFORDABLE AND CLEAN ENERGY

13 CLIMATE ACTION

Energy availability is important for many human activities. Currently, most energy consumed is based on fossil fuels (about 80%), nuclear energy and biofuels.

Fossil fuels account for 60% of global greenhouse gas emissions and therefore contribute to human-induced climate change. Major accidents have shown that nuclear energy, for the time being, poses significant security risks.

Access to reliable and affordable clean energy in combination with energy conservation and efficiency is crucial to foster sustainable and inclusive communities. Clean energy contributes to climate-change mitigation and reducing air pollution.

Clean-energy technologies provide affordable, reliable, efficient and sustainable energy. Their availability has positive social, economic and environmental impacts through enhanced energy security, human health and well-being, and nature conservation.

Energy resources that can naturally replenish in our lifetime include biofuel, solar, wind, kinetic and geothermal energy.

Learning about clean energy and implementation of the relevant technology is a powerful educational and practical asset. When applied, it functions as a tool to reduce costs and CO_2 emissions while providing clean energy.

Biomass Production

Food and fuel are expensive and necessary commodities that are not always easily available. According to the World Food Programme's Hunger Map 2019, 821 million people do not get enough to eat.

Additionally, 1.2 billion have little or no access to electricity, and therefore rely on firewood collection or illegal logging, which contributes to deforestation. With increasing demand and limited arable land available, it is essential to transition towards responsible production and consumption of biomass.

Biomass production in UNESCO Green Academies is an opportunity to use ecological services to optimize food or fuel production while reducing the environmental footprint. Successful and responsible crop production can be achieved by considering the climate, location and soil quality to select relevant crop varieties and cultural techniques. Crop diversity and rotation combined with sustainable pest management strategies should be considered to reduce crop loss due to pests and diseases.

Food Production

Growing crops actively contributes to food security and awareness of its value and challenges. Green Academies will enhance knowledge and skills for the production of edible products, including the five food groups (carbohydrates, fruits and vegetables, fat, proteins and dairy) for human consumption and animal feed. Youth clubs could keep fish, livestock and poultry for eggs, milk and protein production, in accordance with animal welfare ethics and regulations.

Additionally, different diets and their environmental footprints can be discussed. For example, since meat production contributes to greenhouse gas emissions and deforestation, adopting a balanced plant-based diet with reduced meat and animal-sourced food intake is beneficial to both human health and the environment.

Biofuel Production

Biofuel can be obtained from fast-growing species for the production of charcoal, wood-chips, reed-biofuel and oils. Producing biofuel contributes to offsetting local deforestation and illegal wood-cutting and therefore protects the environment and biodiversity.

Waste Management (Reduce, Reuse, Recycle)

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Overconsumption of natural resources in the 20th and 21st centuries has already caused widespread global environmental degradation. Ecosystems have been lost and fragmented, reminding us that the planet's natural resources are limited.

"Reduce, reuse, recycle" is a mantra calling for responsible consumption and production. We can all participate by adopting more resource- and energy-efficient lifestyles, reducing pollution while increasing health and well-being. To achieve this goal, everyone should take part, from producers to consumers, working individually and collectively to change our behaviours to achieve sustainable lifestyles and all of the Sustainable Development Goals.

Organic waste can be composted and used as a valuable source of nutrients for biomass production. This will reduce the amount of waste going into landfills while enhancing local soil fertility. It also contributes to food security and nutrition.

There are many other forms of waste posing serious threats to aquatic, coastal and terrestrial ecosystems, as well as human health. Youth clubs will determine the different waste types produced in their schools and implement existing or innovative waste-management methods to actively tackle the issue.

Development and implementation of realistic waste-management programmes will benefit the environment, the students and their communities' well-being.

Youth clubs should strive to prevent waste buildup at its source. The involvement of educational institutions together with whole communities alongside recycling and waste-management companies will be imperative to success.

The Plastic Initiative

Our lives are surrounded by convenient plastic. Between 1980 and 2015, the global amount of plastic production increased from 100 million to over 400 million tons. Large quantities of plastic waste enters the world's oceans annually, from cities via plastic-polluted rivers.

The Plastic Initiative developed by the UNESCO Bangkok Office aims to support sustainable plastic management, as well as producer, user and consumer behaviour.

The Plastic Initiative aims at mobilizing communities to find solutions and take action to solve plastic waste-management issues through existing ideas, innovation and education.

More information can be found at

https://quest4action.org

There is no "easy fix" to improve the situation. School clean-up campaigns are not enough. We need to mobilize youth, raise awareness, enhance environmental education and turn to action. We need to involve government authorities to adjust policies and practices, and the private sector to support professional action to clean up the mess.

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