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«Εκπαιδεύοντας και ενδυναμώνοντας παιδιά και νέους σε όλο τον κόσμο ώστε να γίνουν ενεργοί καταλύτες αλλαγής για ένα βιώσιμο μέλλον: η περίπτωση της κλιματικής αλλαγής»

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“Educating and empowering children and youth across the world to become active agents of change for a sustainable future: the case of climate change”

Maria Spentzou

ΠΡΑΚΤΙΚΟ ΚΡΙΣΕΩΣ
ΤΗΣ ΣΥΝΕΔΡΙΑΣΗΣ ΤΗΣ ΤΡΙΜΕΛΟΥΣ ΕΞΕΤΑΣΤΙΚΗΣ ΕΠΙΤΡΟΠΗΣ ΓΙΑ ΤΗΝ
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.Μαρίας Σπέντζου

Εξεταστική Επιτροπή ,

Επιβλέπων ,
Μέλος ,
Μέλος

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Η εξεταστική επιτροπή αφού έλαβε υπ' όψιν το περιεχόμενο της εργασίας και τη συμβολή της στην επιστήμη, με ψήφους προτείνει την απονομή στον παραπάνω Μεταπτυχιακό Φοιτητή την απονομή του Μεταπτυχιακού Διπλώματος Ειδίκευσης(Master's).

Στην ψηφοφορία για την βαθμολογία ο υποψήφιος έλαβε για τον βαθμό «ΑΡΙΣΤΑ» ψήφους για τον βαθμό «ΛΙΑΝ ΚΑΛΩΣ» ψήφους και για τον βαθμό «ΚΑΛΩΣ» ψήφους Κατά συνέπεια, απονέμεται ο βαθμός «(Αριστα/Λίαν Καλώς/Καλώς)& (Βαθμός)..... ».

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Key words

Children, youth, education, empowerment, climate change, agents

Executive summary

Climate change is threatening prosperity and livelihoods of humans, animals, ecosystems and the environment. Unless we act now, and engage all stakeholders, from the local to the global level, consequences will be irreversible. Children and youth are not only a vulnerable group, who is the most burdened by climate change and who will live longer on this planet, but also have the right, responsibility, capability, energy and motivation to be change makers, reducing vulnerability, enhancing resilience and building capacity. The purpose of this systematic literature review is to explore a) how children and youth around the world can be empowered to take action against climate children, b) how important is education in cultivating knowledge, skills, values and behavior changes c) what educational and other intervention programs and Sustainable Development initiatives are implemented in different parts of the world to transform children and youth to active agents of change, d) how can these programs be monitored and evaluated, and e) what key factors constitute an effective program.

Dedication

To my husband and life companion Andreas, for his support and for helping me realize this life changing experience and mission and one more dream come true during the time we have been together.

To our wonderful and beloved children, Katerina, Dimitris, Anna and Nagia, our young active agents of change, who are wise enough to know that although this MSc took a lot of quality time from us, making the world a better place for everyone, requires commitment and devotion. I hope that one day each one of them will follow their hearts and inner calling to serve the world.

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Introduction

Climate change is happening here and now and threatens the well-being, health, livelihoods and sustainability not only of humans but also of animals, ecosystems and the environment. Humanity and planet earth are facing a global emergency.

Climate change is caused mainly by human factors such as industrial revolution, greenhouse effect, deforestation and mining in addition to natural factors like solar energy and has short and long term consequences, including rising temperatures, floodings and water insecurity, extreme weather events, natural disasters, deforestation, droughts, desertification, sea level rising and shrinking glaciers. All these conditions have a major effect on health, economy, well-being, livelihoods access to education, poverty, inequalities, safety, protection, migration and conflict. Climate change is a complex problem with ecological, economic, social and political impacts across the world. Consequences of this crisis are far-reaching, interlinked and have a domino effect and include food insecurity and malnutrition, water insecurity, loss of biodiversity, increase in waterborne, vector-borne and respiratory diseases, mental and physical trauma and even death. It is an unprecedented global challenge that must be tackled immediately since it threatens peace and stability, increases the number of people affected by poverty and inequalities”(1) and threatens from coral reefs to forests and other vital ecosystems. It is a global challenge which is intergenerational, multifaceted and complex, requiring collective and holistic response, collaborations and synergies of a wide cross-section of fields, civil society like communities, NGOs, institutions, academia, citizens, governments, and the private sector to develop and implement coordinated initiatives and strategies at a local, national, regional, and international level(2). Furthermore, the same human activities that drive climate change and biodiversity loss, also drive pandemic risk through their consequences on the environment which is why it essential to focus more on prevention, since the Covid 19 pandemic economic consequences are 100 times the estimated cost of prevention(3). People in developing countries are most at risk since they rely mainly on natural resources and do not have infrastructure or resources to cope with stresses. Children and youth are not only a vulnerable group, who is the most burdened by climate change and who will live longer on this planet, but also have the right, responsibility, capability, energy and motivation to be change makers, reducing vulnerability, enhancing resilience and building capacity.

Methodology

The purpose of this systematic literature review focusing on children and youth with respect to climate change is to outline reports, articles and findings across the world and to indicate lessons learned and solutions from various stakeholders at the local or global level to combat climate change. Specifically, this systematic literature review aimed to explore a) how children and youth around the world can be

empowered to take action against climate children, b) how important is education in cultivating knowledge, skills, values and behavior changes c) what educational and other intervention programs and Sustainable Development initiatives are implemented in different parts of the world to transform children and youth to active agents of change, d) how can these programs be monitored and evaluated, and e) what key factors constitute an effective program. Finally, an effective education intervention program is designed and put forward, outlining elements of quality education programs within the field of Education for Sustainable Development and Climate Change Environmental Education inspired by global citizenship and environmental stewardship.

General part

The problem

In the last 50 years, burning of fossil fuels and land-use change has increasingly produced large quantities of greenhouse gases, especially carbon dioxide (CO₂)(4), rising by 70% between 1970 and 2004. Global warming threatens children's well-being, health, development, education and protection(5) and is one of WHO's global healthcare challenges in the coming decade. Climate change crisis is an emergency happening now and caused mainly by human activities. It leads to sea level rise, melting of ice sheets and glaciers, destabilization of major ice sheets, ocean acidification causing rise in ocean temperatures and resulting in coral bleaching and loss (6), extreme weather events, heatwaves, tropical cyclone events killing 170,000 people and affecting 250 million between 2001-2010. Moreover, over a third of the Amazon rainforest is threatened by climate change(6). Each decade is warmer than the previous one, and the 16 warmest years on record have been noted during the past 20 years. 2016 was the warmest year in Greece, and September 2020 was the warmest in history (7). Rising temperatures, enhance drought which exacerbates desertification and leads to water and food insecurity, undernutrition, malnourishment and elevated infant mortality (8). According to the 2013 IPCC, global temperatures will likely rise 2°C causing GDP fall by 15% and may increase 4.8°C by 2100 if current pace in emissions continue(9). Climate change is projected to a) increase the global burden of disease(10) especially with respect to non communicable diseases (NCDs), the biggest killers including COPD, asthma, acute lower respiratory tract infections, TB and lung cancer, and to respiratory diseases which are linked to the environment, and are more preventable than most other diseases, and b) increase conflict and political instability due to scarce resources when already more than 1.6 billion people live in conflict-affected areas, including 600 million youth (11). Key climate indicators include global temperature, greenhouse gases, cryosphere-sea ice, sea level, ocean heat content and ocean acidification(12).

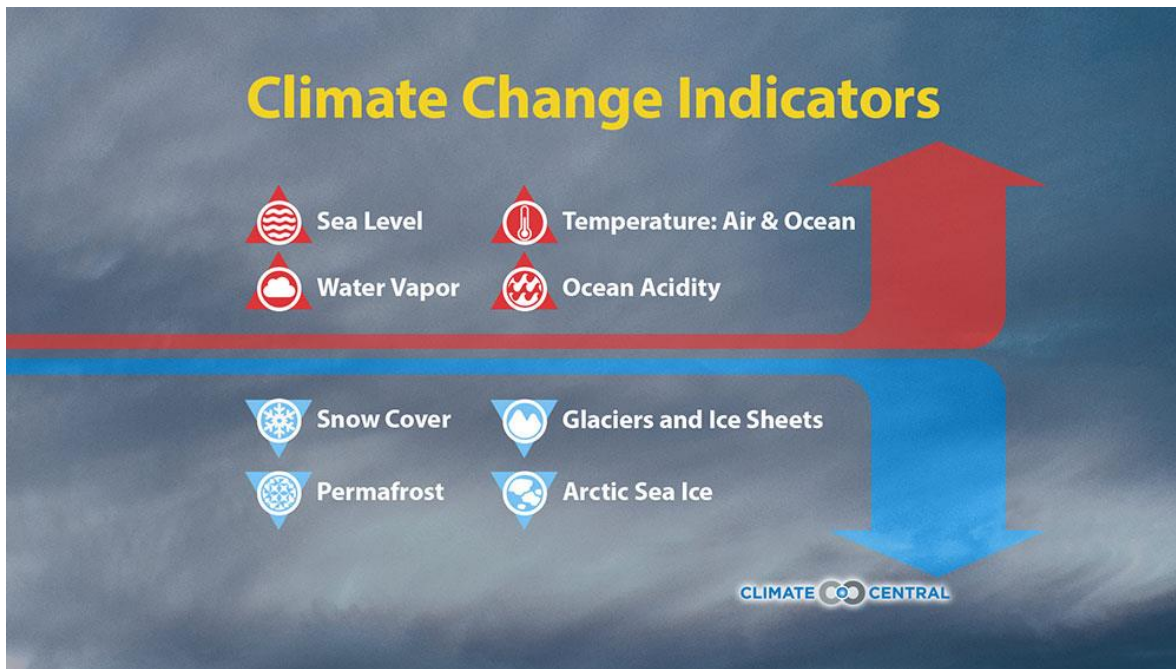


Figure 1. [TVM_ClimateChangeIndicators_web.jpg \(1000×563\) \(climatecentral.org\)](#)

Collective activities and behaviors of humankind jeopardize our survival and it is becoming more challenging to reverse the effects, as the change is becoming more rapid, dramatic and catastrophic. Drastic change and enforcement of measures from the global community are urgently needed (13).

Causes of climate change

Greenhouse emissions (GHE) are produced from the production, transportation, use and disposal of goods consumed and the energy-intensive lifestyles of developed countries. In particular, the greatest sources of GHE include by electricity and heat, agriculture and land, industry and transportation in order of damage caused(5).

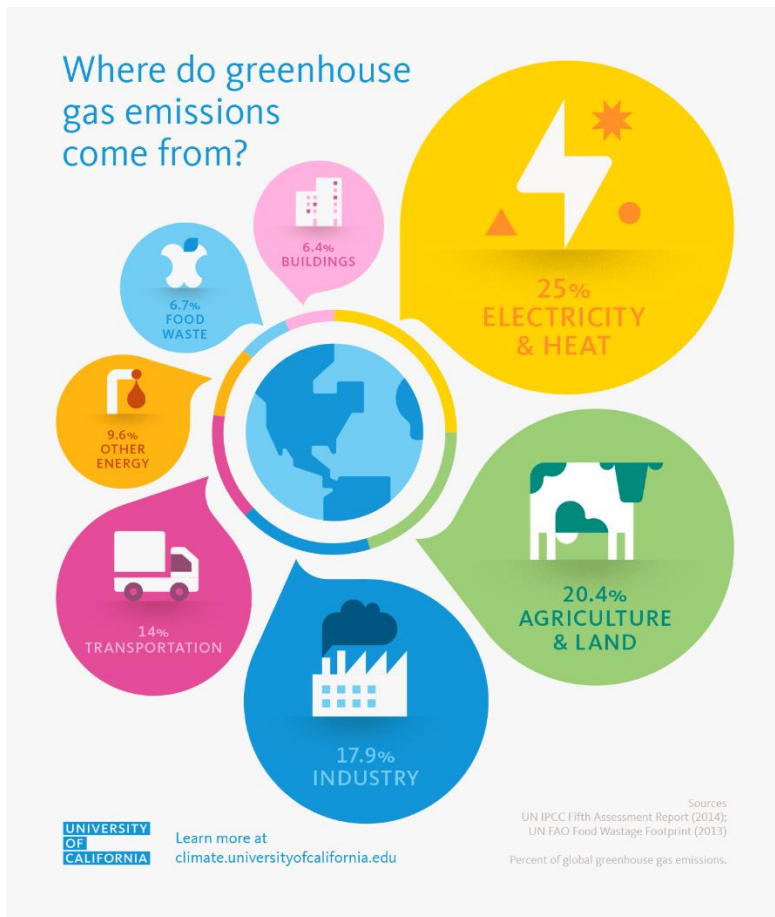


Figure 2. Sources of greenhouse emissions ipcc 2020 - Bing images

It is noteworthy that 12% of the world’s population living in Global North account for 60% of global private consumer spending; while the one third living in South Asia and sub-Saharan Africa account for only 3%(14). According to BBC, the biggest emitters of carbon dioxide are China and the US followed by Europe and India.

Immediate consequences of climate change

Climate change threatens to reverse the gains in global child health and reductions in global child mortality achieved within last 25 years(15). Health impacts from climate change include impacts caused by weather extremes, consequences of environmental degradation due to climate change and consequences from populations’ displacement caused by conflict or environmental degradation including traumatic, psychological and other consequences(16). Short-term consequences include water and food insecurity, undernutrition, health problems and diseases, extreme weather events and disasters

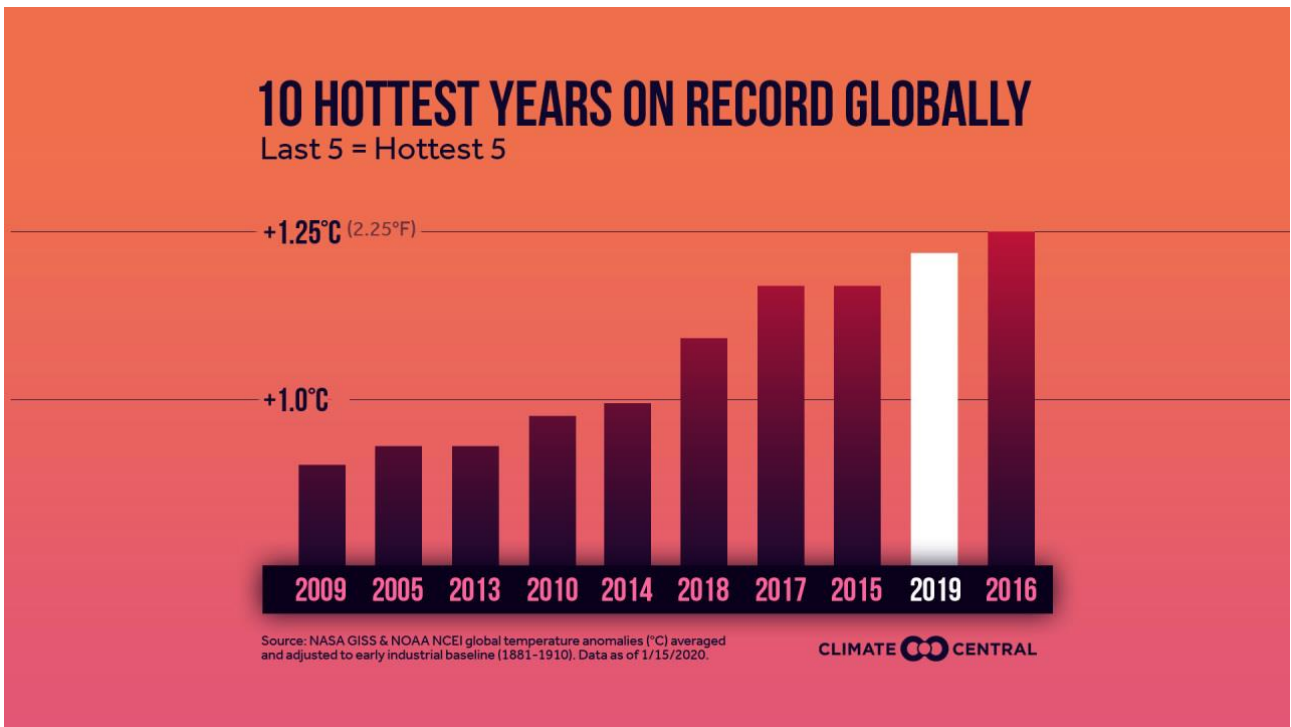


Figure 3. Hottest year on record - Bing images



Figure 4. Climate-change-impacts-on-coastal-odisha-4-638_orig.jpg (638×479) (weebly.com)

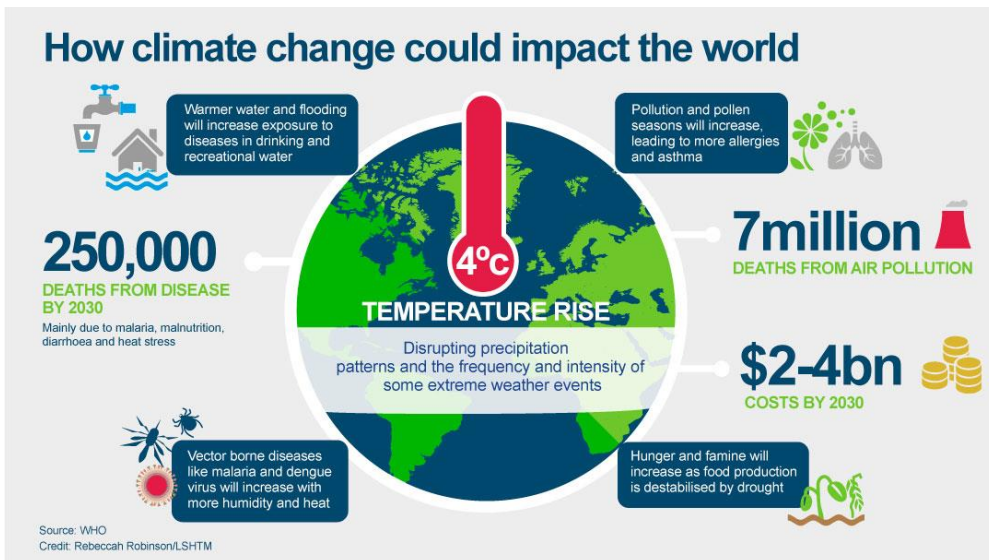


Figure 5. [Photo-4.9.2..jpg \(800x450\) \(aquaticlifelab.eu\)](#)



Figure 6. [New-climate-statement-infographic_2018_indicators.png \(600x600\) \(ane4bf-datap1.s3-eu-west-1.amazonaws.com\)](#)

Health

Children's health is severely jeopardized by climate change consequences due to differences in development, physiology, immunity and metabolism compared to adults. Eighty eight per cent of the existing global burden of disease attributed to climate change affects children under five years old.

Climate change's impacts include extreme weather related morbidity and mortality, exposure to toxic chemicals, poverty, food and physical insecurity(10). Global warming is expected to cause approximately 250 000 additional deaths annually between 2030 and 2050; 38 000 due to heat exposure in elderly people, 48 000 due to diarrhea, 60 000 due to malaria, and 95 000 due to childhood undernutrition(17).

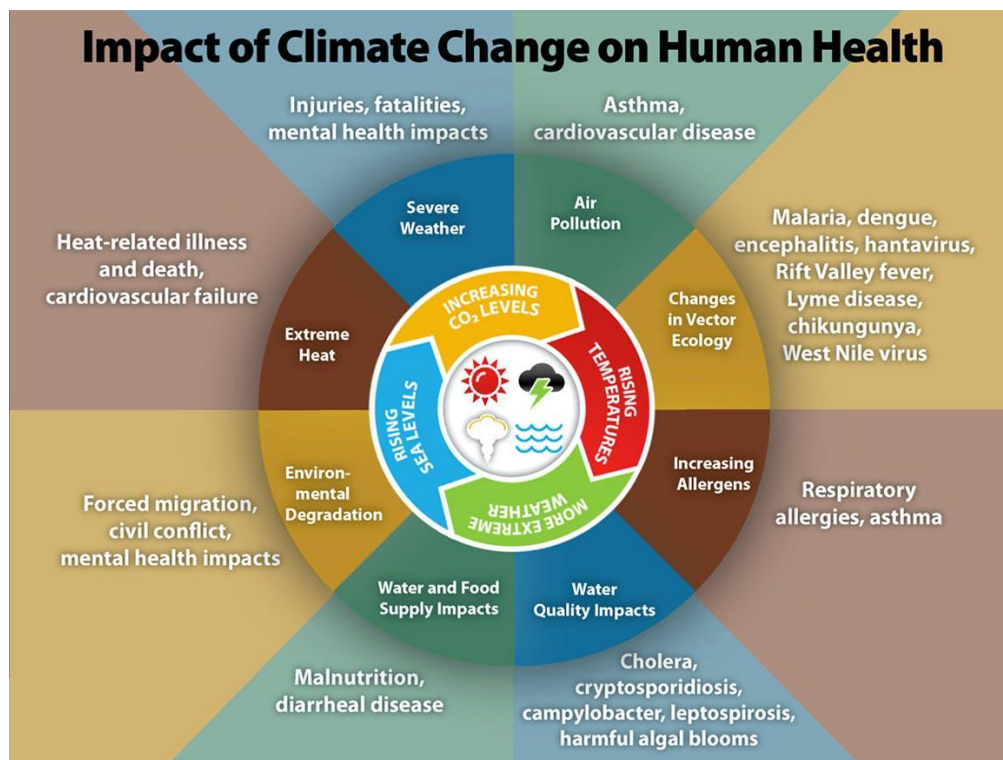


Figure 7. Major health impacts of climate change - Bing images

Water

Climate change, population growth, and the resulting increase in demand for food, energy, and biofuels will lead almost half of the global population to live in high water stress areas by 2030(18). With rainfalls sharply declining and temperatures rising in southern Africa, threats related to water increase include contamination, pollution, degradation, over-exploitation, competition, displacement and conflict. Water scarcity affects 1.6 billion people currently and is expected to impact 2.8 billion people by 2025 according to World Bank.

Diseases

Climate-related threats are considered the most significant global health challenge of our times.(15) Environmental factors like air, water and soil pollution cause one in four deaths worldwide. Within 2012, 12.6 million deaths occurred (17), particularly in Southeast Asia followed by Western Pacific region. Furthermore, warmer climates impact the range, life cycle, geography, feeding, breeding patterns, survival, growth and presence(19) of vectors, threatening and harming mainly children and youth (20) and leading to alterations and re-emergence of diseases such as Chikungunya(15). Changes in climate increase likelihood of vector-borne diseases (3) such as malaria killing over 400 000 people and mainly children under 5 years old in the African continent. Extreme high air temperatures and air pollution related diseases account for as many as 8.2 million of the deaths (17) and include asthma affecting 300 million people (19), heart and lung disease(6).

Undernutrition

Extreme heat and weather events, natural disasters, droughts and floods impact agriculture, yield production, biodiversity, livestock and fisheries and consequently food availability leading to food insecurity and undernutrition. Undernutrition accounts for 45% of total deaths in children under 5 (15) and is a risk for disease as it lowers resistance. WHO forecasts that by year 2030, there will be between 77000 to 131000 additional deaths in children under 5 caused by climate change related undernutrition. Malnutrition and undernutrition kills 3.1 million people yearly. According to UNICEF (2011) 20% of rural Indonesian children left school due to weather events related financial problems and 60% of children claimed that food prices are severely affected by rain. 200,000 people will die, half of which are children and 200 million people will suffer from food insecurity as a climate change consequence in poor regions. Rising temperatures result in diminishing of staple food production by up to 50 per cent in Africa increasing malnutrition, undernutrition and stunting rates(8). Food safety and security is jeopardized by droughts and flooding, particularly in regions relying in agriculture and farming. Malnutrition negatively affects vulnerable groups(21) and impacts South-East Asian(22) and Sub-Saharan African communities. By 2050, 30 million more children will be malnourished due to climate change(8). Furthermore, there is a rise in global acute malnutrition (GAM) in drought affected areas such as Chad from 14.5 per cent in 2011 to 18 per cent in 2012(8).

Disasters

Climate- related disasters are catastrophic events caused by natural processes of the earth, including flood, heat waves, hurricanes, droughts wildfires , often coupled and acting like dominos and result in a) injuries and fatalities, b) diseases, c) negative physical and mental health effects, d) environmental disruption (23), e) loss of property and damaged infrastructure(24), f) jeopardized

health care(15) g) economic, political and social consequences, h) suffering, and i) overwhelming of local capacity, necessitating external assistance . Severity is measured in life losses, economic losses and the ability of the population to rebuild (24). Globally, the number of natural disasters has more than tripled since the 1960s, causing deaths, immigration and increased health and mental health risks. Within the first half of the 20 the century 12 disasters took place annually while by 2004, 350 disaster took place. Around 1000 natural disasters have taken place in Africa in the last decade , affecting over 460 million people and resulting in 880,000 casualties(25). Furthermore, in 2021 in Central America, Hurricane Iota was the second major tropical cyclone to strike the same region within the same month. The human development index 2018 human development index ranks countries by mortality rates caused from disasters

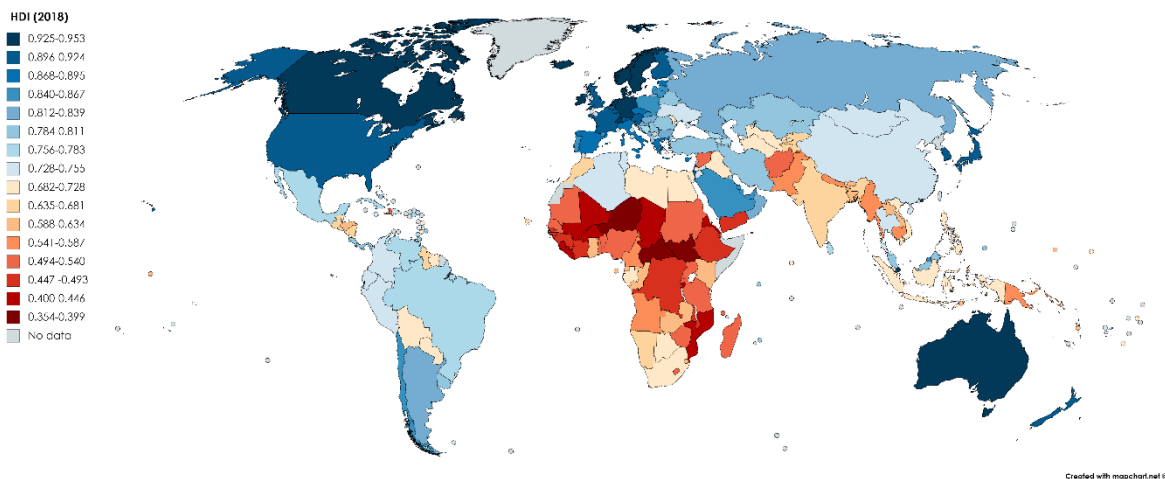


Figure 8. Human development index 2018 - Bing images

Disaster-affected children went from 66.5 million annually in the late 1990s, to as many as 175 million annually in recent years(8). Women and children are 14 times more likely to die in a disaster than men are. Furthermore, wildfires are becoming more frequent and intense around the world, destroying natural habitats, threatening the survival of species and causing 10% of the world’s greenhouse gas emissions annually (6). Climate change alters the frequency, magnitude, timing and location of natural disasters, rendering children susceptible and a) threatening their health via injury and trauma and restricting access to medical care, b) jeopardizing their mental health, c) interrupting education due to migration, damaged schools or economic problems. It is vital to mitigate children’s vulnerability and exposure in order to safeguard them through disaster preparedness and education. Children can serve as climate-change agents locally and globally by passing on knowledge to their communities and supporting mitigation programs, resulting in fewer disasters and health risks (26).

Increasing the risk perception including likelihood, susceptibility and severity of a disaster and knowledge of the children are important to affect the way children behave and respond to disasters. Disaster education programs usually take place with physical presence, yet innovative digital approaches such as virtual reality, video gaming and on line platforms have been developed.

Extreme weather events

Extreme weather events jeopardize humans' and ecosystem's health and safety, threaten water quantity and food availability, production, distribution and access resulting in loss of income, hunger, poverty(5) and biodiversity loss undermining child health, wellbeing and livelihoods(8), causing political and public health crises, conflicts, migration, trauma diseases, stresses and deaths. Floods, extreme precipitation and variable rainfall patterns have increased in frequency and intensity(1), contaminating and reducing freshwater supplies, increasing the risk of water-borne and vector-borne diseases like diarrhea killing over 500 000 children aged under 5 yearly with an additional 48 000 deaths per year in young children expected by 2030 (15) and causing drownings, injuries, damages in addition to famine, malnutrition and undernutrition. Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhea and heat stress. Indirectly, disasters and extreme weather events lead to resource scarcities resulting in a) social and civil conflicts, b) exacerbation of existing poverty and inequalities (23), c) decrease in school enrollment and attendance especially for women , d) immigration and displacement increasing the risks for child abuse and trafficking, e) parental stress and f) decreased social supports leading to child maltreatment and to children working to support their families.

Long term consequences

Long-term consequences of climate change include economic, environmental injustice, mental health problems, job insecurity, and migration

Economic Impact

Climate change poses a hazard to a) insurance due to extreme weather events costing \$1.825 trillion in the last 40 years and insurance companies raising premiums to cover costs, b) world's GDP reduction, c) employment, since 1.2 billion jobs are threatened in sectors like agriculture, fisheries, and forestry (27), d) immigration with 26 million people being annually displaced including children threatened by health, mental health and safety risks(15) and 1 billion people predicted to emigrate by 2050 due to food insecurity, e) national security since bases and stations are damaged, and f) rising food prices. If we don't act now, the economic impact will be as catastrophic as the cost of fighting two world wars combined with the 1930 stock market crash(28). The direct damage costs to health is

estimated between USD 2-4 billion per year by 2030 and unless urgent action is taken, climate change costs will be equal to losing at least 5% of global GDP each year, suggesting economic threats in addition to health and social threats(8). United Nations Office for Disaster Risk Reduction (UNISDR) indicates that in the decade, climate-related disasters have caused global economic losses of US\$2 trillion. Moreover, WMO indicates that, between 2001 and 2010, there were 511 tropical cyclone-related events causing economic damages of US\$380 billion.

Migration

Environmental degradation, and political instability and conflict caused by scarce resources leads to immigration Since year 2009, it is estimated that one person every second has been displaced by a disaster, with an average of 22.5 million people displaced by climate-related events since 2008 according to Norwegian Refugee Council and Internal Displacement Monitoring Center GRID 2018 report and it is estimated that by 2050 migrants will reach 140 million people according to World Bank(29) .

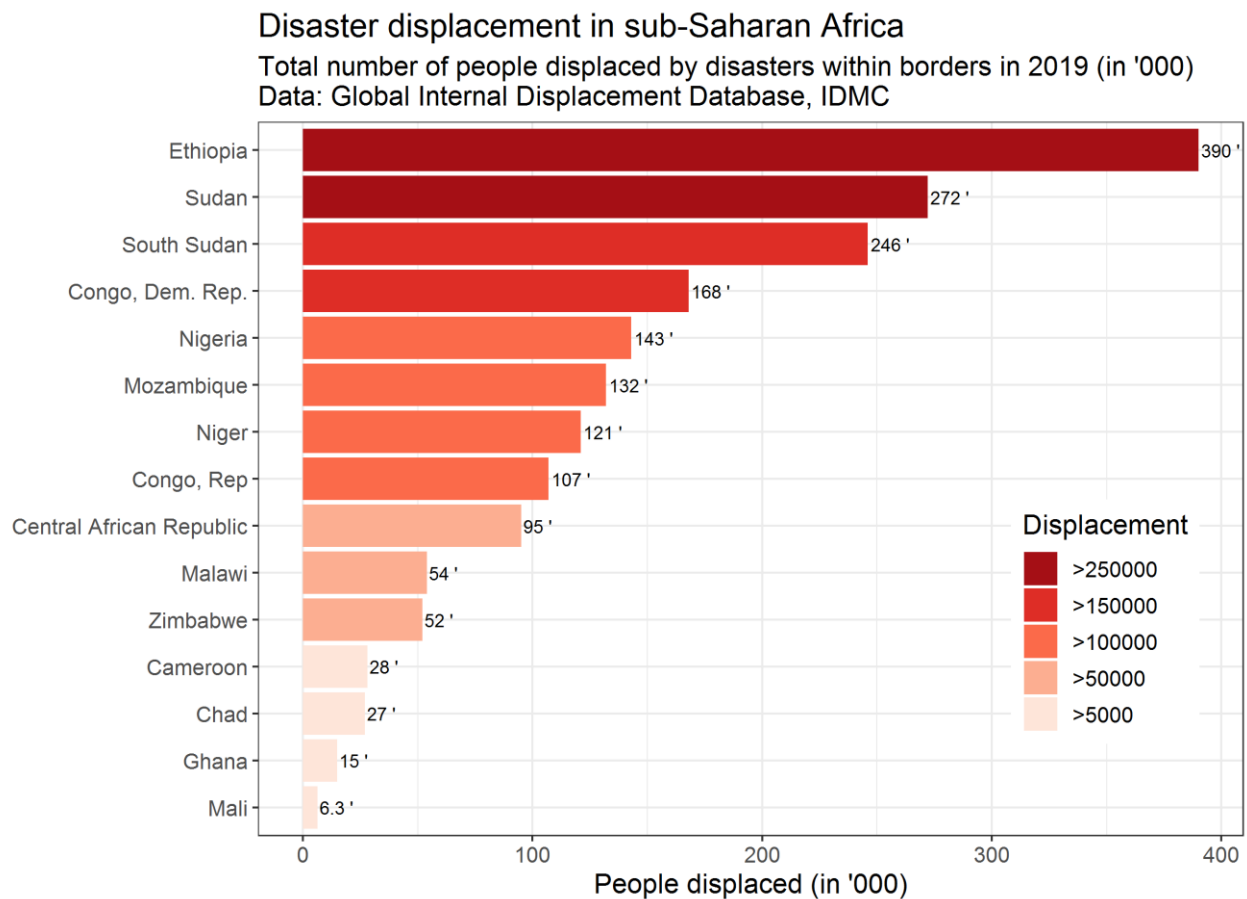


Figure 9. Africa Migrations Climate Change - Bing images

Inequalities, environmental injustice and factors exacerbating inequalities

Global climate change worsens environmental injustice(10) since its health consequences burden heavily the world's disadvantaged children, who already have poor survival rates and low life expectancies caused by poverty, disease, malnutrition, inadequate housing, lack of access to healthcare, inability to buy medicines (30), insufficient healthcare and f) living in endemic disease regions and socio-economic disadvantage(30). More than 200 million children under 5 years in developing countries do not reach their development potential due to poverty, malnutrition and poor health, disrupting their cognitive, physical and social-emotional development(30). Disadvantaged children are more likely to be exposed to pathogenic agents from inadequate sanitation, become ill from lower resistance and have no access to health care, perpetuating the cycle of poverty as they have poor health, lack of readiness for school and have subsequent low incomes.(30) Climate change affects the social and environmental determinants of health including clean air, safe drinking water, sufficient food and secure shelter. Areas with weak health infrastructure and low socioeconomic status are least able to cope, prepare and respond exacerbating existing inequalities (10). Climate change amplifies existing inequities, by disproportionately affecting already poor whose livelihoods depend on the environment and who live in conditions susceptible to environmental stressors, exacerbating the unequal distribution of many essential determinants of health, such as access to clean water, sanitation, food, shelter and gender equality, indicating a violation of human rights and inequities in life chances. Due to inequalities, food security affects young women more and specific regions like rural Africa, where more than half of the region is young people live due to reduction of potable water, groundwater and rainfall (31).

Challenges and priorities in different regions of the world. Differences and common factors

Unicef indicates that the effects of any crises is determined by the vulnerability levels(8). Environmental threats are exacerbated in developing countries in sub Saharan Africa, SE Asia and the Small Island Developing States , Equatorial Africa, and Latin America which suffer the greatest burden due to particularities including a) geographical, b) geological, c) demographical, d) socio-economic like heavy debt to poverty, unstable economies, low economic resilience, weak infrastructure, and e) political like absence of democracy (32). Their populations are susceptible to climate change more speedily and directly since they are a)located in warmer regions, b) rely mainly on agriculture which is highly climate- sensitive economic sector, c) are severely affected by variations in rainfall patterns and weather extremes, d) depend on scarce natural resources for food, water, shelter, heat and livelihood, e) lack proper healthcare, adaptation mechanisms and disaster mitigation systems and f) lack resources to cope with the aftermath of natural disasters.

Although developed countries are responsible for more than 75% of total GHG emissions and particularly China, USA and Europe, almost all (95%) of cities facing extreme climate risks are in Africa or Asia (33). Disadvantaged communities that have little or no ability to be protected from, to cope, recover and rebuild after a disaster or to safely relocate, increasing inequities and health hazards(30). Countries that will suffer most from weather extremes include Arctic region, Asia and the Pacific, The Caribbean, Central Asia, Gulf of Mexico, Latin America, the Middle East, North Africa, the Sahel zone and Southern Africa(16). Sub-Saharan Africa suffers from various environmental threats like deforestation, soil erosion, desertification, wetland degradation, human induced degradation and insect infestation(32). Additionally, small island developing states (SIDS), low-lying coastal areas and regions near lakes and rivers are at great risk from floods and rising sea levels and increasing natural disasters, leading to displacement and forced migration.

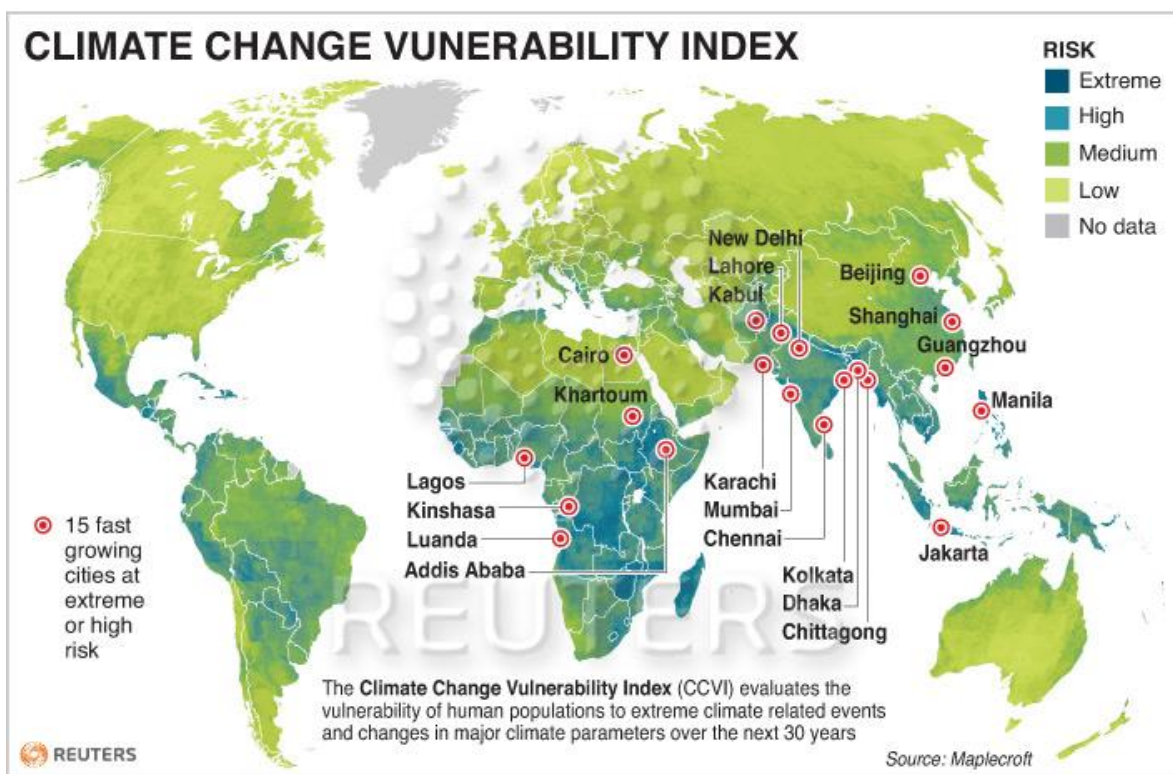


Figure 10. Climate Change Vulnerability Index - Bing images

In 2004, Global North had 10% of world’s youth with 55%per cent of global education expenditure, while sub-Saharan Africa had 15% the world’s youth and only 2% of worldwide spending on education(1). Paris Agreement 2015(34) dictates the need for conservation and immediate response to the urgent threat of climate change especially in the Global South which is particularly vulnerable to climate change. “Climate justice” and the relationship of climate change actions and eradication of

poverty, food security and human rights is stressed in addition to the importance of education, training and public participation, and sustainable lifestyles and patterns of consumption and production.

Various regions of the globe are affected differently since Africa relies on groundwater and rainfall, while Asia on wheat and rice production. Agricultural productivity could decline between 9 and 21 % in developing countries as a result of climate change(22) In Global South, there are inadequate response mechanisms and infrastructure resulting in a force multiplier effect whereby health issues are elevated to a health and safety crisis. Moreover, in mountainous regions, melting glaciers impact freshwater ecosystems. Himalayan glaciers feed great Asian rivers such as the Yangtze, Yellow, Ganges, Mekong and Indus affecting communities in China, India, and Pakistan, which account for more than 40 per cent of the world's youth. Over a billion people rely on these glaciers for drinking water, sanitation, agriculture and hydroelectric power. Furthermore, India is expected to be in a state of water stress before 2025(31) while sub-Arctic forests are likely to be particularly badly affected, with tree lines gradually retreating north as temperatures rise. In tropical forests such as the Amazon, where there's abundant biodiversity, even modest levels of climate change can cause high levels of extinction.(6) Moreover, climate change is amplified in the polar regions like the Antarctic ice sheet, the largest single mass of ice on earth accounting for 90% of fresh water which are crucial for regulating earth's climate and particularly vulnerable to the effects of global warming (6). Rising temperatures a) increase the likelihood of diseases and of heat stress especially in the Global South due to inadequate housing conditions, b) affect availability, quantity and quality of water due to sea level rises, increase in the rate of glacier and snow-cover retreat.



Figure 11. [D21VISrWsAAXRIQ.png \(550x550\) \(skepticalscience.com\)](#)

THE COUNTRIES MOST AT RISK FROM CLIMATE CHANGE

the **eco**experts

WORLD MAP

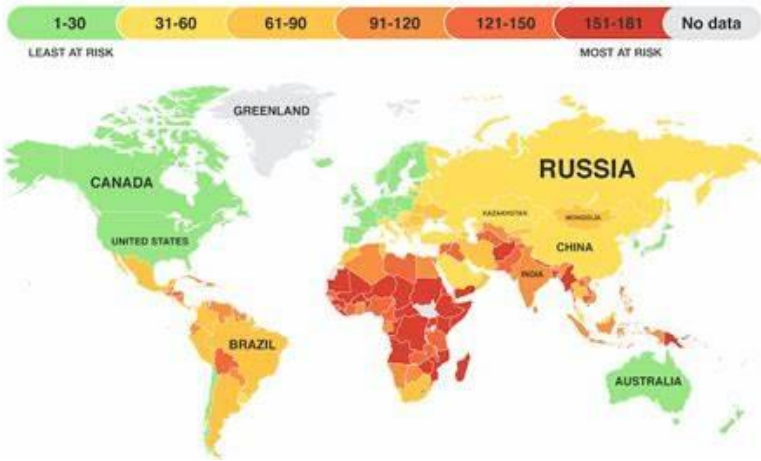


Figure 12. Areas affected by climate change who - Bing images

COUNTRIES MOST LIKELY TO SURVIVE CLIMATE CHANGE



Figure 13. [Climate-change-242062.jpg \(590×788\) \(express.co.uk\)](#)

Vulnerable groups at risk

Global climate change has severe effects especially on vulnerable populations such as children, youth, elderly, living in poverty and rural areas, disabled, those in conflict and post-conflict areas, indigenous, with HIV/AIDS, refugees and internally displaced persons and migrants, minorities(10), populations living in small island developing states and other coastal regions, megacities, mountainous and polar regions and those in developing countries. Those most affected are children under five and elderly, which accounted for almost half of all the deaths attributable to environmental factors(25) and people with disabilities or pre-existing medical conditions which are most susceptible to health consequences.



Figure 14. [Climatechange-infographic1-2.jpg \(948×957\) \(eldersclimateaction.org\)](#)

Girls and young women are more vulnerable to climate change effects since they are exposed to violence, risk and disease when they take care of their families, collect water, prepare food, with no access to education or resources to equip them with necessary tools to respond to disasters (21). Climate-related events amplify gender inequalities and by 2025 climate change will deprive more than 12.5 million girls from education (35). Nonetheless, educating female learners and vulnerable groups is crucial in reinforcing community adaptation(36) and resilience. Governments should give girls agency and opportunities for safe, inclusive and meaningful participation in all public decision-making that affects them(37), and to put girls who are being left furthest behind first like girls with disabilities, in poor rural areas, married girls, and girls in crisis-affected areas.

Effects of climate change on children

Almost one third of the global population that is 2.2 billions are children and youth under 18 years of age. More than 160 million children inhabit high or extremely high drought zones and over 500 million live in areas with extremely high flood risk(15). About 87% of world's adolescents grow in regions affected by poverty, hunger, disease and violence(36). Effects of climate change place children's psychological well-being and health at risk which can lead to problems with emotion regulation, cognition, learning, behavior, language development, and academic performance (38). Additionally, youth livelihood and prosperity is at risk since unemployment rates are higher among youth and most of the world's youth lives in the world's poorest regions relying heavily on natural resources for employment. More than 600 million children live in the 10 countries most vulnerable to climate change and 88% of the global burden of disease attributed to climate change affects children under five(17). Children live at a faster pace than adults do and anything harmful in the environment has greater impact on them such as their risk of respiratory infections like pneumonia. Children breathe faster, play outdoors, have a sensitive metabolism and are highly exposed to air pollution, allergens or smoke of burning fuels indoors, resulting in respiratory problems and acute respiratory illnesses (16) like asthma affecting 334 million people worldwide which is the most common and severe chronic disease in children of developing countries(16). Furthermore, young children are reliant on adults for their survival and are also affected when climate change hits their parents and other caregivers, such as loss of livelihoods and crop productivity(21). Climate change worsens lower respiratory tract infections, diarrhea, malaria and dengue, which are responsible for more than 50% of childhood deaths. Thirty-five percent of excess child mortality is secondary to malnutrition which worsens with climate change due to increasing food insecurity(10). Globally, children are estimated to bear 88% of the burden of disease due to climate change, with the poorest

disproportionately affected(10). One in five deaths annually around the world occurs in a child under five. Save the Children (2010) suggests that children from the poorest families are up to 10 times more likely to bear the burden of environmental disasters. Furthermore, children under 5 years of age experience up to two-thirds of preventable illness and death from environmental hazards.

Climate change alters the frequency, magnitude, and location of natural hazards, rendering disadvantaged children at risk since natural disasters a) threaten children's physical health, b) restrict access to medical care, c) are linked to mental health problems and d) interrupt education by migration, damaged schools, or economic needs of family leading to children into the labor force.

The interaction between children's biological, climate change susceptibility and health vulnerabilities together with social disadvantage(26) amplify child health risks (30) particularly in the Global South. Children need more protection before, during and after disasters due to their age, living conditions, ethnicity, disabilities or chronic diseases. Children's susceptibility to environmental hazards, disasters and crises is attributable to a) their immature cognitive, physical and physiological development and sensitive metabolism, b) dependency on others for safety, protection and livelihoods, c) higher and longer exposure to environmental threats by spending a lot of time outdoors such as fatalities, injuries and trauma , d) greater need for water increasing risk for diarrhea and dehydration, e) higher risk of diseases, malnutrition, and human rights violations, f) inadequate access to medical care. Additional threats for children include domestic violence due to crisis induced social and economic pressures faced by their parents(26), and higher risk of sexual assault, trafficking, abuse and neglect especially under 5 years. Moreover children's mental and emotional wellbeing is at risk including post-traumatic stress disorders, sleep disturbance, aggressive behavior, depression and anxiety, and substance abuse(30). Furthermore, there are critical times defined as "windows of vulnerability" throughout pregnancy and early childhood during which undernutrition, infection or illness can result in life-long impairments like stunting, neurological impairments and immune dysfunction, reducing the possibilities for a productive life as an adult(30).

Children and youth as active agents of change

Although children are the least responsible, they are the future generation who will live longer to face climate change consequences and must tackle them by becoming change agents to safeguard their physical, mental and social well-being. According to the Convention on the Rights of the Child children have the right to a) life, survival and development, b) have voice in decision-making processes that affect them, and c) participate in processes, decisions, and activities in order to influence justice and outcomes, challenge abuses of power, realize their potential and facilitate

society's development. Historically, the younger generation has promoted social change, embraced innovative values, initiated movements for social transformations through art and other media (14). At 2000, at COP 6 in Hague, the first youth conference and youth declaration took place leading the way for more (14). Children have unique perspectives on their local environment emerging from the way they interact with it, playfully with mindfulness and inquiry. Additionally, they have the incentives, motivation and energy required to facilitate resilience a recovery from disasters. Because 1.8 billion young people comprising the largest youth generation in history, are highly mobile and will live on the planet for long, they should a) take action for societal transformation, b) have networks to connect, mobilize and engage in sustainable development action, c) have a key role in advocacy, d) do lobbying, e) have training opportunities to become green job entrepreneurs and innovators, f) be heard in decision making, g) engage in inter-generational dialogue(39), h) participate in collecting disaggregated data as cost free researchers and statisticians i) take actions to adopt sustainable lifestyles and transition to the 5 RS including refuse, recycle, repair, reuse and refurbish, j) access information, k) be involved in initiatives, adaptation and mitigation policies. Programs and initiatives should a) aim at primary school aged children, which still attend school, b) reach youth in remote areas including indigenous, c) mobilize, and empower female youth and other vulnerable groups.

Strategies, tools and solutions to tackle climate change

Preparedness

FAO suggests a proactive approach emphasizing risk prevention and preparedness involving the capacity of governments and communities to effectively anticipate respond to and recover from the impacts of disasters. Furthermore, sustainable development includes strengthening the psychological resilience of people, resilient livelihoods and resilience of households. Effective programs of disaster preparedness take into consideration a) age, b) ability, c) development of the child, d) knowledge and skills, e) risk perception and f) education. Effective actions to prepare children for climate-related disasters include a) children becoming agents and advocates of mitigation, b) aiming at behavior change and intergenerational effects, c) families empowering children to prepare for disasters, d) available content and resources, and e) involvement of media and celebrities to promote preparedness.

Other strategies for combating climate change locally and internationally are mitigation and adaptation.

Mitigation

Mitigation involves actions aiming to prevent GHG emissions, slow the progression of climate change and lower fossil fuels dependency through measures and policies promoting sustainable action

such as renewable energy, new technologies using cleaner, affordable energies, ecofriendly transportation, forest conservation and reforestation and transforming consumer behavior(40). Children can be agents of change for climate change mitigation, by transferring knowledge to their community and reducing vulnerability. Greta Thunberg is one of many examples of youth advocating for climate change mitigation around the world. Climate change mitigation programs should a) empower children as agents advocating behavior change in families and communities, b) develop and use a palette of strategies according to need and context, c) engage formal and informal leaders within the community, d) involve the media, e) form networks, f) build on communication, trust and coordination, g) include social and health policies into policies (30),

Adaptation

Because climate change affects children's health and well-being, it is essential to consider children's needs before, during, and after severe climate events in planning and policies on climate change preparedness, response, and recovery in order to a) reduce their vulnerability, b) increase their resilience, c) protect and equip them with skills, resources and coping mechanisms such as DRR education (36), d) reduce mortality and e) have better early childhood development (21). Adaptation measures are interlinked to developing outcomes such as resilient communities and infrastructure, safeguarding health, livelihoods, food security and education. The World Bank supports adaptation capacity to climate shocks, with actions supporting early warning systems, DRR and civic awareness ,climate information services, water security, coastal resilience and social protection systems through initiatives like the Action Plan on Climate Change Adaptation and Resilience aiming to support governments while FAO's 'Planning for Community Based Adaptation (CBA) to Climate Change' aims to protect people, communities and ecosystems using natural resources, biogas, solar driers and reservoirs. Many countries work with UNEP, UNDP and FAO on projects focusing on ecosystem-based, knowledge, analysis and networking like World Adaptation Science and National Adaptation Plans (NAPs) to help build resilience by supporting financially developing economies to recover. The World Bank Group suggests that measures including climate-smart agriculture, food production diversification, establishment of social protection mechanisms and investments in agricultural technology is more cost-effective than tackling the problems after they occur.

In 2020 twenty developing countries developed National Adaptation Plans (NAPs), to build resilience in agriculture, energy, infrastructure, ecosystems, health, water and tourism and a relevant NAP Country Platform facilitating sharing of good practices, lessons learned and collaboration.

Green Climate Fund (GCF) Country Program provides climate action especially for African states, Least Developed Countries (LDCs), Small Island Developing States (SIDS) which are considered high risk (41).

SDGs

Sustainable development as defined in 1987 in “Our common future” document, is acting in the present while thinking about the future, while emphasizing the interdependence and interconnectedness of environment, economy and society(42). The significant role of ESD is recognized in various conventions, including UN Conference on Sustainable Development, World Conference on ESD and Agenda 2030 for Sustainable Development. The 2030 Agenda for Sustainable Development, adopted by UN Members in 2015 calls all 193 countries to collaborate into achieving the 17 Sustainable Development Goals (SDGs) and 169 targets, to end poverty, improve health and education, reduce inequality, and drive economic growth, while combating climate change and preserving natural resources (43). To achieve the SDGs, UNDP is implementing six Signature Solutions including a) eradicating poverty affecting 1.3 billion people, b) governance for peaceful, just, and inclusive societies, c) crisis prevention and increased resilience to strengthen 1.6 billion people live in conflict-affected settings, including 600 million youth, d) nature-based solutions for development such as green economies, f) clean, affordable energy from renewable sources to help 840 million people worldwide with no access to electricity, g) women's empowerment and gender equality.



Figure 15. SDGs - Bing images

Education and its significance

Education is a right for every child, yet circumstances like poverty, diseases, disasters, undernutrition, discrimination, climate change and conflict deprive millions of children of education, particularly in developing countries and especially girls. According to N. Mandela, “Education is the most powerful weapon which you can use to change the world” and has a pivotal part to play in helping people gain information, knowledge, skills, tools, and values necessary for a sustainable future. Education has a crucial role in combating climate change, as a means of adaptation in developing countries or of mitigation in developed countries (21). UNFCCC and Kyoto protocol put forward the significance of education, empowerment and engagement of all stakeholders on climate change policies and especially in cultivating youth with necessary skills and capacities to become change catalysts. Furthermore, education and outreach are considered cross-cutting strategies that support other strategies, mobilizing key stakeholders and have a vital role in a) raising environmental awareness, b) encouraging behavior change, c) forming and connecting international and local communities and d) creating a shared global vision(1).

Education for Sustainable Development, Climate Change Environmental Education and Environmental Education

International recognition of ESD as a key enabler for sustainable development has been acknowledged in a) multiple summits and conferences such as the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992; World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, and the UN Conference on Sustainable Development (UNCSD) in 2012, b) key global agreements like the Paris Agreement and in c) programs like the Global Action Program (GAP).

ESD is a holistic, interdisciplinary and transformational approach that a) integrates contents such as climate change, poverty and sustainable consumption into the curriculum, b) creates interactive, learner-centered teaching and learning settings, c) involves action-oriented, transformative pedagogy, d) supports self-directed learning, participation and collaboration, e) bridges formal and informal education and f) has learning outcomes like cultivation of relevant attitudes, knowledge, skills, and behavior that support inquiry, civic responsibility, community action and involvement, and global solidarity .

UNESCO and UNEP put forward Environmental education in 1977, emphasizing its significance in cultivating the knowledge, understanding, attitudes, values and skills needed. EE should be a) lifelong, b) integrated in all levels of formal and non-formal education, c) holistic, d) interdisciplinary,

e) context specific, f) tailored to learners’ needs and capabilities and g) promoted through the mass media to spread awareness. EE promotes understanding of the interdependency between people and the environment, sustainable development, behavior and lifestyles and responsibility and solidarity at a “glocal” level.

EE and ESD help increase awareness and knowledge, reduce vulnerability, build resilience, promote youth engagement and participation. Climate change education increases the adaptive capacity of communities, helps to adopt environmental stewardship, and develops children’s capacity to be change catalysts and active citizens (21).

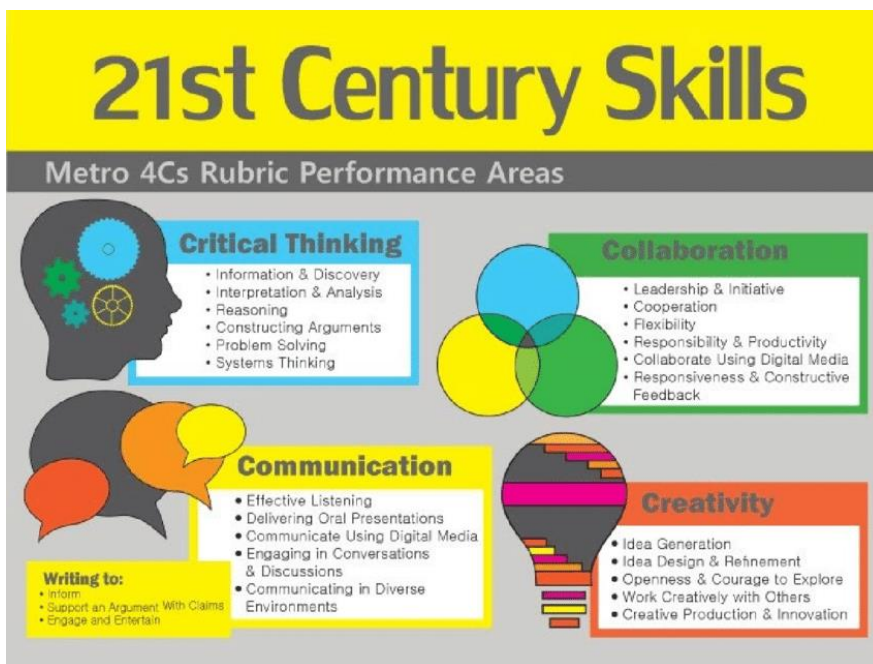


Figure 16. [4cs of 21 century - Bing images](#)

Education should a) be child-, disability- and gender-sensitive leaving no one left behind, b) promote inclusivity and equitability with lifelong learning for all(44), c) be offered in formal, informal and non-formal education settings like youth centers, camps, peer to peer initiatives, parks, forests and school grounds, d) employ inquiry-based and group-based pedagogy (45), e) align education with realities, f) encourage child participation with hands - on, learning by doing, group processes, g) involve continuing lifelong education through distance learning and teacher resource centers, h) be holistic and transformational, i) be integrated in global, regional, national and local policies, j) promote civic responsibility and action, k) be recognized as a key enabler of all SDGs and achieves its purpose by transforming society(46), l) recognize youth as key actors in addressing sustainability challenges and in decision-making.

Specifically, CC and EE should a) incorporate UNICEF’s key principles of child friendly schools including child-centeredness, protection, inclusiveness and child participation(21), b) engage school cluster and school and community approaches enhancing efficient use and sharing of resources through centers, synergy, coordinated activities and good practices, c) scale up and mainstream CCEE, d) educate industry, government, and public strengthening stewardship concepts and environmental certification programs such as adopt-a-beach, adopt-a-river etc. and e) connect bottom up and top down actions (2). Additionally, CCEE strategies should a) be locally relevant by to learners’ needs and capacities like South Africa’s National Environmental Education Program and weather service designed curriculum for CC with resource guides, workshops, competition, media campaign), b) be delivered in a safe, disaster resilient and protective environment without discrimination since 875 million schoolchildren live in seismic-high risk zones and face extreme weather conditions, c) involve infrastructure improvements such as latrines combined with life skills based hygiene education as in Malawi, where attendance rates of girls increased and dropout rates reduced, d) involve whole school approach such as “Green schools” or “Eco schools” ,e) engage the community like Southern Nepal’s project promoting girls’ leadership in school-based risk education (47), f) entail a life-skills based approach with lessons progressing from one year to the next, g) involve integration in other subjects in underresourced settings or infused throughout the curriculum in quality education systems, h) consider context of community like risk and protective environmental factors. CCEE, ESD and global citizenship programs could be integrated in education in numerous forms such as a) awareness raising strategies through social and mass media, b) with academic institutions as key actors in ESD initiatives(39), c) providing a safe environment focusing on WASH with life-skills based education,d) creating green schools, e) training youth for green job skills, f) enhancing school -community partnership where children are involved in community environmental management, action, and monitoring, g) being embedded in policy, h) going from local to global, i) considering processes, outcomes and contextual issues, j) assessing outcomes from existing albeit limited surveys (48), k) integrated and infused across the curriculum, l) connection with the real world issues, m) linked to community well-being and sustainability(49) *with* collaborations between experts, researchers, educators, administrators, students, parents and local NGOs promote assessing school safety, creating school disaster management committees and emergency preparedness and evacuation plans or doing community outreach and volunteer programs. Methods for investigating CC and sustainability include mapping, modeling, community tourings recording environmental features, collecting disaggregated data. Specifically, Unisef young climate ambassadors suggest that children should a)research issues, b) communicate findings, c) increase awareness, d) suggest

solutions, e) initiate behavior change, f) use informal and formal channels like school committees and community-based organizations and art and technology to communicate their views.

Children's capacities from 6-12 years old evolve from environmental care, to local environmental management, action research, community projects, community environmental management, community environmental action research, community-based monitoring, community ecological action research for strategic action on ecosystem(48).

Characteristics of effective educational programs include a) accreditation for institutions and certification for learners, b) providing training, materials and resources to empower educators with knowledge, skills, values and attitudes, d) exploring digital opportunities, e) collaboration between authorities, organizations and NGOs and f) clearly defined indicators of effectiveness and impact,g) standardization, monitoring and systematic, long term evaluation leading to improvement, h) considering scope, relevance, articulation and continuity in program assessment, i) field and academia professionals collaborating in publishing results and applying an evaluation framework including essential components such as objectives, design, indicators, recommendations and impact(50) such as the National Project for Excellence in Environmental Education (63), j) using results of program assessment to identify limitations, areas for improvement, trends and outcomes and evaluating program effectiveness, k) properly trained IT support staff and stable IT environments(64).

Furthermore, effective EE programs should include a) active and experiential engagement in real-world environmental problems, b) empowerment and student-centered learning, c) social engagement like inter-generational communications, d) teacher engagement like field trips, e) acknowledgement of the importance of the roles of adults as role models in developing environmental literacy, f) emotional connections, g) collaboration involving communities and real-world problems, h) a holistic experience with pre- and post – experience activities, i) link between program content and students' home lives, j) student reflection (28), k) multiple channels of delivery (18), l) access to education, m) institutionalization of EE such as the Seychelles, where the Ministry of Education created an Environmental Education Unit and implemented a compulsory teacher training program(1).

Monitoring and evaluation of educational programs

Monitoring of successful programs should a) take place within schools assessing knowledge, attitudes, skills and behavioral intent and at the national level by mainstreaming and scaling up CC and environmental issues into the national educational system, b) entail children's participation to

ensure sustainability , c) analyze results, d) identify gaps, e) create action plans, f) have independent authorities regularly tracking progress, g) have criteria and indicators that are context specific and adhere to standards of conceptual framework. Moreover, to better monitor quality, equity and inclusion, a) efforts should be made to increase the capacity of governments to disaggregate data appropriately and use them effectively for planning and policy-making, b)research and evaluation culture should be adopted, c) global quality standards for learning outcomes should be followed, d) information and data should be freely accessible to all(46) , e) follow-up and review based on robust monitoring, reporting and evaluation policies, systems and tools should be adopted.

Assessment, and monitoring should a) focus on specific impacts and targets, b) monitor results (2), c) have quantifiable targets measuring environmental, economic and social impacts, d) use globally approved standardized methods and protocols for assessment and formal monitoring, e) set key indicators to monitor the progress of initiatives and outcome including extent to which educators are trained for ESD, to which youth are engaged in ESD and to which ESD is promoted in local communities, f) promote and adopt evidence-based reports, surveys , analyses, testimonies, g) identify trends, h) share best practices and lessons learned around the world, i) publish findings and reports like GEM Global education monitoring report by UNESCO . A framework with principles for monitoring and assessment has been proposed to address progress towards meeting the SDGs including a) indicators limited in number and globally harmonized to allow comparisons between countries, b) consensus-based, in line with international standards, c) constructed from well-established data sources, d) presence of internationally accepted methodologies, for the design and implementation of sampling and analysis techniques.

Given the variety of learning objectives outcomes and competencies entailed in ESD, EE and CCEE various methods and initiatives have been employed such as the International Civics and Citizenship Study (ICCS) across 38 countries, sponsored by the International Association for the Evaluation of Educational Achievement(39), PISA and other large-scale assessments like the International Civic and Citizenship Education Study (ICCS) 2016(51).

Challenges of EE program evaluation include a) diversity of the field, b) lack of clear guidelines and framework, c) need for formative evaluations and published results, d) assessment of long term results, e) institutional resistance to evaluation(50) . Moreover, EE programs should have researchers a) measure behavioral outcomes, b) conduct larger scale studies and c) provide additional data such as comparison groups and qualitative interviews(28) .

Empowerment

Empowerment is the process of increasing people's capacity to make choices and to transform them into desired actions and outcomes and become agents of change (52). Empowerment is a term often used with respect to women, such as Gender Equality and the Empowerment of Women (GEEW) and is promoted by many entities including the UN (53). Children and youth under 25 years comprise more than 46% of humanity, indicating that their empowerment and engagement has a huge impact on the future of our planet and the urgency for them to develop environmental stewardship and global citizenship. Empowerment entails participation, involvement, engagement, agency, advocacy, active role as agent of change. Empowered children and youth need a) tools and platforms to voice their opinions through advocacy, b) summits and forums to participate, c) decision making to participate through delegations, d) to influence and work together with key actors to develop policies via intergenerational dialogue, e) engaging mass media for campaigning (8) and f) participate in mitigation and adaptation plans. With appropriate education, empowerment, training, motivation, guidance and action based projects, children become active members of their communities, offering solutions and readily engaged and mobilized to take action against climate change and respond to emergencies with adaptation and resilience, strengthening the community's capacity (31).

Meaningful participation connects to empowerment as it cultivates' self-confidence and self-efficacy which empowers youth to defend their rights.(54) Youth participation is essential because it a) is a basic human right b) serves their best interest, c) enhances accountability and civic responsibility ,d) increases protection and inclusion, e) develops life skills(16), f) offers solutions, g) enhances capacity building and h) increases likelihood for effective outreach (54). Effective and ethical participation of adolescents should be transparent and informative, voluntary, respectful, relevant, meaningful, child-adolescent friendly, inclusive and equitable(54).Professionals involved with adolescents' participation should have knowledge of children's rights, skills and respectful non-discriminatory attitudes. The International Association for Public Participation developed a "spectrum of engagement" indicating different levels including a) informing about the problem, alternatives, opportunities, and/or solutions, b) consulting, c) involving the public, d) collaborating in the development of alternatives and preferred solution and e) empowering by placing final decision making in the hands of the public(47).

IAP2'S PUBLIC PARTICIPATION SPECTRUM



The IAP2 Federation has developed the Spectrum to help groups define the public's role in any public participation process. The IAP2 Spectrum is quickly becoming an international standard.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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Figure 17. The International Association for Public Participation developed a “spectrum of engagement” - Bing images



Figure 18. Civic engagement - Bing images

Moreover, there are three modes of adolescent participation depending on their level of engagement and influence in decision-making, including a) consultative, b) collaborative and c) adolescent-led.

Types of adolescent civic engagement include a) volunteering and service, b) mobilizing peers and community to engage in awareness and actions, c) participation in action research, media and arts initiatives, d) participation in advocacy or activism to influence policies, e) social entrepreneurship, f) leadership training and practice (54) and g) engagement in dialogue, decisions, mechanisms, processes, events, campaigns, actions and programs.

Solutions to tackle climate change

UN's 2030 Agenda for Sustainable Development suggests several actions to minimize greenhouse emissions and adapt to climate change consequences including a) promoting physical and mental health and well-being through universal health coverage and access to quality health care, b) inclusive and sustainable economic growth, c) supporting youth employment and women's economic empowerment and inclusion, d) acknowledging the contribution of migrants in sustainable development, e) promoting regenerative and sustainable agriculture, pastoralist and fisheries, f) strengthening renewable energy solutions and transportation, g) forming international collaboration between governments in mitigation, adaptation, economy, technology, development, and capacity-building, h) facilitating implementation of SDGs while acknowledging national priorities, i) developing global partnership and solidarity between global south and north, governments, private and public sector, civil society, j) enhancing conservation of natural resources and preservation of biodiversity and ecosystems(55).

Green economy

Green jobs enhance resilience and sustainability and are defined by UNEP as “work in agriculture, industry, research and development, services, and administration that contributes to preserving or restoring the quality of the environment” (51). Key strategies to facilitate transition to green jobs include a) relevant University programs such as those offered from Cambridge, Harvard, South Pacific, b) vocational training for new technologies, c) green internships and fellowships, d) certification programs e) collaborations between academic institutions and local industry associations to meet labor demand, f) raising awareness about future potential of green sectors and g) promoting green entrepreneurship(1), e) availability of grants and financing options for youth start-ups, f) creating a link between public employment programs and existing youth training programs(18). In the last ten years green economy has become a priority for 65 countries , providing 24 million green

jobs in sectors like energy supply, recycling, agriculture, and transportation (27) and promoting youth employment through circular economy, collaboration, solidarity and resilience. COP21 Paris The Sustainable Innovation Forum (SIF15) at 2015, brought together from business, Government, finance, UN, NGO and civil society in an effort to reinforce business innovation and the emerging green economy. UNEP's Inclusive Green Economy (IGE), Green Economy Initiative (GEI) and Global Green New Deal involves low carbon, clean production, supports social equity while combating wasteful consumption, includes elements such as content-specific public employment programs for poor and unemployed youth to provide them with skills while engaging them in environmental rehabilitation. Many countries have piloted such programs, like "The Working for Water" initiative in South Africa.

Reaching and protecting vulnerable groups

To protect the vulnerable groups, actions should include a) reaching indigenous communities by a) "increasing climate change awareness through education and training, b) forming networks to share their perspectives and experiences like the Indigenous Peoples' Global Summit on Climate Change, c) building solidarity and strengthen partnerships among vulnerable adolescents, c) ensuring accessible, diversity-friendly information for adolescents, d) understanding developing countries' environment and its degradation, regulation and conservation are important and focusing sustainable development efforts on health, education, sanitation, infrastructure, services, clean water, solid waste management and urban planning(57), e) risk reduction initiatives targeted to children, women and families teaching them practical actions to protect themselves in case of a disaster, f) creation of response strategies involving participation, prevention and empowerment for emergency preparedness. With respect to women, internationally, there have been various initiatives, conventions and plans to give women a) access to land and other resources, b) to enhance gender-based inclusion in environmental issues like Nairobi's emphasis in women's participation in national and international ecosystem management and control of environment degradation, and Convention on the Elimination of All Forms of Discrimination against Women, c) to promote active involvement and empowerment in order to participate in economic and political planning and decision-making, d) to encourage them to bring their unique perspectives, e) fair and inclusive transition to a carbon neutral economy including women and vulnerable groups in decision-making positions(59), f) meeting the needs of the most vulnerable including migrants in adaptation measures, g) scale -up proven approaches (21).

Creating a climate change agenda for children and youth

To create a climate change agenda for children and youth, according to Rio agenda 21 and UNICEF, governments should a) ensure the survival, protection and development of children, b) consider their interests, c) implement program for children's rights including health, nutrition, education and poverty alleviation, d) meet local communities' basic needs by empowering local populations, e) maintain cooperation and collaboration between UN entities and organizations(60), f) implement law reform processes incorporating adolescents' suggestions, g) institutionalize platforms for exchanging and sharing, h) allocate sufficient resources, i) encourage adolescent-led associations, j) strengthening adolescent participation in decision-making, policies, forums and delegations and k) use suggestions to inform ongoing advocacy and include in reports(54). Furthermore, UN suggests several actions considering youth, including a) EE in formal and informal education and in training of educators, b) participation of youth in collecting and analyzing data and taking action to strengthen environmental knowledge and engagement, c) exchanging best practices of environmentally sound technologies ,d) enhancing youth participation , awareness and action in the conservation of the environment, e) promoting children and youth activism, f) enhancing vocational training and employment opportunities for youth, g) promoting dialogue with youth organizations on developing environment plans and programs at local, national and international levels, h) promoting children participation in the development of climate change mitigation and disaster preparedness programs, i) having DRR programs reach all children , especially the vulnerable ones to safeguard them from disasters, j) taking part in global decision making, k) supporting peer education, l) participating in decision making policies, giving their perspectives, solutions and measures from their viewpoint, m) developing platforms for adolescent participation, n) link adolescents with activists for mentoring and inspiration, o) designate small grants for adolescent-led initiatives, o) giving them voices and asking the right people asking them to commit to environmental protection and hold politicians accountable, p) campaigning using social media, q) be informed, influence and act(6) in the community and in policy development.

To empower and encourage youth to take action, be engaged and to mobilize collective action for positive change, a) self-confidence must be built by understanding that they are capable of adopting small changes in their daily lives, b) resources must be strengthened, c) technological support should be given to enhance communication, connection, access and inclusion, d) sustainable lifestyles should be endorsed, e) volunteering, community service and collective action should be promoted, f) intergenerational dialogue should be promoted, g) information hubs should be supported, h) youth

should have a voice and representation in all United Nations processes, i) participation in school and community environmental protection activities(1)

Specific Part

Elements for creating an effective educational program to help children and youth become active agents of change

The following program is designed to be delivered to primary school age children. It combines elements of many best practices and models of education e.g. project based learning, interdisciplinary and child centered approach, project cycle management, service learning, compassionate leadership, global citizenship, social entrepreneurship, sustainability, youth activism, elements of child friendly schools (61) and more.

The goal is to educate, inspire and mobilize children and youth into becoming catalysts of change that take action to combat climate change, environmental threats or societal challenges as put forward by the SDGs and strive for a more prosperous, peaceful and sustainable world, for themselves and future generations. The students must solve real world, authentic challenges with real world tools and solutions, transferable, transformational and valuable beyond the classroom and into their daily lives.

It aims to cultivate a) life skills like interpersonal and personal transferable skills and leadership skills, cognitive skills such as critical thinking and higher order skills such as analyzing and evaluating, b) values such as compassion and respect, c) attitudes such as positive mindset, wanting to become part of the solution and d) behavior change in terms of sustainable consumption and lifestyle.

In order to increase the outreach and impact of the program, it is addressed to teachers, caregivers, social scientists and education professionals of formal, informal and non-formal education who want to be a part of making this world a better place. Furthermore, it is proposed to recruit representatives from each school that will be trained, attend workshops, follow up meetings and have the role of the coordinator who supervises monitors and evaluates the progress of the program within his area or supervision.

It includes elements such as manual, lesson plans, training of teachers, toolkit, presentations, and videos. Teachers are encouraged to a) enroll in platforms for sharing resources and exchange of knowledge, best practices and ideas, b) form a tribe with people with similar interests, network with specialists and professionals, c) find mentors, d) engage in lifelong learning and e) engage in peer to peer learning. Once they do these steps, they can encourage students to do undertake them too.

To increase the outreach of the impact and spread the good deeds, the following actions are suggested a) different level of awards for the school depending on the level of commitment, b) become member

of a network and celebration events, c) present projects as best practices in forums, conferences and platforms, d) sharing on social media in order to create a positive movement.

Each unit includes objectives, resources required, pedagogy, introductory theory, activity instructions and skills. It is based on Carbon Busters Club template of educational programs and similar programs were designed and offered by this author and Dr. Georgina Spyres through Carbon Buster NGO (62).

It should be noted that effective educational programs involve curriculum that is locally relevant, gender sensitive and action based, age -, level – and context specific and content that involves knowledge, skills, positive attitudes, behaviors and values, abilities, motivations, mobilization and commitment that consider the future of the economy, ecology, and society, increase resilience and enhance well-being.

The following table indicates significant elements of effective educational programs.

Figure 19. Table with significant elements of effective educational programs

Knowledge	ESD, DRR, natural resources, green job skills , climate and environmental protection, ,environmental degradation, climate change literacy, mitigation and adaptation measures , emergency preparedness, EECC, life cycle of consumer product, circularity, sustainable consumption, green lifestyles sustainable livelihoods skills, human rights, poverty , social responsibility, environmental injustice(8), gender equality, clean and affordable energy, green technologies, biodiversity, conservation and restoration
Skills	life skills, 4 Cs of 21 st century skills, communication, emotional intelligence, sustainable likelihood skills, ability to cope with local environmental hazards

Positive attitudes, behaviors and values	environmental stewardship, active and global citizenship, natural resource management, civic education and responsibility, community action and involvement, global solidarity, appreciation of local, migrant and indigenous knowledge of the environment, rights and responsibilities regarding environment and resources
Abilities	Coping with local environmental hazards and health issues
Motivations, mobilization and commitment	Working individually and collectively toward solutions and preventing new problems(36)

Proposals and conclusions

In the developing world of Global South, actions to tackle climate change should include a) acknowledging the wisdom of Indigenous and contribution of immigrants ,b) emphasis on adaptation, c) adopting methods such as underresourced education or emergency education to reach those furthest behind and furthest away without resources,d) harness the power of nature with renewable energy, e) developing context specific capacity building programs for the local communities with their involvement, f) enhance adaptation actions , g) empowering the most vulnerable like youth and women to help increase their own and their families and community's resilience , h) promote green job skills and i) investing in formal, informal and non-formal education to provide children, youth and communities with knowledge, skills, values, behaviors necessary for climate change warriors!

On the other hand developed countries of the Global North could a) give emphasis in mitigation efforts, b),collaboration and support of the Global South via sharing and exchanging expertise and know-how with local experts, c) funding and giving incentives to Global South youth for technology and scientific innovations taking advantage of local resources and know how, d) developing standardized assessment and evaluation for quality education programs addressing climate change, considering local needs, capacities and resources, f) form intersectoral collaborations, synergies like One Health approach to tackle the climate change challenge

Despite the differences and variations in approaches and strategies, there is a shared vision and a common mission, forming partnerships to save planet earth and humanity in solidarity

In conclusion, to combat climate change emergency, solutions should involve a) education, essential in changing minds and behaviors through knowledge, skills, and values, b) empowerment, significant in enhancing the resilience of the most vulnerable ones, c) intersectoral synergies and collaborations, d) exchange and sharing of knowledge and good practices and lessons learned, e)promotion of green economy and renewable energy solutions, f) shifting to an eco-lifestyle, g) understanding that we are all in this together and that common agreements, frameworks, measures and partnerships and solidarity are needed.

Finally, with respect to children and youth, it is essential to a) educate them as early as possible and while they still attend school, b) reach those furthest behind, c) empower them to become active agents of change instead of being passive spectators, d) reduce their vulnerability and enhance their resilience through adaptation and preparedness actions, e) involve them in their communities taking action as researchers and data collectors f) giving them voice to voice their concerns and solutions in

delegations, forums and policy making, g) having their health, mental health and well-being at the top of the climate and health agenda of global agreements meetings and assemblies.

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Appendix I Initiatives, frameworks, forums, platforms, organizations, schools, awards, competitions, guides, manuals and kits for youth and educators

This list is intended to provide resources and links to facilitate active involvement of youth and educators in DRR, climate change and environmental protection.

2021 SUMMIT | Young Activists Summit

Youth4Climate in 2021 in Italy will bring together 400 young climate leaders from all over the globe—two from each of the 197 member-countries of the UNFCCC.

The Global Learning and Observations to Benefit the Environment (GLOBE) Program (by NASA and NSF) is an international science and education program that provides students, teachers, scientists, and citizens and public with the opportunity to participate in data collection and the scientific process, and contribute meaningfully to our understanding of the global environment. Mission: To promote the teaching and learning of science, enhance environmental literacy and stewardship, and promote scientific discovery.

A Framework for EE strategies(49) is a framework applying to formal and non-formal education and includes those who design, deliver, and collaborate with learners, whether they work for government agencies, NGOs, schools, or other efforts. It emphasizes information, building understanding, improving skills and enabling sustainable Action

UNESCO's and World Bank Group's "Education for All" (1990) strives to provide quality education for all children, girls, vulnerable and disadvantaged children, including life-skills programs“(60).

UNESCO/UNEP International Environmental Education Program (IEEP)

UNESCO 's framework Global Action Program has connected 97 key stakeholders, and 26 million learners and trained 2 million teachers through ESD content and action-based projects in communities, to inspire action in their communities.

In 2030 Agenda for Sustainable Development reaching the furthest behind first is proposed as these communities face the higher risks of unresourced and disrupted education due to crises, disasters or conflicts and exclusion or no access to education by specific groups, young children and youth. And it is those same people that need education the most in order to be protected, develop resilience and be given a chance for a better future.

UNEP and UNICEF developed an Environmental education resource pack for child friendly schools in order to empower children and to promote risk mitigation and disaster risk reduction(36)

Children's world water forum. The international education and resource network, Trinidad and Tobago Global Disaster Safety Map Project involves children creating community disaster safety maps which are connected to national safety maps which are then joined to form a global safety map, educating and empowering children in mitigation and preparedness measures for disaster management(8).

Making Cities Resilient 2030 (65) is an initiative for strengthening resilience and preventing risk through advocacy, networks for sharing knowledge, exchanging expertise, and developing synergies. Knowledge, monitoring and reporting tools are provided to enhance safety, resilience and suitability by 2030 to facilitate preparing for future risk scenarios, strengthen societal, institutional and financial capacity for resilience, and increasing infrastructure resilience.

UNEP's CLIMWARN Project improves Early Warning Systems (EWS) in developing countries.

CDC provides training, education and consultation to local and tribal public health authorities for preparedness and emergency response via Learning Centers (PERLC)

UNESCO/UNEP International Environmental Education Program (IEEP)(66) aims at fostering awareness of economic, social, political and ecological interdependence in urban and rural areas; giving every person opportunities to acquire the knowledge, values, attitudes, commitments and skills needed to protect the environment; develop new behavior patterns of behavior and promote ESD.

UNICEF environmental club schools with actions to tackle climate change

Initiatives of world bank group include West Africa Agricultural Productivity Program, West Africa Coastal Areas Program, Africa Hydromet Program, Disaster Risk Financing and Insurance Program (DRFIP), Shire River Basin Management Program, and the Africa Climate Resilient Investment Summit networking authorities, academics, private developers, and technology and service providers.

https://cdn.naaee.org/sites/default/files/eeepro/resource/files/community_engagement_-_guidelines_for_excellence_0.pdf

<https://www.gaiiaeducation.org/face-to-face/youth-glocalisers-for-change/>

<https://drive.google.com/file/d/1RfaVYIiJnRHHmH1lfa5mHUGH1DQinVp/view>

<https://www.worldbank.org/en/topic/climatechange/brief/3-things-you-need-to-know-about-adaptation-and-resilience>

<https://www.un.org/development/desa/disabilities/envision2030.html>

<https://ed.ted.com/earth-school>

<https://wedocs.unep.org/bitstream/handle/20.500.11822/28007/ChallengeBagdeTkt.pdf?sequence=1&isAllowed=y>

<https://www.unep.org/resources?f%5B0%5D=category%3A452&f%5B1%5D=topic%3A23>

<https://moocs.ou.nl/dashboard>

https://www.unicef.org/publications/files/CFS_Climate_E_web.pdf

UNICEF: Convention on the Rights of the Child. Available online at www.unicef.org/crc

https://www.unicef.org/publications/files/CFS_Climate_E_web.pdf

https://www.unicef.org/environment/files/AYCEOs_climate-change_take-action-now_EN.pdf

UNICEF: Guide to Action. www.unicef.org/knowyourrights/files/guide-to-action.pdf is a basic strategy to promote and protect children's rights.

Online Resources from The University of Wisconsin Extension include the Best Education Practices Decision Tree, designed to guide natural resources educators as they plan outreach and educational strategies. <http://fyi.uwex.edu/wateroutreach/water-outreach-education/decision-tree-start/>.

Similarly, the Educating About Behavior and the Environment worksheet developed by the University of Wisconsin Extension helps set measurable goals, identify the audience and outreach techniques https://naaee.org/sites/default/files/cpbworksheet11_07.pdf.

An Outreach Continuum <http://fyi.uwex.edu/wateroutreach/changing-public-behavior/self-study-module/self-studymodule-step-7/vii-a-continuum-of-choices>

Community-Based Disaster Risk Management (CBDRM)

<https://www.greenschool.org/>

<https://www.nab.vu/education>

<http://www.childreninachangingclimate.org/>

Media Activities and Good Ideas by, with and for Children (MAGIC). www.unicef.org/magic where the media play an important role in the development and promotion of children's rights.

Voices of Youth. www.unicef.org/voy offers young people a global online community within which they can explore issues related to human rights and social change, with a 'Take Action' section for ideas.

United Nations Food and Agriculture Organization: Web portal on climate change, children and youth. <http://www.fao.org/climatechange/54458/en> offers activities and resources in cooperation with a number of United Nations agencies and civil society organizations in light of the designated decade of 'Education for Sustainable Development.'

The Earth Child Institute. www.earthchildinstitute.org is dedicated to all matters related to children and the environment, with a special focus on climate change and water-related issues with 'fun and games' section.

The Secretariat of the United Nations Secretary-General's Study on Violence against Children, Our Right to be Protected From Violence: Activities for Learning and Taking Action for Children and Young People, 2006. www.unviolencestudy.org. This guide is for youth leaders, peer educators and teachers who work with young people.

Supporting young people to take action on climate change Scouts Canada: Climate Change. www.scouts.ca/dnn/ProgramResources/PackageResources/ClimateChange/tabid/253/Default.aspx details the Jumpstart program of Scouts Canada, which fosters attitudes and behaviors that care for the environment and use resources wisely and www.scout.org/en/about_scouting/the_youth_programme/environment/environment_programme offering tools, resources and initiatives to help Scouts and other young people work together for the good of the local and global environment.

Climate Change - Children and Youth. www.fao.org/climatechange/youth/en developed by the FAO in collaboration with WAGGGS, promotes the participation of children and young people in a range of environmental, social and sustainable development issues, including climate change.

https://www.unicef.org/publications/files/Climate_Change_and_Children.pdf

<https://www.unicef-irc.org/publications/509-climate-change-and-children-a-human-security-challenge-policy-review-paper.html>

<https://www.climatecentre.org/downloads/files/CTK/Climate%20Training%20Kit%20User%20Guide.pdf>

<https://www.climatecentre.org/training>

<https://www.tigweb.org/>

https://climatecentre.org/downloads/modules/training_downloads/4c%20Youth%20Unit%20-%20Lets%20Act%20Module%20overview.pdf

https://climatecentre.org/downloads/modules/training_downloads/4b%20Youth%20unit%20-%20Lets%20learn%20module%20overview.pdf

https://climatecentre.org/downloads/modules/training_downloads/4a%20Youth%20unit%20-%20Lets%20engage%20module%20overview.pdf

<https://www.climatecentre.org/>

https://www.unicef-irc.org/publications/pdf/climate_change.pdf

<https://unesdoc.unesco.org/ark:/48223/pf0000247444>

<https://unesdoc.unesco.org/ark:/48223/pf0000246435>

<https://www.peaceloveandplanet.org/environmental-education/kids-environmental-programs>

<https://unesdoc.unesco.org/ark:/48223/pf0000096345>

http://www.unep.fr/ozonaction/information/mmcfiles/4820-e-EdPack_1_guide_low.pdf.pdf

http://www.unep.fr/ozonaction/information/mmcfiles/4820-e-EdPack_1_guide_low.pdf.pdf

<https://www.unep.org/news-and-stories/story/amid-covid-19-these-10-countries-are-aiming-kickstart-their-economies>

<https://www.count-us-in.org/>

<https://www.ohchr.org/documents/issues/education/training/infographic-wphre.pdf>

https://d1c337161ud3pr.cloudfront.net/files%2F515aaf5d-38bf-4285-9eca-64ecd8013975_Rethinking%20Learning.png

<https://wyc2020.paperform.co/>

<https://unesdoc.unesco.org/ark:/48223/pf0000374270>

<https://unesdoc.unesco.org/ark:/48223/pf0000246435>

<https://www.globe.gov/about/overview>

https://www.globe.gov/documents/348830/55942507/EGclimate_book_FINAL_27april2017.pdf/541e56a4-294a-41b7-be2b-20c632321966

<http://www.fao.org/3/a-i5216e.pdf>

<https://www.waterschool.com/>

BILL AND MELINDA GATES FOUNDATION AND KIT (2017). Empowerment of women and girls: a conceptual understanding.

INTER-AGENCY REGIONAL GROUP ON YOUTH (2018). Adolescent and youth engagement. MENA UN: NGO Adolescent and Youth Group toolkit.

INTER-AGENCY WORKING GROUP ON CHILDREN'S PARTICIPATION (2007). Children as active citizens: commitments and obligations for children's civil rights

UNICEF & SAVE THE CHILDREN (2011). Every Child's Right to be Heard: A Resource Guide on the UN Committee on the Rights of the Child General Comment No. 12.

CHILD RIGHTS CONNECT (2013). Speak up for your rights. OP3 CRC. A short guide for children, teens and child-led organizations about a new United Nations Treaty that lets you speak up about child rights violations.

NGO GROUP FOR THE CRC (2011). Together with children – for children. A guide for non-governmental organizations accompanying children in CRC reporting, including preparation of and submission of reports, support for delegates of children/adolescents to present their views to the Committee on the Rights of the Child.

ACLU (2015). Stand Up/Speak Up: A Guide for Youth Activists. USA. Provides guidance for young people who want to create change in their schools and communities. It includes advice on recruiting members; researching issues; planning campaigns; identifying allies, opponents and decision makers; creating a coalition; leveraging the media; and dealing with the results.

ADVOCATES FOR YOUTH (2013). Youth activist's toolkit. Includes tools for mapping power, planning and implementing strategic activism with 198 methods for non-violent activism

UNICEF (2018) 's document n how children and youth can participate in decisions involving their lives through the Child Friendly Cities Initiative and within their local communities

https://ciudadesamigas.org/wp-content/uploads/2019/05/CFCI_Child_and_Youth_Participation_-_Options_for_Action.pdf

SAVE THE CHILDREN (2002). Child to Child: A practical guide – Empowering Children As Active Citizens.

SAVE THE CHILDREN SWEDEN (2007). Child-led Disaster Risk Reduction: A practical guide. This guide – intended for trainers, teachers, facilitators and children – illustrates the steps to take to replicate a successful Child-led Disaster Risk Reduction (CLDRR) programme.

UNICEF (2016). Child-centred disaster risk reduction: Contributing to resilient development. This provides key conceptual and technical approaches to support child-centred DRR.

UNDRR (2019). Words into Action: On the frontline of disaster risk reduction and resilience: Children and youth engagement guide.

ADVOCATES FOR YOUTH (2013). Youth activist’s toolkit. •

GADRRRES, Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector.

UNICEF INNOCENTI (2014). The challenges of climate change: Children in the front line • UNICEF (2019).

Risk-informed Education Programming for Resilience Guidance note • UNICEF (2019).

Youth Advocacy Guide, Youth Advocacy Guide Workbook • UNICEF (2019). Adolescent Kit for expression and innovation.

UNITAR (2013). Integrating Climate Change in Education at Primary and Secondary Level

OZER, E.J. & PLATT, A.A. (2017). Adolescent participation in research: innovation, rationale and next steps. UNICEF Innocenti Research Brief, 2017-07.

COMMONWEALTH SECRETARIAT (2005). Booklet 1: Participation in the Second Decade of Life What and Why?; Booklet 2: Adolescent and Youth Participation Adults Get Ready!; Booklet 3: Adolescent Participation and the Project Cycle; and Booklet 4: Tools for Adolescent and Youth Participation. • DYNAMIX LTD & UNICEF (2006). Toolbox of Participative Tools: Adapted from the UNICEF workshop on participatory approaches for working with children and young people in programme planning, implementation and studies and evaluation, 3–8 April 2006, Dar es Salaam, Tanzania

WOMEN’S REFUGEE COUNCIL. I’m Here: Adolescent Girls in Emergencies. I’m Here is an operational approach for humanitarian actors to reach the most vulnerable adolescent girls, and to be accountable to their safety, health and well-being from the start of a response to crisis. From the start of an emergency, ‘I’m Here’ enables humanitarians to engage girls in their own solutions, ensuring effective programmes and protected rights.

UNICEF (2018). UNICEF Guidance Note: Adolescent Participation in UNICEF Programme Monitoring and Evaluation. This guidance should be used during the planning phase. It provides step-

by-step guidance on how to support meaningful participation of adolescents in monitoring and evaluation activities.

SAVE THE CHILDREN NORWAY (2008). A kit of tools for participatory research and evaluation with children, young people and adults. This publication includes more than 35 participatory tools that can be used and adapted with and by adolescents to explore and analyse their experiences, to prioritize and plan action, to strengthen their individual and collective capacities to implement actions and advocacy, and to monitor their initiatives.

UNICEF (2017). Toolkit for adolescent and youth engagement. UNICEF MENA. This toolkit provides those working in the humanitarian and development sectors with a collection of key tools to support young people's participation and engagement. It includes guidance to support adolescent participation in programming, and guidance to strengthen adolescent- and youth-led civic, social and economic engagement

WORLD VISION INTERNATIONAL (2017). Leading the way: Guidance on the participation of children and young people in global engagements.

CHILD RIGHTS CONNECT (2010). Together With Children For Children - A guide for non-governmental organisations accompanying children in CRC reporting.

INTER-AGENCY REGIONAL GROUP ON YOUTH (2018). Adolescent and youth engagement. MENA UN: NGO Adolescent and Youth Group toolkit.

ITU (2018). Digital skills toolkit. • UNICEF ET AL. (2017). LSCE: Reimagining Life Skills and Citizenship Education in the Middle East and North Africa: A Four-dimensional and systems approach to 21st Century Skills.

UNICEF (2019). Getting into the game: Understanding the evidence for child-focused sport for development.

USAID (2014). Youth engagement in development: effective approaches and action-oriented recommendations for the field

UROCHILD & LEARNING FOR WELL-BEING (2019). We are here: A child participation toolbox. Provides guidance to create a safe enabling environment to move from participation to partnerships among adults, adolescents and children. It includes creative and practical tools to improve adolescents' skills and roles as participants, representatives and facilitators.

THE YEP4EUROPE CONSORTIUM (2017). Using digital media for youth engagement and active citizenship. This publication includes details of the training methodology 'Find-Tell-Act' from a project that empowered migrant young people. This methodology for a non-formal training course is based on blended learning, implemented mainly as face-to-face activities. It includes four interrelated

digital media modules/ workshops on: i) digital journalism, ii) digital photography, iii) digital storytelling and iv) online platforms.

UNICEF (2014). Child Rights Education Toolkit: Rooting child rights in Early Childhood Education, Primary and Secondary Schools. This toolkit provides a wealth of guidance to assist practitioners and decision makers in rooting the provisions and principles of the CRC and the ‘child rights approach’ into early childhood education, primary and secondary schools. The guidance supports whole school approaches

UNICEF ET AL. (2017). LSCE: Reimagining Life Skills and Citizenship Education in the Middle East and North Africa: A Four-dimensional and systems approach to 21st Century Skills.

UNHCR ET AL. (2018). Sport for Protection Toolkit. Programming with young people in forced displacement settlements. This toolkit shares practical guidance and tools for using sport to strengthen the protection of young people

PLAN INTERNATIONAL (2013). Sticks and Stones: A training manual for facilitators on how to increase the involvement of children in their own protection. This manual is the sequel to Bamboo Shoots. It includes guidance and 23 activities that can be used with children/ adolescents to increase their participation in their own protection. Activities can be adapted depending on the participants’ ages and abilities and the cultural setting.

<https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>

Lesson Plans & Resources | Kids Against Plastic – kids.againsta.plastic.co.uk

plastic clever schools network

RSPB’s Big Schools’ Birdwatch www.rspb.org.uk/schoolswatch/

http://www.unicef.org/education/bege_61668.html

www.undp.org/sgp

Climate Change Education for Sustainable Development at UNESCO:
<http://www.unesco.org/new/en/education/themes/leading-the-internationalagenda/education-for-sustainable-development/climate-change-education/>

YouthXchange Climate Change and Lifestyles Guidebook:
<http://unesdoc.unesco.org/images/0021/002128/212876E.pdf>

YouthXChange Training Kit on Responsible Consumption:
<http://unesdoc.unesco.org/images/0015/001587/158700e.pdf>

TUNZA <http://www.unep.org/tunza> • UNFCCC Youth Portal:
http://unfccc.int/cc_inet/cc_inet/youth_portal/items/6578.php

UN Joint Framework Initiative on Children, Youth and Climate Change:
http://unfccc.int/cc_inet/cc_inet/youth_portal/items/6519.php

Growing Together in a Changing Climate, the United Nations, Young People, and Climate Change
http://unfccc.int/files/cc_inet/information_pool/application/pdf/growingtogether.pdf

Youth Participation in the UNFCCC Negotiation Process: The United Nations, Young People and
Climate Change
http://unfccc.int/files/cc_inet/information_pool/application/pdf/unfccc_youthparticipation.pdf

Youth in Action on Climate Change: Inspirations from Around the World:
http://unfccc.int/cc_inet/cc_inet/information_pool/simple_search/items/3522.php?display
Pool=1584&lang=6 • <http://uniteforclimate.org/>

<http://www.fao.org/climatechange/youth>

Youth Environmental Opportunities, YEO is an online social platform which is a youth-led initiative to share the opportunity information across the world. YEO share the different opportunity information about the environment and SDGs' goal which is mostly related to the opportunity of international conferences, jobs, internships, seminar, forums, awards, grants, scholarships, fellowships, training, competitions, campaign etc.

UNDP Yung environmental journalists

WWF is using art and art exhibitions to drive positive change

Nelsonmandela.org , the Nelson Mandela Foundation focuses to making just societies by mobilising the legacy of Nelson Mandela, providing public access to information and convening dialogue on critical social issues. The key objective is finding sustainable solutions to the problems confronting humanity through deep dialogue informed by research, analysis and evaluation.

Climate Change - The Big Picture (<http://bigpicture.unfccc.int/>)

SDG websites Human Rights and the 2030 Agenda for Sustainable Development
<http://www.ohchr.org/EN/Issues/MDG/Pages/The2030Agenda.aspx> OECD and the Sustainable Development Goals: Delivering on universal goals and targets <https://www.oecd.org/dac/sustainable-development-goals.htm>

SDG Indicators <http://unstats.un.org/sdgs/indicators/indicators-list/>The Guardian: Sustainable development goals: all you need to know <https://www.theguardian.com/global-development/2015/jan/19/sustainable-development-goals-united-nations>The UN Sustainable Development Knowledge Platform sustainabledevelopment.un.org <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals>UNESCO and Sustainable Classroom, curriculum and youth work resources

British Council: Sustainable Development Goals resource https://schoolsonline.britishcouncil.org/sites/default/files/sdg_education_pack_v3.pdf

Gaia Education's Design for Sustainability E-learning Programme <http://www.gaiaeducation.org/index.php/en/online>GlobalGiving: Crowdfunding for the SDGs <https://www.globalgiving.org/sdg/Green> Pack: Teaching material on sustainability issues <http://education.rec.org/green-pack.html>

OpenLearn. The Open University: Material for self-study on all kinds of topics <http://www.open.edu/openlearn/>OXFAM: A selection of suggested teaching ideas around the SDGs <https://www.oxfam.org.uk/education/resources/sustainable-development-goals>

Sustainability Gamepedia: A database of games related to sustainability <http://www.games4sustainability.org/gamepedia/>Teaching and Learning for a Sustainable Future: Resources for teachers about teaching approaches as well as classroom activities on diverse topics related to sustainability http://www.unesco.org/education/tlsf/mods/theme_gs.html

Teach UNICEF: Collection of teacher resources on the SDGs <https://teachunicef.org/teaching-materials/topic/sustainable-development-goals>

The Goals.org: Free global education and learning portal on sustainable development solutions <http://www.thegoals.org>

The Lazy Person's Guide to Saving the World <http://www.un.org/sustainabledevelopment/takeaction>

The Story of Stuff: An online resource that investigates the humanity's unsustainable use of materials <http://storyofstuff.org>

The World We Want. A Guide to the Goals for Children and Young People http://www.unicef.org/agenda2030/files/TWWW_A4_Single_Page_LowRes_English.pdf

The Youth resource pack from MYCI: Methodologies for introducing the SDGs to young people in an engaging and informative manner http://www.youth.ie/sites/youth.ie/files/SDGs_Youth_Resource%20_Pack.pdf

UNESCO: Good Practices in Teacher Education Institutions <http://unesdoc.unesco.org/images/0015/001524/152452eo.pdf>

World's Largest Lesson: Find everything you need to introduce the SDGs to young people, take part and take action <http://worldslargestlesson.globalgoals.org>

Young Masters Programme on Sustainable Development: Online courses and international exchange between students on sustainable development <http://www.goymmp.org/en/frontpage>

Eco-Schools Networks <http://www.ecoschools.global>

Food and Agriculture Organization of the United Nations (FAO) <http://www.fao.org/home/en/>

GAIA Education <http://www.gaiamedia.org>

Global Ecovillage Network <http://www.gen.ecovillage.org>

Global Footprint Network <http://www.footprintnetwork.org/en/index.php/GFN/>

Higher Education Sustainability Initiative (HESI) <https://sustainabledevelopment.un.org/sdinaction/hesi>

CLEI: Local Governments for Sustainability <http://www.iclei.org> International Institute for Sustainable Development <http://www.iisd.org>

Sustainable Development Solutions Network <http://unsdsn.org>

UNESCO ASPnet schools <http://www.unesco.org/new/en/education/networks/global-networks/aspnet>

United Nations Development Programme <http://www.undp.org> United Nations Environment Programme <http://www.unep.org>

World Federation of UNESCO Clubs, Centres and Associations (WFUCA) <http://wfuca.org> World Health Organization <http://www.who.int/en/>

Teaching and Professional Learning Support Education for Sustainability Starter Kit <http://www.sustainableschoolsproject.org/tools-resources/starter-kit>

Education for Sustainable Development Toolkit [http://www.esdtoolkit.org/German Curriculum Framework Education for Sustainable Development](http://www.esdtoolkit.org/German_Curriculum_Framework_Education_for_Sustainable_Development) <http://ensi.org/global/downloads/Publications/418/Curriculum%20Framework%20ESD%20final%2001.pdf>

Guide to Education for Sustainability <http://sustainableschoolsproject.org/sites/default/files/EFSGuide2015b.pdf> Guide to Quality and Education for Sustainability in Higher Education [http://efsandquality.glos.ac.uk/Shaping the future we want. UN Decade of ESD. Final report](http://efsandquality.glos.ac.uk/Shaping_the_future_we_want.UN_Decade_of_ESD.Final_report) <http://unesdoc.unesco.org/images/0023/002303/230302e.pdf> UNESCO's Roadmap to ESD. Implementing the Global Action Programme <http://unesdoc.unesco.org/images/0023/002305/230514e.pdf>

UNESCO's Teaching and Learning for a Sustainable Future

[http://www.unesco.org/education/tlsf/Vanderbilt University's Guide for Teaching Sustainability](http://www.unesco.org/education/tlsf/Vanderbilt%20University's%20Guide%20for%20Teaching%20Sustainability)

<https://cft.vanderbilt.edu/guides-sub-pages/teaching-sustainability>

Whole-school approaches to sustainability: A review of models for professional development in pre-service teacher education (Australian Research Institute in Education for Sustainability)

<http://aries.mq.edu.au/projects/preservice/files/TeacherEduDec06.pdf>

CCC:Learn Introductory e-Course on Climate Change (<https://unccelearn.org/course/>)

Key resources: yUNESCO GAP on ESD Roadmap (UNESCO, 2014)

UNESCO's Teaching and Learning for a Sustainable Future multimedia programme

Sustainable Development Solutions network online resources for ESDyESD Toolkit includes a list of ESD resources

Climate change in the classroom: UNESCO course for secondary teachers (International) This six-day online course on climate change enables teachers from diverse subject areas at the secondary level to introduce Climate Change Education for Sustainable Development (CCESD) across the curriculum. It comprises 4 parts: (1) Course Framework and Overview, (2) Teachers' Education Course daily materials, (3) Regional Resource Packs, and (4) Daily Classroom Materials for teachers. (<http://unesdoc.unesco.org/images/0021/002197/219752e.pdf>)

The GLOBE programme (US/International) sponsored by NASA and the National Science Foundation (USA). Established in 1995, the programme has been implemented in 115 countries, training more than 22,669 teachers and engaging 28,466 schools and thousands of students all over the world. The programme encourages innovative approaches for youth to think globally but act locally, such as adopting a highway and focusing on fuel efficiency. (<http://www.globe.gov/>)

The Cleen programme (Albania)The Child-Led Environmental Education Initiative (Cleen programme) educates children in primary schools in Albania on climate change issues and environmental protection. Over the past three years, 2,944 teachers have been trained, reaching 50,000 children yearly. The programme involves embedding climate change into the curriculum and developing methodologies and guides to communicate the science in an entertaining manner, through the use of puzzles, games and child-to-child teaching. (https://unfccc.int/files/cooperation_and_support/education_and_outreach/application/pdf/article6_presentation_albana_markja.pdf)

Yunga Climate Change Challenge Badge (International) Developed in collaboration with UN agencies, aim to raise awareness, educate and motivate youth to change their behaviour and become active agents of change in their local community. The series is used by teachers and youth leaders and are educational and fun and cover topics such as Biodiversity; Climate Change and Food Security;

Energy; Forests; the Ocean; Soils; and Water (Source: Climate Badges: Youth and United Nations Global Alliance).

The BBC Media Action toolkit “Communicating Climate Change: What You Can Do” Example of media climate change messaging” in collaboration with UNESCO to support the training of journalists to enhance their knowledge and skills. Through this project, media capacity will be strengthened , as a way to raise greater public awareness and hold policy-makers to account on their commitments/obligations under the Paris Agreement with a guidebook on Africa, entitled “Climate Change in Africa: A Guidebook for Journalists”. (<http://unesdoc.unesco.org/images/0022/002254/225451e.pdf>)

Stakeholder mapping tool: Net-Map Education for Sustainable Development Lens: A Policy and Practice Review Tool (UNESCO, 2010)

NOT JUST HOT AIR: Putting Climate Change Education into Practice

The SEED Initiative Website (Cross-sector partnering for sustainable development): <https://www.seed.uno>

Organizations and networks

Eco-Schools Networks <http://www.ecoschools.global>

Food and Agriculture Organization of the United Nations (FAO) <http://www.fao.org/home/en/>

GAIA Education <http://www.gaiaeducation.org>

Global Ecovillage Network <http://www.gen.ecovillage.org>

Global Footprint Network <http://www.footprintnetwork.org/en/index.php/GFN/>

Higher Education Sustainability Initiative (HESI) <https://sustainabledevelopment.un.org/sdination/hesi>

ICLEI: Local Governments for Sustainability <http://www.iclei.org>

International Institute for Sustainable Development <http://www.iisd.org>

Sustainable Development Solutions Network <http://unsdsn.org>

UNESCO ASPnet schools <http://www.unesco.org/new/en/education/networks/global-networks/aspnet>

United Nations Development Programme <http://www.undp.org/>

United Nations Environment Programme <http://www.unep.org>

World Federation of UNESCO Clubs, Centres and Associations (WFUCA) <http://wfuca.org/>

World Health Organization <http://www.who.int/en/>

Teaching and Professional Learning Support

Education for Sustainability Starter Kit <http://www.sustainableschoolsproject.org/tools-resources/starter-kit>

Education for Sustainable Development Toolkit <http://www.esdtoolkit.org/>

German Curriculum Framework Education for Sustainable Development <http://ensi.org/global/downloads/Publications/418/Curriculum%20Framework%20ESD%20final%2001.pdf>

Guide to Education for Sustainability <http://sustainableschoolsproject.org/sites/default/files/EFSGuide2015b.pdf>

Guide to Quality and Education for Sustainability in Higher Education <http://efsandquality.glos.ac.uk/>

Shaping the future we want. UN Decade of ESD. Final report <http://unesdoc.unesco.org/images/0023/002303/230302e.pdf>

UNESCO's Roadmap to ESD. Implementing the Global Action Programme <http://unesdoc.unesco.org/images/0023/002305/230514e.pdf>

UNESCO's Teaching and Learning for a Sustainable Future <http://www.unesco.org/education/tlsf/Vanderbilt>

University's Guide for Teaching Sustainability <https://cft.vanderbilt.edu/guides-sub-pages/teaching-sustainability>

Whole-school approaches to sustainability: A review of models for professional development in pre-service teacher education (Australian Research Institute in Education for Sustainability) <http://aries.mq.edu.au/projects/preservice/files/TeacherEduDec06.pdf>

UNESCO course for secondary teachers Climate Change Education for Sustainable Development (CCESD) (<http://unesdoc.unesco.org/images/0021/002197/219752e.pdf>)

The Cleen programme (Albania)The Child-Led Environmental Education Initiative (Cleen programme) educates children in primary schools in Albania on climate change issues and environmental protection. Over the past three years, 2,944 teachers have been trained, reaching 50,000 children yearly. (https://unfccc.int/files/cooperation_and_support/education_and_outreach/application/pdf/article6_presentation_albana_markja.pdf)

Barefootcollege.org in India involving digital night school technology solutions like solar Powered Projector and digital curriculum

UN's Climate Action Super Heroes. Climate Action Superheroes – Info Page – United Nations Sustainable Development

The Association for the Study of Literature and Environment (ASLE) offers access to emerging conversations and debates, innovative classroom work, environmental writing. Our association works with professors, practicing writers and artists, environmental educators and activists, and environmentally concerned citizen.

California Education and the Environment Initiative

The California Education and the Environment Initiative is a program of CalRecycle's Office of Education and the Environment (OEE) fostering environmental literacy among all California students as part of a high-quality K-12 education.

CIEEM Information about careers in environmental field from professionals in the UK, Ireland and abroad.

Earth Day Network - EDN Engaging 500 millions students in Earth Day environmental education activities, strategic global partnerships and developing resources for students and teachers to learn about local environmental issues for environmental civic action.

Elementary GLOBE introduces young students to Earth science. The Teacher Implementation Guide provides an overview of Elementary GLOBE, the connections that the curriculum makes to literacy, the use of science journals, elementary science inquiry, standards alignment, and connections to other parts of elementary curriculum.

https://www.globe.gov/documents/348830/55942507/03_EGc_FINAL_2Oct2017.pdf/c2b637bc-93a5-45ba-9b9e-98ef74a579fe

eePRO is an online community to connect environmental education (EE) professionals around the world offering job opportunities, webinars, online courses, discussion forums, and many more resources, and you can share your own news and content with others.

Green Anglicans is an educational resource manual developed by the Environmental Network of the Anglican Church of Southern Africa to provide a resource for Sunday Schools for younger children. Greenheart Education GreenHearted.org is a primer on transformative education for sustainability for k-12 education, with a special focus on primary education.

Green Teacher is a non-profit organization dedicated to helping educators and promoting environmental awareness among young people with a Green Teacher magazine with articles, activities and resources.

Go Green Initiative is a global environmental education program that trains teachers and volunteers in schools in environmental stewardship, with instruction for volunteers in all 50 U.S. states and 73

countries, teaching them to integrate environmental education into existing curriculum and quantify their environmental impact.

InTeGrate - Interdisciplinary Teaching about Earth for a Sustainable Future for undergraduate educators across a range of courses.

Learning and Teaching about the Environment - EPA is a website for K-12 students and educators with quality homework resources, lesson plans and project ideas for Environmental education (EE)

National Service Center for Environmental Publications - EPA

North American Association for Environmental Education We bring the brightest minds together to advance environmental literacy and civic engagement through the power of education to create a more sustainable future for all.

Resources4Rethinking connects teachers to lesson plans, books, videos and other materials that explore the environmental, social and economic dimensions of important issues.

Roots & Shoots Founded by Dr. Jane Goodall, is a youth service program that empowers youth to lead local change through service and become compassionate leaders.

The Encyclopedia of the Earth (EoE) is a free, expert-reviewed collection of content for students, educators, scholars, professionals, and the general public.

The National Wildlife Federation | Educator Resources provides educators with curriculum and activities for environmental stewardship.

Think Earth Environmental Education Foundation focuses on EE for students from kindergarten through middle school.

The National Project for Excellence in Environmental Education has received funding from the U.S. Environmental Protection Agency through the Environmental Education and Training Partnership (EETAP) and EECapacity.

Nature Kids/Jovenes de la Naturaleza Lafayette (NKJN) is a book full of photos along with a story , called Agua Pura Fotonovela, in Santa Barbara, California. <http://cetehama.ucanr.edu/?impact=758>

Burlington's Community Sailing Center (CSC) implements "Floating Classrooms" to teach environmental science curriculum to students on shore and through sailing.

BNC works to increase access not only through excellent, affordable environmental education programs, but through training and hiring practices aimed at employing qualified women, low-income workers, and people of color at all levels.

www.openlands.org

www.faithinplace.org.

MERITO Foundation empowers students to address climate change and ocean acidification at <https://naaee.org/eeopro/blog/eecapacitys-ccc-fellowship-and-eecco>.

<http://www.meritofoundation.org>.

Members do river cleanup and stewardship activities, together with rangers, police, and local leaders at Friends of the River Banks at <http://www.friendsoftheriverbanks.org>.

Boston Nature Center's programs at <http://www.massaudubon.org/get-outdoors/wildlife-sanctuaries/boston-nature-center>.

NAAEE, in partnership with the Kettering Foundation, created the Environmental Issues Forums (EIF) providing tools, training, and support for engaging adults and students in discussions about environmental issues.

Resources for Community Engagement

Everyday Democracy www.everyday-democracy.org

National Audubon Society's Diversity and the Conservation Movement https://naaee.org/sites/default/files/eeopro/resource/files/diversity_module.9.22.15.pdf

National Audubon Society's Tools for Engagement <https://naaee.org/sites/default/files/eeopro/resource/files/toolsofengagement.pdf>

National Coalition for Dialogue and Deliberation (NCDD) www.ncdd.org

National Extension Water Outreach Education <http://fyi.uwex.edu/wateroutreach/>

Standards of Excellence for Urban National Wildlife Refuges <http://www.fws.gov/urban/soe.php>

The University of Kansas Community Toolbox <http://ctb.ku.edu/en> This website offers an array of practical, "how-to" guidance in specific skills

University of Minnesota Extension—Civic Engagement <http://www.extension.umn.edu/community/civicengagement/>

TreePeople is an environmental education and advocacy organization in the U.S which involves more than two million people in planting and taking care of more than two million trees <https://kokuahawaiiifoundation.org/aina>

ĀINA In Schools is a farm to school initiative that connects children to their local land, waters, and food to grow a healthier Hawai‘i.

Initiatives from different countries

Ethiopia – aligns its National Learning Strategy with its Climate-Resilient Green Economy (CRGE) initiative to protect the country from climate change and build a green economy that will help to switch to a new and more sustainable development model by 2025. A large-scale capacity-building programme, UN CC:Learn helped Ethiopia to further integrate climate change into the formal education system through classroom materials and teacher training. The project is being implemented under the joint leadership of the Ministry of Environment, Forests and Climate Change and the Ministry of Education. (Source: UN CC:Learn in Ethiopia)

Viet Nam –as a response to the UN Decade of Education for Sustainable Development (DESD), a National DESD Committee was formed in Viet Nam in 2006 drafting the first National Action Plan of Education for Sustainable Development and linking the plan to existing environmental initiatives such as the Environmental Education in Viet Nam Schools programme and the International Decade of Water for Life Campaign. (Source: NOT JUST HOT AIR: Putting Climate Change Education into Practice, UNESCO, 2015)

Kenya integrates its climate outreach strategy into Second National Communication to the UNFCCC Kenya plays an active role in the international climate change negotiations and has also pioneered in climate outreach. Its national programme was conceived by the National Environmental Management Authority (NEMA), which hosts the climate change UNFCCC focal point.

Kenya’s current Climate Change Action Strategy – 2013-2017 for a concise summary of how a number of other national policies and strategies align with its Climate Action Strategy

Namibia implements through the Climate Change Action Plan, 2009 four activities specifically geared toward improving climate information and participation of farmers and farming communities.

Developing needs assessments carried out in 5 countries, for the development of National Climate Change ESD programmes. (UNESCO, 2015) like Kenya and Bangladesh. Practical steps for assessing needs and delivery capacities include

a)review existing needs /capacity assessments required, b) make preliminary list of key needs and delivery capacities, c) assess institutional delivery capacities for example, Jamaica’s situational review of the current climate realities affecting key sectors or Namibia implementing through the Action Plan four activities specifically geared toward improving climate information and

participation of farmers and farming communities (Source: Namibia proposed Climate Change Action Plan, 2009)

In Mexico the International Non-Governmental Organization (INGO) and

Rainforest Alliance has established a meaningful partnership of ensuring long-term support for CC Education and embedding it within school programmes and especially important for indigenous resource deprived communities (Source: AlianzaMexicoREDD++)

India: International NGO, state government, national banks, and community-based organization partner to raise awareness on climate change, implement renewable energy and support women's entrepreneurship

By setting up Renewable Energy Centres, the enterprise Switch ON: ONergy increases solar power awareness and sells its own affordable solar energy products.

The initiative forms partnerships, conducts impact assessments, advocates at the national and state level, raises awareness on renewable energy in the intervention areas, nurtures innovation projects and builds capacity through the training of rural entrepreneurs. The Orissa Tribal Empowerment and Livelihoods Programme improves the livelihoods of marginalized poor groups helping to integrate women and tribal communities into the production and distribution of solar products. The World Wildlife Fund India (WWF India) promotes renewable energy solutions to mitigate climate change, and raises awareness about climate change.

Switch ON: ONergy ensures that off-grid village households can sustainably finance solar products by further partnering with national banks, microfinance institutions and credit cooperatives. (Source: Seed Initiative)

Zambia: UN Agency, government and construction sector partner for green jobs training with the Green Jobs partnership programme aiming to contribute to the improvement and greening of existing jobs and creation of new green jobs in in the construction sector via eco-friendly building materials, services, goods and technologies such as water conservation. (Source: Zambia Green Jobs)© ONergy Solar

Costa Rica shows how sustainable development policies that include ESD can help to reinforce and drive changes in education systems.

Kenya formulated a national ESD Policy Framework in 2012 through the Kenya Institute of Curriculum Development with the goal of enhancing sustainable development through transformative curriculum support materials(39).

Unite4Climate Zambia is one of UNICEF's signature child-led advocacy programmes.

Examples of gender and intergenerational approaches

Leadership programme: "Young Women for a Greener Future" Led by the World Association of Girl Guides and Girl Scouts (WAGGGS), focused on developing participants' personal and leadership skills to affect environmental issues in their own countries and in the world. The 70 young participants developed national environmental projects to deliver on their return home. Source: United Nations Joint Framework Initiative on Children, Youth and Climate Change (2013, p. 45)

The Junior Farmer Field and Life Schools (JFFLS) programme – Climate Change Module Led by FAO and the ILO, empowers vulnerable youth (age 15-24) from rural areas by providing them with the livelihood options and gender-sensitive skills needed for long-term food security and has been piloted in Malawi and the United Republic of Tanzania.

Chile – National Climate Change Action Plan 2008-2012 (NCCAP) The Strategy is structured around three main focal areas: (1) adaptation, (2) mitigation and (3) the creation and promotion of national capacities.

Tanzania - National Climate Change Communications Strategy 2012-2017 (NCCCS) requires the Environment Minister to take measures to address climate change.

Uganda – National Climate Change Learning Strategy (NCCLS) 2013-2022 aims to strengthen human resources and skills to advance low-emission and climate-resilient development in Uganda with collaboration of the Ministry of Water and Environment and various sectors.

Bye Bye Plastic Bags (Bali, Indonesia)

Two Green School students in Grades 6 and 7, started the biggest "Children Driven Action" campaign Bali has ever seen: ByebyePlasticBagsOnBali and now have a team of over 25 children working with them and have a petition running to ban the use, sale and production of plastic bags in Bali.

Weblinks:

<http://byebyeplasticbag.wix.com/byebyeplasticbags>

Videos:

<https://www.youtube.com/watch?v=P8GCjrDWWUM>

Ocean Sole is an organization that has transformed the litter that washes up on Kenya's shores into works of art while creating employment opportunities for local people in coastal and urban communities of Kenya. The company has estimated that 400,000 recovered rubber sandals are used in their products every year and are sold worldwide.

Weblink: <http://www.oceansoleafrica.com/>

Video: [http://www.video.intranet.ou.nl/mediadienst/_public/php/external_video.php?Q=2104|video ID](http://www.video.intranet.ou.nl/mediadienst/_public/php/external_video.php?Q=2104|videoID)

Beat the Microbead in the Netherlands is a Plastic Soup Foundation's application and campaign Beat the Microbead targeted towards microbeads in cosmetics

Resources

Weblink: <http://www.beatthemicrobead.org/>

Video: <https://www.youtube.com/watch?v=voWTPAE9pqQ>

OSEAN (Our Sea of East Asia Network) is a South Korean non-profit organization aiming to protect the marine environment by linking citizens and science to research, education, policy development, and international cooperation for the protection of the marine environment.

Weblink: <http://www.koreamarinelitter.blogspot.kr/>

The Plastic Garbage Project in Switzerland aims to give public as possible an impetus to use plastic in a more conscious way. The project aims at encouraging action and changing behaviour with an exhibition touring throughout Europe, the Arab World and other continents.

Weblink: <http://www.plasticgarbageproject.org/>

Video: <https://www.youtube.com/watch?v=e99m0uKcUDM>

Wecyclers is a recycling collection company that is partnered with the Lagos Waste Management Authority in Lagos, Nigeria.. Wecyclers employs local people to collect waste and turn them into new products.

Weblink: <http://www.wecyclers.com/>

Video: https://www.youtube.com/watch?v=eGYFHfc_ONg

UpGyres is a Canadian not-for-profit organisation with the aim to develop new equipment, technology and methodology for transforming ocean pollution into resources. UpGyres and its partners are at the research and development stage for recovering waste microfibres from washing machine effluent.

Weblink: <http://upgyres.org/>

Video: <https://www.youtube.com/watch?v=AUXNRTGzZ7k>

Green -Plastics.net website in USA provides news, discussion, videos, and other resources for people interested in bioplastics, sharing an interest in plastic, sustainability and the environment.

Weblink: <http://green-plastics.net/>

Video: <https://www.youtube.com/user/greenplasticsnet>

TeachWild in Australia began in 2011, Shell Australia, Earthwatch and CSIRO initiated a partnership to address marine debris through ‘citizen science’ activities to engage the wider community, like in-school workshops for teachers and students known as ‘Scientist for a Day’, professional development expeditions, volunteering days, online webinars, a dedicated website (www.teachwild.org.au).

Video: <https://www.youtube.com/watch?v=ISg3Pp0J5KI>

Net Positiva & Bureo Skateboards is a fishnet collection and recycling program turning discarded fishing nets into skateboards in Chile in January 2014, while supporting coastal communities and bringing awareness to a major threat to our oceans.

Weblink: <http://shop.bureo.co/pages/net-positiva>

Videos:

<https://vimeo.com/110186248>

<https://vimeo.com/109498230> (password: fuerzachile)

Surfers Against Sewage tries to improve the water quality of the UK coast by being a national marine conservation charity with several campaigns against marine litter with campaigns such as “Return to sender” targeting producers to take extended producer responsibility and marine litter campaign “Message in a bottle” introducing a Deposit Return System for plastic bottles in the UK.

Weblink: <https://www.sas.org.uk/>

Video:

<https://www.youtube.com/watch?v=ZG7BWbJKtHA>

<https://www.youtube.com/watch?v=lJrI8lJ2dqM>

RAPMaLi is a Caribbean Regional Action Plan for Marine Litter designed to serve as a toolkit to assist Small Island Developing States (SIDS) in incorporating components of proper waste management across all sectors.

Weblink: <http://www.cep.unep.org/regional-action-plan-on-marine-litter-management-rapmali-for-the-wider-caribbean-region>

National plastic bag ban in Rwanda is a nation-wide ban through tax incentives and recycling contracts from manufacturers, in addition to fines in case of violation.

Videos:

<https://www.youtube.com/watch?v=58aBoXJARNQ>

<https://www.youtube.com/watch?v=d8PX7ndjDt8>

Zero Waste Europe in the Netherlands is a knowledge network and an advocacy group, representing active communities in countries across the EU suggesting that anything that is produced can be re-used, repaired, composted or recycled back into the system.

Weblink: <http://www.zerowasteurope.eu/>

Video:

<https://www.youtube.com/watch?v=urPPprUMIt8>

<https://www.youtube.com/watch?v=l8cxsFN0Sl8>

Beachpedia in USA is a project of the Surfrider Foundation, with the goal of collecting and publishing knowledge on coastal environmental topics from Surfrider chapter activists and subject-matter experts. Activists, scientists and staff do various environmental and educational campaigns on coasts hoping to provide tools and information to help communities make a positive impact on their local beaches.

Weblink: <http://www.beachpedia.org/>

Video: <https://www.youtube.com/watch?v=jmV0gqBb6i4>

Sustainable Seas Trust is a Non-Profit Organisation (NPO) that supports and connects communities across Africa through research, education, enterprise development and growing awareness about ocean conservation and plastic pollution. We also build networks for sharing information and support focused on waste management. Through our events and projects, the African Marine Waste Network, Hope Spots and Marine Education, we are bringing like-minded and passionate people together, locally and internationally, to manage the issues of plastic waste in Africa.

Weblink: <https://sst.org.za/>

Sustainable Coastlines is a multi-award winning New Zealand charity whose mission is to enable people to look after the coastlines and waterways, coordinating large-scale coastal clean-up events, educational programs, public awareness campaigns and riparian planting projects.

Weblink: <http://sustainablecoastlines.org/about/overview/>

Watamu Marine Association is a unique initiative at the Kenyan coast bringing together members from the community, tourism and environment sectors promoting community development and empowerment and advocating for the protection and preservation of Watamu Marine Park and Reserves.

Weblink: <http://www.watamu.biz/>

Poverty-Environment Initiative - United Nations Partnerships for SDGs platform is a long-standing partnership between UNDP and UN Environment, plus other agencies such as UNCDF, FAO or UN Women, that is improving the ability of governments in developing countries to govern natural resources better, reduce poverty, promote environmental sustainability. This is integrated approach to effectively prioritize the poverty, environment and climate nexus in policy dialogue and in government and private sector investment decisions.

Be the Change Initiative guides and encourages civilians to change consumption patterns, using active transport such as cycling, and buying local foods.

Lazy Person's Guide to Saving the World gives inspiration to live sustainably

Another great resource is the 170 Actions to Transform the World.

Virtual Youth Summit in India in 2020 celebrated their completion of the Tide Turners Plastic Challenge, a global initiative to educate young people about plastic pollution by UNEP, Clean Seas Campaign, World Wide Fund for Nature India (WWF India), Centre for Environment Education (CEE), and the Million Sparks Foundation.

The International Support Network for African Development (ISNAD-Africa) is a UNEP-accredited non-governmental organisation to raising global support for green growth in Africa, operating a network of more than 1,500 green growth professionals, researchers, youths, students and enthusiasts from over 100 countries across the globe, implementing the Environmental Education Programme (EEP) aiming to empower African youth to find innovative local environmental solutions across the continent, to identify challenges and needs in their communities, develop solutions, and to gain hands-on experience in implementing their ideas supported through mentorship from international experts and peer learning and present their projects to other participating students' teams in other African countries, experts from across the globe, partnering organisations among other stakeholders and win monetary awards .Environmental Education Programme (EEP) 2020 (isnad-africa.org)

The “Green Existing Schools” training webinar series provides green school initiatives that can be implemented in existing schools communities.

Climate Action project involves millions of students across 107 countries and is supported by governments in 15 countries. The project is free, student-centered and aims to lead to a change of behavior through education, in collaboration with WWF and NASA, and endorsed by Jane Goodall, President Higgins, Kumi Naidoo, scientists and public figures. For example, students from Guatemala, Portugal, Philippines and Jamaica planted trees, Kenyan students made fences out of plastic bottles, Nigerian students developed small biogas plants, American students created mobile solar suitcases, German students applied to the government for solar panels for their school and Canadian students 3D printed coral reef hoping to slow down coral bleaching in the world's oceans. They also explored the potential of the mealworm in biodegrading styrofoam and other plastics. www.climate-action.info

<https://www.rootsandshoots.org> by Dr. Jane Goodall empowers youth across the globe to understand their power and influence of their voice and actions to create change , to get engaged, to take action, affect positive change in communities, make an impact on our world every single day, through advice and guidance, virtually bringing them together.

International climate initiative Germany is a competition for ideas and solutions

Greenpeace developed a Global Voices Map/Platform to facilitate sharing campaigns on social media and stories related to environmental activists, from all over the world.

WWF created “My Footprint app” as a hub for positive change with practical advice on how you can help the environment.

2020 Regional Environmental Stewardship Award Winners.! Environmental Stewardship

Adopt your MP Across the world young people are speaking up on climate change – directly to their politicians! Both the Canadian Youth Climate Coalition (CYCC) in Canada and the Australian Youth Climate Coalition (AYCC) in Australia have launched Adopt-an-MP campaigns where young people ‘adopt’ their local Member of Parliament and talk to them about climate change.

Global Youth Climate Movement’s It’s Getting Hot In Here, the international youth climate change blog. Here, young people around the world share action tips, successes, inspirations and the latest news from their countries. www.itsgettinghotinhere.org

Monthly Online workshops by UNESCO

The Canadian Youth Climate Coalition (CYCC), African Youth Initiative on Climate Change (AYICC) and Australian Youth Climate Coalition (AYCC) are just three examples of how young individuals and youth-led organisations can unite to present a single, co-ordinated voice on climate change, even across entire continents collaborating on projects and learn from each others’ experiences. <http://www.youthclimatecoalition.org>

Student Coalitions Groups such as the Sierra Youth Coalition, Campus Climate Challenge and the Australian Student Environment Network formed coalitions to make their university campuses sustainable. By sharing what has worked and what hasn’t they can all be more successful. Sierra Youth Coalition: <http://syc-cjs.org/sustainable/> Campus Climate Challenge: <http://climatechallenge.org/> Australian Student Environment Network: <http://www.asen.org.au>

Solar Generation International www.solargeneration.org

Community Mapping Guide , A youth community mapping toolkit for East Africa One Stop Centres” provide youth with safe spaces in urban settings where they can meet and take the lead in their own development as well as that of their urban environment, and be participants through initiatives such as municipal and national Youth Councils, for example in shaping policy related to issues affecting youth. One Stop and We Are the Future Urban Youth Centres. One Stop Youth Resource Centre Programme | UN-Habitat

One Stop Youth Resource Centre Programme | UN-Habitat

United Nations Joint Framework Initiative on Children, Youth and Climate Change (Joint Framework Initiative).

The United Nations Development Programme (UNDP) implements the Global Environment Facility's Small Grants Programme, which provides funding for projects on mitigation or adaptation to climate change proposed by youth organizations or non-governmental organizations that work with youth.

Through its Climate Change Education for Sustainable Development Programme, UNESCO supports the development of national climate change education programmes, policies and resources.

The United Nations Human Settlements Programme (UN-HABITAT) supports youth-led groups through its Urban Youth Fund and 'One Stop Youth Resource Centres' to develop programmes to mitigate the effects of climate change in urban areas.

You, me & the climate is a youth leadership initiative supported by the National Trust empowering young people to take action <https://twitter.com/Climateers>

Taking It Global Youth around the world actively engaged and connected in shaping a more inclusive, peaceful and sustainable world. (<https://www.tigweb.org/>)

Commit2Change

OzonAction education pack: a guide for primary school teachers, UNEP, 2006

<https://www.tigweb.org/action-tools/initiatives/>

SustainUS is a youth organization that engages at the intersection of national and international politics, aiming to to end of the fossil fuel era, develop lifelong leaders to be effective "Agents of Change"<https://sustainus.org/>

<https://www.unep.org/champions> is designed for young environmentalists

Student Switch Off is a not-for-profit international campaign encouraging student action on climate change with eco - competitions within halls of residence at universities in various EU countries. <https://studentswitchoff.org/>

IYCN , Indian Youth Climate Network aims to generate awareness and empower a generation of young people to take effective action against climate change, at a local, state, national and international level.

<https://iycn.in/> has coalitions, campaigns, solution based – projects , creates action plans for implementation and has programs such as Agents of Change, Climate Leadership Program

Enviroschools Foundation <http://www.enviroschools.org.nz/>

Kibera Community Youth Project (KCYP) involves youth making solar panels to power radio, charge mobiles and rechargeable batteries. <http://news.bbc.co.uk/2/hi/Africa/4001061.stm>

United Nations Environment Assembly (UNEA)

UNICEFFS Young Climate Ambassadors

'Unite for Climate' – UNICEF's social network for young people interested in the environment and climate change allows youth people around the world to join in via the web or mobile phones.

UNICEF works actively with the academia including Harvard's Berkman Center for Internet and Society to develop online safety guidelines, to collaborating with YouTube on the Youth Climate debates,

Dell YouthConnect program, involved the donation of 160 laptops to the Forum –so the young attendees can engage online and exchange voices with other children around the world.

Google, will launch a mapping contest with the proceeds going to UNICEF's innovation work in January.

IKEA Social Initiative is running a campaign giving one solar desk lamp to UNICEF for each lamp sold, to help children developing countries
https://www.unicef.org/infobycountry/denmark_51984.html

UNICEF Voices of Youth is UNICEF's digital community for youth by youth with blogs, illustrations, poems, new stories, opportunities and resources on social media

#Voicesofyouth <https://www.voicesofyouth.org/>

National environment youth Corps in Lesotho)

UNEP and UNICEF developed an Environmental education resource pack for child friendly schools in order to empower children and to promote risk mitigation and disaster risk reduction

the United Nations Children's Fund (UNICEF), in partnership with UNEP, has developed Unite for Climate, a social networking tool that serves as a platform for youth exchange and mobilization for action on climate change.

The International Federation of Red Cross and Red Crescent Societies include 186 member National Societies, many of which sponsor dynamic youth volunteer programmes.

The Kick the Carbon Habit Education Campaign was initiated by UNEP to empower and educate youth and the general public in the area of environmental responsibility.

The Fiji Red Cross Society is developing a youth group curriculum on disaster awareness

New Zealand Enviroschools Foundation is a national initiative that takes a whole-school approach to education for a sustainable future.

Solomon Islands Red Cross Society organized The Honiara Youth and Climate Change Forum, brought intergenerational dialogues through discussion and fieldwork, action plans like school awareness programmes, village assessments, radio quizzes, advocacy activities, and youth networks.

Indian Youth Summit on Climate Change

Tuvalu Climate change adaptation and disaster risk reduction programmes led by the Red Cross Society have engaged youth in workshops on disaster risk assessment and response.

Climate change is a global challenge, and the Internet has facilitated the development of worldwide networks, collaborative partnerships, and youth-led discussion forums.

Displays at the World Museum Liverpool and at COP 15 as part of the Children in a Changing Climate display with eighty schools in twelve countries involved..

Youth Earth Plan

The China Youth Climate Action Network produced a Guidebook, which is being used on university campuses to promote student awareness and activism.

Nepal Children in a Changing Climate is a programme identifying “child champions” to promote the adoption of environmentally responsible policies, developing and sharing learning tools, inspiring child-led action through online forums and international networks.

Greenpeace’s Solar Generation is a network of young people from 15 countries engaging in climate change advocacy and activism.

The Young Men’s Christian Association (YMCA-Ghana)

The Children International Youth Council in India

Korean students participated in the CO2 Zero Eco Campus Competitions,

Samoa Youth affiliated with the Samoa Red Cross Society

United States The Climate Change Action

United States The Clinton Global Initiative University involves Columbia University's Engineers without Borders and Uganda Programme collaboration on an energy platform in farms.

In Latin America the International Student Initiative for Action on Climate Change provides young academics and professionals with the opportunity to contribute to the development of climate change mitigation policies aimed at protecting their region's tropical forests.

The New York University (NYU) Sustainability Initiative

Australian Youth Climate Coalition

China Youth Climate Action Network

International Coordination Meeting of Youth Organisations (ICMYO)

International Coordination Meeting of Youth Organisations

The European Youth Forum, or Youth Forum Jeunesse (YFJ)

Appendix II Glossary and terms

CCEE Climate Change Environmental Education

CRS Convention for the Rights of Children

ESD Education for Sustainable Deveoplment

EE Environmental education

FAO Food and Agriculture Organization

SDGs Sustainable Developmentn Goals

UNESCO United Nations Educational, Scientific and Cultural Organization

UN united Nations

UNEP united Nations Enviroment Program

UNICEF Nations International Children's Emergency Fund

UNFCCC United Nations Framework Convention on Climate Change

IPPC Intergovenrmental Panel on climate Change

WHO Worls Health Organization