

15 Voices on Climate Change

A collection of essays by journalists
from Egypt, Morocco, Bulgaria,
Kenya, Kosovo, Uganda, Romania

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Green journalism as an indispensable genre – the case of Kosovo.

After politics and football, showbiz occupies the largest place in our media space and everywhere in other media. Environmental reports are at the moment of floods, forest fires or any symbolic marked day. While climate change in the news comes only in the section on the world as something that does not belong to us, at least from our point of view.

Just as disinformation and misinformation made people not believe in Covid-19 or the vaccine in the same way the media is losing the chance to inform people about the danger posed by climate change

What happened in Kosovo with journalism, not only, but also with free information, and consequently with the loss of the notion of Climate Change?

Kosovo, the centuries-old changes

Kosovo in the years of communism, since the end of World War II has had a modest but coherent journalism.

Since 1948, when it was found and developed the 'corporation' of daily journalism, the 'Rilindja' daily, which in its heyday has taken its place in the market of the former socialist Yugoslavia with more than 120,000 copies per day. This was definitely a period if not the golden, brilliant period of print journalism.

In the seventies and eighties, of the twentieth century, in Kosovo of Yugoslavia there was an explosion of weekly newspapers and magazines, profiled and periodical. Among the most prominent were 'Zeririnisë' then 'Zerijavor', as well as later, the social entertainment magazine 'Kosovarja', the daily 'Bujku' and the profiled political magazine 'Koha'.

All of these, in one way or another, dealt with social chronicles and local themes, less often with political events, except with the events of the socialist federal structures that were the main themes. But never on aspects of nature, science, the environment and climate change. Climate change and global warming in the former Yugoslavia was not a taboo topic, but a notion still unknown to the phraseology of the mass media.

Press journalism is extinct

In post-war Kosovo, journalism seemed to be reborn. That's how it looked and that's how it happened. At least for a short time, until the mainstream print media reached up to fifty thousand copies in the market. But after that, they suffered their downfall, one after another; 'Epoka e re', 'Kosova sot', 'Bota sot', 'Lajm', 'Ekspress', 'Zëriditor' and most recently, until this year, 'Kohaditore'. In reality, during the last few years, in the kiosk, you could only find a copy of the dailies 'Zëriditor' and 'Kohaditore', as well as some Scandinavians, but nothing else. But, from now on, Kosovo has been left without these same emblems.

Looking closely at the disappearance of press journalism in Kosovo, we can say that few of them have played the right role of announcers and informants, while even fewer of them have dealt with the topics of climate change. It is not even a question of having the environment on their front pages with headlines, while the topic of climate change has been insignificant.

Portals without money and without vision

Several other, new portals were established, 'independent' of political influences, but being inexperienced and without tradition on the other hand financially unsupported, worsened the state of journalism and fair information rather than created useful information. Thus risked passing into the syndrome of clicks only to exist by not following any norms of journalistic ethics. Nor is it imagined to deal with major topics such as climate change.

A decade of green radio journalism

RTK - Radio 1 as a public radio has been reporting on the environment since the entry into force of the Kyoto agreement, in February 2005. Public media radio has been a pioneer of reporting on climate change and global warming even when the situation is viewed with scepticism, while reporting on it was still deemed unnecessary with the prejudice of what is Kosovo has to do with climate change and global warming. On the contrary, the radio also reported on the Paris Agreement, in December 2015. RTK - Radio 1, from 2017 the show 'ON AIR' established the section with audio clips, a special initiative in the form of a daily journalism campaign, to provide facts about the environment, health, climate change and global warming as well as providing interviews with experts, local and international officials, as well as anyone else who might contribute to the issue. 'ON AIR', of Radio Television of Kosovo in the audiovisual space is the founder of 'Green Journalism'.

Green journalism - the new genre of journalism

When we talk about green journalism as a new genre, it was established by the online platform, 'BB Green Kosovo', which was officially established in 2019. It was born as a great need for green information, where it would report exclusively on the environment and the dire environmental situation in Kosovo, on a professional platform. The aim of the green journalists of 'BB Green Kosova' was for the citizens of Kosovo to be informed about the real environmental situation in the country, to be aware of their actions and to understand what obligations the country's institutions have on environmental issues. Believing that only the right information brings us to the intended changes for the environment and sustainable development towards a green future. The slogan of 'BB Green' is 'Earth is what we have in common', therefore only together can we manage to save Kosovo from pollution and degradation of nature. Green journalism created even more echoes during the first year where polluted air, polluted soil and polluted water were reported. 'BB Green' influenced the daily reports together with the citizens to stop the construction of the neighbourhood at Lake Badovci (where 500 thousand inhabitants are supplied with drinking water, including capital of Prishtina). Kosovo's water resources remain the biggest threat to the country, as a result of climate change. Little green journalism on television National Television reports rarely and only when the welfare of the country and the political order are threatened, or occasionally when floods may occur. It can be said that RTK as a public medium, although with incomplete reports, remains so far the medium that gives the most space to the issue of the environment, such as the show 'RTK Story'.

Conclusions

Journalist specialization and audience retrieval

Since the war, the media in Kosovo have not shown interest in advancing journalists professionally, all that has helped in essential training have been international institutions and organizations both before and now. By profiling the journalists or allowing them to specialize in a certain field, the attention would be turned to the real issues, where the media themselves would benefit, both professionally and financially, and would regain the lost trust of the citizens.

Media transformation - with new minds.

The media in Kosovo have never taken seriously the essence of life, development and the needs of society. They have mainly dealt with debates of daily political agendas, interest groups or the enrichment of their owners. As the biggest crime is environmental crime and their influence passes through the media to the public, journalists have not managed to make shows about the environment or climate change in 'prime time'. To transform the media, the mentality of media managers must change to look at long-term investment and transformation, and to generate budget revenues in other digital forms by structuring new agendas.

Election campaign in the media program 'Environment and Climate Change'

In Kosovo, the public media has led for many things, whatever it has undertaken with its program scheme has been followed by other private and commercial media. Therefore, in order to transform the media space, the public media must set another goal. With budget opportunities it would easily create new agenda in the media market. The management of Radio Television of Kosovo for more than a year of 'Green Journalists' has a proposal to start with the program scheme - "Election program for the environment." RTK would become the first media outlet with an election campaign, making the environment in local and parliamentary elections part of the electoral debate. This would be a revolution by making the election program - 'Environment and Climate Change' part of it.

Editorial for the environment and the European way

This is another idea and proposal made to the management and board of RTK to establish a 'Green Journalism' editorial office. With the formation of the editorial office, many interested journalists of the public media would gather to report professionally and scientifically on the environment, climate change and global warming. Where not only would the public broadcaster's obligation to the public be met, but it would be the main path to national transfiguration in all aspects, both media, social, political and green under the 'Green Agreement' towards the European path, towards renewable energy and sustainability. The safest way for Kosovo to achieve its environmental objectives is to be reported by media literate journalists with dignity, knowledge and stand within any issue they are faced with.

Steps toward sustainable development in Egypt

D*espite Water Scarcity and Rising Sea threats Egypt on path to green economy*

Egypt is an important model of climate change vulnerabilities, with water scarcity and sea levels rise which threatens densely populated Nile delta, that will severely impact agriculture, coastal zones, aqua-culture and fisheries, water resources, human habitat and settlements, and human health.

Steps toward sustainable development

Egypt has developed policies to address the effects of climate change on its local industries and environment through documents such as its National Strategy for Climate Change Adaptation and Disaster Risk Reduction.

In 2016, Egypt launched "EGYPT'S VISION 2030" with eight sustainability goals, reflects the three dimensions of sustainable development: the economic dimension, the social dimension, and the environmental dimension.

In 2021, Egypt launched "National Climate Change Strategy 2050 "during its participation in the activities of the climate conference in Glasgow "COP26".

The strategy works to achieve five main objectives: achieving sustainable economic growth, building resilience and resilience to climate change, improving governance and management of work in the field of climate change, improving infrastructure for climate finance, and improving infrastructure for climate finance.

The Egyptian government is also preparing two national strategies represented in the national strategy for climate change and the national strategy for hydrogen, to explore opportunities to produce, use and transport hydrogen as an energy source, especially blue and green hydrogen.

Green projects in the budget

Egypt's plan for the current fiscal year in the state's general budget includes green projects representing 30% of the total projects to be implemented, compared to 15% in the last fiscal year, and it is targeted to reach 50%-60% by 2024/2025.

Also, The Ministry of Planning, in cooperation with the Ministry of Finance, has issued green bonds worth 750 million dollars to mobilize resources for green projects.

Renewable energy sources today represent about 20% of the energy mix in Egypt, and Egypt is working to reach 42% by 2035 in conjunction with the rationalization of energy subsidies.

Some facilities

The Egyptian government preparing a guide to green economic incentives provided to the private sector to encourage investment in environmentally friendly projects and products.

The Ministry of Finance is also studying the impact of green incentives on the state's public treasury.

In the meantime, and to encourage the use of clean energy, electric cars have been exempted from customs tax since 2018, and recently the customs tax on cars that operate with two engines (petrol / electric) "HYBRID", up to 1,600 cc, has been reduced 10 % to subject to a 30% customs tax.

Egypt has also launched a pricing tariff for renewable energy, to encourage the private sector to invest in this important sector, in a manner that achieves an attractive return on investment through longterm energy purchase agreements that will continue until the end of the project's lifespan (20 years for wind projects, 25 years for solar projects).

Cost of adaptation

Although the transition to green energy has become priority worldwide, funding developing, and poor countries remains the most important obstacle.

Egypt have been trying to benefit from green finance initiatives and funds offered by international financial institutions to establish environmentally friendly projects that take advantage of its natural resources.

The Green Climate Fund granted Egypt USD 32 million as part of the Paris Agreement to support developing to combat the repercussions of climate change.

The European Bank for Reconstruction and Development, the French Development Agency, the European Investment Bank, and the European Union have launched a new green economy financing program for Egypt which provide €140 million with energy efficiency loans and small-scale renewable energy investments for private companies through a group of participating banks.

With international financial institutions support, Egypt has established the Benban Solar Power Plant project in Aswan Governorate, southern Egypt, which includes the largest gathering of solar power plants in the world.

Regarding wind energy, Egypt has one of the largest wind stations in the world in the Gulf of Suez, a wind farm of Jabal al-Zayt that generates a total capacity of 580 MW.

Egypt has successful stories in the field on green projects, but still needs financial and technical support, as it is facing huge geopolitical challenges and a steady increase in population.

"The implementation of developing countries commitments in the face of climate change depends on the amount of support they receive, especially from financing, which is the cornerstone and the main determinant of our countries' ability to raise their climate ambitions" The Egyptian President Abdel Fattah El-Sisi during his speech at the Climate Summit COP26.

The estimated cost of adaption in Africa, in a below 2°C warming pathway, estimated at around USD 35 billion a year by 2050, and on track to 3.5-4°C warming by 2100 cost of adaptation could reach USD 50 billion per year by 2050.

Africa Adaptation Gap report also builds on UNEP's Global Adaptation Gap Report 2014, said that the international funding will be required to bridge the growing adaptation gap even if African nations commit to ways to increase domestic sources.

Climate change influence on tourism within the Mediterranean region

The wider Mediterranean region is the world's leading tourist destination and is mainly concentrated in the coastal areas which receive 30% of international tourist's arrival annually according to the WWF report. Its climate is perceived, quite erroneously by many tourists as idyllic and delightful. They ignore the heat waves, floods and strong winds that can plague the region at times. For many holiday seekers, the renowned radiance and clarity of light is what has remained seductive to north European visitors since the habit of escaping from the cold and dark of the northern winter has become a yearly ritual. While the search for a salubrious, amenable climate which was once the prerogative of the wealthy or privileged classes of society, it has now become a mass phenomenon with the search for 'endless summer'. Over 80% of tourists visiting the Mediterranean region come from Europe with Germany begin the largest market followed by the United Kingdom, France and Italy and on the other hand Spain, France, Italy and Greece receive almost 80% of the Mediterranean tourism indicated the WWF report.

Such international tourism is one of the most effective ways of redistributing wealth, as it moves money into local economies from other parts of the country and overseas and the local economic effects to such a region would include: increases employment, increased spending, economic diversification and improved infrastructure. There are however some negative economic effects on local and regional communities within the tourism sector and they include excessive dependence, adverse political developments and environmental effects.

The quality of the environment both natural and man-made is essential to tourism and the Mediterranean region is likely to become less attractive for health reason especially during the 'hot summer' that are very uncomfortable. The danger that most tourists are likely to face include the dangers increasingly associated with the skin cancer and with a much higher frequency of severe heat waves in some instances (Perry, 1987). It is in the months of October-November that the lingering warmth and sunshine of the Mediterranean provides the biggest contrast with the weather in the northern Europe (Carter, 1991). Rotmans, Hulme and Downing (1994) suggest that the area suitable for sun-related tourism will decline a lot will be in Italy and Greece as summer temperatures make beach tourism too uncomfortable. They further suggest that the Mediterranean area is likely to face other climate-related problems such as marine water pollution and the scarcity of fresh water supplies. The availability of water supply could become a major constraint and the quantity and quality of water available may not be sufficient to satisfy future tourist demands.

On the other hand, (Conte, Sorani and Piervitali 1999) heat waves cause rises in the death rate, especially in urban areas, for example in one episode from 13 July –2 August 1983 in Rome 450 deaths above the normal average occurred. In 1987 more than 1100 residents died in Greece between 20-31st July (Katsouyanni et al 1988) with a combination of

temperatures above 40C and poor air quality in 1998. In Cyprus, 45 deaths attributable to heat were noted when the maximum temperature exceeded 40C on successive days.

This has become so rampant that in Athens the National Weather Service of Greece forecasts heat wave emergencies and warnings are disseminated to the public. Extreme heat waves and the deaths involved frequently get reported in the media of foreign countries and give a negative image to potential holiday-makers since most of them especially from northern Europe aren't used to temperatures as high as 40C. For example, in 1998 there were stories in the UK press of holiday makers in Greece staying in their hotel room to try to escape the intense heat on the beaches.

In addition, the high temperatures often result to forest fires, that have become too widespread in August 1994 in Tuscany, Corsica, Sardinia and France lead in evacuations of tourists facilities such camp sites. Pinol, Terradas and Lloret (1998) found that in coastal eastern Spain there has been increased fire activity and the number of days of very high fire risk is likely to increase further since there is a correlation between summer heat and fire occurrence. Rising mean summer temperatures will inevitably be accompanied by more occasions of extreme maximum temperatures. And heat wave conditions are also implicated in the development and proliferation of algal blooms which can lead to closure of beaches, disfiguration of the coastal environment, and kills of fish as has happened in the Adriatic.

Tourism is a continuously adapting industry and it's currently exposed to the predicted effects of climate change such as sea-level rises, changes in ocean currents, higher temperatures, changes in precipitation patterns and the frequency or intensity of extreme weather events. Such effects can lead to a loss of biodiversity and to impact on the natural and build environmental and tourism related infrastructure. Climate change will present new 3 challenges but also lead to opportunities for tourist investment to capitalise on the new environmental conditions and some of the emerging adaptations include:

1. Breaking the traditional seasonal patterns – higher air and sea temperatures are likely to encourage a longer tourists season and therefore most resorts will be discouraged from closing down attitude at the end of the high summers.
2. Tourists will increasingly expect holiday accommodation to be air conditioned and such type of accommodation will attract a premium price whilst the poorer quality one will become less attractive.
3. There will be a higher risk of epidemics of cholera and typhoid as well as infectious diseases such malaria and dengue fever and such health scares will frighten tourists away as it happened at Salou in Spain a few years ago.

The implications for tourism industry in this Mediterranean region mean that the industry has to become even more closely concerned with the broad environmental sustainability of its own actions. And the sustainability of a destination depends on the ability of the diverse range of stakeholders across levels of government, business and local communities to work together to implement suitable measures to ensure community and environmentally friendly outcomes. In conclusion, more research is needed to quantify the climatic wellbeing of tourists by developing tourism climatic indices and beach comfort indices, which can be calibrated to include the effects of climate change. Past growth and attractiveness are not necessarily a guide to the future and the Mediterranean tourist industry cannot assume an untroubled and guaranteed future.

Climate Change: A heat wave turns into inferno

It's like a horror movie, but it's not ... it's real life", said a woman fleeing by ferry from flaming forests on Greek Island of Evia. She is one of thousands of residents who have had to evacuate Greece's second biggest island as severe wildfires raged. (BBC News, 9 August 2021)

August 2021 began with Greece's most severe heatwave in decades and turned into one of the country's most destructive fire seasons that have destroyed more than 100,000 hectares of forests, left three dead, hundreds homeless, caused economic and environmental damage, and forced thousands to flee. (The Guardian website, 12 August 2021)

Residents had been ordered to evacuate: "It's time to leave". The fires were getting closer and closer to their homes. Therefore, about 1,400 people were rescued by ferry boats from the beaches on the island of Evia, as wildfires continued to rage for many days. At the same time, the Greece's fire department sent 64 firefighters, more than 20 fire engines, water-dropping airplanes and helicopters, and several countries also sent help including firefighting aircraft, in an attempt to contain what the Greek Prime Minister Kyriako Mitsotakis described as the country's "greatest ecological disaster in decades". (DW website, 23 August 2021)

In attempts to tackle the blaze, residents have also become volunteer firefighters and were the first line of defence against the wildfires that have erupted in the island. "I learned to fight fires because I had to, it's not my job, and I'm not a firefighter. I just felt that the place needed me as the fires started, so I've done it", said a local supermarket worker, one of the volunteer firefighters trying to put out the huge wildfires across the Greek Island. (BBC News, 12 August 2021)

The Prime Minister Mitsotakis attributed the disaster to "Climate change", saying: "The climate crisis, I'd like to use this term, and not climate change, the climate crisis is here", adding that he was ready to make the "bold changes" needed to tackle the changing climate.

Wildfires, how are they linked to climate change?

Greece is one of several Mediterranean countries that have been hit by a severe fire season this year, as the region experienced its worst heatwave in decades. And during this summer's hot temperatures, dry and warm conditions occurred, letting to fuel wildfires.

Climate change is the key factor in increasing the risk of the hot, dry weather. Despite human activities, such as lighting campfires and discarding lit cigarettes, which are mainly responsible for starting the fires, hotter weather makes forests drier and more susceptible to burning. Once a fire starts, warmer temperatures and drier conditions can help fires spread and make them harder to put out.

Climate change causes the drying of organic matter in forests (the material that burns and spreads wildfire), and forest fires risks depend on a number of factors, such as the

temperature, soil moisture, the presence of trees, and other potential fuel. (Centre for climate and energy solutions - C2ES website)

Europe experiences hottest summer on record

Actually, the summer of 2021 was extremely dry and warm, especially in Europe. The EU Copernicus Climate Change Service (C3S) announced, Sept 7, that Europe witnessed its hottest summer on record this year. (DW website, 7 September 2021)

Copernicus found the average temperature from June to August 2021 was close to 1°C above the 1991-2020 average, making it the warmest summer in the C3S dataset, though the previous warmest summers of 2010 and 2018 were only about 0.1°C cooler, which is a small margin. (Copernicus Climate Change Service - C3S website, Climate Bulletin, 7 September 2021)

Second hottest July on record in Europe, Copernicus

July 2021 joins July 2020 as the third warmest July on record globally, less than 0.1°C cooler than July 2019 and July 2016. It was the second warmest July on record for Europe, with heat waves occurred from the Baltic to the eastern Mediterranean. (C3S Climate Bulletin, 5 August 2021)

August globally joint third warmest on record

Globally, August 2021 was the joint third warmest on record at a little over 0.3°C warmer than the 1991-2020 average. In Europe, August 2021 was near the 1991- 2020 average, but with several conditions across the continent, such as record breaking maximum temperatures in Mediterranean countries, and warmer-than-average temperatures in the east. (C3S, Climate Bulletin, 7 September 2021)

According to Copernicus, the temperatures were particularly severe in countries such as Italy, Greece, Turkey and Spain. The Italian region of Sicily witnessed a temperature of 48.8 °C in August, the highest temperature ever reported in Europe. These all led to large fire outbreaks.

Wildfires in Europe in 2020 and 2021

After the worst year to date in 2019, 2020 was another year in which fires burnt large areas of natural land in Europe, according to the Annual Report of the Joint Research Centre (JRC) of the European Commission, on forest fires in Europe, the Middle East and North Africa. About 339,489 hectares (ha) in total were burnt in the EU in 2020, which is slightly above the amount recorded in 2019. (European Commission report on forest fires, 29 October 2021)

This year (2021), fire season is even worse. According to the report, some 0.5 million ha were burnt, 61% being forests that will take years to recover. About 130,000 ha were burnt by the end of June, and wildfires have erupted not only in the southern states, but also were a serious threat for central and northern Europe. (European Commission report on forest fires, 29 October 2021).

Firefighting Operations

This year, the EU has reinforced its capacity to help countries to contain the large fires that hit the Mediterranean region. Firefighting operations have been carried out with the largest EU Civil Protection Mechanism deployment in Europe in the last decade.

This EU Mechanism continued to help battle forest fires in Greece and the rest of the Mediterranean region. It has helped mobilize 14 firefighting planes, 3 helicopters, some 1,300 rescuers and 250 vehicles. In Greece alone, 9 planes, close to 1,000 firefighters and 200 vehicles were engaged to put out the wildfires with the aid of thousands of volunteers, according to a European Commission press release. (European Commission press release, wildfires information bulletin, 13 August 2021)

Due to all those efforts, fires were successfully contained in several Mediterranean countries, but still have many repercussions.

The blazes this year have destroyed large forest areas and other ecosystems, which will take years to recover. Industries that depend on forests in the European region may also be seriously affected if the fires continue to increase. Also, desertification, especially in Southern Europe, can be another long-term consequence of wildfires. It would lead to significant loss of agricultural production. (European Commission press release, wildfires information bulletin, 13 August 2021)

Preventing massive wildfires is now a priority

In fact, climate change has caused severe heatwaves and a longer annual fire season. For this reason, preventing another summer of wildfires like this one is now a priority. The EU is working actively to prevent massive wildfires in future summers, to preserve forests, recover biodiversity and save lives. In March this year, the Commission published new guidelines for prevention of wildfires, for forest and vegetation management to limit the spread and intensity of fires. (Commission report on forest fires, 29 October 2021).

Cooperation is also a must to achieve these targets, and save forests, as said Commissioner for Crisis Management, Janez Lenarčič, during a European workshop on Forest Fire, that took place in Athens: "Today, Europe faces many significant disaster threats and cooperation is key to address them. By taking a joint-approach to disaster risk management, all European countries can be prepared for future possible hazards. Our discussions will help with our forward planning for future wildfire threats". (European Commission, press release, 22 November 2021).

Financing Climate action in Kenya

Climate Change and its devastating effects is the greatest discussion issue at the moment globally. The just concluded COP26 in Glasgow, Scotland, saw different climate champions demonstrate calling for action by global leaders to limit the global temperatures to 1.5 degrees Celsius. However, at the end of the COP26, there was a feeling from some quarters that nothing much was achieved, especially on ending fossil fuel and coal which are the biggest contributors of greenhouse gasses.

The question that lingers in the minds of many is: given the scale of effects of the current global 1.1 degrees Celsius on people, communities wildlife and the entire ecosystem, should the world be talking about limiting the temperatures at 1.5 degrees or it should actually be less than 1.1 degrees?

Africa emits only 4% of the global greenhouse gases.

But on the contrary, it suffers most with countries with highest emission level avoiding to fully commit to eliminating coal and fossil fuel which are the main contributors to global warming. As it was witnessed in this year's COP26 in Glasgow, China and India came in at the last minute to the end of the COP and announced that they prefer "phase down" and not phase out of coal. With this type of attitude from the highest emitters, Africa and developing nations will continue to suffer from the effects of climate change.

United Nations Framework Convention on Climate Change doesn't have set limits for any country on emissions, it depends on commitment from the individual countries to limit or cut down on emissions. The Paris agreement was not fully adhered to due to lack of proper laws to push countries to honor their commitments. This in turn led to less provision of the agreed 100 billion dollars every year to mitigate effects of climate change in developing countries. In this case, developing countries have continued to suffer the effects global warming. (UNFCCC Report 1992 <https://unfccc.int/process-and-meetings/the-convention/what-is-the-united-nations-framework-convention-on-climate-change>)

Climate change according to IPCC report, staying at 1.5 degrees will be prerequisite to achieve Sustainable Development Goals SDGs. By 2030, 120 million people could be hit by poverty should the temperatures rise to 1.5 degrees according to IPCC report. However, 1.5 degrees could save 40 million people from pangs of hunger compared to 2 degrees. (IPCCC special report on GLOBAL WARMING OF 1.5 Degrees Celsius: Sustainable Development, Poverty Eradication and Reducing Inequalities. Chapter 5 of IPCC Report October 8, 2018. <https://www.ipcc.ch/sr15/>)

These are not just numbers from IPCC, in Kenya at the moment, more than 2 million people are facing hunger. Deaths of livestock and wildlife is on the rise every day. What would happen to Kenya should the temperatures hit 1.5 degrees Celsius?

In the region, Kenya, Somalia, Ethiopia, Uganda, Sudan, Eritrea and Djibouti were hard hit by a wave of locusts in 2019 and 2020, leaving thousands of hectares of green vegetation completely destroyed. Livelihoods were seriously affected with farmers left counting losses. To date many are yet to recover from the invasion. Rise in lakes water levels has been recorded in Kenya for the last 3 years. This has led to

mass displacement of people, loss of crops, flooding of schools, damage of property, submerging of game parks pushing wildlife to where people are and mass movement of people. This has increased the level of poverty in some areas. Cases of crocodile attacks in some of the lakes where water levels increased were reported.

Diseases such as malaria, dengue fever, water borne diseases claimed lives in different regions.

In 2019 Mozambique was hit by a cyclone that displaced thousands of people and leaving more than 1.3 million children vulnerable to the effects of weather. These are some of the effects of climate change outcomes in the region. Why should richer nations not increase funding to mitigate these effects on developing nations and at the same time honour their pledges?

Lack of financing is having a negative effect on adaptation and mitigation of climate related effects on local communities in the developing countries.

A report by World Wildlife Fund (WWF), human-wildlife conflict is as much a development and humanitarian issue as it is a conservation concern. Despite being so strongly linked to the Sustainable Development Goals (SDGs) such as the SDG 2 on zero hunger, human-wildlife conflict continues to be overlooked by policymakers. If the world has a chance of meeting the SDGs by the 2030 deadline, human-wildlife conflict must be explicitly included in SDG implementation plans, as well as at the heart of the Convention on Biodiversity's new framework.

(Human-wildlife conflict, one of the greatest threats to wildlife species. WWF and UNEP report 8 July 2021 <https://www.unep.org/news-and-stories/pressrelease/human-wildlife-conflict-one-greatest-threats-wildlife-species-wwf>)

Financing is key in this.

In one of its interventions, Kenya set to launch a FINANCING LOCALLY-LED CLIMATE ACTION (FLLOCA) PROGRAMME this month, whose overall agenda is to upgrade National Determined Contributions (NDCs) to support the country to low carbon climate resilient-net-zero development pathway by 2050.

Non-State actors, Sweden government, the county governments, the national government, non-government organizations and donors will fund the project whose aim is to help the local communities to carry out climate change adaptation projects.

The programme will create also sensitize people on proper land use, climate smart farming, planting of best species of trees in farms, watershed, forests among others to fight climate change.

In fixing forests degradation that was rampant over the years, the government of Kenya in 2018 put a moratorium on all logging in public and government forests. (After a story I covered highlighting how forests degradation was taking place under the watch of the government agency that was mandated to protect forests).

At the same time, the government ordered that environment studies be added to the curriculum to have the young generation learn conservation at a young age. These are some of the interventions that Kenya has undertaken which in the course of time are expected to support climate action.

Journalism that highlights climate related stories acts as a powerful tool if well handled. It can lead to government action where needed to fix an environment issue.

However, lack of support from editors could dim the hopes of a dedicated journalist whose agenda is to create more awareness on climate related issues.

My personal experience has been “don’t give up”. I was forced to fight hard to have all my environment stories given airtime. Overtime it worked and today I do not struggle much to tell climate stories.

Very few reporters want to venture into environment reporting citing, lack of interest and jargon that is involved with climate science. Lack of training is also another challenge.

Kenya experienced wildfire in Mount Kenya, Africa’s second tallest mountain, but local coverage was not extensive due to poor journalist judgments and lack of interest by editors. Editors also should be involved in climate change reporting trainings to give them a better understanding on the need to support climate related stories.

Fellowships, training and grants are some of the interventions that journalists need to boost their morale in climate reporting. Developing countries have a challenge when it comes to public transport. Cities are full of traffic jams especially early morning when people are going to work and late evening while returning back home. In East Africa for example, many people depend on private run public transport which is not properly managed. Insecurity in public service vehicles has pushed many to buy private vehicles for their comfort. Many have landed into serious debts to purchase vehicles in pursuit of comfort and running away from public transport. This is contributing to emission. We can argue that some level of insecurity is leading to climate change in most cities. Those with private vehicles also normally do not want to share transport to and from work, with their neighbours, this in turn leads to having many cars on the road, causing traffic jam leading to air pollution due carbon dioxide emissions. Turn, this affects the health of people living in cities.

Improved public transport can itself help reduce greenhouse gases in cities. Cities like Nairobi are experiencing warmer temperatures compared to ten years ago. Water table has also been affected by effects of climate crisis. Currently in cities like Nairobi, one has to drill more than 200 meters to access water. This in itself is a risk to the water table. With such outcomes and effects, communicating climate stories must be given a higher priority.

Politicians in their campaigns never mention anything to do with climate action. Politicians should have environment advisors when drafting their manifestos to include climate action. Mass protests in demanding a better environment in most cases is appears to be the language some governments understand.

In Kenya there are no conspicuous environment lobby groups who are for or against climate issues. The late Professor Wangari Maathai was a well-known champion for environment. Though there are people in Kenya fighting for the environment, their voices are not as loud as they should be. But the good thing is that the numbers are growing.

Kenya is currently at 60% renewable energy production. But more needs to be done. Most people have embraced solar energy for lighting and in some cases industrial use. But high taxes on solar panels and other accessories is deterring many from embracing clean energy. This is where government’s subsidies and tax relieve should come in but unfortunately, it is not the case.

Environment conservation is not for a few. Communities, individuals, governments, non-government organizations and even journalists have a responsibility to play their part in environment protection to combat climate change.

Revisiting Glasgow COP26, my view is that the conversation was paused and could be revived again in COP27 in Egypt next year. Because a lot of issues were not discussed into conclusion. The few agreements that were reached should be implemented if the world has to realize limitations of temperatures to 1.5 degrees Celsius.

Our lifestyles have to change especially in the way we treat our world. The future generations will build on the foundation that this generation has laid or is laying on environment issues. We hold the key to a better environment. It depends on how we use it.

Climate change and risks to sustainable development within Mediterranean region

Climate change and sustainable development

Climate change, caused by human activities, is having an impact on the Mediterranean region. It is changing the climate, sea levels and plants and animals, but also the way humans live, their health and well-being.

The impacts of climate change are particularly serious for the most vulnerable groups in society. The region is already experiencing increased heat waves, more intense rainfall and droughts.

Climate change Risks on sustainable development in the Mediterranean

Recent climate change has stronger impacts on the Mediterranean Basin than before, causing additional concerns in an environment also affected by other problems such as land use change (urbanization, intensified agriculture), pollution and declining biodiversity. Climate change is the most pressing risk to sustainable development within the Mediterranean region. Climate change is a significant and growing threat to human development in the Mediterranean region. It is already affecting the region's capacity to achieve goals and objectives in sustainable development and exacerbating existing vulnerabilities.

According to a recent synthesis, published in Nature Climate Change by several MedECC¹ researchers, that addresses future risks associated with this change, there are many risks on sustainable development, especially for coming generations.

It increases pollution and declines biodiversity. In most impact domains (such as water, ecosystems, food, health and security), current changes and future scenarios consistently point to significant and increasing risks during the coming decades.

The Mediterranean region is one of the most vulnerable regions of the world to climate change. The region has already experienced some of the worst impacts of climate change, including droughts, desertification, sea-level rise and loss of biodiversity.

These impacts are likely to intensify, and new ones emerge as climate change continues. The social, economic and environmental effects of climate change on the region are potentially devastating.

Human-induced climate change is predicted to have serious implications for sustainable development in the Mediterranean region. The countries of the region are highly dependent on rainfall, which is at risk due to climate change.

The impacts of climate change are projected to hit agriculture, fisheries, forests, health and human migration, all of which are at the heart of sustainable development. These impacts are expected to be felt more seriously by the poorer communities.

¹ https://ufmsecretariat.org/wp-content/uploads/2019/10/MedECC-Booklet_EN_WEB.pdf

The first and perhaps most important point to be made is that climate change and the risks it poses to sustainable development within the Mediterranean region are not new issues. They were, in fact, at the top of the agenda many years ago and have been discussed at countless conferences and seminars since then. But we have yet to translate this concern into concrete policies and actions that will arrest or even reverse the potential damage that climate change could cause to the region. This has been due to a number of factors, including a lack of cooperation among Mediterranean countries, as well as a lack of leadership among EU countries and other factors.

Climate change and sustainable development in the Mediterranean: Impacts and consequences

In general, Climate change increases the costs of development in the poorest countries by between 25 and 30 percent. For developing countries, the annual cost of infrastructure that is resilient to climate change is around \$1.2 trillion to \$1.5 trillion, resulting in a yearly \$700 billion gap in financing. It will take combining efforts of development banks, financial institutions, export credit agencies, institutional investors, and public budgets to meet the climate and development challenge.

In fact, climate change within the Mediterranean region is a complex phenomenon, which is compounded by the region's unique geography and ecology. It is also a region which is home to some of the world's most vulnerable populations, and where the impacts of climate change will have the most severe consequences. This raises the question of how to respond to the risks posed by climate change in a way which will promote rather than hinder sustainable development in the region.

The Mediterranean region been identified as one of the regions most at risk from the impacts of climate change, and the impacts are already being felt. Significant changes in rainfall and temperatures will have far-reaching impacts on the region's economies, societies, and ecosystems. These changes will create risks to sustainable development, including increased poverty, economic losses, and social tensions.

The consequences of climate change are already being felt in the region. The impact on sustainable development, however, is not well known. This report investigates the impact of climate change on sustainable development and on the potential economic, social, and environmental impacts.

This raises the question of how to respond to the risks posed by climate change in a way which will promote rather than hinder sustainable development in the region. The region's economic, agricultural, and social systems are especially vulnerable to changes in climate and in the environment.

Here are some indications, according to UNEP MAP² statistics (UN environment program, article "Climate change in the Mediterranean):

- The Mediterranean region is warming 20% faster than the global average.
- Impacts will exert additional pressure on already strained ecosystems and on vulnerable economies and societies.
- Coastal zones face heightened disaster risks, including flooding and erosion, and the salinization of river deltas and aquifers that sustain food security and livelihoods.
- The Mediterranean is home to more than 510 million people.
- By 2050, water demand is projected to double or even triple.

² See: <https://www.unep.org/unepmap/resources/factsheets/climate-change>

- 2°C global warming will reduce precipitation by ~10 to 15%.
- An increase of 2°C to 4°C would reduce precipitation by up to 30% in Southern Europe.
- Water temperature is expected to rise by between 1.8°C and 3.5°C by 2100 with hotspots in Spain and in the Eastern Mediterranean.

Policies for the sustainable development of Mediterranean countries need to mitigate these risks and consider adaptation options, but currently lack adequate information — particularly for the most vulnerable southern Mediterranean societies, where fewer systematic observations schemes and impact models are based.

Climate change threats for the biodiversity in the Mediterranean

"Making nature healthy again is key to our physical and mental wellbeing and is an ally in the fight against climate change and disease outbreaks. It is at the heart of our growth strategy, the European Green Deal, and is part of a European recovery that gives more back to the planet than it takes away."
- Ursula von der Leyen, President of the European Commission

Why biodiversity is so important?

Biodiversity is the variety of life forms on Earth. It is made up from the diversity of genes, species and ecosystems as a whole. Through his interaction with the physical environment, this diversity creates complex ecosystems that provide a vital system life support for all living organisms, including human beings.

Biodiversity and ecosystems are important in themselves, but they also provide a flow vital of the goods and services on which we depend. We need food, fibre, fuel, medicines and services such as climate regulation, flood prevention, water purification, pollination and soil formation, as these are essential for economic prosperity, security, health and quality of life. Therefore, the loss of biodiversity means more than just the loss of species. This also means reducing the productivity and resilience of entire ecosystems. Depletion of fish stocks, widespread reduction of soil fertility, extinction of pollinator populations and the reduced capacity of our rivers to retain water floods are all consequences of biodiversity loss.

In the last century, mankind has benefited greatly from our economic development enriched life. However, much of this development is growing associated with a decline in the variety and extent of natural systems - in other words, of biodiversity.

Part of this problem is that although the economic and social welfare of people depend on biodiversity and the continuous flow of many services offered by it, they are generally considered predominantly goods without any concrete economic value. The benefits that the nature of society brings they are often ignored and are rarely taken into account in everyday decisions when it comes to compromise.

As a result, our natural capital continues to deteriorate, endangering our well-being, ours and that of countless species and habitats. The ability of human ingenuity and a technology to replace this loss is limited. Once this limit is exceeded, the situation it is irremediable. The costs of artificial solutions can be much higher than those it would involve maintaining biodiversity from the outset.

The decline of biodiversity moves forward with unprecedented speed: species are becoming extinct at a rate 100 greater than that registered in the pre-human era.

The main threats to biodiversity

The main threats to the natural heritage are tied to the impact of human activities and to the growing demand for natural resources and ecosystem services, which proves increasingly incompatible with the preservation of those resources and services in a state able to guarantee their survival and transmission to future generations. In Western and Central Europe, and throughout the Mediterranean basin, the presence of man from ancient times has led to alterations in the natural ecosystems and habitats, which today, in the majority of

cases, appear fragmented and subject to various types of disturbances. Five main causes for the loss of biodiversity are particularly worthy of note: the deterioration and destruction of habitats, fragmentation, the introduction of alien species and the excessive exploitation of resources and species.

The indirect effects of actions of human origin, and especially those traceable to climate changes, have been noted in numerous studies and reports. A widely read article in the review *Science* stated that, before the year 2050, climate change is destined to become the second leading cause (after deforestation and forest deterioration) of loss of biodiversity on both sea and land.

Climate change impacts and biodiversity loss are two of the most important challenges and risks for human societies; at the same time climate and biodiversity are intertwined through mechanistic links and feedbacks. Climate change exacerbates risks to biodiversity and natural and managed habitats; at the same time, natural and managed ecosystems and their biodiversity play a key role in the fluxes of greenhouse gases, as well as in supporting climate adaptation. The absorption of more than 50% of anthropogenic CO₂ emissions through photosynthesis and consequent carbon storage in biomass and organic material, as well as through CO₂ dissolution in ocean water, already reduces global climate change naturally (but causes ocean acidification). However, nature's contributions to attenuating climate change, partly provided by the underpinning biodiversity, are at risk from ecosystem degradation resulting from progressive climate change and human activities. In fact, ecosystem degradation through land-use changes and other impacts on natural carbon stocks and sequestration is a major contributor to cumulative CO₂ emissions, and, therefore, an additional driver of climate change.

Climate change and biodiversity loss are closely interconnected and share common drivers through human activities. Both have predominantly negative impacts on human wellbeing and quality of life. Increased atmospheric greenhouse gas concentrations lead to increased mean temperatures, altered precipitation regimes, increased frequency of extreme weather events, and oxygen depletion and acidification of aquatic environments, most of which adversely affect biodiversity.

Reciprocally, changes in biodiversity affect the climate system, especially through their impacts on the nitrogen, carbon and water cycles. These interactions can generate complex feedbacks between climate, biodiversity and humans that may produce more pronounced and less predictable outcomes. Ignoring the inseparable nature of climate, biodiversity, and human quality of life will result in non-optimal solutions to either crisis.

What are the main facts of climate change in the Mediterranean region?

• Air temperature

- Average annual temperatures are now approximately 1.5°C higher than during the preindustrial period and well above current global warming trends (+1.1°C)
- The temperature is projected to continue to exceed global rates, rising approximately 0.5 degree by 2030 and 1.5 degrees by 2050.

• Precipitation

- Climate models clearly indicate a trend towards reduced rainfall in coming decades
- strong trends towards drier conditions.
- A global atmospheric temperature increase of 2°C is expected to be accompanied by a reduction of 10 to 30% in summer precipitations in some regions, thereby enhancing existing water shortages and decreasing agricultural productivity, particularly in southern countries.

• Sea temperature

- Warming of the Mediterranean Sea surface is currently estimated at 0.4°C per decade for the period between 1985 and 2006
- The projections for 2100 vary between +1.8°C and 3.5°C average compared to the period between 1961 and 1990.

- **Sea level**

- It has risen between 1970 and 2006 at the level of 1.1 mm per year.
- There has been a sharp increase during the last two decades as sea level rise reached about 3 mm per year.
- The accelerating ice loss in Greenland and Antarctic ice sheets implies a significant risk for additional sea-level rise in the Mediterranean region.
- The rising of the sea is projected to accelerate, resulting in a further increase of about 25 cm from its current level by 2050.
- The higher mean sea level, combined with tidal forces and storms, will result in more frequent /and or severe coastal flooding.

Climate change in the Mediterranean region may affect safe access to natural resources (water and food), healthy state of ecosystems and human health and security with respect to natural disaster.

Due to climate change alone, the irrigation demands in the region are projected to increase between 4 and 18% by the end of the century. Population growth may escalate these numbers further to 22-74%. Tourism development, new industries and urban sprawl may increase water pollution, too.

The acidification of sea water, increasing heat waves in combination with drought and land-use change also affect the natural ecosystems, posing risks in biodiversity and fisheries.

Food production from agriculture and fisheries across the Mediterranean region is also changing due to the social, economic and environmental changes. Combined with the on going switch to more animal-based food production, southern countries are at risk to increase their dependence on trade.

Public health is impacted by multiple trends of change, through heat waves, pollution (higher risk of cardiovascular or respiratory diseases), and the increased spread of disease vectors (West Nile virus, Dengue, Chikungunya). In politically unstable countries, environmental change is an increasingly relevant factor for socioeconomic risks, due to famines, migration and conflict. Human security will also be threatened due to extreme weather, such as a rise in sea level posing a higher risk of storm surges for people living in coastal areas in the region.

Climate change threats to the biodiversity in Mediterranean

The Mediterranean region is home to almost half of the plant and animal species, and more than half of the habitats, listed in the EU Habitats Directive. However, this reservoir of biodiversity is threatened by climate driven habitat loss because the Mediterranean climate zone is at risk of becoming smaller. Existing protected sites, along with natural and semi-natural areas that remain in the Mediterranean zone, will be critical for adaptation and biodiversity conservation.

According to *PESETA III Task 10: Mediterranean habitat loss under RCP4.5 and RCP8.5 climate change projections*, the climate change impacts for the biodiversity in the Mediterranean region would be:

- **IMPACTS ON THE MEDITERRANEAN ZONE IN A HIGH WARMING SCENARIO**

The present Mediterranean climate zone may contract by 16% by the end of the century under a high warming scenario and without adaptation. The magnitude of this contraction is equivalent in area to around half of Italy, at 157,000 km². The zone is projected to contract around central and southern parts of the Iberian Peninsula, southern Italy and Sicily, southern and north - eastern Greece and Crete, Cyprus, and parts of southern Turkey. Only 71% of the present area of the Mediterranean zone remains stable. Expansion of the arid zone is almost always the cause for contraction of the Mediterranean zone. The arid zone is projected to increase by more than twice its current extent - this is equivalent to three times the size of Greece. A conversion of this magnitude will lead to a decrease of

biodiversity due to the migration or local extinction of Mediterranean species that are unable to cope with the magnitude of habitat change.

• IMPACTS ON THE MEDITERRANEAN ZONE IN A 2°C WARMING SCENARIO

Limiting global warming to 2°C (assuming no adaptation), in line with the goals of the Paris Agreement in 2015, could see less contraction and greater stability of the Mediterranean zone, and significantly less expansion of the arid zone, compared to the high warming scenario. 91% of the present Mediterranean zone remains stable under the 2°C warming scenario – this compares to only 71% with high warming. Climate change mitigation significantly reduces expansion of the arid climate zone. Under the 2°C warming scenario the arid zone increases in area by 14% from nowadays. This compares to a 128% increase under high warming.

Conclusions

Significant biodiversity loss is currently occurring, with consequences deep for the natural world and for the well-being of men. The main causes of these losses are changes in natural habitat. These are due to intensive agricultural production systems, construction, quarrying, overexploitation of forests, oceans, rivers, lakes and soils, alien invasions, pollution and - increasingly - due global climate change.

Nature-based Solutions implemented in the Mediterranean through restoration and improving conservation of ecosystems such as forests, wetlands and sea grass meadows, can help communities to address the climate and biodiversity crisis and societal needs in a post Covid19 era. Forests and other types of vegetation help lower air temperature in urban areas or stabilise slopes. Wetlands can regulate floods and sea level rise. Coastal vegetation and natural features such as sand dunes and 5 Posidonia-beach systems can provide protection against storm surges and strong winds. Agro-biodiversity practices can enhance food production. Nature-based Solutions also aim to generate local employment and new economic opportunities in a fair and equitable way.

These findings highlight the urgent need for climate change mitigation. Rapidly reducing greenhouse gas emissions this decade will help save thousands of species from extinction, and protect the life-giving benefits they provide to humans. Keeping global warming below 2°C flattens the curve of climate change risk to biodiversity. It does this by massively reducing the number of species at risk and buys more time for species and ecosystems to adapt to the changing climate – whether that's by finding new habitats, changing their behaviour, or with the help of human-led conservation efforts. There's also an urgent need to ramp up efforts to help people in high-risk regions adapt their livelihoods as climate change alters local ecosystems. Projecting where and when species will be exposed to dangerous climate change throughout the century could provide an early warning system, identifying those areas most at risk of abrupt ecological disruption. In addition to highlighting the urgent need for reducing fossil fuel usage, these results could help guide conservation efforts, such as designating new protected areas in climate refuge. They could also inform resilient ecosystem-based approaches for helping people adapt to changing climates. An example would be planting mangroves to protect coastal communities against increasing flooding. The potential to continuously update and validate these near-term projections as ecological responses to climate change unfold should further refine projections of future climate risks to biodiversity that are so central to managing the climate crisis.

Our planet is still teeming with life. And with the right political leadership and daily actions that we take as citizens, we still have the power to keep it that way.

Impact of climate change on the future land use in Uganda

With less than 3% of agricultural cropland under irrigation, subsistence farmers in Uganda are largely dependent on seasonal precipitation for crop production. The majority of crops grown in the country especially staple food crops like Matooke (Plantains) are sensitive to the availability of water throughout their growing period and hence vulnerable to climatic impacts.

In response to these challenges, the Government has developed an ambitious irrigation master plan where dams have been constructed in some of the affected areas to support farmers get water for their animals and small-scale horticulture. However, the energy implications of implementing the plan have not been explored in detail. For example, in the identified driest climate, electricity required for pumping water is expected to increase but most rural areas do not have electricity, some of the dams and shallow wells dry up during extreme temperatures to mention but a few.

Rainfall variations in Uganda

East Africa's climate is naturally dynamic with high temporal and spatial rainfall variability, some of which can be explained by large scale oscillations in atmospheric and ocean circulation (including El- Nino Southern Oscillation and less well known events such as the Indian Ocean Dipole reversal).

Climate variability, floods, droughts and changes in seasonal rainfall have continued to cause significant socio-economic impacts in Uganda. This has led to widespread infrastructure damage, displacement and destruction of livelihood assets. Droughts have also taken a significant toll with for example, nearly 1.8 million people affected through increased malnutrition, poverty, illness, asset loss and migration.

Changes in rainfall reliability, onset and cessation have caused crop failure and hunger and this can be exacerbated by other stresses such as land degradation or insecurity.

Table below shows Land use and coverage in Uganda.

	Area in KM2	As percentage of total area
Open water	36,909.2	15.28
wetland	30,105	13.00
Farm land	83,931	35.03
Tropical high forests	8,846.7	3.66
Rest	81,246.1	33.71
Total	241,038	100.00

Source: - State of the Environment report, 2000/01

Impacts

Climate change has manifested a wide range of interrelated impacts for the environment and economy of Uganda and the well-being of its people. Whilst many of these are negative, there may also be potentially beneficial outcomes such as increased grazing area for livestock in the cattle corridor with increased rainfall or opportunities to grow more profitable crops.

Impacts however are likely to be:

1. Increased food insecurity.
2. Shifts in areas affected and increased incidence in some areas of diseases, such as dengue fever, malaria and water borne diseases associated with floods.
3. Elevated rates of erosion and land degradation because of increased mean rainfall or higher intensity events.
4. Greater risks of flood damage to infrastructure, property and settlements.
5. Shifts in the viable area for coffee cultivation with increased temperature.
6. Reduced output of the maize crop which is a staple food.
7. Reduction in grazing potential within the cattle corridor.
8. Biodiversity loss and extinctions as niches are closed out by temperature increases and pressure on natural resources.
9. Implications for Lake Victoria levels and Nile flows.

Adaptation and mitigation strategies.

Whilst the impacts of climate change are potentially very significant for the future development trajectory of Uganda, there have been few exercises to quantify the implications or to assess the impact of past variability on the country's economy for example evaluating the potential fiscal implications of climate change to position adaptation appropriately in terms of political priorities. Currently, local councils have started budgeting towards climate change at the grassroots level. These budgets are geared towards activities like greening streets and public spaces, raising seedlings which are distributed to interested farmers and enforcement.

Table 4.4 shows adaptation options for crops

Adaptation Options	Changes in Practice	Government Action
Irrigation	<ul style="list-style-type: none">• Develop capacity to tap water for irrigation;• Apply weather and climate information; Encourage water harvesting;	Develop initial irrigation infrastructure Construct water reservoirs; Create incentives for water harvesting; Re-enforce implementation of the Water Statute (1995).

Diversification of crops	Introduce drought resistant crops; Remove cultural barriers; Diversify crops grown in the locality	Promote development and production of drought resistant varieties; Strengthen capacity of research institutions.
Improved farming methods	Popularize mulching to conserve soil and water; Improvement of management And agricultural practices.	Strengthen extension services
Processing and Storage facilities	Engage in food processing; Improve food storage technologies.	Create incentives for food processing industry; Stimulate market for agricultural products

Vulnerability

A recent International Climate Risk Report labels Uganda as one of the most unprepared and most vulnerable countries in the world (CIGI 2007). Vulnerability, the potential to be adversely affected by an event or change is a key concept for appraising effective interventions and responses to climate change. On the basis of macro level indicators, Uganda can be considered to be highly vulnerable given its dependence on primary production and natural resource use, weak institutional capacity, limited infrastructure, limited capacity and equipment for disaster management, limited financial resources and low income per capita and heavy reliance on rain fed agriculture.

The ability to cope and recover is low within Uganda, adaptation to climate change is defined as adjustments to actual or expected climatic stimuli to moderate harm or exploit benefits. Ability to adapt at country, community or household level is characterized as adaptive capacity and is related to the assets that one has access and how well these are used.

Poverty, low diversity of income and livelihoods, HIV/Aids, insecurity and weak institutions are key factors in heightening Uganda's vulnerability to climate change, lowering its resilience and adaptive capacity. Therefore in planning interventions around climate Change would be vital to understand and consider these underlying issues and their often unequal distribution as well as direct sectoral impacts which unfortunately are to the contrary in my country Uganda.

Community responses

Communities have resorted to collection of wild fruits and wild foods, reliance on remittances, switching to non-farming activities, migration and sale of assets to purchase food from open markets. Therefore, it is important also not to assume that livelihood diversification makes people resilient to climate impacts. Social bonds between people and community-based groups such as credit groups or committees, or other households have supported opportunities for

adaptation, providing households with routes of assistance.

Conclusions and recommendations

Uganda is highly vulnerable to climate change and climate variability, recent floods and droughts have demonstrated how tightly bound Uganda's economy, the wellbeing of its people and climate are. As existing high levels of climate variability continue and conditions become warmer and possibly wetter because of human induced climate change there are risks of catastrophic impacts on infrastructure, agriculture, the environment and ecosystems. In conjunction with increasing pressure on natural resources, these threaten to halt or reverse Uganda's development over the coming century.

It will undoubtedly be the poor who feel these impacts the hardest.

Urban forests and Climate change: A case of Uganda

Urban forests can be defined as networks or systems comprising all woodlands, groups of trees, and individual trees located in urban and peri-urban areas; they include, therefore, forests, street trees, trees in parks and gardens, and trees in derelict corners (FAO, n.d.).

An urban forest encompasses the trees and shrubs in an urban area, including trees in yards, along streets and utility corridors, in protected areas, and in watersheds. This includes individual trees, street trees, green spaces with trees, and even the associated vegetation and the soil beneath the trees (cities4forests, n.d.).

In many regions, urban forests are the most extensive, functional, and visible form of green infrastructure in cities. Green infrastructure is the natural and semi-natural infrastructure within a city that provides ecosystem services like stormwater management or air pollution abatement (cities4forests, n.d.).

Urban forests are the backbone of the green infrastructure, bridging rural and urban areas and ameliorating a city's environmental footprint.

Climate change refers to long-term shifts in temperatures and weather patterns (un.org, n.d.). These shifts may be natural, such as through variations in the solar cycle. But since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.

Burning fossil fuels generates greenhouse gas emissions that act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures. And emissions continue to rise. As a result, the Earth is now about 1.1°C warmer than it was in the late 1800s. The last decade (2011- 2020) was the warmest on record.

According to (un.org, n.d.), many people think climate change mainly means warmer temperatures. But temperature rise is only the beginning of the story. Because the earth is a system, where everything is connected, changes in one area can influence changes in all others. The consequences of climate change now include, among others, intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms and declining biodiversity.

A case of Uganda

In Uganda, encroachment on state lands is a common practice (Kayanja & Byarugaba, 2001). Forest reserves are a form of state land under forest cover of either high land tropical forest or low land moist forest, and woodlands. Deforestation is eminent in Uganda considering the reduction of forest cover from the precolonial days to present.

In Uganda, the early people derived their livelihood from natural forests by collecting wild fruits for food, fuelwood for domestic heating and metal working, wood for building and making canoes for fishing and warfare, herbs and other plant parts for medicine, and many other social and cultural uses (Esegu & Ndemere, 2002).

Subsequently forestry management developed into economic activities to supply both fuelwood and timber for domestic and industrial uses, for export. Forests were also cleared for establishment of plantation crops such as coffee, sugar cane and tea.

From 1898-1998 Uganda's forest resources consisted of 1,483,920ha of a variety of natural forests, 39,080 ha of coniferous and eucalyptus plantations, and numerous individual trees and small woodlots interspersed with food and cash crops on farm land (Forest Department 1996).

This resource base supplied 96% of domestic energy needs in form of fuel wood to over 90% of the population. It was also vital for processing high value export crops like tea and tobacco. Estimates indicated that forestry accounted for 23% of the country's GDP.

This was largely possible due to forest management and conservation efforts during the last 100 years (Esegu & Ndemere, 2002).

The destruction of Urban forests

In 2009, 15 urban forest reserves were de-gazetted to cater for the growing population and development in some towns countrywide (Tenywa, 2009). According to the then Director of natural forests at the National Forestry Authority (NFA) Hudson Andrua, it was difficult to sustain some of the urban forests because of the pressure from politicians and socio-economic activities. The local authorities were required to provide alternative land in exchange for the urban forests that are to be degazetted.

The Ministry of Water and Environment named the forest reserves as Arua, Kitubulu in Entebbe, Fort Portal, Gulu, Kabale, Lira, Mbale, Mbarara and Soroti. Others are Lutoboka in Kalangala, Kapchorwa, Kitgum, Nebbi, Ntungamo and Rukungiri districts. The intention of the people behind the de-gazettement was to get money by selling the land to the big shots. However, according to the Chairperson of Entebbe District Wildlife Association, Kitubulu and Kyewaga were part of the ecological system of Lake Victoria. Without Kitubulu, the rain water gets to sweep all the soil into the lake (Tenywa, 2009).

A study by Makerere University scientists, Dr. Eric Sande, Dr. Isabirye Basuta, Dr. Deborah Baranga and Dr. Robert Kityo showed that Kitubulu was a habitat for rare bird species. The report said the forest houses four primates including the black and white Columbus monkeys, once common around the lakeshores but fast disappearing (Tenywa, 2009).

Also, for decades, Mbale central forest reserve also known as Mutoto forest has environmentally been an ecosystem of regional and national importance as well as a livelihood source for many lives. In 2015, the National Forestry Authority, (NFA), gave Mbale town a go ahead to take over at least 400 out of 520 hectares of the reserve to expand the town once granted a city status (Omagor, 2021).

Conservationists are calling upon the government of Uganda, development partners and the national institutions intervene to save these forests in cities across the country because Uganda needs more trees than buildings.

Forests are home to over 80% of all terrestrial wild fauna and flora in Uganda, while supplying 90% of Uganda's energy needs, generating 61% of the country's tourism income, and providing jobs for around one million people, according to national statistics. Forests also provide vital ecosystems services and resources essential to social and economic development, yet rapid population growth, demand for agricultural land and infrastructure development, as well as demand for forest products, are putting great strain on Uganda's forests.

However, according to the Ministry of Water and Environment, Uganda's forest cover has declined from 24% in 1990 to just 8% 2018, and with the decline continuing at its present rate,

Uganda risks being without any forest cover by 2040.

Restoration efforts

The National Development Plan II (NDP 11) had a target of increasing the forest cover to 18%. NDP III had the same target. As a country we are thinking by 2040 under Vision 2040, the forest cover of Uganda should go back to 1990 level of 24%.

The National Forestry Authority (NFA) is undertaking restoration every year the only challenge is not enough money is released for restoration purposes, but at least 50% of what is planned is achieved.

For example, in the 2019/2020 financial year 5,500 hectares of the natural eye forest was restored but on only half of the 2,233 hectares which was not a small task. It amounted to 22 square kilometers of tropical eye forests, and as of now 22% of forests in Uganda are still encroached.

NFA under the community tree planting programme, for five years until June 2020, produced over 20 million tree seedlings per year. In five years NFA raised and distributed over 100 million tree seedlings but not all grew. However, the survival rate was 70% that is 70 million trees.

The UNDP Resident Representative Elsie Attafuah said Uganda's environmental, economic and social wellbeing are tightly bound to the benefits that healthy forests provide. According to Attafuah, deforestation has the potential to threaten this fine balance through exacerbating climate change and reducing biodiversity, and if deforestation is not addressed the impacts have potential to stall or even reverse Uganda's development trajectory.

Why urban forests are needed

Globally more than half the world's population now lives in towns and cities, and that proportion will continue to grow in coming decades. If planned and managed well, cities can be great places to live, but many urban development's cause environmental havoc ultimately leading to problems such as urban "heat islands", flooding, and air pollution (Borelli & Conigliaro, 2018). The cost for citizens is borne in deteriorating well-being; the costs for the planet include increased greenhouse gas emissions and other waste and the degradation of soils and waterways. Cities need forests.

Uganda is urbanizing at an estimated rate of 5.2% annually, one of the fastest growing rates in the world. According to the Ministry of Lands, Housing and Urban Development, in 2030 Uganda's urban population will reach over 30%. Uganda will rank as the 25 most populated country in the world, according to the United Nations forecast. The urban population will exceed 20 million people in the regional cities only that include Arua, Gulu, Lira, Soroti, Mbale, Jinja, Masaka, Mbarara, Hoima and Fortportal. This number is also projected to continue rising and will be responsible for more than half of the world's population by 2050, says the Ministry of Lands, Housing and Urban Development.

According to the Ministry, urbanization is a driver, and together with other interlinked forces, will create demand for space and resources which are all limited, and as a result, contribute to natural and man-made disasters.

Within the urban settings in Uganda the environmental challenges include among others land degradation, deteriorating air and water quality, poor solid waste management, inadequate greenery for residents, flooding and fire. The Minister of state for Urban Development Obiga Kania in a statement to mark World Cities Day on the October 31, 2021, said one of the frontline challenges for cities today, is the impacts due to climate change.

Conclusion

The network of woodlands, groups of trees and individual trees in a city and on its fringes performs a huge range of functions such as regulating climate; storing carbon; removing air pollutants; reducing the risk of flooding; assisting in food, energy and water security; and improving the physical and mental health of citizens (Borelli & Conigliaro, 2018). Forests enhance the look of cities and play important roles in social cohesion; they may even reduce crime (Borelli & Conigliaro, 2018).

According to the Ministry of Lands, Housing and Urban Development, in Uganda there is improved governance and engagement between city and town councils. There is improved money generation which is being channeled in improving service delivery and climate related interventions for the cities and urban town council dwellers that includes infrastructure development, such as tree planting, establishing green parks and public opens accessible to everyone, protecting the green spaces and processing land titles for them from encroachment, landscaping which all translates to climate change resilience.

Environmental social management plans are a must for all our urban development plans. If given a contract to construct roads, one must identify the risk to the environment, and tree planting is a must whether trees have been cut or not.

A number of interests have been put in place to address resilience and climate change including restoring, protecting, and establishing urban forests. Planning has become a collective responsibility. People, government and everyone are all playing their roles to have beautiful cities/urban dwellings that are climate change resilient.

Land-atmosphere interactions, water cycle processes and climate change

Efforts to understand land-atmosphere interactions are mainly hinged on the soil moisture and precipitation relationships. The interactions are local in space and between the land surface and the column of air above it (Zu et al 2011). In fact according to Zu et al (2011), the interactions mutually influence the variables of the land surface with the evolution of the surface fluxes, state variables of the planetary boundary layer, and state variables of the free atmosphere that allows for modulation of clouds and precipitation.

Moreover, the interaction does yield positive and negative feedback processes. Zue et al (2011) elucidates that in positive feedback process interaction both variables change in a similar manner, as opposed to changing in opposite ways in a negative feedback process. This is illustrated like in the case of an increase in wind speed, which is likely to increase the moisture flux as a positive feedback, while in the case of negative feedback; an increase in evaporative flux can lead to reduction in surface temperature (Zue et al 2011).

Definition of climate change

Climate change on the other hand has various interpretations influenced by peoples' environment, culture and economic activities. Many people perceive it through their sense of changing temperatures leading to sea level rises, floods, melting glaciers, floods and droughts, heat waves, storms as well as erratic rains.

Climate change is also viewed as the average weather in a place over many years while climate change is a shift in the average conditions says (BBC 2021). Rapid climate change being witnessed is caused by dirty fuel such as oil, coal and gas for powering their homes, factories and transport, elaborates (BBC 2021).

When these fossil fuels burn, they release greenhouse gases - mostly carbon dioxide (CO₂). These gases trap the Sun's heat and cause the planet's temperature to rise leading to effects such as drought (BBC 2021).

The National Geographic on the other hand views climate change as a long-term shift in global or regional climate patterns stating that it dwells on the rise in global temperatures from the mid-20th century to date (National Geographic 2020).

According to Sands (2016), scientific evidence indicates that increases in atmospheric concentrations of selected greenhouse gases due to human activities leads to an enhanced 'greenhouse effect' and global climatic change.

Sands (2016), says that an increase in the global mean temperature of more than two degrees centigrade above that occurring in pre-industrial times is thought to constitute dangerous global warming.

Moreover, Sands (2016) opines that Carbon dioxide emitted from the combustion of fossil fuels, industrial and agriculture activities are key contributors to the threat of climate change.

The United Nations however has a more succinct definition of climate change. It says climate change is the manifestation of long-term shifts in temperatures and weather patterns (United Nations 2021). According to the United Nations (2021), the said shifts may occur naturally, for example through variations in the solar cycle. The United Nations places human beings at the centre for their role in driving climate change.

Burning fossil fuels generates greenhouse gas emissions that act as a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures (United Nations 2021).

Examples of greenhouse gas emissions that are causing climate change include carbon dioxide and methane. They come from using fossil fuels, garbage landfills are equally a major source of methane emissions.

Causes of Climate Change

Experts have identified varied causes of climate change. The European Union Commission (2021), notes that human beings are key influencers of climate which is fueled by rise of earth's temperature increase as a result of use of fossil, deforestation and livestock rearing.

The commission further observes that the greenhouse gases or rather gasses that trap the sun's heat and bars it from leaking back into space combine with those occurring in the atmosphere thus increasing the warming of the globe. Examples of greenhouse gases are carbon dioxide, methane, nitrous oxide and fluorinated gases among others like Methane, which is emitted by livestock farming.

For instance burning coal, oil and gas produces carbon dioxide and nitrous oxide while deforestation leads to removal of trees that absorb carbon dioxide from the atmosphere thus regulating climate.

The scenario is contributing to global warming and according to the United Nations (2021), the period 2011-2020 has been noted to be the warmest decade recorded in human history, given that average temperatures reached 1.1°C as global with warming caused by human activities scoring 0.2°C per decade.

Impacts of climate change

According to BBC (2021), extreme weather events that are turning intense, threatening lives and livelihoods. Further warming, states BBC (2021), certain regions could turn uninhabitable, as farmland turns into desert. Moreover, in some regions extreme rainfall is causing historic flooding (BBC 2021).

Concerned with the situation, in 1988, United Nations Environmental Programme and the

World Metrological Organisation established the Intergovernmental Panel on Climate Change (IPCC) to provide the scientific guidance necessary to take further action (Sands 2016).

The situation is worrying. The Foreign Relations Council (2013) observes that the minor shifts in temperature could cause disasters such as rising sea levels, violent and volatile weather patterns, desertification, famine, water shortages, and other secondary effects among them conflict.

Likewise, people in poorer countries are expected to suffer the most for they lack resources to adapt to climate change. Many African nations such as Kenya are likely to suffer droughts and food shortages.

International regimes to address climate change

The scenario has led to emergence of various international protocols and regimes to aid in tackling the climate change problem. They are aimed at regulating the interaction of human activity with the global climate system, to mitigate global climate change.

Other than the UNFCCC, there are other regimes such as the 1997 Kyoto Protocol that established internationally binding GHG emission reduction targets and timetables for countries.

Additionally, the 2015 Paris Agreement that required the commitment of the international community to reduce emissions to keep global temperature increase below 2°C. Some like the Reducing Emissions from Deforestation and Forest Degradation (REDD) attaches a financial value to forests relating to their provision of ecosystem services, more specifically for sequestering carbon (Patberg et al).

Conclusion

In conclusion, people have varied but related definitions of what constitutes climate change. Secondly, human-induced climate change has been a key contributor to changing patterns of extreme weather across the globe.

Extreme weather is also on the rise and the situation will continue so whether predictable of unpredictable.

The global climate regime such as norms, rules, and decision-making procedures for guiding the behavior of actors in combatting impacts of climate change have undergone a remarkable transformation over time. However, their adherence is still wanting with nations especially rich ones who are the main polluters faltering on their commitments while the poor less polluting but highly impacted ones heavily suffering climate change effects.

Fires in the Mediterranean: A Sizzling Matter

Today, the term climate change has become synonymous with the increasing and alarming changes in climate patterns and extreme weather, the most significant of which is the increasing frequency of severe and occasionally catastrophic events. From the loss of ice caps and melting of permafrost to the rise of ocean levels and coral bleaching, the impacts of climate change have been felt throughout the world.

Forest Fires on the Rise in the Mediterranean

Climate change has seen the Mediterranean heat up by nearly an entire degree in the past [century](#). As a result, forest fires are increasing in the region due to a combination of drought, warming, and human activity.

"Recent data indicates a temperature increase of about 0.85°C globally and 1.3°C in the Mediterranean area in the last century, compared to temperatures recorded over the period 1880-1920 (Solomou et al., 2017). The Mediterranean climate is expected to become drier and warmer, with decreasing water available for plants and increasing evapotranspiration (IPCC, 2007b)". (From the State of Mediterranean Forests 2018) Fires in the southern Mediterranean are also on the rise as shown by the Algeria wildfires which claimed the lives of 57 civilians and 33 soldiers since [August 9](#).

These fires are mostly attributed to a combination of factors, including climate characteristics, proximity to populated areas, fuel load of vegetation (especially scrub), and land use, together with weather factors such as wind speed, atmospheric stability, and relative humidity.

Forest Fires in the Mediterranean: A Serious Threat

The problem of forest fires in the Mediterranean is more serious now than a century ago. The average annual number of forest fires throughout the Mediterranean basin is close to 50 000, i.e. twice as many as during the [1970s](#).

A large number of those fires are driven by manmade activities, such as the destruction of brush in landfills, illegal off-road vehicle use, and careless disposal of smoking material by campers and hikers. (D. Alexandrian, F. Esnault and G. Calabri, 1999).

Also, the biggest factor driving the increase in fires is that the Mediterranean has a hotter, drier climate, making the forests more flammable and less able to withstand wildfires, and increasing the likelihood of catastrophic fires.

Human Impact on the Climate Has Gone beyond the Pale

Although these changes in climate have long been observed, the human impact on the climate has gone beyond the pale as "Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiative

forcing, observed warming, and understanding of the climate system."([From](#) the 2013 IPCC Fourth Assessment Report states, IPCC AR5).

Besides forest fires, droughts, flooding, and heatwaves are growing in frequency and intensity. There are now more than [5.000](#) wildfires per year putting a strain on the region's fire-fighting resources.

If climate change continues, an increase in wildfires is expected worldwide and not only in the Mediterranean region. In addition to the direct costs caused by the fires, costs have been incurred in terms of public health and the environment. Climate change has caused more insect breeding, which has led to an increase in diseases like [malaria](#), which has a devastating impact on human health in the region.

Wildfires in the Mediterranean: an Underwhelming Response

The current response to the wildfires in the Mediterranean has been underwhelming as the increase in fires in the region could be the catalyst for more significant changes, making it more difficult to protect the forests.

While there are many fire-fighting resources in the Mediterranean, the region's firefighting resources are not as well-equipped to respond to fires in the forest as they are to fires on the coast, which poses an added danger as the forest encroaches on the [shoreline](#).

A more thorough and better-coordinated response to the Mediterranean fires is a necessity to keep the fires from destroying the region. However, due to the financial constraints on the region, it is unlikely that this response will occur.

The region is already suffering from many other environmental problems, but the good news lies in the fact that there is an increasing recognition that the climate is changing, and there is a large economic and fiscal cost to doing [nothing](#).

Climate change: Inadequate Response with Dire Costs

The UNFCCC (United Nations Framework Convention on Climate Change) was adopted in 1992 and created the framework for the actions needed to address climate change. To reduce carbon emissions, the international community has committed to a global average of less than 2 degrees Celsius of warming."

Scientists say that the world's current approach to solving climate change is inadequate as the world is not acting fast enough to prevent the worst effects such as extreme droughts and warming of water and soil.

According to Mattias Söderberg, Co-chair of the ACT Alliance Advisory Group on Climate Change Advocacy, *"living with the effects of climate change is a reality that many developing countries already struggle with."*

"For most developing countries action is only possible if supported by finance and technology from developed countries. Developed countries therefore, having the biggest historic responsibility, should show leadership by reducing emissions and providing finance and technological support before the climate situation is irreversible and its impacts unmanageable", he added.

Among the reasons for such a lack of progress, researchers point to the high costs of implementing change, economic factors, and the growing gap between poor and rich countries. These factors have resulted in a reduction in the ability of countries to implement effective and meaningful actions on climate change.

Climate Change Impacts on Mediterranean Region

The Mediterranean region has become one of the most vulnerable and prominent climate change hot spots. The impacts of climate change have affected human and natural structures including human health, water management, agriculture, marine/plant diversity, and socio-economic productivity (Kim et al., 2010).

In the last decade, the Euro-Mediterranean region has experienced extreme weather and climate events such as the hottest summers recorded in the years 2003 and 2010. Extreme temperatures are being realized more over the land and in the sea. (Cramer et al., 2018)

Why The Mediterranean Region?

Today, the climate crisis has affected every part of the world to some degree and some may wonder why to focus on the Mediterranean region. The Mediterranean Sea is the largest of all semi-enclosed seas in Europe. The region occupies about 6.5% of all global land. 23 countries surround the Mediterranean Sea and they host over 480 million individuals, which made up about 7.3 percent by the year 2015 (EcAp-MED I (2012-2015) | UNEPMAP, 2021).

In addition, the region is a crossroad of three continents: Asia, Africa, and Europe. Most of these economies rely on natural resources. The Mediterranean Sea is one of the busiest shipping routes across the world (EcAp-MED I (2012-2015) | UNEPMAP, 2021). By the year 2016, the Mediterranean countries contributed 10.4% to the global GDP (Merchant et al., 2015).

From this information, one can understand why the Mediterranean region is critical when it comes to addressing climate change and the impact it has not just in the region but across the globe.

The Climate Crisis

There exist variations in the cultural, socio-economic, and societal conditions among Mediterranean countries. On the northern rim of the Mediterranean, we have several developed EU Member States and the Eastern rim with intermediately developed countries, with the least developed countries found in North Africa (Lange, 2019).

A combination of changes in routine and demand patterns has led to increasing demand for water, food, and energy in the Mediterranean region. The groundwater aquifers and water reservoirs are over-exploited and the utilization of ecosystem services heightened. As a result, environmental integrity is stressed and this further exacerbates the impacts of the ongoing climate crisis.

Experts note that South-Western Europe has recorded a temperature rise of 2°C (IPCC, 2007). This increase in temperature is also felt in North Africa but more research needs to be undertaken to quantify the increase in this region.

There has also been an increase in the frequency and intensity of heatwaves in the Mediterranean Basin since 1950 (Cramer et al., 2018). According to Molina et al. (2020), the combination of droughts increased heat waves, and evolving land-use practices have led to heightened fire risks. Today we see more frequent and severe fires in the region.

Advantages of the Climate Crisis

There is contention as to whether the advantages of climate change truly exist. This is because what appears to be advantages is riddled with destruction and disruption from the impacts of climate change. These include:

1. The Antarctic, Arctic, Siberia, and other colder regions might begin experiencing more plant growth. Farmers in some of the Mediterranean regions may benefit from early-onset springs and longer warmer seasons that are favorable to farming (Kirchhoff et al., 2017).
2. There is increased CO₂ emission in the Mediterranean region. Some studies indicate that most plants tend to grow better in environments with higher carbon dioxide levels. Such plants also tend to be more resistant to drought (Rogeli et al., 2012).
3. Hoegh-Guldberg et al. (2018) project that in the future, shipping commerce will thrive because the Northwest Passage will be open more often due to the Arctic sea ice loss.
4. We are likely to see fewer deaths occurring as a result of the harsh conditions in the Arctic.
5. Because growing seasons will be longer, we are likely to do see an increase in food production in some of the Mediterranean regions (Rogeli et al., 2012).
6. We might have more discoveries of gas and oil reserves that were previously untapped.

Disadvantages of the Climate Crisis

Undoubtedly, the disadvantages of the climate crisis in the Mediterranean region far outweigh the advantages. These include:

1. Extreme Weather and Ocean Warming

The ocean and weather are interconnected and water cycles have an impact on weather patterns. So technically what affects the ocean will ultimately affect the weather. The warmer temperatures being realized in the ocean affect circulation. When circulation and temperatures in the ocean are affected, we experience more frequent severe weather events. Extreme weather events lead to the destruction of property, habitats, loss of human and plant life (Salomon et al. 2007).

Warming oceans have higher acidity that leads to the death of coral reefs that play an important role in protecting shorelines from storms, heavy waves, and floods. Coral reefs are also a habitat for about 25% of species living in the ocean. Their death means that the species become extinct and more erosion occurs on the Coastal lines.

According to the United States Geography Survey (2020), warming ocean waters has led to the melting of ice sheets and glaciers. As a result, the natural habitat of animals that live in a cold climate has been affected and the freshwater reserves across the world are diminishing.

1. Land Desertification

The disruption of weather patterns has led to more intensified droughts that last longer. This has affected the agricultural sector because crops can't thrive without adequate water. A shortage in crops and grasslands means that livestock and other animals will starve. With freshwater reserves diminishing, farming practices such as irrigation are becoming more difficult and so many farmers are likely to lose their livelihoods.

Increased desertification leads to border conflicts as people fight for the existing scarce water resources (Kirchhoff et al., 2017). During the conflict, more resources are damaged or lost making an already bad situation worse.

2. Economic, Health, and Social Impact

Climate experts project that we're going to see an increase in insect-borne diseases. According to Beniston et al. (2007) when temperatures keep getting warmer and the colder season are not as cold, insects that die off during colder seasons will stay alive. Such insects could be carriers of illnesses such as Lyme disease.

The Mediterranean region has extremes of very rich and developed countries to poor developing nations. We are likely to see a surge in migration of people from drier, hotter poorer areas moving into the more favorable regions. This is likely to cause tension and strain to the favored areas. (Zorita and von Storch 1999).

The increase in temperatures means that people now require more energy for their cooling needs. This means that there will be an increase in air pollution and deaths associated with extremely hot weather events.

The climate crisis has led to the early and longer blooming of plants, this worsens air pollution and as a result, we see more people developing asthma, allergies, and other respiratory challenges. This shift is already being recorded by health experts (Frei et al. 2006).

3. Impact on the Balance of Nature

For every ecosystem to thrive, a delicate balance needs to be maintained. The effects of climate change are throwing nature out of balance. Some regions are more affected than others.

The Mediterranean region is a climate crisis hot spot and has been adversely affected. Species communities in the Eastern and Southern Mediterranean have significantly changed. We're seeing an increased number of animal and plant species at risk of extinction. A recent study in the Israeli shelf showed that compared to historic records, only 5-12% of species are still in existence (Albano et.al, 2021).

While there is a lack of traditional species in the Mediterranean region, there is also a surge in non-indigenous species in the seascape. For instance, local fishers in Portofino, Italy, have reported an increase in catches of barracuda a type of fish that was rare in the region until two decades ago. Today it is more abundant than ever before. (Giakoumi, et al. 2019)

When animals migrate to other habitats to escape the harsh climate conditions occurring, they disrupt the ecosystems in the new habitats. Experts also project that pests such as fungi, viruses, and parasites that perish in very low temperatures are no longer dying because the Mediterranean region is experiencing increasing warmer temperatures. This has led to an increase in animal, plant, and human diseases (Albano et.al, 2021).

What Next?

Addressing the climate crisis is key in helping solve a lot of the effects of climate change worldwide. The region is a crossroad of three continents: Asia, Africa, and Europe. Most of these economies rely on natural resources. With the population in Asia and Africa growing at a faster rate than is possible to replenish the natural resources, we are likely to see more adverse effects of climate change in this region (Herring, 2020).

We all need to take action to reverse these effects so that we can save our world from catastrophe. As a journalist, I believe I must report on what is happening in the Mediterranean region in a way that will get people's attention and motivate them to act. The only way to report on climate change accurately is by working with scientists so that we can get scientific facts, and then interpret them in a way that is understandable to the masses.

As the renowned journalist and diplomat Henry Grunwald said, "Journalism can never be silent: that is its greatest virtue and its greatest fault. It must speak, and speak immediately, while the echoes of wonder, the claims of triumph, and the signs of horror are still in the air."

Climate change effects in Northern, Rift Valley and Western part of Kenya.

President Uhuru Kenyatta of Kenya, declared the ongoing drought affecting the northern (arid and semi-arid lands (ASAL), part of the country as a national disaster after about 13 counties were affected by droughts. They are faced dire situations of starvation causing lives of over 2.1 millions people at risk, after meeting 85 leaders from Arid and Semi-Arid lands community led by Treasurer Cabinet Secretary UkurYatan,.

The president instructed The National Treasurer and ministry of Interior and coordination Government to spearhead Government effort to assist and rescue affected households and communities by aid them with water and relief food as well as livestock uptake (Kanze Dena Mararo, the President's spokesperson, September 08 2021).

In June 2021, most arid and semi-arid land (ASAL) areas received less than 50 per cent of the average rainfall, hence causing a decline in the health of vegetation compared to the preceding month.

Those in the north-eastern region received less than 25 per cent of average precipitation that month.

The drought situation is still experiencing since mid of these year though it was expected to last until September in the arid and semi-arid land ASAL counties, whereby majority of population in north- eastern region are pastoralists and agro-pastoralists.

Deteriorating conditions of vegetation, increased distances to water sources, loss of livestock that is major live hood to pastoralists' communities, and reducing milk production and increasing number of children at risk of malnutrition were observed in the affected regions. Also, the conditions will cause risk malnutrition to children under five years of age and majority of old people (over 80 years) die of hunger.

section of leaders from the northern (arid and semi-arid lands (ASAL), called a press conference in Nairobi and pleaded with the government agencies to fast track the current intervention measures in place to mitigate the effect of the revenging drought in their counties. They also, requested national government to address the humanitarian crisis in the affected areas. Whereby over 2 million people were facing shortage of food insecurity and are in need of urgent assistance from the government, and non-government organizations. Also, livestock's (Caramels, goats, cows and other animals) in the region have died due to lack of vegetation, scarcity of water, and extreme heat in the region (Julias Otieno, The Political Reporter, 12th November 2021).

According to recent warning from the weatherman, there may be not any reprieve anytime soon, while according to the national drought management authority over 2 Million of people in the country, have been exposed to hunger, a situation that brought by locust invasion and minimal rain in the counties.

Ironically, as the country continue experiencing drought in most of parts of counties, while during heavy rainy seasons, same parts of the country starts experience to floods during rainfall season. Many parts of East Africa region are experienced heavy rainfall, which caused rising

level of waters from coastal shore, lakes and rivers that result to destroy shoreline regions. In 2020, some parts of Kenya experienced months of sustained torrential rains that caused rising lake water levels and accompanying floods, which had stirred thousands of people to flee their homes, farms for safety and causing a lot of destructions. There was causality of drowning of people, majority being children, disable people, women, old age people, and sick people. Most people were got injuries while were fleeing for safe places, and there were more cases of animal (Crocodile and Hippopotamus) bite. Also, more causality experienced during evacuation of patients in flooded region and loss of health infrastructure including essential drugs in the facilities.

High rate of breeding mosquitoes in the region were at a high rate, that caused infection of malaria to children in surrounding flooded areas, resulting to severe number of hospitalization and high rate of mortality among children from six months to four years.

In 2021, most parts of Kenya, has experiencing abnormally high rainfall, hence resulting rising water levels of Lake Victoria, and the Rift Valley lakes. Counties of Great Rift Valley, Kisumu, Busia, Homa Bay, Migori, Tana River are now depending on humanitarian aid after the heavy rains and floods that over flooded over 4,800 acres of land since Mid of this year, causing a lot of loss of crops on farms. Most unhealthy cases increased in those regions. Unhygienic cases were on the rise, causing community around affected by diarrhoea due to infected water from contaminated with clean water. High cases of children under five years were registered in surrounding healthy facilities were by they were affected by pneumonia, rise in continuous coughing, asthma, malaria, hypothermia.

In 2020, most parts along Lake Naivasha experienced months of torrential rains that caused flooding to its banks, hence results to waters submerged an entire area forcing hundreds of community around to flee from their residential homes and farms to upper safer side. The Surrounding industries and other places that offered employment to the locals were submerged and employed people became jobless while owners of the companies, in affected areas their properties were destroyed too.

Lake Naivasha expanded to 173 square kilometers from 122 square kilometers. This was a result of increase rainfall and siltation, which results to push waters outwards, said Cyrus Oguna, the Kenyan government spokesperson.

Lake Naivasha flooding, displaced more than 500 hose holds, also, it caused human-wildlife conflict, whereby became inhabitant of crocodiles and hippos due to loss of grazing after forcing them to move to higher parts of the land where the displaced people had also flee for rescue. People in the surround affected region were feared their life from wild animals, restricted them to move around the region past 7P.M, caused human-wildlife conflict.

Also in 2020, Lake Baringo was experienced torrential rains that caused floods its banks, to 734 hectares of land were submerged, which results to displacement of more than 5,000 people, destroyed houses, farms, essential infrastructures, roads, and hotels infrastructures. The 716 households were affected by floods, 9 people were died through floods, 688 livestock were lost, The reports from County government of Baringo.

Since 2019 up to date the country has receiving abnormal torrential of rainfall in most parts of Kenya. In Nairobi County, when there was experiencing of torrential rainfall in region, there was floods most parts of the slums areas. Which caused submerging and destroying infrastructures, home states, and caused injuries to people in slums areas. Also, caused death from drown, more numbers of children exposed to cold being affected to pneumonia and malaria. Most of school infrastructure were destroyed too leaving quite a number of students unable to access to education. People in affected slums who majority live an informal structure, with majorities are depend on hand to mouth left with nothing during flooding seasons. Causing most of them

depend from aids (Food, shelter, water, clothes) from Samaritan people, non-government organization, Nairobi county government and national government.

In Migori, which is part of western of Kenya, also experiencing floods during torrential of rainfall. Whereby, when there is heavy rain in the upstream it leads to heavy run off water to flow into River Migori and River Gucha. The run off overflow cause erosion of soil that end up flows into the river channels as flows downstream as water overflows its banks leading to floods in the region. On the flood plain region also are affected by experience flash floods from the neighbouring hills within the Lower GuchaMigori Sub-catchment, leading to damage of houses and losses of properties, damaging of infrastructure, crops and livestock and displacing more than 3000 people every year.

The measures against floods, management policy in relevant river basin shall be mitigation against the impacts of flood damage which include disruption of the daily livelihood and lack of a hospitable and safe evacuation place moreover enlighten schemes that will make it easier, quicker and faster life-skills in recovery from the flood damages.

Lake Victoria, have continue experiencing a unique type of flooding that has caused all five counties boarding to affected by rising of water levels from the lake region. At least 37,140 households have been affected. Among affected surrounding counties to the lake are; Busia, Siaya, Kisumu, Homabay, and Migori. Reports, from Kenya government, the Ministry of Environment and Forestry.

The affected counties, their houses and farming fields were submerged. Their economic activities were crippled as most of their live hoods was farming and fishing. Their social amenities, healthy facilities, sanitation facilities, learning institutions (primary and secondary schools), boreholes and shallow wells were destroyed. Roads network were destroyed, forced them to use boats as a form of transport to access services across the affected flooded regions.

Climate change has led to more frequent extreme weather like droughts which last longer than usual, causing challenges with water security, food security and economic growth even more difficult. Resulting to shortage on harvests and agricultural production which account for about 33% of total Gross Domestic Product (GDP. All these factors. Also, has led impact at-risk populations like marginalized communities, women and the youth(Wikipedia, 26 October 2021).

Climate change is main concern to human being's issue. The Government can protect Amazon forests like in Mount Kenya, the Aberdare range, the Mau escarpment, Mount Elgon and the Cherangani hills by restricting citizens from cutting down trees for industrial purpose, it causes sucking up huge amounts of carbon, and by making better laws to protect our environment (Nicholas Asego, November 7th 2016).

Also, government should change our main energy sources from stop using fossil fuels like Petrol and diesel vehicles to clean and renewable energy, like solar, wind, wave, tidal and geothermal power, and Switch to sustainable transport (Greenpeace UK, 2015).

Climate change causes a decline in the productivity of crops and fruits and increases the poverty of farmers

Climate change causes a decline in the productivity of crops and fruits and increases the poverty of farmers

Reducing the productivity of agricultural lands, increasing water consumption, increasing the use of "systemic" pesticides that cause cancer, and reducing the profit margin of the farmer.

Abdel-Razzaq Sayed" - a farmer in the village of Fayed in the Ismailia governorate - hits "hands on hands" for the loss of the mango crop, and the flowering contract of the tree was injured due to the high temperatures of 40 and 42 degrees Celsius, unusually in the months of "February and March", which caused the fall of the flower contract and injury. Trees were affected by insect diseases such as aphids and thrips, and sooty mold increased, decreasing the productivity of the acre to about 15 tons out of 40 tons in the previous year.

"Abdul-Razzaq" is among the two thirds of Egypt's poor working in agriculture, and about 811 million people worldwide have entered into poverty as a result of the damages caused by climate change, according to United Nations data.

Hussein Abu Saddam - Head of the Farmers Syndicate in Egypt. Climate changes and temperature differences have reduced the productivity of crops and fruits "mangoes, olives, wheat, tomatoes and maize" by up to 25%; It affected the productivity of olives and maize, which were infected with migratory insects from African countries, the "African Armyworm" and the "Autumn Army" worm, and the wheat was infected with yellow rust.

Saddam added: The movement of strong winds and torrential rain causes root rot in some winter crops such as "strawberries, tomatoes and potatoes" due to the absence of good agricultural drainage.

In the same context, engineer Hossam Reda, an agricultural extension expert, says that wheat was affected by high humidity and temperatures last January and February, and it was infected with the cross-border yellow rust disease that came from Turkey and Iran, which was transmitted through the wind, to be affected by modern wheat varieties that do not have resistance to these diseases.

Productivity decreased from 20 ardebs to about 6 ardebs in the "Seds 12" category, which is the same case in Gemmayzeh 11 and Shendweil one. In addition, a two-degree increase

in temperature reduces productivity by 9% and increases water consumption by 19%. Tomato and potato crops were also affected by fungal and insect diseases, such as the "late and early symposium", which destroys the crop within 24 hours, and the productivity has decreased from 45 tons to 15 tons. It also requires an increased cost of systemic carcinogenic pesticides, according to the FPA report, because this type of pesticide is included in Plant sap path.

"Reda" adds that increasing temperatures will reduce productivity by 14% and increase water consumption by 5%. In addition, an increase in temperatures of 3.5 degrees Celsius for maize will lead to a decrease in productivity of 19% and water consumption plus 16%. The study recommends developing short-season varieties to reduce the effects of climate changes, which have the ability to tolerate salinity because it is expected to increase the salinity of the soil. The data are according to the study of the FAO "Food and Agriculture of the United Nations", and a study by Dr. Ayman Farid Abu Hadid, Ain Shams University entitled "Climate Change and the Egyptian Agricultural Crises".

Climate change and its effect on health in the Mediterranean – the effect of heatwaves

According to WHO (2021) Mediterranean region and Eastern Europe will be two region in Europe with highest increase of the number and intensity of heatwaves in this century, due to climate change.

Rising global average air temperatures are just one manifestation of climate change, although climate change is often associated with the term 'global warming'. Another consequence is the increase in the frequency of extreme weather events. According to one of the world's largest insurance companies, Munich RE, the number of geophysical phenomena such as earthquakes, tsunamis and volcanic eruptions remains relatively constant, while the number of extreme weather events has increased by 300-400 %over the past 30 years.

Often underestimated, heat waves are one of the most dangerous extreme weather events. They are increasingly affecting the southern European countries and Mediterranean and are becoming a serious threat to public health. For this reason, states, governments and local communities must make targeted efforts not only to reduce greenhouse gas emissions in order to mitigate the effects of climate change, but also to pay attention to the development of plans and programs for adaptation to hot weather and the construction of early warning systems.

Since 1960, the annual number of days with extremely high temperatures has increased by 10 per decade in most countries of Southeast Europe and the Scandinavian Peninsula. Of great concern are the analyzes, which show that events that at the beginning of this century were thought to occur twice a century (such as the heat wave in Europe in 2003) are now expected to occur twice a decade.

The number of days with high temperatures is increasing in both northern and southern Europe. In 2019, very high temperatures were observed in large areas of Western and Northern Europe, including in areas that have rarely encountered this phenomenon in the past. Another striking example is the hot weather in Siberia in June 2020, when a record high temperature of 38 ° C was measured in Verkhoyansk. Experts from the World Weather Attribution say that without anthropogenic climate change, this event could not have happened at all.

Forecasts of increasing, frequent and prolonged heat waves are a cause for concern on the part of health authorities in all European (and not only) countries, especially against the background of forecasts that the share of the elderly population on the old continent, which is particularly vulnerable group to hot weather, by 2050 will jump from 18 to 28%.

Scientists say the risk of fatal accidents due to high temperatures has been steadily rising since the 1980s. At the moment the share of the population living in climatic conditions that lead to deadly high temperatures in at least 20 days of the year, is 30%. If measures are not taken to limit greenhouse gas emissions (ie the "business as usual" scenario is being implemented), this risk will cover 74% of the world's population by the end of the century. The endangered

population will reach 48% by 2100, even if greenhouse gas emissions are immediately drastically reduced.

The extremely hot summer of 2017 has provoked a team of scientists from the World Weather Attribution (WWA) to conduct a study on the likelihood of such summers in the future in southern Europe against the background of global warming. According to their simulation model, if the amount of greenhouse gases continues to increase, summers like 2017 will become the norm for Southern Europe by the middle of the century. Currently, the probability of a very hot summer is 12%, and with an increase in average temperatures by 2 °C the probability jumps to 42%.

What exactly is the heat wave?

There are many definitions, but for the temperate climate zone, a heat wave is considered to be a period of at least 3 consecutive days during which air temperatures reach and exceed 30 °C. The combination of high daytime temperatures with nighttime temperatures above 20 °C - the so-called "tropical nights", which do not allow the body to rest from the heat during the day, is particularly difficult for the body to tolerate.

The most dangerous of the heat waves in the summer is the first one. It's characterized by the so-called "harvest effect" - people die in old age and with a weakened body due to previous chronic or acute diseases. At the beginning of the season, the previous cooler weather put us to sleep and we usually did not adapt our clothes or behavior to the very hot weather.

Seasonality in turbidity is described using daily death statistics. Current data from the PHERE project show that mortality increases by 2% with each degree of temperature rise above a certain threshold in cities in Northern Europe and by 3% in cities in Southern Europe. The peak of deaths is delayed in time - follows a maximum of 3 days of temperatures.

In addition to an increase in mortality, unusually hot weather has seen an increase in road accidents, work accidents, cases of collective violence and crimes against personality.

Especially dangerous in the summer is the use of a dark-colored car without air conditioning. The risk of accidents increases by about 30% at compartment temperatures above 37 °C compared to the normal temperature of about 22 °C. The underestimation of the high temperatures in cars left locked for a while in the scorching sun is the reason why young children and pets die every year from heat stroke. In the United States alone, 750 children have died in such incidents in the last 20 years.

Heat stroke is the most severe and life-threatening condition associated with hot weather. Signs of heat stroke include nausea, vomiting, fainting, confusion, disorientation, loss of consciousness and coma. Particularly indicative symptoms are high body temperature - over 40

°C and lack of sweating, despite high air temperatures. Signs of heat stroke before its fatal development include fatigue, cramps, fainting, headache, sensitivity to light, dizziness, nausea and vomiting, reddening of the skin, rapid heartbeat and breathing.

Heat stroke can damage the brain and other vital organs and be fatal. The greatest danger is

in young children, people over 65 years of age, those suffering from chronic cardiovascular and respiratory diseases, as well as residents of large cities, where dense multi-storey buildings and sparse vegetation contribute to the establishment of particularly high temperatures in hot weather. - the so-called "heat island".

The heat island is a phenomenon typical of big cities.

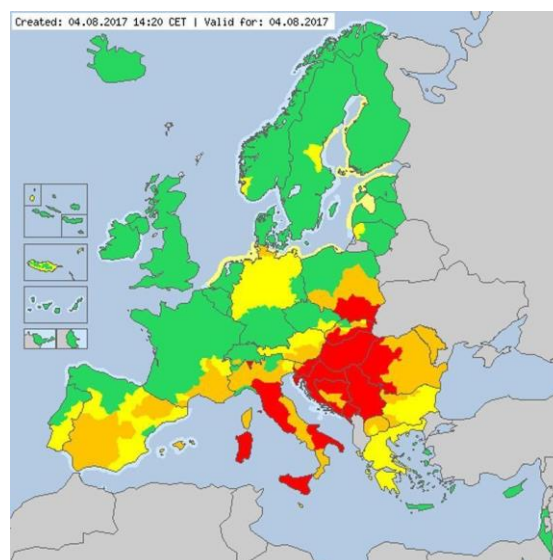
Under favorable weather conditions (maintaining stable anticyclonic weather) the difference between the city center and its periphery can reach and exceed 10 °C. It's like living 300-400 km closer to the equator.

According to some studies, women are more vulnerable than men in hot weather - their mortality is higher in all age groups. Women have a higher body and skin temperature, and in some countries the strict division of male and female work probably plays a role. Thus, performing certain activities outside (increased exposure) or indoors (such as cooking), as well as wearing certain clothing by women, can further exacerbate the adverse effects of hot weather. The group of vulnerable people also includes those suffering from mental disorders and people who practice outdoor or thermal stress. Those living alone and people with disabilities who cannot afford air conditioning in their homes are also at greater risk. What can be done by the health sector in the field of prevention and adaptation to hot weather?

Construction of early warning systems. Heat waves can be predicted. However, a weather forecast alone is not enough to build an early warning system. It is necessary for the information to reach the vulnerable population, as well as to determine the criteria under which the warning system will be activated. To determine the above criteria, it is necessary to analyze historical data on this phenomenon, which is the work of climatologists and epidemiologists. Mortality has been found to rise sharply above a certain temperature threshold, which is individual to each geographical area. This calls for a study of the relationship between hot weather and the resulting deaths for a period of at least 10 years. Once these two conditions are met, coordination of alert systems is needed, which requires the joint efforts of health authorities, meteorological services and crisis response services.

At the European level, the Meteoalarm warning system for dangerous and particularly dangerous phenomena of meteorological origin has been operating for more than a decade.

Meteoalarm map from August 4, 2017, warning about the Lucifer heat wave.



Action plan to protect the population from the effects of hot weather

The development of an action plan for the protection of the population from the effects of hot weather is a recommendation of the World Health Organization to the health authorities in individual countries. These plans include a set of measures for the periods before and during the summer season. However, their greatest effectiveness would be if long-term measures in the areas of construction, urban planning, landscaping, energy, etc. are implemented in advance. The implementation of the plan and its elements can be divided into five stages:

1. Development and compilation of a long-term plan;
2. Preparatory activities carried out until the onset of the summer period;
3. Preventive measures carried out during the summer;
4. Special measures taken during abnormally hot weather;
5. Monitoring and evaluation.

Hot weather adaptation measures are actually saving lives. In Western European countries, where serious work is already being done by state and local authorities, there has been a reduction in heat wave mortality, although the frequency of the latter has increased amid global warming. Unfortunately, estimates of mortality in other European countries are pessimistic.
