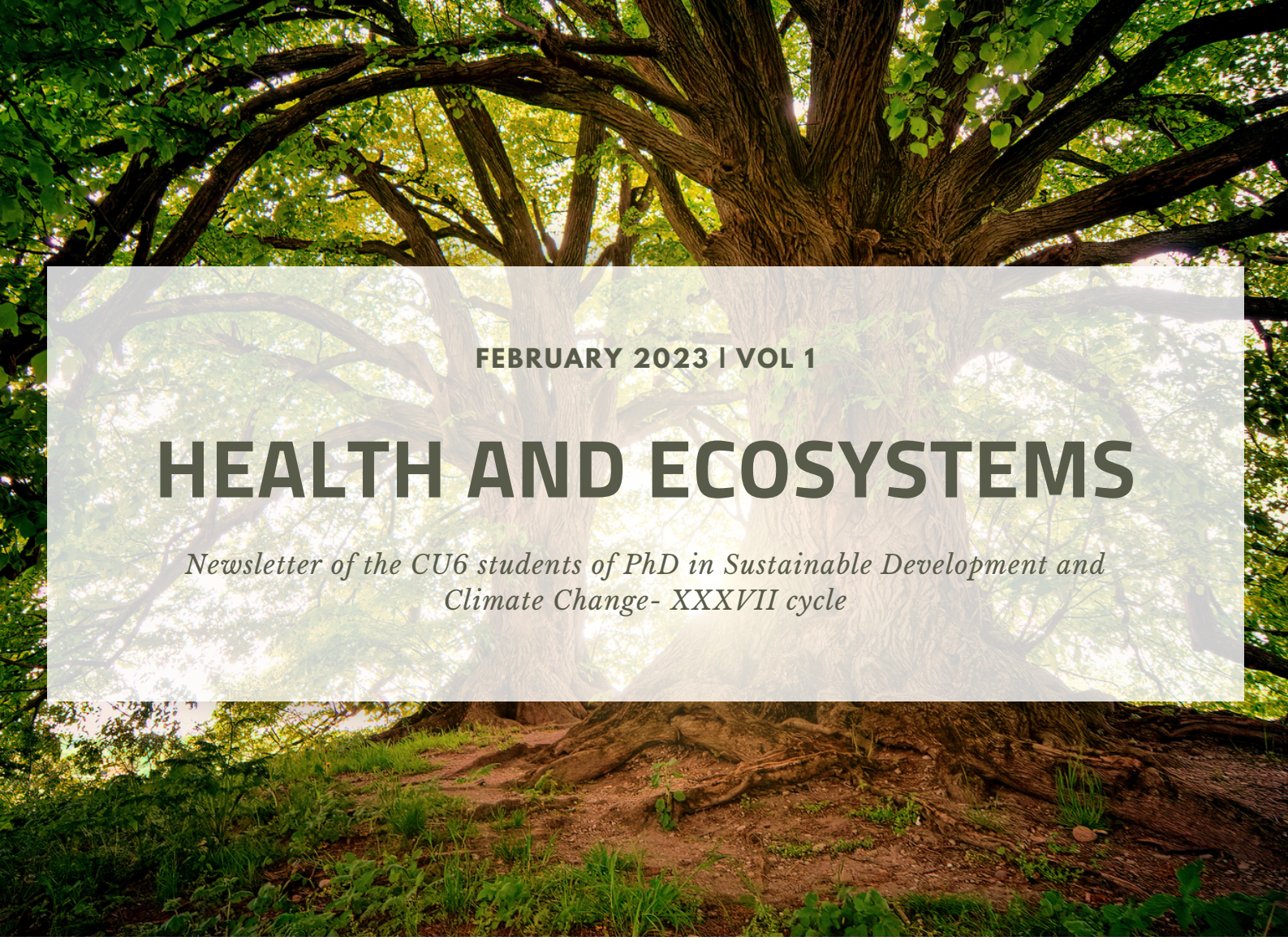


FEBRUARY 2023 | VOL 1

HEALTH AND ECOSYSTEMS

Newsletter of the CU6 students of PhD in Sustainable Development and Climate Change- XXXVII cycle

AN INTRODUCTION TO THE NEWSLETTER AND OUR PHD

By Silvia Maritano

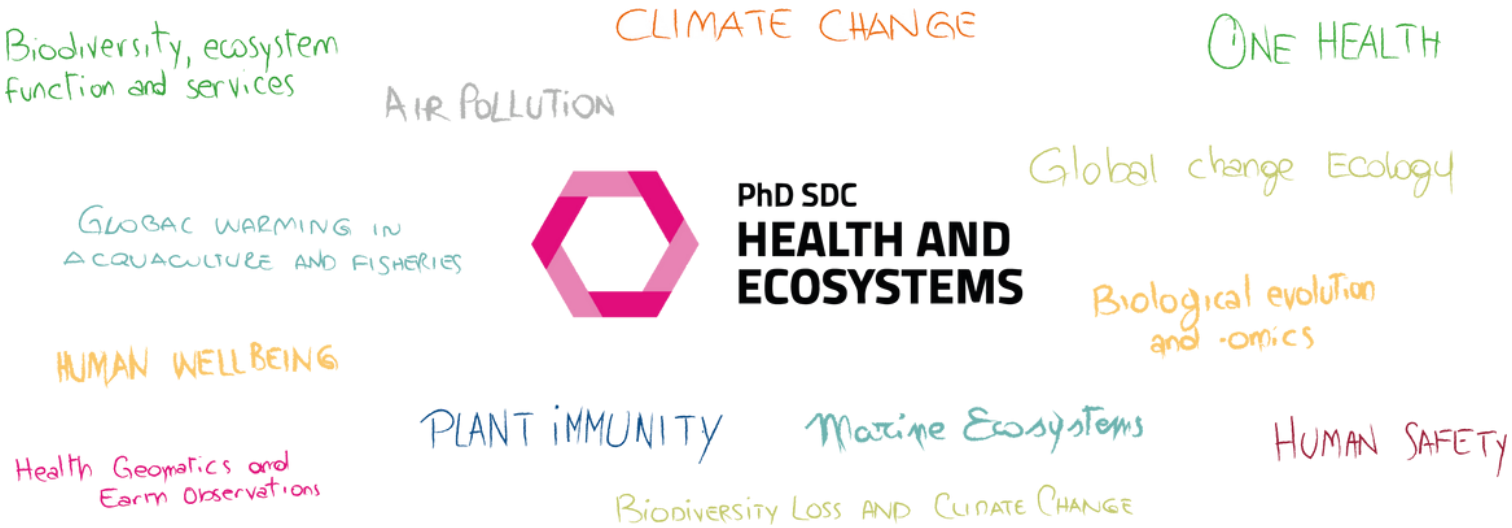
PhD SDC
SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE

The PhD in Sustainable Development and Climate change (SDC) is a 3 year nation-wide Italian PhD Project, which involves more than 100 students per year spread over more than 50 partner universities. The common goal of the PhD is to tackle Climate Change and its Consequences and to design and implement new solutions for a sustainable society. The involved students come from different backgrounds, countries and universities and are divided in six thematic curricula: *CU1- Earth System and Environment, CU2-Socio-economic risk and impacts, CU3-Technology and Territory, CU4-Theories, Institutions and Cultures, CU5-Agriculture and Forestry, CU6- Health and Ecosystems.*

The aim of this Newsletter, realised by CU6 students of the first cycle of PhD SDC, is to share their research activity and research-related topics of interest that will help to better understand and advance the common PhD goal of ensuring a Sustainable Development from the CU6 perspective of Health and Ecosystems.

TOPIC OF THIS NEWSLETTER

An introduction: Our backgrounds and expectations



These are the keywords belonging to each of our PhD projects, encompassing several disciplines and topics related with climate change, ecosystems and human health

ABOUT OUR CU AND THE NEWSLETTER TOPIC

By Vasudha Chaturvedi

This newsletter topic is “An Introduction- Research and Expectations”.
In order to properly start this project of sharing some of our research-related insights, we’ll provide you an introduction of what our Curriculum 6 is and on who we are, both as people and PhD students.
As we are aware, human interference and excessive exploitation of resources have led to major destruction to many ecosystems and environmental variables.

One obvious and clear example is what we call climate change. There is still unclear and insufficient evidence about how these changes have been hampered, to what extent, what are the direct and indirect implications of these changes to different ecosystem such as oceans, glaciers, permafrost, river water, flora, aquatic, terrestrial and micro-bacterial life, human health.

The CU6 curriculum is spread across an extensive range of disciplines, all focusing on climate change impacts on the ecosystem as a whole. The topics include research dealing with human health, oceans, flora, bacteria, cryosphere and diseases.
We aim at untangling the complexity of interactions among anthropogenic activities, climate change, ecosystems and human health and at answering and finding clues for the recurring questions mentioned above

NAME: Veronica

SURNAME: Nanni

FROM: Italy

GRADUATED IN: Scienze dei Sistemi Naturali, Università degli Studi di Genova

CURRENTLY WORKING AT: Istituto Universitario degli Studi Supreriori IUSS Pavia , PV

SPECIFIC MARKS: I'm a hiking and sailing fan

IMPACT OF MASS AND SOCIAL MEDIA ON PUBLIC PERCEPTION OF BIODIVERSITY

By Veronica Nanni

Ecologist, conservationist, young researcher. I work on human dimensions of wildlife conservation and management and my research focus on social and ecological aspects of the human-wildlife interactions. I had various international experiences, working in Slovenia at the University of Ljubljana, in Finland at the Finnish Museum of Natural History (LUOMUS) and in Spain at the Joint Research Institute for Biodiversity (IMIB).
I worked as a research fellow at the University of Turin studying human perception of underground ecosystems. I am currently a PhD candidate at the Italian national PhD program on climate change and sustainability. I also study ecology and habitat selection models for owls in urban areas and the concentration of pollutants in owls and their prey.

I investigate Human Dimensions of wildlife conservation and management. My research focus on social acceptance of human-wildlife conflicts and the role played by mass media and social media on risk perception.

I believe that communication is the most effective way to preserve human and ecosystem health.

News plays a major role in the human perception of wildlife and biodiversity. Most people have little direct experience with wildlife, and the mass media often becomes the means by which people connect with nature, thus their importance on transmitting reliable information to help species conservation. A balanced and accurate communication about health risk involving bats is fundamental to both mitigate the spread of diseases and render conservation efforts for bats more effective. These are the results that I will try to achieve with my PhD project

Here are my publications: https://www.researchgate.net/profile/Veronica-Nanni.

NAME: Daniela Maria

SURNAME: Rasà

FROM: Italy

GRADUATED IN: Sanitary Biology, University of Catania

CURRENTLY WORKING AT: Neuroscience Institute Cavalieri Ottolenghi, Department of Neuroscience "Rita Levi Montalcini", University of Turin

SPECIFIC MARKS:I love movies, spinning and sea

UNRAVELLING THE EFFECT OF A STRESSFUL LIFESTYLE ON AMYOTROPHIC LATERAL SCLEROSIS ONSET AND PROGRESSION

By Daniela Maria Rasà

I am from Catania where I lived until 2018, when I moved to Turin searching for new professional challenges. Although far from my hometown and missing the sea, I continued to cultivate a big passion… that for nature! Indeed, I regularly explore the Piedmont hills and mountains for long walks.
I graduated in biology at the University of Catania and during those years, I approached the neuroscience field, since I was involved in several projects focused on brain tumors and neurodegenerative diseases. In Turin I had the opportunity to take part in an ambitious Telethon project dedicated to the identification of new therapies for spinal muscular atrophy.

These personal and professional experiences helped me to understand the value of the environment in which we live and to reflect on the positive (or negative) effects that it could induce on ourselves. Therefore, I took advantage of this PhD program to investigate the effects of external factors (environmental and social) on our well-being and on the development of neurodegenerative diseases.

The goal of my project is to study a correlation between stressors and onset/progression of Amyotrophic Lateral Sclerosis (ALS), a severe neuromuscular disease.
I will assess the stress effects on in vitro ALS models, unraveling the triggered cellular and molecular mechanisms. I will also study in vivo the expression of several ALS-related genes in presence/absence of stress. Then, I will correlate the gene expression with neuroinflammation, ROS production, neuron structural alterations, mitochondrial activity, and motor behavior of ALS mice.
The project aims to demonstrate that lifestyle is a key aspect in well-being: a healthy and relaxed life could be fundamental to prevent disease onset. My ambition perfectly fits with the SDG3, aimed at "ensure healthy lives and promote well-being for all at all ages".

NAME: Chiara

SURNAME: Casiraghi

FROM: Bulciago (LC), Italy

GRADUATED IN:
Environmental Sciences
University of Insubria

CURRENTLY WORKING AT:
Department of science and high technology (DISAT), Università degli Studi dell'Insubria, CO

SPECIFIC MARKS: Mountains, Trekking, children's educator, curling player and volleyball referee

ACTION TI RESTORE ALPINE GRASSLAND HABITATS TO MITIGATE THE IMPACTS OF CLIMATE CHANGE

By Chiara Casiraghi

I am 24 years old and originally from a small town near Lecco in the Manzonian Pre-Alps. I studied languages in high school and then completely changed my path by enrolling in the Faculty of Environmental Sciences at the University of Insubria in Como. I have always had a passion for nature since I was a child, especially when every Sunday I went to the mountains with my family for walks. In my free time I run a mountain association together with my friends, I am a city councilor and a volleyball referee.

During my college years I had the opportunity to have numerous experiences in the field. I did both of my theses in one of the most beautiful places in the world, the upper Valtellina. Here I had the opportunity to begin to understand the impacts of climate change on alpine vegetation, the subject of my doctoral project. During these years I learned different methodologies and began to look at this environment with different eyes.

I enrolled this PhD program to give continuity to what I already studied and to get a broader view of what current climate change is.

My project has as its main focus the **adaptation and mitigation of climate change impacts** in an area where impacts on vegetation are evident, through the **removal of shrubs**, which have a well-established expansion in alpine grasslands. This input causes significant alterations and positive feedbacks related to carbon dioxide emission. The cutting intervention would return the environment to the conditions of the early 1990s, when shrub expansion was already occurring but limited.

This project will achieve the following specific goals: (I) The activation of negative feedback with respect to climate change by increasing the storage capacity of atmospheric CO2 by plant ecosystems. (II) Promoting climate change adaptation and mitigation by counteracting one of its main impacts in Alpine areas. (III) Promoting the adaptation of alpine species by restoring the state of state of plant biocenosis to the conditions of the early 1990s. (IV) Promoting knowledge and awareness of citizens and the local social environment about the problems related to the impacts of climate change in areas characterized by high ecological fragility.

NAME: Simone

SURNAME: Giachello

FROM: Italy

GRADUATED IN: Nature Sciences, Università di Milano

CURRENTLY WORKING AT: Department of Environmental Science and Policy - Università degli Studi di Milano, MI

SPECIFIC MARKS: Nature lover with a soft spot for herpetofauna, trekker, photographer

BIODIVERSITY OF COMMUNITIES EMERGING AFTER THE RETREAT OF GLACIERS ANALYZED THROUGH ENVIRONMENTAL DNA

By Simone Giachello

Born in Milan, and now living in the Bergamasque Alps, I've always been fascinated by nature. Motivated by an irrepressible desire to learn more about the environment, at 20 years old, I drastically shifted my university studies from Computer Engineering to Nature Sciences. Sincethen, I constantly feed and grow my passion for nature at 360 degrees combining different activities such as scientific research, trekking, and photography.

My academic years have been plentiful of miscellaneous experiences, among which: studying a pack of wolves in Piedmont, working in the Danube Delta as a Nature Guide, visiting tens of Sardinian caves to study cave salamanders, or monitoring amphibian communities to identify the drivers influencing their population dynamics. All these experiences, together with the university courses, made me realize how complex are nature dynamics but also how our everyday life impacts and is impacted by the environment we live in

The strict interrelation between humanity and ecosystems is one of the main reasons why I decided to continue my career in the research sector, to try to understand the consequences of our actions on nature and therefore how to limit our impact on the environment. To do so, my PhD is focusing on one of the most threatened environments on Earth, glaciers. Glacial environments are notoriously among the other habitats the most affected by climate change, rising temperatures are reshaping these fragile ecosystems and the impact on biodiversity is still not clear. Using a dataset composed by a wide range of soil organisms (bacteria, protists, fungi, plants, and animals) collected in 1448 soil samples from 48 glacier forelands all around the world, I aim to understand how soil communities develop along the ecological successions occurring after glacier retreat, with a particular focus on the drivers influencing changes in biodiversity.

NAME: Vasudha

SURNAME: Chaturvedi

FROM: India

GRADUATED IN: Geo-Information Science and Earth Observation, ITC, University of Twente

CURRENTLY WORKING AT: Theoretical and Applied Sciences- University of Insubria

SPECIFIC MARKS: Swimmer, Hiker, bird watcher and yoga practitioner

RELATIONSHIPS BETWEEN CLIMATE CHANGE, PERMAFROST AND ECOSYSTEMS IN ALPINE PERIGLACIAL, PROGLACIAL AND GLACIAL ENVIRONMENTS

By Vasudha Chaturvedi

I come from a small city in the foothills of Himalayas (kashipur, uttarakhand) India. I mostly studied in a boarding school and, during winter and summer breaks, I used to join my father for treks which led to my interest in wildlife, ecosystems and climate change.
I graduated in Geography at Delhi University, India. After that, I worked for a wildlife institute and sanctuary using remote sensing data and I then interned with Indian Institute of Remote sensing over permafrost modeling in Western Himalayan region. This internship made me realize the importance of permafrost, greenhouse gas emissions and climate change effects on it. Thus to improve my skills and knowledge over remote sensing techniques and how it can be used for permafrost modeling I did my masters at ITC, University of Twente and wrote my thesis on emissions from permafrost.

My PhD topic can be considered a continuation of my master thesis and internship.

My study area consists of two regions: Stelvio Pass (Italy) and Alaska. The project I am working aims to attain these objectives: (I) Modeling of permafrost extent over both the study area and study the changes which occurred there over the past years (II) Identifying the factors that contribute to the active layer changes in the permafrost. (III) Modeling active layer dynamics with response to change in surface temperature. (IV) Assess how the changing dynamics of the active layer is affecting carbon dioxide and methane gas emissions. (V) Identify the environmental variables which cause variations in the emissions of these gasses with abrupt thawing. (VI) Carrying out field measurements to measure active layer, CO2 and CH4 emissions to validate the modeled estimates in Alaska.

Here relevant publications:
https://doi.org/10.3390/rs13214403

NAME: Simone

SURNAME: Palazzolo

FROM: Italy

GRADUATED IN: Veterinary Medicine, Università degli Studi di Messina

CURRENTLY WORKING AT: Università degli Studi di Messina; ME.

SPECIFIC MARKS: I'm 198 cm tall and NO, I DON'T PLAY BASKETBALL

EVALUATION OF THE RISE IN TEMPERATURE ON THE VER'S EPIDEMIOLOGY, IN THE CLIMATE CHANGE'S PERSPECTIVE

By Simone Palazzolo

I'm Simone and I'm from Modica, a small town in Oriental Sicily. I'm 26 years old and I have an irrepressible passion for animals, plants and in general for nature in its entirety.

I graduated to the High School "Principi Grimaldi" in Modica as a Agriculture Technician. In 2021 I got a single-cycle Master's degree in Medicine Veterinary in Messina with the following thesis: "Health monitoring and reproduction of Tilapia (Oreochromis niloticus) under controlled conditions. Evaluation as a potential medical-surgical tool for skin lesions treatment". Then I worked as Veterinary in an animal hospital in Brescia for 3 months, just before the PhD.
Now I'm working in the "Università degli studi di Messina". I chose this PhD because in my life I've been always really sensible, careful and interested in environmental's problems and also about climate change and all the effects on the ecosystems.

I think that my background is really related to this PhD. My degree's thesis had two main purposes: the first is to reduce the impact of Tilapia's breeding through the employment of a waste product, like the skin for medical use; the second one was to follow a complete health monitoring in order to deep in knowledge different pathologies and to allow to the breeders to reduce the fish mortality and morbidity.

My PhD project has the main purpose to understand how the rising temperature could influence the pathogenesis and the epidemiology of an important pathology called **VER** (Viral Encephalo-Retinopathy), which, as mortality percentage, it's one of the pathology with the greater impact on sea breams and European sea bass farms.

NAME: Hiba

SURNAME: Abyaba

FROM: Rabat- Kingdom of Morocco

GRADUATED IN: Marine Bio-Ecology; Faculty of - University of Cagliari

CURRENTLY WORKING AT: Marine Biology Ecology Laboratory, University of Cagliari (CA)

SPECIFIC MARKS: Muslim

VULNERABILITY TO CLIMATE CHANGE MANIFESTATIONS OF THE MEDITERRANEAN SEA SPECIES, HABITAT AND ECOSYSTEM FUNCTIONS

By Hiba Abyaba

Born and raised in Morocco, science has always been part of my life. I graduated from the University of Mohammed V, Rabat, Morocco, in Health Biology – Neurosciences. I transferred at 21 years old to Italy to pursue my passion for environment protection. After my Master's degree in Marine Bio-Ecology in the University of Cagliari, I couldn't miss the chance to be part of the PhD-SDC, as it expresses exactly the approach I aim for in the future. The multidisciplinary aspect and the cultural diversity in this PhD are indeed advocates for international cooperation. Gathering forces to protect our ecosystems will increase chances for better mental and physical health.

My PhD project focuses on bridging science-based evidence to policy makers and stakeholders to fulfill knowledge gaps of the ecological performance of species, habitats and ecosystem functions, in order to make the most adequate decisions regarding our planet. Therefore, I've been involved in two different research projects led by my supervisor professor Antonio PUSCEDDU

The first project deals with the implementation of the Strategy of Adaptation to Climate Change of the Sardinia Region. Within this project, using a metanalytic approach, I created a large dataset from the literature, by which, in collaboration with researchers at the University of Palermo, I extracted the relevant data about key life traits of selected marine species putatively affected by sea warming, and I used them to construct the first empirical (correlative) thermal performance curves that pave the way to, next, create habitat suitability maps under current temperature regimes and future IPCC scenarios.

The second project is a Project of Relevant National Interest (Call 2017) focused on "Marine habitats restoration in a climate change-impaired Mediterranean Sea". I've been asked to set up a series of manipulative experiments in mesocosm aimed at assessing the vulnerability of echinoderms to either sea warming and marine heat waves. These experiments aimed to assess the trophodynamic role of these animals under different temperature regimes and after marine heat peaks.

NAME: Silvia

SURNAME: Maritano

FROM: Italy

GRADUATED IN: Medicine, Università degli Studi di Torino

CURRENTLY WORKING AT: Epidemiology Department- Università degli Studi di Torino

SPECIFIC MARKS: Yoga teacher, creative activities and handcrafting enthusiast

CLIMATE CHANGE AND CHILD HEALTH: AN ASSESSMENT OF EXPOSURE AND OF LIFESTYLE /DIET RELATED MITIGATION OPTIONS

By Silvia Maritano

I grew up and still live near Turin, in a small town in Susa Valley, where I'm used to going hiking and exploring the nature which surrounds it. I would define myself as an active person but I also like to observe, and what I enjoy to observe the most is the relationship between human civilization and the natural systems in which it lives.

I studied medicine and I spent one beautiful year of Erasmus in Slovenia, where, due to volunteering experiences and environment conservation-related projects, I started to wonder about including my interests (in particular Climate Change) in my professional life. Thus, when I came back to Turin I started to work on my thesis project, in the Epidemiology department. Here I had the opportunity to study Environmental Epidemiology, write my thesis on pesticide exposure and respiratory health, and most importantly to study the climate change consequences on human health. For this reason I worked one year in the department, following the RIAS (Rete Italiana Ambiente e Salute) project, before applying for this PhD.

My PhD project is bringing together what I've been studying and interested over the past years, dealing with two projects, which focus on child health from two different perspectives.
(I) The first deals with mitigation and will calculate the diet-related impact (in terms of Greenhouse Gas emission and Land Use) of a child cohort and examine its relationship with child growth parameters, in order to identify dietary changes which are able to *co-benefit* human and environmental health. (II) The second aims at characterizing the human climate-related *exposome* (i.e. the totality of environmental exposures individuals face during their lifetime). We will examine the exposure of an Italian child cohort to different climate change related events. We will analyze how this exposure is changing over time and how this differential exposure (over time and space) is impacting on child health.
In both projects we are examining the role of the socio-economic context in shaping those relationship and possibly determine differential impact and effects.

NAME: Carlotta

SURNAME: Santolini

FROM: Italy

GRADUATED IN: Marine Biology, Università Politecnica delle Marche (Univpm); AN

CURRENTLY WORKING AT: Ecotoxicological Laboratory of Water Ecosystem; University of Insubria, CO

SPECIFIC MARKS: Scuba Diver Instructor, Ocean Ambassador for the UNESCO, Young Ocean Advocate for the EU commission

THE NATURAL ARCHIVE: SEDIMENTS CORE TO INVESTIGATE THE CLIMATE CHANGE EFFECTS (COMO LAKE)

By Carlotta Santolini

I was born and grew up in Rimini and I've spent my whole life close to the sea. When I was young I used to sail and now I am a scuba diver instructor whose first aim is to teach how to respect the Sea and the underwater ecosystem. For 2015 I've been working as a volunteer for Fondazione Cetacea an environmental education Onlus in Rimini involved in citizen science projects, whose aim is to take care and free Sea turtles captured by fishermen and bycatch. I graduated during Covid pandemic and since I couldn't leave for my thesis project in the Indian Ocean I've managed to work with the Sea closer to Italy.

In 2021 I lived 3 months on board of a sailing boat where I was the Responsible for the Research and Divulgation activities. I sailed along the Italian coast to collect data about climate change and alien species both underwater and interviewing the fishermen. When I got back I founded a project called "Blueat" that allows me to attend lots of events both in Italy and abroad to spread the problems of these species brought by anthropogenic impact.

I decided to attend this PhD program to specialize my studies into Climate Change and to collaborate to the Agenda 2030 as much as possible. This is a great opportunity to create a network with other people to achieve the GES. My PhD project relates a lot with my background since I am working on Sediments Core to Investigate the Climate Change Effects in the last 150 years of Como Lake. Our main goal is to obtain, with paleolimnological analysis, a time series of data to understand if an anthropogenic impact occurred in time.
My goals are to analyze: (I) Climate Change effects: assess whether there are clear impacts due to climate changes through observations of temperature, community changes and contamination (II) Microplastics: I'll carry out analyses of the microplastics both in the collected sediments and zooplankton samples in order to see if there has been an evolution during years. (III) Micro pollutants :Since in past studies the analysis of the main contaminants have already been done, we can make new analysis to compare the changes due to the anthropic impact

NAME: Tosin

SURNAME: Afeniforo

FROM: Nigeria

GRADUATED IN: Zoology; Universty of Ibadan

CURRENTLY WORKING AT: Applied Biology and Experimenta Medicine/University of Messina; ME

SPECIFIC MARKS: Climate Activist

MICROPLASTICS AND CLIMATE CHANGE: POTENTIAL THREATS TO HUMAN HEALTH

By Tosin Afeniforo

I grew up in southwestern Nigeria which is graciously endowed with nature. My love for nature and science encouraged me to study zoology at the university. I continued my graduate studies in climate change with a focus on climate change and health, climate change and biodiversity conservation, and ocean conservation. After my graduation, I, therefore, picked up an interest in climate advocacy and I have been active for about 4 years in lending my voice to the vulnerable and pushing for climate justice in rural communities.

I was motivated to join the National Ph.D. Program in Sustainable Development and Climate Change (Ph.D. SDC) because it emphasizes my research interest and career path. Ph.D. SDC allows for international cooperation and its multidisciplinary approach to tackling climate change and providing sustainable solutions to various sectors affecting human life is a plus for me.

My research work under the Ph.D. SDC is designed to investigate the combined effects of microplastic ingestion and climate change on marine organisms.
Recently, the increasing discharge of microplastics into the oceans has been a major concern globally. Hence, there comes the need to study its effect on both marine and human life in the phase of changing climate.

The project is expected to show the level of accumulation and abundance of microplastic ingestion in studied organisms. We are also aiming at unraveling the potential effects of multiple stressors (i.e. microplastic ingestion and induced climate change effects) on those studied organism.

SPECIAL THANKS TO:

The CU6 coordinator Prof. **Denis Sarigiannis** and Dr. **Antonios Statidakis** for the Newsletter ideation and conceptualization.

Dr. **Marcello Arosio** and the **PhD- SDC communication team** for the supervision and the technical support

USEFUL LINKS

Instagram PhD page: https://www.instagram.com/phd_sdc/

PhD website: