



Maria and Chucao's journey:

**An opportunity
to understand
planetary health**

Yasna Palmeiro Silva and Rocío González Tapia
Illustrations Paula Bustamante Jaña



MÁS UNIVERSIDAD

Cátedra UNESCO
Educación Científica
para la Ciudadanía



unesco

Cátedra



Centro de Comunicación
de las Ciencias

Universidad Autónoma de Chile

GEA
Salud
Planetaria



HELLO! I AM A CHUCAO, A BIRD FOUND ONLY IN THE SOUTHERN FORESTS OF SOUTH AMERICA. I AM HIGHLY SENSITIVE TO THE DESTRUCTION OF THE FORESTS WHERE I LIVE, AND MY SONG ENRICHES THE HUMID LANDSCAPES OF CHILE AND ARGENTINA. IN THE YEAR 2023, THE PEOPLE OF CHILE CHOSE ME AS THE "AMBASSADOR OF CHILEAN WILDLIFE 2024" THROUGH AN OPEN VOTE ORGANISED BY THE JANE GOODALL INSTITUTE-CHILE.

I INVITE YOU TO JOIN ME ON THIS JOURNEY, WHERE WE WILL LEARN MORE ABOUT THE CLOSE LINKS BETWEEN HUMAN HEALTH AND THE HEALTH OF OTHER SPECIES AND THEIR ECOSYSTEMS. LET'S GO!



Maria and Chucao's journey: An opportunity to understand planetary health

Yasna Palmeiro Silva and Rocío González Tapia

First edition: March 2024

Santiago, Chile

© Universidad Autónoma de Chile

Vicerrectoría de Investigación y Doctorados

Avenida Pedro de Valdivia 425, Providencia

Santiago, Chile

Texts: Yasna Palmeiro Silva and Rocío González Tapia

Illustrations and scripting: Paula Bustamante Jana

Design and layout: Paula Bustamante Jana and Paulo González Ibarra

Front page design: Pedro Díaz Muñoz

Editorial and text correction: Rocío Jana Prado, Isidora Sesnic Humeres

Coordination: Nataly Venegas Zúñiga and Gisel Pérez Barahona

Digital ISBN: 978-956-417-025-1



This material can be copied and redistributed by any medium or format, and can also be remixed, transformed, and created from the material as long as the authorship is properly acknowledged and the contributions are disseminated under the same licence as the original material.

Presentation

Gea, Planetary Health is one of the four Scientific Culture Programmes of the Science Communication Centre of the Universidad Autónoma de Chile, which seeks to establish the concept of planetary health in the public conversation, helping to understand the relationship between the degradation of human health and that of the different natural ecosystems, using didactic formats that are close and clear to people.

The book *Maria and Chucao's journey: An opportunity to understand planetary health* uses a simple narrative, with an endemic bird from the temperate forests of south-central Chile as the protagonist. Through a trip through the city, Chucao explains to María different concepts of planetary health and how climate change also affects the quality of life of people and other species.

This material reflects on the intricate processes between the planet's natural systems and human beings, including the deep relationship between species and the natural environment. This book seeks to raise awareness of the changes we must make, as a civilisation, to take care of ourselves, our environment, and the planet.

Science Communication Centre Team
Vice-Provost for Research and Doctorates
UNIVERSIDAD AUTÓNOMA DE CHILE

ANY DAY, ANY CITY...





NO, NO, DO NOT
WAIT FOR ME...

/ AM ONE HOUR
AND A HALF AWAY



YES, I CAME BY CAR
TO MAKE IT QUICK

... OK, SEE YOU LATER,

BYE

WF, IT'S
SO HOT!





MY GOSH,
SO MANY CARS TODAY!



HOW STRESSFUL!
I JUST WANT
TO GET HOME...



HI MARIA...



WHAT'S UP?



AM I HALLUCINATING...



OR ARE YOU REAL?



BUT...
YOU SPEAK!

EVIDENTLY, MARIA.
I AM REAL!



YES BECAUSE I AM THE
AMBASSADOR OF THE
CHILEAN FALUNA

AND BECAUSE WE
ARE IN A COMIC, OF
COURSE

MMM, IS IT NOT BECAUSE
I AM DEHYDRATED, AND MY
BRAIN IS TRICKING ME?





DON'T SPEAK NONSENSE,
MARIA!

I'M HERE TO SPEAK ABOUT
PRACTICAL THINGS...




OH, HUMANS, YOU'RE SO
SPECIAL...


BUT YOU KNOW
WHAT?



AS AN AMBASSADOR,
I HAVE OBSERVED A
LOT...



CITIES AND TRAFFIC
CONGESTION... IT WAS
NOT ALWAYS LIKE THIS.



ALL THIS HAS BEEN
UNDERGOING OVER THE
YEARS.





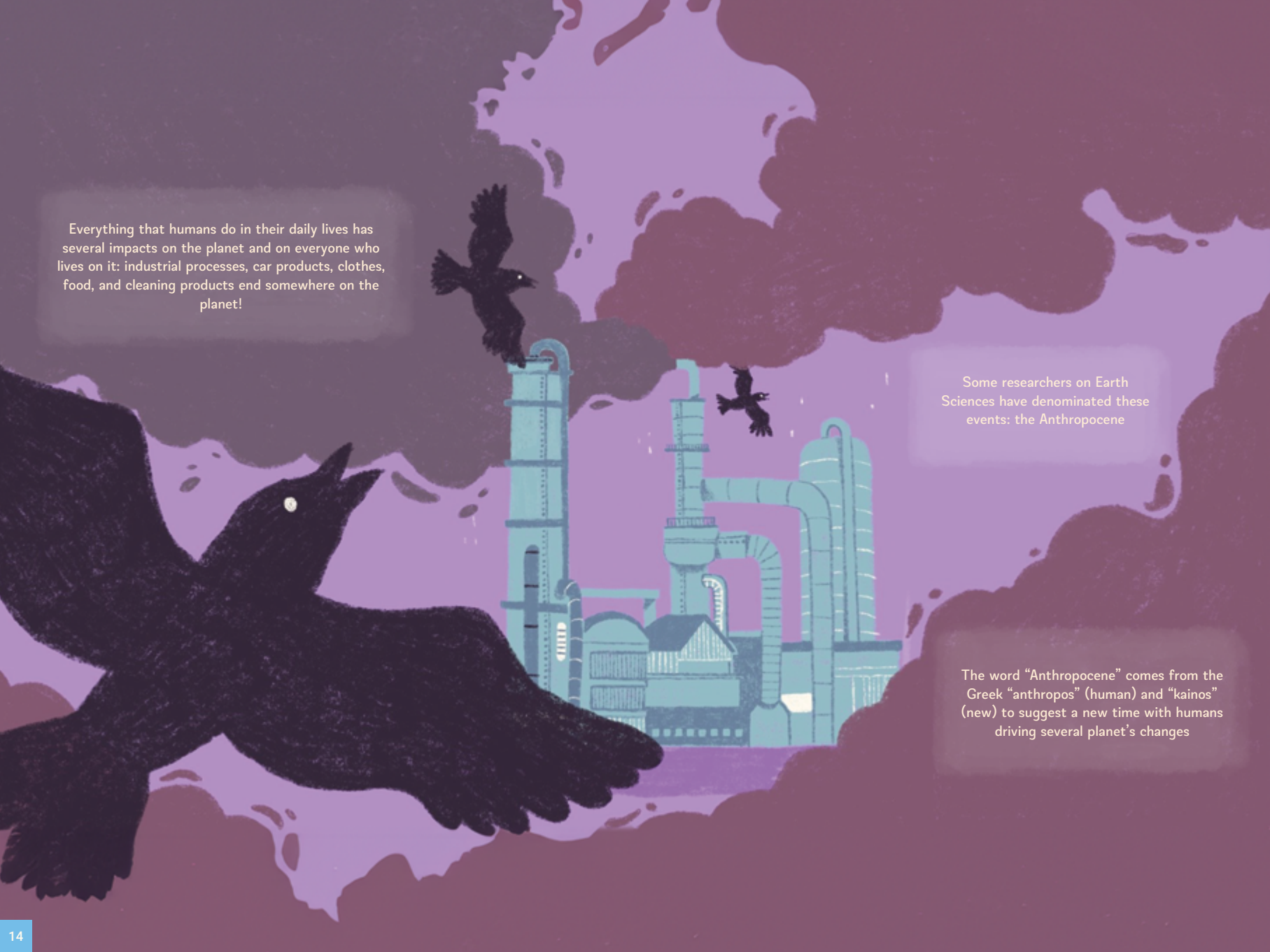
The Earth has always been changing; however, changes have been accelerating since the last century due to human activities

This period is known as "the Great Acceleration"

From plants and animal domestication, going through industrial revolution and technology introduction, humans have quickly changed how the Earth works

ARE YOU SAYING THAT ALL THIS IS RELATED TO TRAFFIC JAMS, NOISE, AND POLLUTION?

YES, I AM

An illustration of a factory with several tall smokestacks emitting thick, dark grey smoke that fills the upper half of the frame. In the foreground, three black birds are shown in flight. One large bird is on the left, facing right with its wings spread. Two smaller birds are positioned higher up, one near the top left and another near the top center, both facing right. The background is a solid light blue color.

Everything that humans do in their daily lives has several impacts on the planet and on everyone who lives on it: industrial processes, car products, clothes, food, and cleaning products end somewhere on the planet!

Some researchers on Earth Sciences have denominated these events: the Anthropocene

The word "Anthropocene" comes from the Greek "anthropos" (human) and "kainos" (new) to suggest a new time with humans driving several planet's changes



These changes are so rapid that the planet cannot “replenish” itself or “recover”, so to speak.

Forests are transformed into cities, crops, or deserts

Tons of plastic, technology waste, and disposable clothes are daily produced... all these actions have severe consequences to the health of the planet, and to the health of humans, too!

Does it sound like the planet is getting sick?

The worst part is that a sick planet affects the health of all of you, humans, but many do not realise!

Everything is connected. The wellbeing of all depends on the health of the environment.



WOW, YOU'RE SO CLEVER, CHUCAO! YOU KNOW SO MANY THINGS



BUT... I JUST DON'T UNDERSTAND HOW ALL THESE CHANGES IN THE ENVIRONMENT ARE LINKED TO MY HEALTH AND PEOPLE'S HEALTH.

An illustration of a blue bird with an orange belly standing on a rock and speaking to a person. A speech bubble from the bird contains the text: "OK, LET ME GIVE YOU SOME EXAMPLES". The person is shown from the chest up, with a surprised or attentive expression. The background is a solid light orange color.



Today, we are witnessing an anthropogenic climate change, which is caused by deforestation and the large amount of greenhouse gases that humans are emitting by burning fossil fuels, such as oil and natural gas.

Fossil fuels, including oil, coal, and natural gas, have been formed from the accumulation of large quantities of organic remains from dead plants and animals

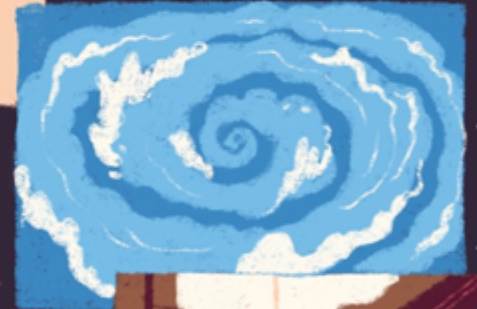
These gases include carbon dioxide, nitrous oxide, and methane, among others. These trap heat in the atmosphere, generating the greenhouse effect, like greenhouses. An excess of these gases in the atmosphere, however, makes the planet much warmer than normal

As the Earth warms and does not release all the heat, this triggers changes in the climate system,

Affecting the clouds, oceans, soil, glaciers, and forests

Everything is unbalanced!

And these changes affect us, you, and every single live organism!



I'm not sure you've heard, but a huge heatwave happened in January...

Several people had cardiovascular problems



Others fainted while running a marathon



And some workers were unable to do their jobs




Even Jose, your neighbour, had to go to the A&E room because he was feeling unwell



Fortunately, healthcare workers were prepared and took good care of him



Extreme heat also increases the risk of mental health problems, injuries, and even death among certain vulnerable groups and species.




WOW, WHAT A
MESS, CHUCAO? /
UNDERSTAND, BUT WHAT
CAN / DO?

/ LIVE VERY FAR FROM
WORK, AND / ALSO
TAKE MY CHILDREN TO
THE SCHOOL THAT IS
HALFWAY THERE

/IT'S NOT LIKE / CAN
SWITCH TO A BIKE THAT
EASILY

THIS IS WHERE
AUTHORITIES AND
URBAN PLANNING PLAY
A FUNDAMENTAL ROLE

CITIES, WITH THEIR GROWING
DEMAND FOR GOODS AND SERVICES,
ARE GENERATING NEGATIVE IMPACTS
ON THE ENVIRONMENT, WHICH IN
TURN AFFECTS THE HEALTH OF THEIR
INHABITANTS



A lot of rubbish is generated in cities, and there are few green spaces and trees

This, together with lots of buildings and streets made of cement and asphalt, increases the ambient temperature, generating urban heat islands

I COULDN'T FIND A SINGLE WORM, I CAN'T TAKE IT ANYMORE!

THE SQUARE HAS LITTLE VEGETATION AND NO SHADE. THERE ARE NOT EVEN BUGS!

BUT ZORZAL, DON'T YOU WATCH THE NEWS? ONE THIRD OF THE FOOD HUMANS PRODUCE IS WASTED.

LET'S GO TO THAT DUMP AND SEE WHAT WE FIND!

These are poorly planned cities



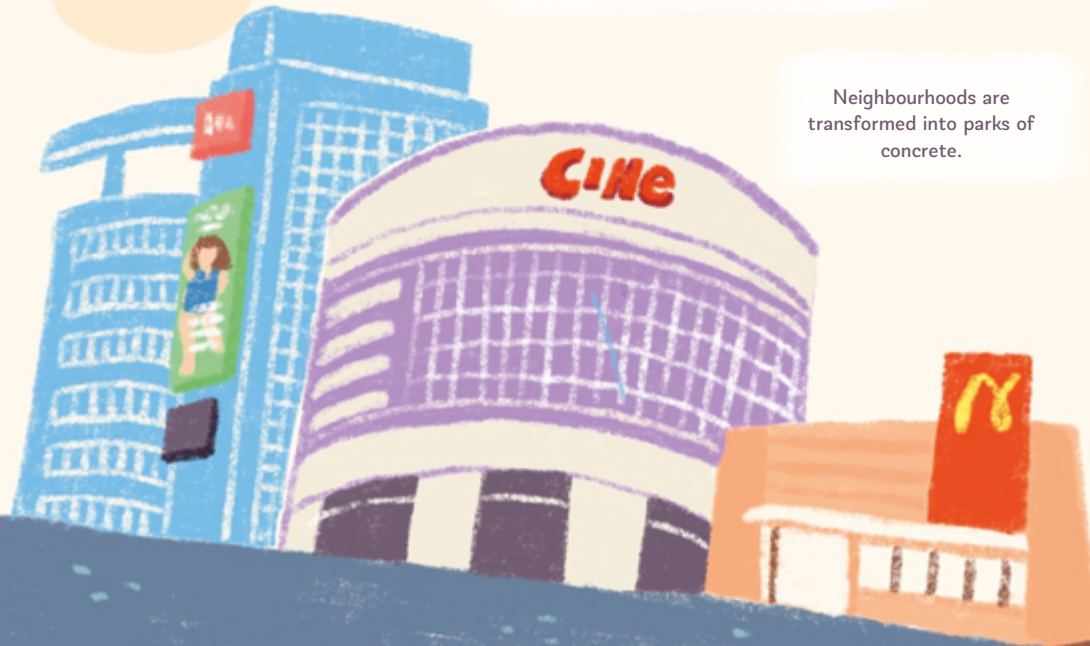
SURELY YOU ONLY HEAR
THE SPARROWS IN YOUR
WINDOW, AND THEY ARE
NOT EVEN FROM HERE!

IT'S TRUE, CHUCAO

When cities are poorly planned,
the quality of life of people and
all biodiversity decreases.

People do not move actively, they do
not walk, everything looks grey... kind
of ugly
Birds, insects, trees, and parks also
disappear...

Neighbourhoods are
transformed into parks of
concrete.





MOST LARGE CITIES, LIKE THIS ONE, DO NOT ALLOW GETTING AROUND BY BICYCLE OR WALKING


SO, IT IS EASIER TO DO ACTIVITIES WITH FEWER HEALTH BENEFITS.

WOW, I HADN'T THOUGHT OF THAT!





YOU'RE RIGHT! WHERE I LIVE, WE DON'T HAVE ANY NICE PARKS OR SQUARES WITH TREES TO SIT UNDER OR COMFORTABLE BENCHES


THERE ARE NO MORE INSECTS THAN COCKROACHES AND FLIES IN THE GARBAGE!



MARIA, DID YOU KNOW
THAT INSECTS WORK A
LOT FOR THE PLANET?



There are many insects that, if they
did not exist, there would not be the
full variety of fruits and vegetables
that people can enjoy every day.



Some insects, such as bees and
native flies, are called “pollinators”:
they move pollen between flowers of
a particular plant, promoting fruits to
be formed.

Humans are many and you are almost
everywhere. If insects continue to
disappear, there will be less food
available, increasing food insecurity risks
that will harm everyone



Another example of how the planet gets sick is because of how economic and productive systems are designed.

In nature, waste does not exist, everything follows a circular process. Humans created another system in which they extract raw materials, produce, consume, and then discard.

However, the resources that can be obtained from the planet are limited, as is the amount of rubbish that can be received.





Rubbish does not disappear when we stop seeing it: plastics turn into microplastics and chemicals contaminate aquifers

Everything remains on the planet but changing. We must understand that the imbalance of one system affects the development of others.

If we take care of planet, we will be taking care of ourselves. This idea was called Planetary Health: a healthy planet means healthy people

For this, we need a Planetary Health lens: working together because every action counts

Governments must develop intersectoral policies that support people to live more sustainably

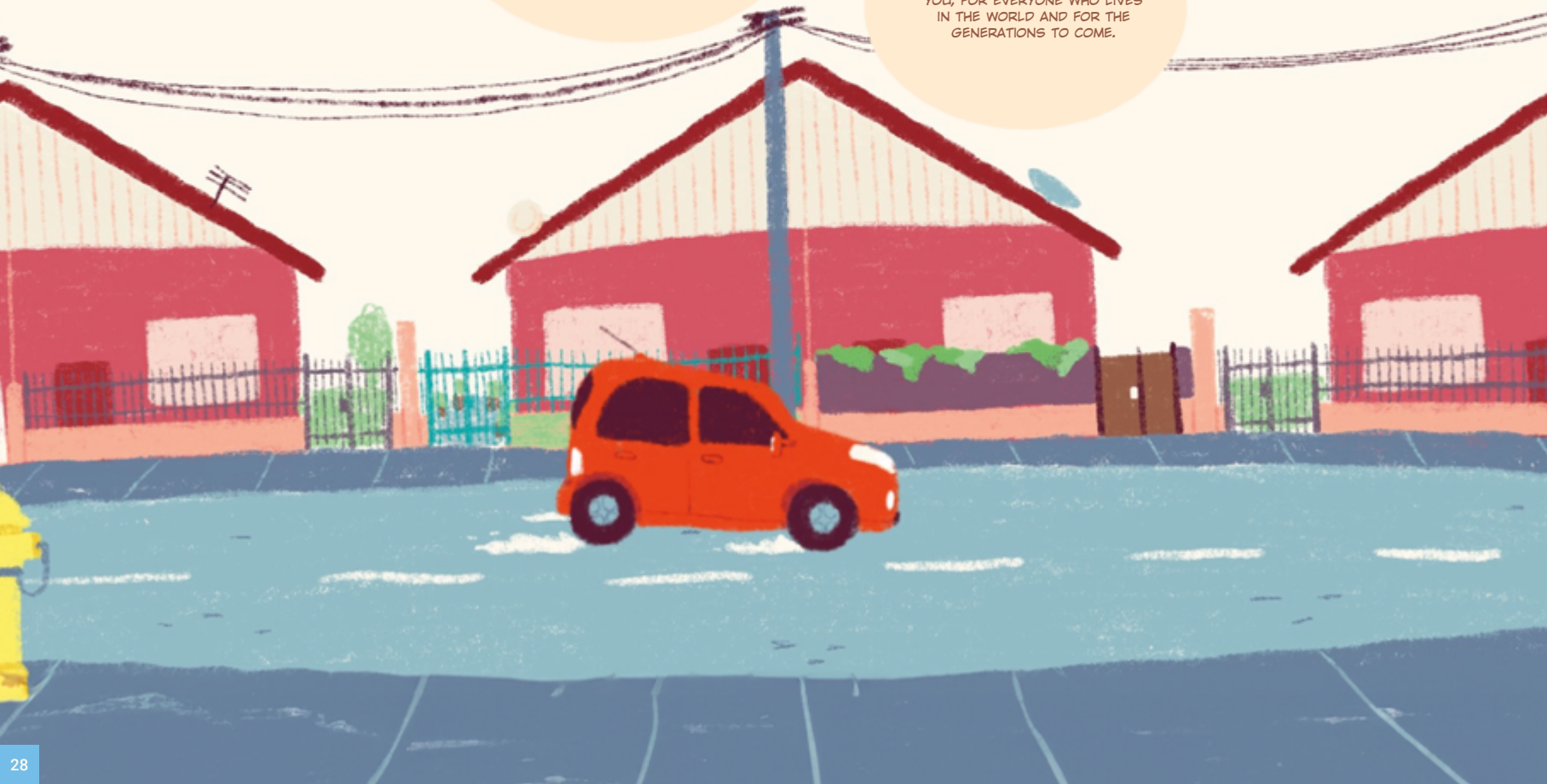
...and people, working in their neighbourhood and community organisations, can promote sustainable development,

Having in mind that human health and wellbeing go hand in hand with the health of the planet!



TOGETHER, THE FUTURE DOESN'T
LOOK SO GREY, CHUCAO. I WILL
TALK TO MY FAMILY, NEIGHBOURS,
AND THE WHOLE COMMUNITY
ABOUT PLANETARY HEALTH

LET'S DO THIS FOR ME, FOR
YOU, FOR EVERYONE WHO LIVES
IN THE WORLD AND FOR THE
GENERATIONS TO COME.





...PLANETARY
HEALTH...



WE ARRIVED AT MY
HOUSE, CHUCAO, TIME
FLEW BY

DO YOU WANT
TO COME IN?



LET'S LEAVE IT FOR
ANOTHER TIME, MARIA, I
HAVE A LOT TO DO AS A
WILDLIFE AMBASSADOR.



MOM!

FINALLY, YOU
GOT HERE!



LOOK, YOU WON'T
BELIEVE WHO
I'M GOING TO
INTRODUCE YOU TO.



TO WHOM?

TO WHOM?



TO CHUCAO, THE
NEW AMBASSADOR
OF CHILEAN FAUNA!





SERIOUSLY KIDS, I CAME ALL
THE WAY LEARNING ABOUT
PLANETARY HEALTH AND HOW
EVERYTHING IS CONNECTED!



LIKE MULTIVERSES?



NO, NOT LIKE THE
MULTIVERSES, HE, HE,
BUT ON THE PLANET





THE END

Basic concepts

WATER AND PLANETARY HEALTH

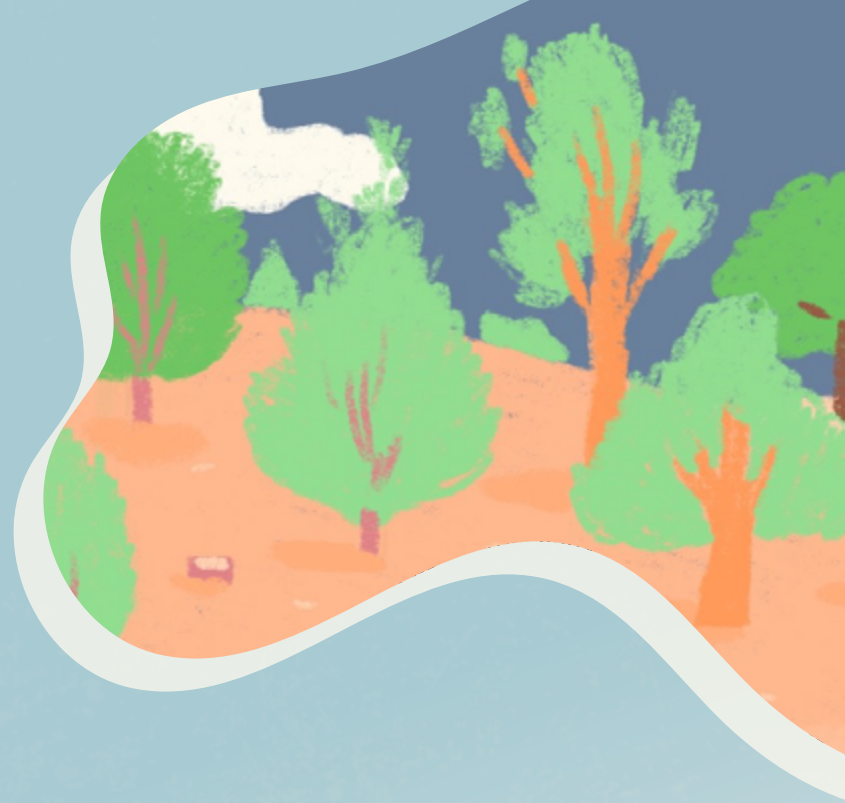
Chile has had drought periods throughout its history. However, since 2010, a severe drought has lasted longer and to a geographical extent never seen before, covering the regions of Coquimbo and La Araucanía. The scientific community decided to call it a megadrought.

ANTHROPOCENE

The global environmental changes and the human's footprint on the planet have been so large that the scientific community proposed calling these events "Anthropocene".

WASTE AND PLANETARY HEALTH

On average, a person ingests plastic equivalent to a credit card a week and a coat hanger a month. This is because rubbish, and particularly plastic, does not disappear when we stop seeing it. In nature, plastic break down into small particles called microplastics, which are already in the air we breathe and the food and water we consume. This affects people's health: it generates inflammatory diseases and some types of cancer.





ANTHROPOGENIC CLIMATE CHANGE

Anthropogenic climate change is a change in the usual climate as a result of human activities. This translates into much more adverse weather such as heatwaves, heavy precipitation events, or hurricanes. All this affects people's health.

BIODIVERSITY AND PLANETARY HEALTH

People's health depends on healthy ecosystems and natural systems. About 80 fruits and vegetables in our diet depend on pollinators (birds and insects that help plants reproduce by carrying pollen from one plant to another on their bodies).

SUSTAINABLE DEVELOPMENT

Sustainable development is a human development that meets the needs of the people living in the world today without compromising the resources of future generations. In addition, the social and environmental effects of this development, not just economic ones, are taken into consideration. To support a sustainable development, the United Nations created 17 goals that, we as humanity, must achieve by 2030.

ENERGY EFFICIENCY

Energy efficiency refers to reducing the amount of energy needed while maintaining the same level of activity. That is, it is doing more with less.

URBAN PLANNING AND PLANETARY HEALTH

The way cities are planned determines our health. Significant amounts of greenhouse gases are emitted by industries, heating systems, and transportation; large quantities of rubbish are produced; and green areas are exchanged for cement, losing biodiversity. All this affects people's health.

Additionally, cities determine what type of food we have access to (whether it is healthy or not) and promote (or not) physical activity and active lifestyles. Most cities are too large and have poor connectivity, encouraging the use of cars instead of public transport, replacing green areas with parking, and promoting sedentary lives.

PLANETARY HEALTH

Planetary health seeks to understand how the changes that human activities have generated in the environment affect people's health.

FOOD SYSTEMS

It includes all interrelated activities from production, processing, transportation, distribution, consumption, and disposal of food products that are originated from agriculture, forestry, fisheries, and food industries. It also includes impacts or outcomes on economic, social, and natural environments.



Bibliography

Whitmee, S., Haines, A., Beyrer, C., Boltz, F., Capon, A. G., de Souza Dias, B. F., Ezeh, A., Frumkin, H., Gong, P., Head, P., Horton, R., Mace, G. M., Marten, R., Myers, S. S., Nishtar, S., Osofsky, S. A., Pattanayak, S. K., Pongsiri, M. J., Romanelli, C., Soucat, A., ... Yach, D. (2015). Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation-Lancet Commission on planetary health. *Lancet*, 386(10007), 1973–2028.

[https://doi.org/10.1016/S0140-6736\(15\)60901-1](https://doi.org/10.1016/S0140-6736(15)60901-1)

Myers, S., & Frumkin, H. (2020). *Planetary Health: Protecting Nature to Protect Ourselves*. Island Press.

Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The trajectory of the Anthropocene: The Great Acceleration. *The Anthropocene Review*, 2(1), 81–98. <https://doi.org/10.1177/2053019614564785>

Rockström, J., W. Steffen, K. Noone, Å. Persson, F. S. Chapin, III, E. Lambin, T. M. Lenton, M. Scheffer, C. Folke, H. Schellnhuber, B. Nykvist, C. A. De Wit, T. Hughes, S. van der Leeuw, H. Rodhe, S. Sörlin, P. K. Snyder, R. Costanza, U. Svedin, M. Falkenmark, L. Karlberg, R. W. Corell, V. J. Fabry, J. Hansen, B. Walker, D. Liverman, K. Richardson, P. Crutzen, & J. Foley (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2), 32. <http://www.ecologyandsociety.org/vol14/iss2/art32/>

Links of interest

SOCIEDAD CHILENA DE SALUD PLANETARIA

www.sochisap.org

PLANETARY HEALTH (THE LANCET)

<https://www.thelancet.com/pb/assets/raw/Lancet/infographics/planetary-health/planetary-health-1436968578270.pdf>

What is planetary health?

**Is it possible that what we do
in our daily lives really affects
planet Earth?**

What can we do about it?

During María's exhausting long car commute from her job at the municipal library to her home, the ambassador of Chilean wildlife, Chucac, suddenly appears in the passenger seat. Through a pleasant conversation, this "wild bird" will make you reflect on different aspects of its life, as well as the consequences of human behaviours on Earth. During this trip, María learns about "the Great Acceleration", "fossil fuels", "urban heat islands", and the real impact of our decisions on the health of the planet and, therefore, on our own health and wellbeing.

From the Science Communication Centre of the Universidad Autónoma de Chile, through the UNESCO Chair of Scientific Education for Citizenship, we make this book available to promote knowledge and reflection around the concept of Planetary Health and its relationship with human health and wellbeing.



Cátedra UNESCO
Educación Científica
para la Ciudadanía



Centro de Comunicación
de las Ciencias
Universidad Autónoma de Chile

