

2021

Duke Kunshan University

Environment Program

Yearbook 2021

International Master of Environmental Policy
Environmental Research Center

Duke | NICHOLAS SCHOOL of
the ENVIRONMENT

Duke | SANFORD SCHOOL of
PUBLIC POLICY



昆山杜克大学
DUKE KUNSHAN
UNIVERSITY

Cover photo credits: Dr. Binbin Li

“Environmental Leader World Changer”

Master of Environmental Policy is a two-year program with three semesters studying in China and one semester studying at Duke University, US. Students will earn a Duke University degree.



The international Master of Environmental Policy (iMEP) program at Duke Kunshan University (DKU) is a collaboration between the Sanford School of Public Policy and the Nicholas School of the Environment at Duke University. This two-year professional degree program trains students to be global environmental innovators with the foundational knowledge and practical skills to inform evidence-based environmental policy solutions.

Through this program, students not only benefit from small classes, one-to-one interaction with world-class faculty, a cutting-edge research center and unparalleled career opportunities, but also earn an advanced degree from world-renowned Duke University. iMEP students have the opportunity to immerse themselves in a variety of fields, including economics, statistics, energy, climate change, water management, conservation biology, environmental health, environmental law and governance.

iMEP students develop their expertise on a specific topic through a 4-month internship and a one-year Capstone Project. For students around the world who care about the environment and want to make a difference, the iMEP program based at DKU is a place where they can meet their mentors and friends, and greet new challenges and discoveries.

iMEP Curriculum

YEAR 1 FALL

Environmental Economics
Statistics and Program Evaluation for
Environmental Policy
Environmental Policy Analysis
1 Elective

YEAR 1 SPRING

Environmental Science
Environmental Policy Practicum
Environmental Policy Process
1 Elective

YEAR 2 FALL

Master's Project Capstone
Environmental Law, Governance and
Regulation
2 Electives

YEAR 2 SPRING

Master's Project Capstone
3 Electives

Option to study abroad at Duke University,
North Carolina, U.S.

Sample of Elective Courses:

Environmental GIS
Key Topics in International Environmental Policy
Modeling for Energy Systems Analysis
Planetary Health and Environmental Epidemiology
Building an NGO Toolkit: From Design to
Monitoring
Climate Change Economics and Policy
Natural Resources and Protected Area
Management
Research Methods

iMEP: Intersection between public policy and environmental study

Students' Choice: A brief intro of the iMEP program

Since the launch of the iMEP program, it has become one of the most welcomed destinations for students who wish to pursue a career path on public policy with a specialized interest in environmental management. In merely five years after the launch of the program, the amount of applications received and the diversity in admitted students has grown remarkably.

Being the first program in the world to integrate the essential core requirements of environmental management and public policy into one interdisciplinary degree, iMEP requires students to spend three semesters at DKU in Kunshan, with an option to spend one semester at Duke University, Durham, to get exposed to the environmental policy landscapes of both China and United States.

Several factors have contributed to the popularity of the iMEP program:

- > *Duke University has established its global reputation in environmental management and public policy.*
- > *The appropriate class size (15~30 students) and frequent social events ensured that each iMEP participant will get sufficient guidance and mentoring from the instructor and professors.*
- > *With research opportunities supported by the Environmental Research Center (ERC) and the alumni network, iMEP students are capable of immersing themselves within a great academic and professional atmosphere to help them learn and grow.*
- > *With the location requirement, students will acquire global experience through the transboundary learning plan.*

According to recent findings, the graduates from the class of 2019 and 2020 in the iMEP program have entered a variety of industries after graduation such as consulting, research, private corporate and NGOs.

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Being the director and co-founder of the iMEP program, professor Zhang has given several insights to the current and incoming iMEP students.

For students who wants to explore a diverse career path but wish to be competent in the professional job market, professor Zhang suggested that:

- **Take advantage of summer internship(s) to build up a comprehensive resume.**
- **Get in touch with the alumni network as early as possible.**
- **Make good use of the Master's project to identify a potential career path.**
- **Enrich the professional skillset in the chosen career path.**

For students who wish to pursue in the academic research career, Zhang also mentioned that they should “find something [they] really like,” and also “it is your ability, not the label, that defines you personally: you don't need to compete with thousands of people, instead, you should try to find your own niche in the research landscape and acquire a unique advantage.”

DIRECTOR'S Insight

In the vision of Professor Zhang, the iMEP program will keep contributing to major environmental topics, such as carbon neutrality, climate change, environmental governance and biodiversity research.

Meanwhile, the program will continue its effort to empower students across the globe for their growth in professional skills and leadership by delivering the highest quality of interdisciplinary education. Furthermore, the program will keep investing into innovative initiatives and external training programs that have substantial societal impacts.

The contents above are compiled from a recent interview with Prof. Junjie Zhang.



Junjie Zhang is Director of Environmental Research Center and Master of Environmental Policy (iMEP) Program at Duke Kunshan University.

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Timeline: highlights of the Environmental program over the past 5 years

iMEP program with Environmental Research Center

To curb China's pressing environmental challenges, the Environmental Research Center (ERC) has become an important hub to incubate interdisciplinary research, and has made great achievements in the past 5 years, including:

- A variety of academic publications in leading journals in: ecology and conservation, environmental economics, environmental governance, and environmental health.
- Established initiatives in quantitative environmental policy, green finance, and the Belt and Road Initiative to connect academic research with policy making.
- Hosting a booming executive education program for entrepreneurs, professionals, and government officials.

ERC has also contributed to the cultivation of iMEP and undergraduate students at DKU/Duke by hosting a wide variety of academic events, such as research brown bag lunch, salon, seminar, workshop, panel discussion and symposium. Besides the events, the ERC faculty members have also provided professional mentorship to help students engage in the environment related initiatives.

The Blue Pioneers Program (BPP) is another great example of ERC's efforts to echo on DKU's motto "Knowledge in the Service of Society". Since 2018, ERC launched BPP as an information hub to provide knowledge and skills in marine conservation as well as a platform to build and expand professional networks.

Shanghai Environmental And Energy Exchange

To gain theoretical knowledge and practical experience of carbon emissions trading. Led by assistant professor Coraline Goron, iMEP students who took the environmental policy analysis class visited the Shanghai Environmental and Energy Exchange on September 25 2020. Focusing on the establishment of the national carbon market and carbon emission rights trading, the staff of the Shanghai Environmental And Energy Exchange shared some valuable experience and knowledge to the students.

The Shanghai Environmental And Energy Exchange is China's first environmental energy trading platform approved by the Shanghai Municipal People's Government. It has become one of the largest environmental exchanges in China in scale and trade volume. Mr Lai Xiaoming, manager of the Exchange, introduced the history of China's participation in the carbon market and the current state of the carbon emissions trading market. After the Copenhagen Summit, China began to gradually apply its carbon emission reduction mechanism in 2010.

This pilot program at Shanghai has now formed a comprehensive carbon emission trading system and established an open, transparent, stable, and effective market.



In October 2011, the National Development and Reform Commission approved the launch of carbon emission trading pilots in **Beijing, Shanghai, Tianjin, Chongqing, Hubei, Guangdong and Shenzhen**. In 2017, China officially launched a national carbon market. The pilot carbon market in China has grown into the world's second-largest carbon market in terms of quota trading volume.

Combining carbon emission control with market orientation, the Shanghai Environment and Energy Exchange has formed a management model that meets the requirements of the carbon market, and actively cultivates and promotes the development of carbon-related industries.

As for the carbon inclusive project, the project is characterized by the **coexistence of public welfare and commerciality** that strives for the participation of the public. Residents' carbon credits obtained through carbon emission reduction can be exchanged for consumption discounts. But at the same time, there are still some problems and deficiencies in China's carbon emission governance. For example, the outstanding liquidity. As the current degree of marketization is still limited, carbon market transactions have the problem of low transaction volume in normal times and frequent transactions during the compliance period. In addition, rather than participate market transactions, companies tend to store excess carbon emission allowances in their accounts for future use.



Qianjiangyuan National Forest Park

In the middle of fall semester, Professor Li Binbin led the class of Natural Resources and Conservation Management to the Qianjiangyuan National Forest Park, Zhejiang for the first round of field investigation. The students took a four-day research-based field trip in the reserve area to gain a deep understanding about the daily routines in a nature reserve and ways to conduct an ecological protection research. The content of the field trip was divided into three modules: workshop, community surveys and field sample observations.



In the workshop, the Park Ranger introduced the vertical management mode as a method to coordinate human activity with nature conservation. In addition to the administrative system, its innovative farmland easement establishes a compensation mechanism for farmers to continue to operate and grow cash crops by signing an agreement to clarify the feasible scale. The easement also limited the use of pesticides and fertilizers.

The workshop helps the students to obtain the basic understanding of the operating system of Qianjiangyuan National Park. The students were then divided into the groups to conduct the survey with residents. Through the interviews and conversation with locals in the villages nearby, students gained the understanding of the advantages and challenges of the current policy.

In addition to qualitative research, the students also went deep into the forest and conducted sample designs for their groups. The class was divided into 3 groups. Each group selects a 20m*20m sample and investigates the wildlife types. With the instruction of professor Binbin Li, the students measured various parameters to approach the data for estimating the habitat type for the further investigation.



Students' perspectives:

"Green mountains and clear water are equal to mountains of gold and silver". I am very lucky to be part of the class joining in the field investigation to learn the environmental conservation problems and measures in the real world. By the end of the day, I felt like my mind was full of the new ideas of how to develop the rural area without destroying the wildlife.

---iMEP '22 student Haoxu Zhang

In the field trip we got chance to have conversation with top designers of the Chinese National Park administration. This is a new start of the era to protect environment with National Park System. I deeply understand that only by using the scientific methods and drawing experience from one another can we make it successfully an effectively.

---iMEP '22 student Ziyue Wang

I felt great fulfilling when I got chance to apply the knowledge learned from classroom to the real world. The field trip made my mind firmer into the environmental policy area. The lovely environment and village people remind me that the happiness relies on the balance of the development and protection. I believe what I'm learning from iMEP could eventually provide valuable advice to solve the environmental issues in the real world.

---iMEP '22 student Jie Zhang

Career Exploration

iMEP is an inherently interdisciplinary program.

The environmental policy field recognizes that in order to protect and manage the environment, one must understand the rules, laws, guidelines, practices, and ethics that guide how different groups or individuals interact with the environment. The iMEP program at DKU is not only an ideal hub for academic study on environmental management and public policy, but also a place for students to find their passions and prepare for their future career in the real world. iMEP program helps students to improve their skills in statistics, policy analysis, public presentation, and economics, with rich fieldwork experience. Furthermore, iMEP faculty, DKU Environment Research Center, DKU & Duke Career Service Office are also helping students to pursue their career goals.



Environmental Economist

Environmental economists bring knowledge of finance, investment and business to the task of developing environmentally friendly economic models and policies. They must balance the economic needs of the organization or government with environmental conservation efforts. You must have strong quantitative and data analysis skills, and the ability to communicate complicated economic models to a wide audience. There are multiple positions available to environmental economists in a variety of sectors, including non-profit foundations, consulting companies, government departments, and private corporations.



Sustainability Consultant/ Green Finance Officer

Sustainability Consultants or Green Finance Officer work at the intersection of efficient business operations and environmental sustainability, supporting a company's transition to a lower carbon footprint. You will be responsible for researching the environmental effects of the company's operations, including but not limited to noise pollution, air pollution, water pollution, energy and material consumption and the carbon emission footprint. Based on your research, you will provide a cost-effective plan for the company's long-term sustainable development.



Pursuing Ph.D. education

As doctoral researchers, students will be able to conduct more in-depth and original research in any area of their interest related to how humans interact with the environment. The fields students will explore include water issues, climate change, ecosystems, waste management, rural and urban land use, and more. Some of the iMEP graduates have successfully enrolled in top universities such as Duke University, Tongji University, University of Oregon, National University of Singapore, San Diego State University, and University of California at Santa Barbara, in which they will be pursuing their doctoral degree and preparing themselves to work in academia, research, government, non-governmental agencies, corporate, or entrepreneurial positions.



Environmental Policy Analyst

Environmental Policy Analyst positions exist in all sectors of society, including government, research institutions, NGO's, IGO's and private companies. Working as an Environmental Policy Analyst requires one to research current policies and analyze data trends to propose environmental policy solutions. The policy content will depend on the work of the organization, so be sure to look for organizations doing work you care about.



NGO Professional

Environmental NGO can play a huge role in environment protection. As one of the most effective media, NGOs can effectively facilitate dialogue with policy makers and general public to promote policy development and sustainable lifestyles. NGOs also conduct scientific research as well as conservation strategies that directly solve environmental issues. A vibrant, strong NGO community will require environmental professionals in a variety of fields.



Environmental Scientists

There are many different kinds of environmental scientists, working to collect and analyze data in many different ways – by hand in the field, using satellites and GIS, and using sociological research methods. Scientists often work on teams, conduct fieldwork to collect data, and spend hours analyzing samples or data in the lab. The ability to communicate complicated scientific findings is a valuable skill in this field. Many environmental scientists continue their studies to earn a PhD. Environmental scientists are on the front lines exploring the relationships between humans and nature and provide policy-makers with the data they need to make sound policy decisions.



Government Sector

To protect the living environment of their citizens, comply with the requirement of international legislation, as well as achieve their sustainable development, each level of government of a country employs environmental scientists in a myriad of jobs. Legislations and regulations made by the central government work as tools to protect the environment, and the effect of such tools needs to be constantly monitored by environmental scientists. In addition to that, the government will also employ people to manage natural resources, monitor environmental threats to people's health and help keep wildlife populations healthy and under control, and all the other specialists and experts mentioned above.

The World's Job Market Under Covid-19

Followed by the measures taken to control the spread of the virus and the slowdown of economic activities, we witnessed some unexpected improvements in our ecosystem, such as the reduction of air pollution and GHG emission, reduction of water pollution, as well as ecological restoration of tourist spots. These unexpected changes remind us to re-examine the human-nature relationship and prompt us to work together for more sustainable development.

Although the sudden outbreak of Covid-19 significantly disrupted labor markets globally during 2020, the job outlook for the environmental industry is still very promising.

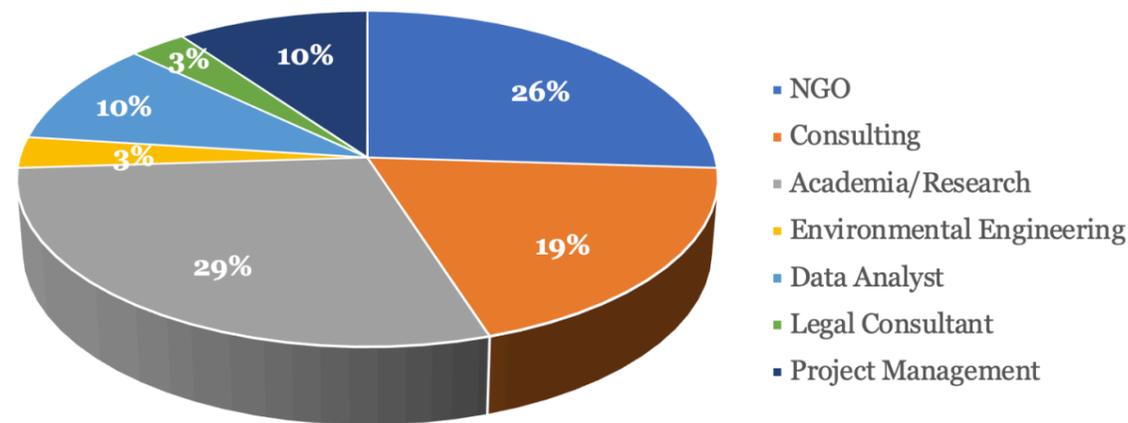
In 2020, China has pledged to peak its emissions by 2030, and achieve carbon neutrality by 2060. This new target as well as the correspondent climate actions are expected to stimulate the demand for environmental experts. Analysts suggest that the annual growth rate of the environmental industry will exceed 20 percent in the following years. As more and more countries choose to adopt a greener pathway to restore their economy post-Covid, the job outlook for the environmental industry is positive outside of China as well. According to the U.S. Bureau of Labor Statistics, the job opportunity growth rate for the environmental industry from 2019 to 2029 is projected to be 8%, which is much faster than the job growth in other industries.

CAREER Path

The summer after their first year in the iMEP program, students complete an internship in the environmental policy field. This internship allows iMEP students to apply skills gained in iMEP core courses to real world applications, learn more about the job they may want post-graduation,

and build their resume for the job search process in their second year. For many iMEP students, their internship employer may also become their client for their second year Master's Project, in which they will research a policy problem and propose a policy solution for the client.

Internship/Full-time Job Opportunities for iMEP students after their first-year study



- NGO
- Consulting
- Academia/Research
- Environmental Engineering
- Data Analyst
- Legal Consultant
- Project Management

Admission Requirements

Applicants must hold the equivalent of a U.S. bachelor's degree from an accredited institution.

Online Application Form Resume Statement of Purpose
 Letters of Recommendation Transcript Official GRE score(Optional)
 Official TOFEL or IELTS or Duolinguo Score

Round	Application Deadline	Program Decision Release
Round 0	Apr. 31, 2021	Sep. 7, 2021
Round 1	Oct. 31, 2021	Nov. 15, 2021
Round 2	Jan. 15, 2022	Feb. 10, 2022
Round 3	Mar. 31, 2022	Jun. 15, 2022





At UNDP office, Putrajaya Malaysia

COVID-19 parallels with Climate Change

By Suzanne Ong, iMEP '21

My summer internship at the United Nations Development Programme (UNDP) was an enriching experience. It was opportune to join in May of 2019, just 2 months after Malaysia's first nationwide lockdown was enacted. The lockdown was effective to curb the spread of COVID-19. Although there have been steps towards socio-economic recovery, the double blow of COVID-19 cases and government control measures had resulted in disparate impacts among society.

In UNDP, I worked on a series of research sprints studying the socio-economic impacts of COVID-19 on the Malaysian society. The COVID-19 impacts towards large businesses, lower income groups (bottom 40%), Micro, Small, Medium Enterprises (MSMEs), and the informal sector were varied. Some businesses such as glove manufacturers and e-hailing firms saw booms in revenue. The informal sector faced increased pressures where jobs were lost, and social safety nets were absent. Gender equality was pushed back, as women shouldered increased care giving burdens while working from home, and higher numbers of domestic violence cases were reported. Turtle sightings and cleaner rivers filled the news, while nature 'healed' when folks stayed socially distanced indoors.



Team debriefing during ethnographic field visit to study COVID-19 impacts on economically disadvantaged groups

Applying my theoretical knowledge from iMEP, I drew parallels between the issues of COVID-19 and climate change. The vulnerabilities that surfaced through COVID-19 may jarringly foreshadow the impacts of climate change. Economically disadvantaged groups tend to suffer greater adverse effects especially given their limited coping ability. In the past year, the issue of sustainable development and environmental justice grew in salience. There is much more work to be done, and I have gained greater awareness towards supporting environmentally resilient nation-building, with special care to protect vulnerable communities.



CAREER Path

Sustainable experience with Walmart

By Han Ding, iMEP '21

I was enlisted by Environmental Defense Fund (EDF) as the 2020 Climate Corps Fellow last year. It was a quite different internship experience compared to my previous ones, but I love it - I worked with EDF and Walmart China to optimize the packaging at Sam's Club as well as conducted research for the factory energy efficiency program.

Plastic waste is a growing concern for Walmart customers, associates, and other key stakeholders. As plastics and labeling policies varied among countries, it is necessary for Walmart China to adjust the strategy under the Chinese context. I was asked to analyze sustainable packaging opportunities for private brands. With the Policy Analysis class in mind, I conducted a preliminary analysis on the recent plastic policies that allow me to identify the risk points. Then I developed a sustainability scorecard to evaluate the packaging, and three products, were analyzed by cost-benefit analysis that I learned at iMEP class to quantify the emission based on the onsite research. The suggestions I made could reduce Walmart's total annual emissions by approximately 60 metric tons. In addition, I designed the energy efficiency survey and assisted with the sustainable training for Walmart's suppliers covering over 2000 suppliers in Asia.

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I found the writing training (years of memos) and the quantitative research methods that I learned from iMEP helped me a lot throughout the summer, and this internship assignment shaped my perspectives on the corporate sustainable strategy, which further facilitated my learning when I took Duke class.

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Being a caregiver and a filmmaker

By Dongyuan Ma, iMEP '22

I often think to myself that, biodiversity conservation is my destiny. I didn't choose it, but rather, it chose me. My home is right near Wanglang National Nature Reserve, Sichuan, which is one of the first four nature reserves that specifically aims at protecting the habitats of rare species such as Giant Panda. Growing up in an environment surrounded by nature and wildlife, I was always interested in the beauty and the mysteries of life. That sort of curiosity motivated me to choose life science as my undergraduate's major.



Out of my great passion for wildlife conservation, during my undergraduate, I spent almost every summer and winter vacation time on different conservation volunteer programs. Those experiences were extremely valuable for me, as they not only convinced me that biodiversity conservation is the cause that I am truly passionate about but also bridged the connection between me and the iMEP program as well as Professor Binbin Li. From 2018 to 2019, I joined Professor Binbin Li's research team three times as a volunteer to help work on her research that investigates the effect of pasture on Giant Panda's habitat. In 2020, I officially became a member of the iMEP program and Professor Binbin Li's lab.

My undergraduate study was more involved with lab experiments, but I personally prefer field works out in the wild, even though the latter one is much more physically demanding and exhausting. Fieldwork may not look as decent, but it's extremely important as the targets of wildlife conservation all live in the wild, and you need on-site experiments and data to support their conservation. Being inspired by the brilliant researchers and conservationists work in the wild, I'm more certain that I want to develop my study and career in the field. And those unexpected encounters with all kinds of animals and plants are true delights during my fieldwork, which make me more fascinated with what I'm doing.

My fieldwork also inspires me to be a filmmaker. I'm currently working on a documentary which is a project that we launched this summer. What I want to make, is not a traditional wildlife conservation documentary that is well filmed and executed by high-technology equipment. What I want to do, is putting together snapshots that our team members take during their fieldwork, as well as those animal videos that are taken by the infrared cameras that we put in the wild. I want to present this documentary from the perspective of the researchers and conservationists work in the nature reserves as well as the community members live near the reserves, to demonstrate the stories of nature, with the pasture issue in the Giant Panda habitat as the overarching theme. This documentary may not be as well-made, but it tells the story more vividly and vibrantly. I want to make such a documentary, that showcases the works done by the conservationists who are often neglected, and I want to show people their struggles, efforts, and feelings. Moreover, I want the story in this documentary to inspire more young people to devote themselves to the cause of biodiversity conservation.



Being an iMEP student, I have more opportunities to work in the wild to conduct my research. As for the economics or statistic courses that the program offers, they may not be as handy for my fieldwork, but they greatly improve my learning skills, logical thinking ability, as well as my perspective. After my graduation, I would like to explore all sorts of career options. But I expect my plan would still be highly related to conservation. Because, ever since my first year as an undergraduate, I've spent almost all my vacation working in reserves. I feel like that every aspect of my life is related to conservation, it is part of my life now.



Entrepreneurship is an unceasing adventure

By Liting Wang, iMEP '22

My adventure of entrepreneurship starts with the founding of the Baobeijia Educational Group. In my freshman year in my college, I decided to drop out of my school and became the founder of the Baobeijia Educational Group. I was in charge of the operation during the initial stage, recruiting, renovation, market expansion, product system construction, etc.



"What I really wanted to do was, creating a joyful learning atmosphere that inspires interests and curiosity, in the context of today's Chinese society where preschool children are facing increasing academic pressure."

The life of being an entrepreneur was painful while fascinating. As a leader, I faced countless obstacles and challenges, but the process of solving problems and learning to improve my skills can make me feel very content. My experience of founding Baobeijia had its ups and downs. We were privileged to receive 10 million level funding, we were also forced to shut down in that same year due to capital chain rupture. However, as I look back today, all those ups and downs were worthwhile for me.

After this thrilling experience, I returned to my university to continue my study. With my previous experience and the knowledge that I gained studying economics, I started to consider what I want to do after my undergraduate study. When I was doing my internships during my undergrads, I got some exposure to the sustainability development of financial institutions, investment institutions, responsible investment, and third-party rating agencies. After this internship, I founded an ESG consulting team with the support of my boss. Our team provided ESG consulting for subsidiaries of Ping An Group. We wrote the first ESG report in the commercial pension insurance industry, integrating ESG concepts with Ping An Annuity's corporate style from an international professional perspective. Furthermore, we made communication plan and creative videos for a lot of clients.

I was really interested in that topic and I think sustainability in China is a rising industry that has a very promising future.



The iMEP program offered by Duke Kunshan University drew my attention as it provides transdisciplinary education on environmental policy and its related fields.

"I think that the vision of the iMEP program perfectly aligns with my interests and my career plan, and that's why I eventually chose to join this program"

I was also attracted by the diversity of the program, I was excited to be able to communicate with students from different backgrounds, attending all kinds of lectures and field exercises, participating in internships, as well as studying at Duke University in the United States to gain a more international perspective.

After the first semester at iMEP, I am happy to say that **my experience here is way beyond my expectation**. I like that the atmosphere in our classrooms is so vibrant and dynamic, the team works and discussions are always so inspiring, and I'm often amazed by how smart and capable that my peers are. Our professors are all very sophisticated and enthusiastic, I learned a lot from them not only academically, but also in many other aspects. In addition, the scenic view of the DKU campus also makes my journey here more joyful.

STUDENT Stories



After completing my study at iMEP, I will probably work on **sustainability development communication** utilizing the knowledge that I gained here. I would like to do some work related to sustainable management and policy-making in financial institutions or fashion brands, which is what I'm interested in and good at. As for entrepreneurship, that adventure has never stopped. I'm currently running a small business—milk tea freedom—that provides services such as photography, graphic design, social media marketing, product design for client companies. I'm also exploring the possibility of starting a consultant company that integrates analysis and marketing services. Entrepreneurship might be challenging, unsettling, and demanding, but the sense of accomplishment and the experiences I gained along the way are my everlasting motivation.



ERC

Environmental Research Center

The Environmental Research Center (ERC) at Duke Kunshan University (DKU) is an interdisciplinary research institution that **integrates research and education programs in environmental science and policy**. The ERC is committed to cultivating state-of-the-art research projects to deal with the pressing environmental policy challenges in China and beyond. ERC faculty work in close collaboration with the Nicholas School of the Environment, Sanford School of Public Policy, Nicholas Institute for Environmental Policy Solutions, and Energy Initiative at Duke University. Since its launch in July 2016, the ERC has achieved remarkable growth in the scale and quality of **academic research, policy outreach, undergraduate, graduate, and executive education**.

The ERC is dedicated to evidence-based environmental policy research in four areas: **ecology and conservation, environmental economics, environmental governance, and environmental health**.

Faculty research projects are supported by reputable funding agencies such as **the US National Science Foundation (US NSF) and National Natural Science Foundation of China (NSFC)**. Research findings have been published in leading academic journals in environmental science and policy.



The ERC hosts a booming **executive education program** that trains entrepreneurs, professionals, and government officials in environmental policy-making skills. In 2018, the ERC partnered with the Packard Foundation, the Paradise Foundation and Yintai Foundation to develop our flagship non-degree training program the Blue Pioneers Program. For the past three years, 60 trainees in total (20 trainees/ year) have received intensive training, taken field trips and completed capstone projects. Under the guidance of more than 20 Chinese and international scientists, non-governmental organization experts and social entrepreneurs, trainees have gained a deeper understanding of marine conservation and NGO-capacity building.

ERC FACULTY

 Junjie Zhang	 Patrick Ward	 Jingbo Cui	 Binbin Li	 Coraline Goron
 William Winner	 Song Gao	 Annemieke van den Dool	 Xiaochen Zhang	 James Miller
 Wanggi Jaung	 Charles Chang	 Huansheng Cao	 Yajuan Lin	 Chuanhui Gu
 Erika Weinthal	 Jim Zhang	 John Vandenberg	 Patrick N. Halpin	 Avner Vengosh
 Jackson Ewing	 Marc Deshusses	 Mike Bergin	 Jonathan Wiener	



Online Panel Discussion - Sustainable DKU initiative



Online Panel Discussion - The Economic Analysis of Climate Policy



Kunshan - Energy Foundation China Low-carbon economic transition conference



DKU Bird Collision Project

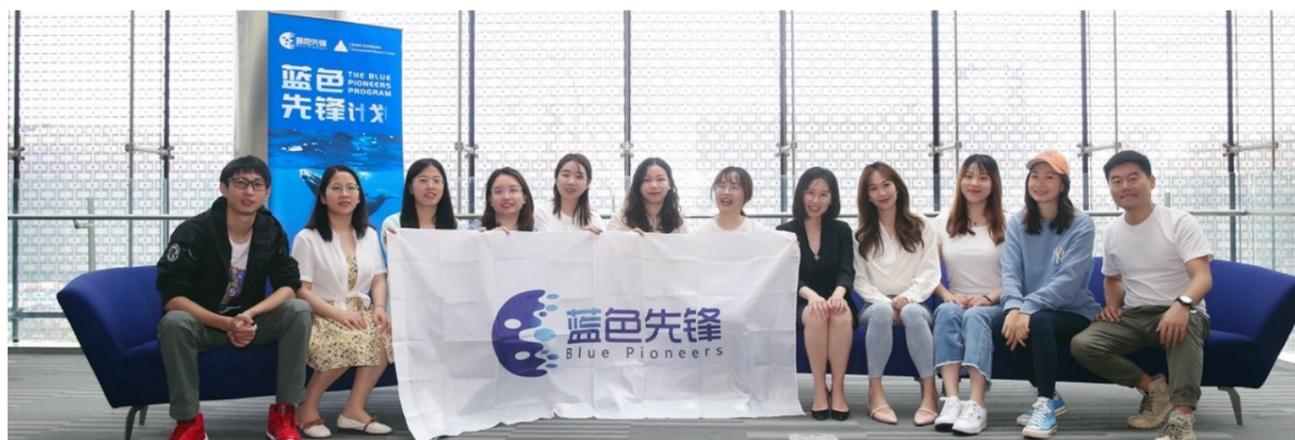


Digital Biomarker Study

BLUE PIONEERS

“Together We Win – Blue Pioneers in Action”

PROGRAM



The Blue Pioneers Program (BPP) aims to educate the next-generation civil society leaders in marine conservation in China. BPP is hosted by the Environmental Research Center at Duke Kunshan University (DKU) with the support from the David and Lucile Packard Foundation, Paradise Foundation, and Yintai Foundation. BPP is a unique program in China dedicated to capacity building for marine-related NGO leaders. It serves as information hub to provide knowledge and skills in marine conservation as well as a communications platform to build and expand professional networks. Since 2018, BPP has successfully trained 60 Blue Pioneers in sustainability, business, and public policy related to marine conservation.

CAPSTONE PROJECTS

**Are you curious about wildlife?
Are you looking for a way to identify and protect them?**

“ The blue pioneers have made a plan on developing such App to help you identify protected species. With the built-in reporting function, the public can easily notifies competent authorities of potential illegal cases of protected species trading. ”



Environmental education and citizen science are effective ways to raise the public’s awareness. Blue Pioneers have developed innovative education programs. "Future Ocean Man" Ocean Challenge Badge Project aims to cultivate future talents for marine conservation in the way of ocean "Scouts".

The project is based on the United Nations Youth Global Alliance's Ocean Challenge Badge and will localize the course contents according to the needs of Chinese Youth.

The coastal zone observation tool kit includes basic knowledge of coastal zone, equipment preparation, scientific and environmental-friendly observation methods and Field Guide on common species in different places.

This tool kit will also help to improve the ecological science of tourism and education activities of coastal zone observation, which will not only raise the public’s awareness about biodiversity of intertidal zone but also make the experience more entertaining.



EVENT HIGHLIGHTS

The Blue Pioneers Program held intensive training module from September 2020 to May 2021. The 2020 cohort has received a systematic training on such topics as marine science and biodiversity, sustainable fisheries and social entrepreneurship and they also went sailing and scuba diving!

Workshop on How Blue Carbon Contribute to China’s Carbon Neutrality Pledge



China’s monumental 2060 carbon neutrality pledge signals a significant shift in China’s economic structure. The blue economy, as an essential component in China’s 21st Century development, provides potential pathways to be part of the solutions in tackling climate change. Blue carbon, the carbon stored in the coastal and marine ecosystem, is critical as it not only provides several kinds of ecosystem service but has high potentials for carbon sequestration and storage.



China is rich in vegetated coastal ecosystems which are powerful blue carbon sinks. The urgent question is how these ecosystems can be utilized to contribute to China’s carbon neutrality agenda.



This Workshop invited speakers from Duke Nicholas Institute for Environmental Policy Solutions, Center for Energy, Development and the Global Environment (EDGE) of Duke University, First Institute of Oceanography and East Sea Bureau of the Ministry of Natural Resources. The speakers discussed the challenges and opportunities of blue carbon through the perspectives of ocean science, climate policy, and innovation.



Xiaoduan Wang, a Board Member of Paradise Foundation and Vice Chairman of Huatian Investment Co., Ltd, addressed the BPP trainees at the graduation ceremony, "I am a scuba diver, and I want to make a contribution to Marine conservation. I've spent a lot of time in Sanya, which used to be one of the most beautiful coral sites in China, but I've also seen water pollution, unsustainable fisheries, coral degradation, and now the effects of climate change, all of these threats make it difficult to be optimistic. Therefore, we need more protection organizations, more professional people to protect the ocean. So, I'm very pleased to support Blue Pioneers."

China's Carbon Pledge

Sets **Ambitious Course** for the 21st Century

Excerpt from Prof. Junjie Zhang's article published on February 23th, 2021

The announcement in September last year was a major upgrade of the pledge in the Paris Agreement to peak carbon emissions around 2030. The new commitment implies that the trajectory of China's carbon emissions will follow an inverse U-shaped curve, although the height of the peak is still not determined.

The pledge of carbon neutrality is not a distant promise but comes with plans and policy measures. Since the announcement, China has been taking steps to create more vigorous climate policies by setting explicit emission goals and targets in the 14th Five-Year Plan, which provides overarching principles and working guidelines for the comprehensive social economic development in the period of 2020-25.



Nevertheless, it is still unclear how the local governments will embrace these new plans and policies, which is instrumental for China to realize its climate ambition.

Additionally, the Ministry of Ecology and Environment just promulgated two guidelines on carbon emissions trading, cementing a crucial foundation to launch the national Emissions Trading Scheme (ETS) in 2021. So far, the ETS only covers the power generation sector but it is likely going to be expanded to cover (petro-) chemicals, building materials, steel, ferrous metals, papermaking, and aviation in the future.

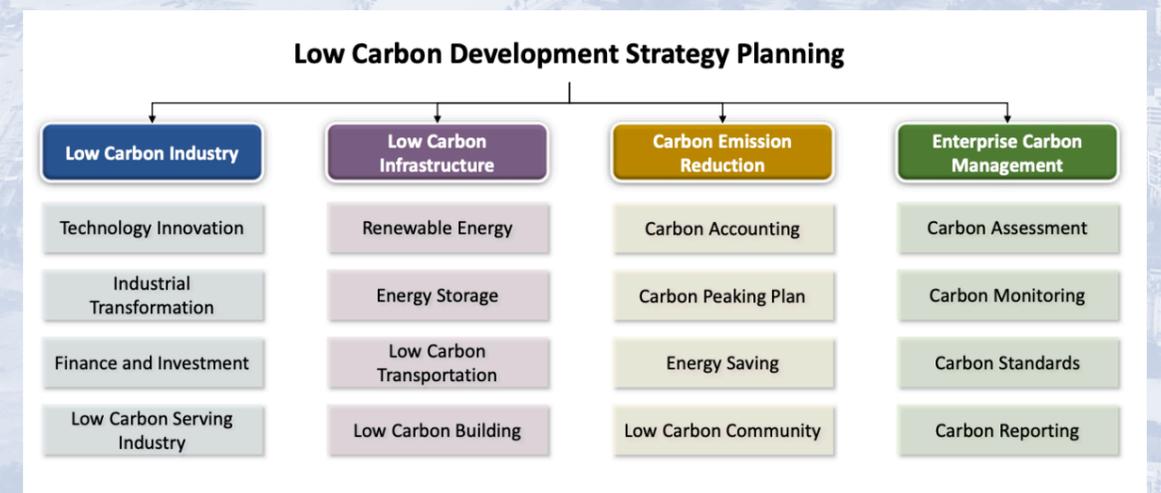
As the largest emitter in the world, China's commitment is meaningful and instrumental for the success of limiting global temperature rise below 1.5 degrees Celsius. The coordinated agenda of carbon neutrality is crucial to ensure that the carbon leakage will not undermine the global efforts in climate mitigation.

China is facing mounting challenges to achieve carbon neutrality while maintaining rapid economic growth. In the two "fifteen-year visions," China aspires to enter the rich-country club around 2035 and to become a medium-level developed country around 2050. The climate target is built upon the assumption of continuous economic growth in the next 30 years. It will be unprecedented in history if China can achieve both economic and climate goals simultaneously.



On September 22th, 2020, President Xi Jinping made the commitment of peaking carbon emission before 2030 and achieving carbon neutrality by 2060 at the United Nations (UN) General Assembly. The ambitious pledge sends a powerful message, not only about what the country thinks it can achieve with its own development, but also about the leading role it intends to play in a changing world of energy transition.

Prof. Junjie Zhang's research focuses on the impact of China's climate policy measures coming with the 2030 and 2060 commitments, and the reacting strategy that local governments and enterprises will take. In addition, the team also pays attention to the unintended distributional consequences of energy transition, and aims to identify the social, economic, and political measures to alleviate these adverse distributional impacts.



Biodiversity and Sustainability Lab (B-Lab) is composed of a research team led by Professor Binbin Li for Environmental Studies.

B-Lab in action:



B-lab published two main papers about livestock grazing this year exploring the impact of global forest grazing and the ICDP community project. They collaborated with Peking University to investigate the wildlife consumption and trade. Another article on *Ecology and Economics for Pandemic Prevention* was published in top journal *Science*. This article discussed the findings that the associated costs of the preventive efforts would be substantially less than the economic and mortality costs of responding to these pathogens once they have emerged.

B-Lab has never loosened up on student cultivation. Sichong Sun, iMEP class of 2021, completed his master's project under the supervision of Dr. Li on *Building a surveillance system for wildlife epidemics in China*. Sun not only collected abundant livestock samples, but also developed a preliminary design for the epidemic surveillance system in China. Meanwhile, the "Bird Collision" project, led by DKU undergraduates Danyang Shi and Winnie Liao, has explored its ambition in many places. Last year, they give a lecture at the Shanghai Nature Museum, introducing the first bird collision survey in China covered with 24 provinces.

In addition to research work, B-Lab continues to support students' studies.



B-Lab team reunion



Wedding ceremony for the former B-Lab student Yan Gao in Wanglang Nature Reserve



DKU undergraduates' lecture table at Shanghai Nature Museum on "Bird Collision" project

Professor Binbin Li



Binbin Li is assistant professor of environmental science at DKU and Environmental Research Center. Her research focuses on loss of biodiversity, endangered and endemic species conservation such as giant pandas, and management of protected areas, which requires conducting field research in challenging conditions in remote areas of China. Li is engaged in science communication and nature education. She is a signed nature photographer at Swild in China. She is devoted to using photography, social media, drama, and other art formats to promote conservation science in the public.

Research raises issue of damage caused by forest livestock grazing

The recent research conducted by Binbin Li and her colleagues has shed light on the effects of a rapid increase in livestock grazing across forested areas globally. Published in the scientific journal *Global Change Biology* in 2021, their study revealed a complex but generally negative picture of the impacts. It could contribute to forest conservation efforts and policies, and provide a scientific basis for future planning of sustainable livestock grazing.

Their results showed that livestock had a negative impact on forest structure, as well as leading to a reduced number of species and exacerbating climate change, but that outcomes were heavily influenced by other environmental factors.

Researchers also found significant ramifications from livestock grazing for climate change, said Bingkun Jiang, co-author of the paper and research assistant in conservation biology at the Environmental Research Center. Instead of being stored within the vegetation, the carbon stock is converted through animals into gaseous carbon in the atmosphere, which contributes to climate change.

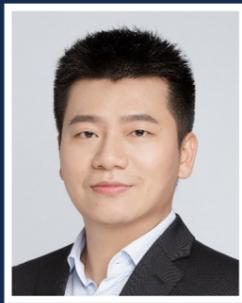


Photo credits: Dr. Binbin Li



In research, education, scientific promotion and social influence, B-Lab has always been on the road, and expected to contribute more and better.

Professor Jingbo CUI



Dr. Jingbo Cui is an Associate Professor of Applied Economics at the Division of Social Sciences and Environmental Research Center at DKU. Cui's research centers on Environmental Economics, Economics of Innovation, and International Trade. His current research projects on climate change and low-carbon innovation have been funded by the National Natural Science Foundation of China.

FACULTY *Insight*

Trade liberalization proved to have positive effects on firms' environmental performance

Environmental economist Jingbo Cui and colleagues measured the reduction of import and export tariffs—on China's environmental protection by comparing the emissions of sulfur dioxide and other major pollutants by manufacturing firms before and after China's accession to the World Trade Organization. Their findings, published in *The World Economy*, demonstrate that trade liberalization has positive effects on improving firms' environmental performance, as firms have increased labor resources for environmental protection and improved production processes to reduce emission intensity.

Dr. Weijie Wang

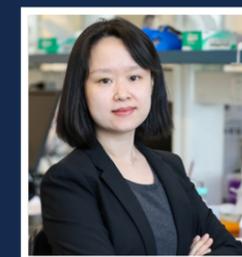


Weijie Wang is a postdoctoral research fellow of climate science at the Environmental Research Center at DKU. Her research focuses on mineral dust and air pollution. She got her Ph.D. in climate science at Scripps Institution of Oceanography at the University of California San Diego. She was a research scientist at NASA Langley Research Center.

The current research focuses on East Asian dust and the population that dust can affect. Dust events occur each spring in East Asia, causing severe air pollution and generating health concerns. Weijie Wang uses satellite observations to study how dust events vary year by year. The combination of satellite observations and demographic information enables the assessment of the population affected by dust.

The study focused on the Western Antarctic Peninsula region (photo by Oscar Schofield)

Professor Yajuan Lin

FACULTY *Insight*

Study reveals worrying implications of warming Western Antarctic Peninsula waters

Dr. Yajuan Lin is an Assistant Professor of Biogeochemistry at DKU and Environmental Research Center. Dr. Lin is a biological oceanographer studying carbon export in the sunlit surface oceans and how it is influenced by microbial communities. Dr. Lin received her Ph.D. in Marine Science and Conservation from Duke University in 2013. Before joining DKU, Dr. Lin did her postdoc at Duke and in IUEM in France. She has participated in multiple large scale international expeditions, including the Antarctic Circumnavigation Expedition and TARA Pacific.

Over a five year period, Yajuan Lin, and other scientists made trips to the Antarctic region to collect DNA samples of microbial sea life, including algae and microzooplankton, as well as employing a mass spectrometer to monitor carbon sequestration levels. The study found water temperature and sea-ice cover to be the dominant factors affecting the makeup of microscopic sea life in the region. The species richness and evenness has declined in this region, leading to less ocean absorption of carbon dioxide, the gas associated with global warming. Published by the scientific journal *Nature Communications*, the results for the first time quantitatively link plankton community structure to carbon export potential along the Antarctic continent, said Lin.

Just transition needed to alleviate the social impacts of decarbonization

The concept of **just transition** embodies the recognition that the benefits of the low carbon transition need to be distributed across society, and that those who stand to lose from it deserve a helping hand. However, the research on China's environmental policies has paid little attention to their distributive and social impacts.

My interest in the fairness of environmental policy has led me to look first at the implementation of environmental targets. My paper co-authored with Genia Kostka and published in **Environmental Politics** has analyzed the fairness of binding environmental targets and environmental inspections in China based on qualitative document analysis and interviews. We found that insufficient differentiation led to an inequitable distribution of emissions reduction responsibility among localities.

A follow up project is now focusing on quantifying the inequity of target distribution across the country based on localities' historical emissions, GDP per capita, and abatement cost.

Dr. Coraline Goron

Assistant Professor of Environmental Policy

Dr. Coraline Goron is the Assistant Professor of Environmental Policy at Duke Kunshan University. Her research centers on environmental politics with a specific focus on China, both domestically and as an increasingly influential actor in global environmental governance. Her Ph.D. thesis received the Marthe Engelborghs-Bertels Prize for Sinology in May 2018. It traced the transformation of China's power stem and environmental protection and analyzed their combined outcomes on the implementation of decarbonization policies. It draws on a vast corpus of Chinese-language documentation, as well as interviews with Chinese industry experts and policy stakeholders.

Secondly, I have also looked at the fairness issues in the implementation of energy transition policies. Under the project **Enabling a Just Transition towards Carbon Neutrality in China** undertaken with Prof. Junjie Zhang, in the summer 2021 I have led fieldwork investigations with students in coal mining communities in Guizhou and rural communities in Hebei.

We observed that there were diverging treatments between the workers of closed private and state-owned mines. We also found that mandated fuel switch from coal to gas or electricity could lead to significant increase in energy costs for rural inhabitants. These field observations and analysis support propositions for policies and strategies aimed at alleviating the social impacts of the transition to consolidate the gains from poverty alleviation and development efforts.

RESEARCH Spotlight

Investigations of new village household gas installation in Hebei Province



Interviews with frontline coal miners in a state-owned coal mine, Guizhou Province



Discussion with village committee members in a village with closed private coal mine, Guizhou Province



At the Nexus of Environmental, Development, and Agricultural Economics

Prof. Ward's research team has been very active during 2020–2021 working on a number of diverse topics at the nexus of environmental, development, and agricultural economics.

Prof. Ward has been working with colleagues from the International Food Policy Research Institute (IFPRI) to study opportunities for expanding access to rural credit to farmers in Odisha, India without land records or credit scores that might otherwise have challenges in availing formal credit, especially women.

This research leverages a technological solution for determining farmers' creditworthiness based on the combination of remotely sensed plot imagery and a machine learning algorithm that estimates crop production potential.

During 2020, much of the work was focused on better understanding gender norms and the extent to which gender-sensitive training could increase women's demand for credit. Rigid social norms continue to constrain women's active involvement in many agricultural decisions, and preliminary results suggest considerably lower demand for credit among women compared to men. Even with supplemental training, however, these norms around gender roles in agriculture seem persistent, and digital credit solutions designed to address women's access to credit may not be sufficient to encourage borrowing and thus narrow the gap in credit utilization between women and men. Research going forward will explore alternative solutions to increase women's access and take-up of agricultural loans, including a picture-based credit model that uses georeferenced smartphone images of farmers' plots and associated satellite imagery to provide access to credit based on past cultivation data rather than land ownership.

Prof. Ward has been working on a related project in Kenya in collaboration with researchers from IFPRI and the University of Greenwich in the UK. In particular, this project is designed to evaluate the impacts of risk contingent credit (RCC), a novel type of agricultural credit instrument that has an insurance contract embedded in it that is designed to compensate the lender in the case of a catastrophic event that effectively wipes out the farmers' crop.

In the absence of such a product, smallholder farmers might be unable to access credit with which to make investments in agricultural production, either because they do not qualify for a loan –

have positive effects on agricultural investments, with RCC increased spending on fertilizer by roughly Ksh 2,180 compared with Ksh 1,500 among farmers with traditional credit. Both RCC and traditional credit had desired effect on households' productivity and welfare, though some early evidence suggests the traditional credit product may actually be more effective at reducing risk rationing in credit access.

Prof. Ward is also currently developing a project with DKU undergraduate student Wynona Eurj Curaming to study the effects of misinformation about the origins of COVID-19 on individuals' support for public policies and investments explicitly aimed at preventing

Professor Patrick Ward



Patrick S. Ward is an associate professor of environmental economics and policy in the iMEP program at Duke Kunshan University. Prior to joining the DKU faculty, Patrick was a research fellow in the Environment and Production Technology Division of the International Food Policy Research Institute (IFPRI). Patrick's primary research interests center around sustainable development, with a particular emphasis on developing country agriculture.



– potentially because they do not have insufficient collateral with which to guarantee a loan (quantity rationing) – or because they are too concerned about the potential loss of collateral (risk rationing). Although the project will continue into 2021, early results from data collected following the 2020 rainy season suggest that both RCC and traditional credit (without an embedded insurance component)

zoonotic diseases from crossing species and causing the next global pandemic. In particular, this research will embed a random (mis-)information treatment in a framed experimental referendum intended to gauge support for a specific public health policy for early reconnaissance on novel coronaviruses emerging in swine which have the potential to crossover to infect humans.

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