



Topic 9:

# People Committed to Fight Climate Change

## Lesson Plans for Children and Youth

**Rise Up Against Climate Change!**

A school-centered educational initiative  
of the Inter-American Development Bank



# Rise Up

Against Climate Change

A school-centered educational initiative of the Inter-American Development Bank

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## Rise Up Lesson Plans

Our Climate Is Changing

Energize!

Water to Treasure

Intelligent Consumption

Sustainable Cities for Smart Urban Growth

You Are What You Eat

Ensuring Healthy Environments

Protecting the Land

People Committed to Fight Climate Change



# Rise Up

## Against Climate Change

Rise Up is a climate change education initiative of the Inter-American Development Bank that seeks to encourage children and youth to use their creativity and energy to come up with feasible, sustainable, long-term strategies to mitigate and adapt to climate change. This set of lesson plans is one of nine on different climate change topics that can be used independently or together with the

other lesson plans and materials of the Rise Up initiative, including instructional videos, learning games and a Green School Toolkit. Each set of lesson plans includes an introductory text about the topic that can serve as a background material for the teacher or as a text for older students. The lesson plans can be used at the primary and secondary levels of education; they are divided into basic, intermediate, and advanced plans to help each teacher determine what activities are appropriate for his or her students. To find all the Rise Up materials please go to **[www.iadb.org/riseup](http://www.iadb.org/riseup)**

*Emiliana Vegas, Chief, Education Division,  
Inter-American Development Bank*



## People Committed to Fight Climate Change

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# Lesson Plan

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Climate change presents huge challenges for humankind. Yet within these challenges lie myriad opportunities for people of all ages, including professional opportunities in exciting, influential fields such as public administration, education, and engineering. The interviews in this chapter will help your students explore some of the possibilities for careers in the fields of climate change, environmental protection, and sustainability.

Below are a few ideas about how to incorporate these interviews into your curriculum. They can also be added to some of the chapters in this course.<sup>1</sup>

<sup>1</sup> The interviews were conducted in 2013. The interviewees may no longer be working in the same jobs.

## Lesson Plan

Time	Place
1-2 hours	Classroom, ideally with projection equipment so that students can see the photos of the interviewees. These are young people with whom students will likely be able to identify.

### Materials

- » The 10 interviews below can be used in 10 different classes. The supplementary material includes the experiences of people who were not interviewed for this project but who are nonetheless interesting and can serve as good examples for your class.



### Preparation

Read the interviews. Links to relevant chapters will help you decide whether to add them to the module you are working on at any given point. Make two copies of each interview. If possible, invite a local professional to class whose work closely relates to that of the interviewee so that students can ask questions. Also, review the interesting and inspiring talks and experiences in the supplementary material.

### Step by step

Project the interviewee's picture, summarize his or her resume aloud, and ask students: Why is this person's career path important?

- » Select two students to role-play the interview, one as the interviewer and the other as the interviewee.

- » Have the two students read the interview.
- » Ask your students:
  - What do you like best about this person's daily life?
  - How is this person contributing to the environment?
  - What interested you most about the interview we just read?
  - What do you most dislike about this person's professional life?
  - Would any of you like to explore or work in this field? Why?
  - Do you think it would be easy to work in this field? Why or why not?
  - What opportunities are there in our region in this field?
- » Ask: Did reading the interview bring to mind any new ideas for a career path or occupation related to the environment other than that of the interviewee?
- » Introduce the person you invited to the class, and ask him or her to share something about his/her profession, the reality of the region, and job opportunities.
- » Invite students to ask questions.
- » Tell your students: "Today, it's not only conservationists and environmentalists who need to think about the environment and sustainable development. We all have to think about it from many different perspectives and in every profession. Mitigating and adapting to the effects of climate change require professionals from all areas."

### Tip for the teacher

Field trips are an interesting way to learn about peoples' daily work. If possible, ask your guests to invite the class to join him or her for a day in the field.

### Formative assessment

Rather than testing students on what they have learned, have your students write a paper addressing the following questions:

- » Would you like to work in environmental protection?

- » Which type of work would you like to do in the fields of climate change, environmental protection, or sustainable development?
- » Research your chosen career and describe what your daily work would entail. What do you hope to contribute to the field?

For students who are not interested in working in one of the above fields, ask them which profession or field they are interested in pursuing. Have them research their chosen career path, including daily activities, common technologies used in the industry, and their field's impact on the environment. They should address each of these in their paper. Also, ask them what they can do to protect the environment and promote sustainability in their chosen profession or field. Remind them that thinking about the environment and sustainability is no longer the exclusive domain of conservationists and environmentalists.



## Environmental Management: Maria Elena Correa

**M**aria Elena Correa studied public administration at the University of Chile, and she earned a Master's degree in environmental studies from the Complutense University of Madrid. She has worked in Chile's Ministry of Environment as a consultant and professional for more than five years. Her very strong interest in protecting the environment has shaped her professional career and life. "We are seeing a paradigm shift in how people view the world and in their concern for the environment. This shift needs to be about more than talk; it also implies action. Without action, good intentions remain only that: good intentions. Sustainability is something we must work toward in our daily lives, not only in major projects," says Correa, who believes that citizen participation is the key to tackling climate change.

### For more information go to:

» **Ensuring Healthy Environments at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

#### » **You studied public administration and then specialized in environmental issues. Why?**

I became interested in environmental issues in my fourth year of college. Not only in sustainable development as a field of study, but also as a philosophy of life.

After that, I focused my internship and subsequent professional practice on the environmental field, because it's important to specialize in your chosen area. I did my postgraduate studies in environmental issues and focused on environmental management, because that's my field of work.

#### » **Why are careers in environmental protection more important today than they were a few years ago? Is this a fad that will pass?**

I think concern for the environment arises from the current problems the planet is facing, and environmental protection will continue to be necessary. So it's a growing field, and careers in this area will tend to pay well.

#### » **Your Master's thesis was on public participation in strategic environmental assessment. What does that mean?**

Strategic environmental assessment seeks to guide decision-making about public policies, plans, and programs to make them more sustainable. Citizen participation has a leading role in this process. Consulting with key stakeholders and beneficiaries of the policies, plans, and programs improves the assessment process and allows decision-makers to select the best alternatives.

#### » **Why is community involvement important in environmental decision-making? How does this participation contribute to a healthy environment?**

International experience has shown that citizen participation leads to better decision-making and that citizens feel more responsible for and involved in the process. The greatest benefit of citizen participation is that it helps mitigate conflicts, and decisions about environmental issues often entail a high level of conflict within communities. Dialogue and stakeholder participation lead to decisions that produce the least environmental impact.

#### » **Do communities have a say in private projects or only in public projects?**

Communities can participate in both public and private projects. The process of strategic environmental assessment seeks to mitigate the impact of all types of projects. When a project is proposed that will have a high environmental impact on a surrounding community, community participation is even more necessary. In the cases that have been analyzed to date, the process works best when a public official ensures and coordinates community participation.

- » **When did you realize you were interested in the environment? Was it while you were in school? Also, what influenced your decision to work for the environment?**

In college, I had a professor who had a strong commitment to the environment, and this motivated me. From there, I became increasingly interested in the topic and studied it formally and on my own.

- » **Why is working on environmental issues in the public sector important?**

For me, working on environmental issues is very important because in many constitutions the state is the guarantor of the citizens' right to live in a pollution-free environment. So policies, programs, and laws are necessary to regulate and guide environmental actions, and the state needs to ensure they are complied with and that the public sector clearly directs the development models that are adopted. Working in an organization that constantly thinks about how to address sustainability is essential for me.

- » **What message would you send to young people who are interested in pursuing careers in environmental stewardship?**

They should think about sustainability and work to help create a more sustainable environment.

- » **Which countries are the most advanced in these topics and why?**

The Nordic countries have managed to “solve” their social problems, and they have taken steps toward solving environmental problems and implementing development models based on sustainability.

- » **Currently, many students in Latin America and the Caribbean do not have access to a college education. Can young people who have technical or technological training work for the environment? What options are available to them?**

I think there are a lot. Earning a college degree is often seen as the only way, but many technological improvements also contribute to sustainability. There is a lot to be done from that standpoint.



## Environmental Research and Education: Diego Mosquera

**D**iego Mosquera is an ecologist by profession, and he has a Master's degree in geographic information systems. He has worked in many different

natural areas in Ecuador. For the past 15 years, he has worked in the Amazon, where he has been a permanent resident for the past 8 years. He runs a high-level research station in one of the most biodiverse places on Earth, and he spends his time there documenting and studying wildlife by using camera traps.

“Nature functions as an intricate network of interactions among species and their environment, and although we don't understand these dynamics, we must prepare for the changes that are coming,” says Mosquera.

### For more information go to:

» **Protecting the Land at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

- » **You have run the Tiputini Biodiversity Station of University San Francisco of Quito since 2005. Why is this reserve, located in the Ecuadorian Amazon, so important?**

It is important because of its incredible diversity. The Tiputini Biodiversity Station is located in Yasuni National Park, which has been documented as one of the most biodiverse places on Earth. No one has been able to produce a complete list of all the species of organisms in a given place, and this challenge is especially daunting in the tropics. The station comprises only 650 hectares, but it has an impressive variety of amphibians, reptiles, birds, and mammals. In terms of plants, the total number of species is close to 2,200, and some 600 species can be found in a single hectare. Because of all this diversity, environmental impacts on Yasuni have greater ramifications

than they do elsewhere. The station's goal is to promote research on this magnificent ecosystem and to generate information that will help document and protect it. The most important component is education, which is why our work is so important.

» **How did your college degrees help you achieve the position you have today at the station?**

I studied ecology in college, and later I earned a Master's degree in geographic information systems. The knowledge I acquired during my studies and especially during field trips increased my interest in protecting the Amazon. This knowledge helped me obtain a position managing the station. A position like this requires a lot of research experience and knowledge of biology, ecology, and even administration. Speaking more than one language is also essential. My university studies were important for those reasons.

» **Why is ecosystem research so important for mitigating and adapting to climate change?**

To understand how to mitigate or adapt to climate change, we must first understand how ecosystems function. Nature functions as an intricate network of interactions among species and their environment, and although we don't understand these dynamics, we must prepare for the changes that are coming. Climate change has repercussions on many levels; it isn't only about it getting hotter or colder or that there will be more or less rain. Climate change implies changes among species' interactions; the spread of pests and invasive species; the productivity of forests and crops; droughts, floods, and disturbances in biogeochemical cycles and soil water reserves; decreased carbon sequestration; and more high-impact natural disasters. All of these will undoubtedly alter our environment and our way of life, producing drastic social and economic changes. If we don't understand how ecosystems work, we can do very little to mitigate or adapt to climate change.

» **You work in environmental education at the station. Who visits you there? What do you teach them and why?**

Most of our visitors are undergraduate students from universities around the world, especially the United States. We also receive researchers interested in studying various organisms (birds, mammals, plants, etc.), doctoral students who come to do their theses, and documentary photographers and teams who visit for specific broadcast projects. The reason they visit, especially students, is to gain direct experience in a region that is full of myths. They receive lectures about the Amazon, conservation, petroleum, biology, geography, and so on; and they work on projects to learn study techniques that will help them in their future careers. We believe in the concept of an open classroom, wherein students have access to facilities such as laboratories, computers, and other equipment. Then, when they go out into the forest, they immediately have a living laboratory in which to explore and implement what they have learned. When students return to their home countries, they leave with a different perspective of the Amazon. They understand its importance and learn to appreciate conservation, and above all they realize that what they do at home is somehow related to the Amazon forest.

» **Does classifying and researching wildlife inform us about climate change?**

Of course! Climate change is one of the biggest threats to many species, especially those that are highly sensitive to changes in the environment, such as amphibians. Changes in the climate affect the seasonality of the forest, which influences the availability of resources that species need to survive. By studying wildlife, we can make inferences about the presence, distribution, and use of resources and activity and behavior patterns, and we can see how these patterns change over time. When there are drastic changes in these patterns, the effects of climate change are evident.

» **Why are careers in environmental protection more important today than they were a few years ago? Is this a fad that will pass?**

Thankfully, environmental issues have become a bigger priority during the past decade, but much remains to be done.

In recent years, the tremendous pressure on ecosystems and resources has put us dangerously close to the point of no return, when we will no longer be able to recover their integrity. The urgent need for changes in the way we live makes it imperative that people get trained on environmental issues. I believe that this is more than a fad; it is a kind of paradigm shift, as we've come to realize that our lives depend on protecting our planet. I hope it's a fad that doesn't pass, because there are many problems and few solutions.

» **What is the environmental reality of the Amazon today, and what do we need to do to protect areas like it?**

The reality is that the Amazon is in serious danger. Human activities and their direct and indirect results have had devastating effects on the forests and the species that live there. Oil extraction, mining, deforestation, agriculture, wildlife trafficking, indiscriminate hunting, constructing roads, and so on are further reducing the forests of the Amazon countries and threatening the delicate balance of the ecosystem. The Amazon is one of the most complex ecosystems on Earth. Its forests took thousands of years to form, and, given its complexity, it doesn't recover as easily as other ecosystems. This isn't about eliminating large areas and then replanting them, because the complexity and diversity of the Amazon will not recover. That is why it's important to conserve large areas of the forests that can be interconnected and thus allow for genetic exchange. We have seen how important it is to protect the integrity of the Amazon rainforest time and again, but unfortunately it is a political issue. We need leaders with new visions who understand that our survival doesn't depend on us but rather on the Earth and on how well we use and care for it. We need leaders who understand that cement is not progress and that real treasure is not oil or minerals beneath the soil but rather the forests that live above it. We need to control population growth, protect more areas, raise awareness, change consumer habits, and even look to ancient practices that were more sustainable. We must invest in and develop new environmentally friendly technologies, and above all we must reduce and eliminate our dependence on oil.

» **What type of professionals or specialists are required to conserve the Amazon and why?**

Personally, I believe anyone who is committed to environmental protection can help, from lawyers to artists. We have made extraordinary advances on the scientific side, but documenting what's happening in the Amazon is useless if it keeps disappearing at such a worrying rate. We need professionals and specialists in many fields, not only in biology. Forest degradation is an issue that has many ramifications, so having specialists in areas such as environmental law, natural resource economics, or engineering is very important. We need to train community and political leaders on the subject and on conservation.

» **What message would you send to young people who are interested in pursuing careers in environmental stewardship?**

Well, I would say that it is definitely worth it, but they will need to arm themselves with patience, and they shouldn't expect to be well paid. However, it is greatly rewarding to know that you have made a tiny contribution to protecting our planet and the species that inhabit it.

» **Are there many scholarship opportunities for undergraduate and graduate students interested in careers involving the environment? Which countries are the most advanced in these topics and why?**

Yes, I think scholarships are increasingly available. Access to scholarships and information is much more widespread than it was a few years ago, which allows for more opportunities. Countries like Holland are very interested in mitigating the effects of climate change, because eventually they will be the first victims. They have come a long way in their research, and they donate a lot of money to both scholarships and further research. Brazil has made great strides in environmental issues as well. It has trained professionals who are very committed to the issues. Costa Rica has made natural resource conservation a primary source of income, and conservation is a government policy priority. The United States is a country of reference, but environmental issues are the last thing on peoples' minds

there. Colombia and Mexico also have excellent environmental professionals in various fields, but not as many as we would like.

» **Currently, many students in Latin America and the Caribbean do not have access to a college education. Can young people with technical or technological training work for the environment? What options are available to them?**

There are many opportunities. Environmental conservation and protection go beyond having a certain degree. Of course, being well educated helps a lot, but ultimately what matters most is what happens in practice. It requires a lot of people who are committed to the environment on many different levels. Technical or technological training is also essential and can be applied on different fronts, often generating even greater impacts and results. You don't have to be a world-renowned scientist with two doctorate degrees to get results.

Is there anything else you would like to talk about in this interview?

As an inhabitant of the Amazon, I am very concerned about its future. I would like to say that it is important to realize that nature is not here for us to decide what happens to it or to decide who lives and who doesn't. Showing respect for life in all its forms is the first step toward changing what we are doing wrong. We still have time.



## Risk Management: M.C. Carolina Neri

**M**.C. Carolina Neri is a geographer by profession. She completed her graduate studies in Earth sciences, with a specialization in natural risk

management, at the National Autonomous University of Mexico. She is currently working toward her doctorate from the Geography Institute, and she is researching the use of climate information for drought prevention. Her professional experience includes participation in various research and consulting projects.

“Given the potential impacts of a changing climate and our increasing vulnerability, the best way to reduce the likelihood of being affected is by adjusting to the potential changes, which means changing what makes us vulnerable,” says Neri, who works on adaptation to climate change and risk reduction.

### For more information go to:

» **Ensuring Healthy Environments and Protecting the Land at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

» **What does risk management and working for adaptation to climate change entail?**

Risk management is about planning preventive actions to reduce a region's or system's vulnerability to certain threats or dangers, such as hurricanes. Temperature increases and changes in precipitation are threats to socioeconomic progress. To identify what we can do to adapt to these changes, we need to understand why we are vulnerable. From a risk management perspective, we need to study climate change and its likely effects and then select and define actions

to reduce our present and future vulnerability.

» **Why is your work useful?**

Studying and evaluating the impacts of meteorological events, climate change scenarios, our adaptive capacities, and so on are extremely important for public policy and program design and for federal, state, and municipal action plans.

» **Why is teaching people to adapt to climate change so important right now?**

Given the potential impacts of a changing climate and our increasing vulnerability, the best way to reduce the likelihood of being affected is by adjusting to the potential changes, which means changing what makes us vulnerable. An obvious example is to stop our excessive use of natural resources. In the future even more people than today will require basic services such as food and water, and without adapting we may exhaust all of our water resources or environmental services before climate change catches up with us.

Why are careers in environmental protection more important today than they were a few years ago? Is this a passing fad?

They have always been important. Today they are higher profile because we need immediate answers to the problems that have been developing for so long. We need to extensively study our mega-diverse, multicultural continent. Perhaps the reflectors are directed at another point for now, but without question the issue of environmental protection will not stop being relevant.

» **When did you realize you were interested in the environment? Was it while you were in school? Also, what influenced your decision to work for the environment?**

When I was a kid, I used to watch the news on television, and I was always interested in knowing why hurricanes or heavy rains caused such widespread damage in so many socioeconomic sectors. I didn't find many answers in elementary school, but in high school my geography teacher explained the relationship between humans and the

environment, and that's when I realized that geography was my calling. In college, I studied the El Niño phenomenon and how droughts affected rain-fed agriculture in places such as Oaxaca's Central Valley. I always link the two.

» **Can you make much money working for the environment? What job opportunities are there in the fields of risk management and adaptation?**

There are opportunities in government agencies such as Mexico's Secretariat of Environment and Natural Resources, National Commission for the Knowledge and Use of Biodiversity, National Institute of Ecology, and the National Forestry Commission, to name a few, as well as in national and international environmental nongovernmental organizations. Today, the issue of climate change is high on national agendas, which implies that large investments are being made, and therefore there are opportunities to participate in studies and projects in academia and in state and municipal institutions.

» **What major challenges and obstacles have you faced in your career? Do any of them have to do with being a woman?**

People who work in risk management and adaptation have to work with key decision makers and stakeholders. I first got involved in research projects while I was still studying, and right away I started giving presentations and speaking at workshops. Some people aren't comfortable with a girl doing an evaluation or having the answers, but that was how I learned to overcome my nerves and be confident in my knowledge.

» **Can you give us an example of a specific situation in which risk management was fundamental?**

One day, a congressional staff person called the institute and spoke with my advisor. He said they were very interested in the proposal we were working on for an early drought warning system, which was the topic of my Master's thesis. After several meetings a document was drawn up that was promoted in the Chamber of Deputies, and we presented the proposal at a hearing. Although the initiative wasn't accepted,

the experience cemented my belief in what I was doing, and I was pleased that at least 10 deputies listened closely to us.

» **What personal qualities does a person need to pursue a career like yours?**

This job requires outreach to academia and institutions and to society in general. Sometimes we act as intermediaries; at other times, we take the side of academia or of the decision makers. So it is important to know how to negotiate and to develop strategic vision.

» **What would you tell young people who are interested in careers related to the environment and adaptation to climate change?**

There is still much to do. We need young people with creative, innovative ideas to tackle the current challenges around climate change.

» **Are there many scholarship opportunities for undergraduate and graduate students interested in risk management? Which countries are the most interested in this topic and why?**

Yes, I can say from experience that Mexico has good scholarship opportunities. Most graduate programs have scholarships available from the National Council for Science and Technology (CONACYT), and many universities have alternative programs, such as at the National Autonomous University of Mexico. There are also other ways to get funding, such as by collaborating on research projects.

The second part of the question makes me think of the United States or the countries in Europe. Their education systems exceed those of many countries. I don't want to go into the details, but I think that one thing that makes a difference is that in countries like the United States, the undergrad teaching and learning processes are very solid, so students assimilate things like theoretical foundations better.

» **Some people who are interested in working on the environment don't have access to a college education. What would you suggest to them? What opportunities are there in education and in the workplace?**

There aren't really any limits today. You can find a lot of information online, in libraries, and so on. However, having a degree opens doors.



## Conservation, Risk Management, Environmental Planning and Participation: Rodrigo Tarquino

**R**odrigo Tarquino is an environmental engineer. For the past 10 years, he has helped various Bolivian institutions apply scientific knowledge to environmental management to guide them toward implementing sound local and regional policies.

"I strongly believe that civil society participation and involvement in environmental planning and management are crucial for better governance and self-management of nature," says Tarquino, who believes that it takes a long-term commitment to really make a true difference for the environment.

**For more information go to:**

» **Our Climate Is Changing, Protecting the Land, and Water to Treasure at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

» **Why is establishing and conserving protected areas important? How does it help mitigate climate change?**

Human beings are part of nature. Today, we are responsible for managing and making decisions for the Earth. To do this, we've established land-planning mechanisms, such as

protected areas that we seek to conserve. Protected areas represent samples of landscapes, species, and ecosystems; and although these are often quite beautiful, their purpose isn't only to make us happy. They also provide environmental services such as the air we breathe, the water we drink, and important aspects of life itself.

Climate change is a real phenomenon that demands attention right now. Researchers and others who work on this topic are studying it and trying to learn more, both to share information about its impact and to take action and promote behavioral changes around its causes. In this regard, protected areas are developmental models wherein we can test what we've learned and that we can use to create awareness about climate change and other topics.

» **What does development with adaptive capacity entail? And what are the most important elements to consider when adapting to climate change?**

Development is a natural process of growth and evolution. It doesn't exist in a vacuum, however; we must also consider the environmental context and remember that it is always changing. To the extent possible, we must be able to adapt to disruptions or changes, whether social, environmental, economic, or political.

Adaptation is the ability to change and modify our behavior according to external conditions. Even if they're not aware of it, people, societies, and countries are exposed to things like climate change. So it's our responsibility to inform ourselves, evaluate our attitudes, change our behaviors as individuals, and help society do the same.

» **Why are careers in environmental protection more important today than they were a few years ago? Is this a passing fad?**

Career paths in environmental protection in Latin America arise from the need to be responsible toward our planet. At first, much of the knowledge was new, but now we have a wealth of environmental information that allows us to act in the legal, political, and productive spheres based on what

we've learned. Although fads will always come and go, I believe that doing what needs to be done takes conviction. And conviction isn't only a fad; it's a desire to have a brighter future and, above all, a better quality of life that is eternally linked with nature.

» **What job opportunities exist for environmental management professionals? Are they only found in the public sector? Or is it also possible to work in the private sector?**

After working for more than 10 years, I can say that the work is where you look for it. I mean, with conviction as your engine, you can always seek out new horizons. Latin America is filled with young people who can think for themselves, and that's a great quality to have in this type of work, where you need to be dynamic and impetuous. There are definitely work opportunities in the public and private sectors ranging from self-employment to working with large organizations.

» **What major challenges and obstacles do you face in your work?**

Organizational bureaucracies and lack of vision, when processes are myopic or lack commitment. Also, obstacles that limit the ability of states, nations, and continents to prioritize conservation and environmental actions, such as crises that distract us from global "development" policies and render them less important. Finally, people who work on short- and medium-term conservation and development projects generally do not have job security, which results in a lack of commitment, in my opinion.

» **What personal qualities does a person need to pursue a career like yours?**

People working in this field often find themselves in remote areas for long periods of time. Students should know that to do one thing you like, you have to do 10 things that you don't like. Environmentalists are patient dreamers; they don't want to be cooped up inside an office 365 days a year.

» **What would you tell young people who are interested in careers relating to the environment and adaptation to climate change?**

The environment needs people who are committed to spending their time fulfilling their dreams. They should know that the profession doesn't always pay well, and that it's not always easy, because you have to face society and say what you think, even if everyone believes you are wrong. Also, even after thousands of years, we still don't really understand nature, and often we don't feel like we are a part of it. That is why it's important to become involved. To understand nature, we must research it so we can help it through planning and management, and so we can do something for nature through our attitudes.

» **Which countries are the most advanced in risk management?**

Risk management is advanced in Japan, Chile, Peru, Colombia, and other countries that are subject to extreme environmental pressures. I am sure that Indonesia is an example today, after the 2004 tsunami. We can learn a lot from those countries.



## Environmental Engineering: Angelica María Acero Díaz-Granados

**A**ngelica María Acero Díaz-Granados is an environmental engineer with professional training from the Free University of Bogota, Colombia,

and a Master's degree in Earth sciences from the Paul Sabatier University in Toulouse, France. Her work entails assessing and implementing management models that optimize the use of natural resources and minimize pollution from human and industrial activities and processes.

She has been involved in mineral exploration projects in Colombia and the Dominican Republic, performing follow-up studies on occupational health and industrial operations safety.

"The mining industry is made up mostly of environmental experts, which is very important because identifying environmental issues and impact is part of what they do. The environmental team's goal is to reduce, control, and/or minimize the impacts they identify, promoting good waste management, the use of clean technologies, the proper use of natural resources, and continuous process improvements," says Acero Díaz-Granados.

**For more information go to:**

» **Ensuring Healthy Environments and Protecting the Land at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

» **What is environmental engineering?**

My personal concept is that environmental engineering is the study of modern society's environmental problems. In general terms, environmental engineering is about environmental stewardship. Taking into account social, economic, and technological dimensions, it promotes comprehensive sustainable development solutions that comply with environmental laws.

» **You have extensive experience in occupational health and industrial safety in the mining sector. What are the most important elements to consider for health and safety in a gold mine?**

In general terms, mining companies should:

- Develop an occupational health and industrial safety management model
- Have clear occupational health and industrial safety policies. Disseminating these policies and ensuring employee commitment is crucial.
- Implement occupational health and industrial safety programs and emergency plans that are tailored to the location and its activities to prevent and/or reduce risks
- Provide workers continuous training and education on health and industrial safety issues to greatly reduce risks
- Establish environmental management programs so the staff knows that the company is committed to environmental conservation and management.

» **For years mercury has been used in gold mining, and we know the health consequences of this. What do you think about the Minamata Convention on Mercury?**

Although achieving a global commitment to reduce the industrial use of mercury and its health and environmental effects has been a long process, the Minamata Convention held in Geneva in 2013 [[Okay/correct?]] helped establish a starting point. Through it, some 140 countries are working to establish global commitments to reduce mercury use and improve its

management to avoid pollution and harm to humans. This issue is everyone's problem. Our countries should set higher control standards to ensure sustainable development and reduce pollution. The Minamata Convention helps raise awareness and improve our environment.

» **Why is it important for a mining company to employ environmentalists?**

The mining industry is made up mostly of environmental experts, which is very important because identifying environmental issues and impact is part of what they do. The environmental team's goal is to reduce, control, and/or minimize the impacts they identify, promoting good waste management, the use of clean technologies, the proper use of natural resources, and continuous process improvements. This helps the mining industry focus on sustainable development.

» **What role does the local community play in terms of maintaining a safe and healthy environment in mining areas? Do private or mixed enterprises take the community into consideration when making decisions about the environment?**

The community plays a key role when there is a direct relationship between the company and the community. For example, mining companies employ strategies for good communications with the public, offering advantages in terms of development and employment generation. They also establish environmental protection and public safety management systems. Through such systems, the mining industry shows its ongoing commitment to the community by seeking to improve the quality of life in local communities.

Currently, private and mixed enterprises are very interested in establishing environmental management and security systems. The mining industry is one of the industries with the greatest focus on accountability and societal well-being. As part of the decision-making process, the community is invited to meetings in which the staff charged with environmental responsibility propose to the community environmental programs designed to ensure the proper use of resources and environmental mitigation and compensation. The community has the

opportunity to express its opinions and concerns and to make suggestions regarding the environmental management plans the company will implement during the project. These opinions are used to modify or improve the environmental programs.

» **When did you realize you were interested in the environment? Was it in school? What influenced your decision to work for the environment?**

I studied some subjects related to the environment in school, such as ecology, natural sciences, and others, which led me to focus my university studies on that area. My decision to study environmental engineering came when I noticed how many environmental problems we had in our area and when I saw the initiatives that companies were beginning to adopt, including environmental management models and the chance to participate actively on various fronts.

» **What job opportunities are there for environmental engineers?**

There are many job opportunities worldwide. Currently, country commitments to adopting environmental management measures in various disciplines provide professional opportunities to work on environmental engineering projects in areas such as waste management, water treatment, air pollution, and environmental management systems, to name a few. In my case, the mining industry has enabled me to use my knowledge while working for a socially responsible industry to create a sustainable development path.

» **Can you tell us about a specific situation in which your work was crucial for the environment and the health of employees or the community?**

While working in mineral exploration in the Dominican Republic, I had the great experience of participating in environmental and occupational health and industrial safety monitoring during exploration activities. The company sought continuous improvements and took its responsibility for the welfare and safety of workers very seriously. We implemented new safety measures, staff training on the proper handling of

machinery, measures for avoiding accidents, and the use of industrial safety tools; and we discussed our responsibilities and commitment to environmental management, among other topics. This greatly increased workers' commitment to health and safety in every area and to properly maintaining their work areas. New environmental management measures were implemented for proper water use and reuse and for solid waste management. We also had good communications with environmental authorities, and we complied with local environmental regulations. This teamwork among managers, employees, communities, and the government facilitated our responsible mining practices.

» **Some people who are interested in working on the environment don't have access to a college education. What would you suggest to them? What opportunities are there in education and in the workplace?**

There are many ways to participate in environmental activities, such as becoming involved with a nongovernmental organization, volunteering with an environmental group and learning about environmental topics empirically, or getting involved in environmental activities in the community along with youth, children, the elderly, and even the authorities, if possible. Also, contacting people who are knowledgeable on the topic or companies or organizations that support environmental initiatives can be a starting point for learning about the environment. From a work standpoint, many jobs contribute to environmental protection and conservation, such as park rangers, environmental awareness event organizers, or environmental fund-raising.

Is there anything else you would like to talk about in this interview to motivate students to work toward protecting the environment and mitigating climate change?

I encourage students to participate in environmental activities in their cities and around the world. Now more than ever, everyone needs to protect and help manage our natural resources. We have to be aware of how the environment influences our lives and those of future generations so we will

make our world a friendly, clean, and harmonious place and develop it sustainably.

We need people who are focusing on protecting the world in our governments, our schools, our businesses, and our lives so they can share their knowledge and offer new ideas for improvements, clean technologies, research, and more.

The consequences of climate change are largely a direct result of mankind's lack of awareness. Serious environmental impacts on water, air, and soil have led to a new generation of natural phenomena. As such, it is important to motivate people to address environmental issues and to use their expertise in these sectors. These sectors need entrepreneurs to contribute to continuous improvements and environmental protection.



## Landscape Design: Eduardo Hinojosa

**W**ith a degree in ecology, Eduardo Hinojosa loves natural beauty and is fully committed to ecology and its processes. His

professional experience has included everything from ecological conservation to designing urban spaces. Initially, he began working in the field of conservation as the research department head at an ecological reserve. Later, he participated in several consulting projects on topics related to the development of public policies for environmental improvement and adaptation to climate change. He also worked on preparing urban development plans and designs and promoting the implementation of techniques, technologies, and designs to increase sustainability.

Currently, he is working toward a Master's degree in urban environmental management in the Netherlands.

"I am convinced that simply trying to avoid negative impacts on and restore ecosystems is not enough; we need to find ways to revitalize them. This applies to both "natural" environments and those that have been modified by humans, whether urban or rural. I am committed to improving the conditions in which society and ecology operate, regardless of where they are located," says Hinojosa.

He believes it is essential to expose young people to the beauty of nature and to make sure they understand the importance of protecting untouched areas and improving areas that have been modified or devastated.

**For more information go to:**

» **Protecting the Land at [www.iadb.org/riseup](http://www.iadb.org/riseup)**



» **What does designing, planning, and conserving landscapes and gardens entail?**

My field is generally called landscape architecture. It's about arranging spaces so that they're suitable for specific activities. The concept of a "landscape" is abstract and subjective; different disciplines define it in different ways. Generally, it involves an observer's perceptions about a certain space. However, cultural, physiographic, and ecological characteristics influence the meaning we give to landscapes. Through design and planning, we can build and manage space and thus drive and even determine the culture that develops there.

» **Why is your specialization useful? Is it mainly about aesthetic needs?**

To a large extent, you could say that it focuses on the aesthetic qualities of spaces. However, it can be approached more holistically by recognizing and emphasizing the ecological and social processes taking place on the landscape. Many human development problems could be solved through such an approach. We could also improve the conditions in which we live as a society and in which wildlife develops.

» **Why are careers in environmental protection more important today than they were a few years ago? Is this a passing fad?**

Environmental stewardship has been brewing for decades, although it has spread so quickly in recent years that it may be fair to call it a fad. Personally, I think that unlike the others, this fad is here to stay.

The environmental degradation and natural resource shortages that have come from excessive exploitation are undeniable. How much influence we actually have on much-hyped effects, so to speak, such as climate change is perhaps debatable. But the fact that it is occurring is increasingly difficult to deny. We need a deep understanding and a commitment to conscious management if we want to regain the environment's functionality and protect ourselves from increasingly challenging situations.

» **When did you realize you were interested in the environment? Was it in school? What influenced your decision to study ecology and landscape and garden design?**

I've always enjoyed natural science, but I'm also very interested in art. After leaning toward the former, studying ecology, and practicing the discipline in its most basic form, I realized I needed to find a way to apply it much more creatively. So curiosity and dissatisfaction led me to study landscape architecture and urban design and planning, disciplines wherein science merges with art.

» **Can you make much money working for the environment? What job opportunities are available in your field?**

While there still aren't many jobs available, it's definitely a growing field. However, it is not easy to find well-paying jobs, particularly in developing countries, but there will be more, better-paid opportunities in the future.

» **What major challenges and obstacles do you face in your daily professional life?**

While they are not necessarily things that I face daily, some of the biggest challenges are related to communicating my ideas, making sure people understand me, and convincing them of the benefits of those ideas. Building a strong case is challenging in any discipline.

» **What personal qualities does a person need to pursue a career like yours?**

A great love for nature. After all, when you're working to improve nature, the greatest starting point is to feel admiration and love for it. You also need great optimism, because the more we learn about the current situation, the more negative the outlook. Only a true optimist can stay focused on finding possible solutions, however idyllic they may seem.

» **What would you tell young people who are interested in careers in environmental stewardship?**

Go for it, definitely! Despite its downsides, it is a very rewarding career in every respect.

» **Some young people cannot afford to go to college. Can they find work in environmental protection from a technical and practical standpoint?**

There are many job opportunities in environmental protection that don't require a college degree. For example, in ecotourism, agroecology activities such as organic farming, permaculture or beekeeping, installing green technologies such as green roofs and walls or alternative energy devices, and gardening and landscaping, to name a few.

» **Are there many scholarship opportunities for undergraduate and graduate students interested in the environment? Which countries are the most advanced and why?**

There are many scholarships available on both the national and international levels, especially for postgraduates. I think there will be more and more opportunities related to environmental protection, perhaps because, as you said, it is something of a fad.

Developed countries tend to invest more time and money in these issues. However, some developing countries are paying special attention to the environment, such as China. There are many reasons for this, but I think it's generally because so many natural resources have been devastated in these countries, and, as the saying goes, you don't know what you've got until it's gone, or almost gone in many cases. In addition, there is more awareness about the benefits of environmental stewardship, including the economic benefits.

» **Is there anything else you would like to talk about in this interview?**

As a champion of environmental protection, I am hopeful that more and more young people will become aware of and interested in improving their surroundings. It's essential to expose young people to the beauty of nature and to make sure they understand the importance of protecting untouched areas and improving areas that have been modified or devastated.

It's up to this generation to save us from the probable future that is emerging, one in which we have managed to survive

while devastating all wildlife ecosystems and conserving only a very limited number of species. It would be a terrible tragedy to destroy the wealth and beauty that we have enjoyed in our lives without giving future generations the chance to experience it too.



## Responsible Consumption: Marcela Trujillo Useche

**M**arcela Trujillo Useche is a lawyer who specializes in construction, land use, and soil policy law. She has a Master's degree in environment

and human and socioeconomic dimensions. She has worked with vulnerable communities and on developing, implementing, and evaluating education and environmental projects. Her current job involves researching and implementing sustainable development and responsible consumption projects.

"The choices we make every day as consumers have a great impact, but often we don't realize it. Our choices drive consumption and market patterns; they have a big influence on natural resources and society," says Useche, who urges people to shop responsibly.

### For more information go to:

» **Intelligent Consumption and Sustainable Cities for Smart Urban Growth at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

» **You just finished your Master's degree in environment, human, and socioeconomic dimensions and did your thesis on education about responsible consumption. Why should we consume responsibly?**

The choices we make every day as consumers have a great impact, but often we don't realize it. Our choices drive consumption and market patterns; they have a big influence on natural resources and society. They contribute to phenomena as serious as climate change and human rights violations.

Today, consumers have the power to directly influence the system, which is a huge responsibility. Responsible consumption and activities aimed at promoting social and environmental responsibility are powerful tools for putting pressure on the market.

» **What items do we need to consume more responsibly and why?**

Mainly food, because the way it is produced has serious implications for the environment, for people, and for health. However, I believe everything we buy has an impact, so it is always important to consider whether the item is really worth the impact or whether we can live without it. We should be aware of our real needs and abandon our consumerist practices.

» **What can be done to raise awareness among consumers when the marketplace, advertising, and society tell us to constantly buy new things?**

We need to approach it from an educational standpoint so that people become aware of the impact of their actions on the environment and on their own health. We need to understand that we are all part of the same system and that each individual action has consequences. That awareness would start transforming people into responsible consumers who demand sustainable products and services that are produced by ethical means.

When we buy something, we are practically voting by supporting or rejecting certain production processes and

service-provision practices. Our choices send indirect messages to decision makers in the government and in corporations and industries.

I believe that through formal and informal education, we can spread valuable knowledge aimed at modifying habits, and we can provide tools to enable people to be more critical of advertising messages. Likewise, we need human innovation to replace processes and materials that are harmful to the planet, along with a paradigm shift so that people stop associating consumption with happiness.

» **When did you realize you were interested in the environment? Was it in school? What led you to decide to study and work for the environment?**

I've loved and been interested in nature since I was little. Ever since I can remember, I've wanted to protect biodiversity and the environment. However, in recent years, I've become more aware of the power consumers have to transform the current system, which is why I started to change my daily habits a few years ago. I felt obliged to help empower people to make informed decisions about their consumption.

» **Can you make much money working for the environment? What job opportunities exist in the field of responsible consumption advocacy?**

Given the current environmental and social crisis, many national and international institutions are investing resources in programs aimed at improving production practices and raising public awareness. Many clean production projects and responsible consumption education programs exist today, so job opportunities in this field have increased significantly over time.

Moreover, we are seeing the birth of a green economy, which seeks to improve human welfare and social equity while significantly reducing environmental risks and ecological shortages.

» **What major challenges and obstacles do you face in your career?**

Sometimes it's frustrating to see how much power and influence the current economic system has on the environment and our natural resources. Our deeply rooted thought systems threaten the very survival of our species. However, humans have a huge challenge before us, and although it isn't easy, every day I meet more people and institutions committed to personal and collective change.

» **Can you tell us about an experience you've had while promoting responsible consumption in a community? What were the results?**

I recently had the opportunity to be part of a home-based, responsible-consumption program in Madrid, Spain. The program was geared toward families who are concerned about the environmental and social impact of their consumption decisions, daily habits, and lifestyles. The initiative aims to help families manage their homes responsibly by:

Promoting self-monitoring of home water and energy consumption

Introducing resource-saving measures and behaviors

Helping them make more ethical and ecological purchases.

The program educates families about the consequences of certain behaviors. It also promotes practical activities and provides tools for conserving resources and selecting products. Together, these things improve families' quality of life according to their purchasing power.

The program is particularly useful not only for reducing the current environmental crisis but also for moving toward sustainability. Assessments have shown that water and energy savings from the program have exceeded initial targets.

What personal qualities does a person need to pursue a career like yours?

I think commitment and perseverance are important, because we really generate change through our own lives and our choices. We must be aware of our individual actions to "walk

our talk" and to show people that it is possible to live in a way that is more environmentally and socially friendly.

» **What would you tell young people who are interested in careers in environmental stewardship and adaptation to climate change?**

I'd say, go for it! There is so much to do, and we need to be creative and innovative to test new ways of living, and, above all, to let go of the paradigms that consider humans to be lord and master over nature. There are many fronts on which one can act to protect the environment, but the most useful is to show people how they can help change the system simply through their consumption choices. Ethical consumption supports companies that act responsibly, ensures their survival in the market, and contributes to positive change. It also sends a clear message to companies that do not follow responsible practices: we will not consume your products unless you change the way you operate!

» **Some people who are interested in working on the environment don't have access to a college education. What would you suggest to them? What opportunities exist in education and in the workplace?**

I think there are many readily accessible courses on social entrepreneurship and innovation that provide important tools for creating income-generating businesses focused on environmental protection. It's relatively easy to access knowledge today, so taking college courses is not essential to work for the environment.

» **Is there anything else you would like to talk about in this interview?**

A real step toward sustainable development is only possible if we reinstate values and practices that have long been lost in a large part of the world: recognizing the finite nature of our natural resources and using them frugally, enjoying our leisure time in ways that do not involve consumption, and appreciating intangibles that provide real quality of life and are generally free. All of this is essential in our systems and educational projects, because global sustainability begins with personal sustainability.



## Permaculture: Jorge Espinosa

Jorge Espinosa earned a degree in photography and humanities in New York. Later, he studied agricultural engineering at the Pan-American

Agriculture School in Zamorano, Honduras. He is currently working toward his Master's degree in integrative eco-social design (permaculture) at Gaia University. His work at Zamorano involves collaborating on the creation of a workshop to experiment with technologies that may solve some of the challenges facing farmers.

"I am very proud that my name, Jorge, means "farmer,"" says Espinosa, who makes his living by thinking about technologies for solving the challenges faced by rural communities.

### For more information go to:

» **You Are What You Eat, Ensuring Healthy Environments, and Sustainable Cities for Smart Urban Growth** at [www.iadb.org/riseup](http://www.iadb.org/riseup)

#### » **What is permaculture? How does it help fight climate change?**

Permaculture is a methodology for sustainability. The interesting thing is that in sustainability we tend to focus on the end point; whether or not we're aware of it, we try to extend our business or project for as long as possible. However, "permaculture" suggests infinity, a kind of "permanent" agriculture and culture. Yet the only constant in the universe is change, so a permanent culture must be able to adapt as well as be resilient to change.

Permaculture aims to protect people, the Earth, and the future through principles such as zero-waste generation and promoting diversity in our food supply and cultural systems. Permaculture incorporates a full range of carbon farming, such as holistic livestock and agroforestry management, which fix carbon in the Earth's living systems. We know from the study of regeneration agriculture that the same measures used to combat climate change are also (not coincidentally) the best practices for adapting to it: strengthening regional food systems, getting people to spend time in nature, and designing and implementing multipurpose landscapes that house biodiversity, nourish us, provide us with work and economic security, and protect us from floods and droughts.

#### » **You are currently working on a financial permaculture project. What does that entail?**

Financial permaculture aims to bring financial and business professionals into the world of the environment and permaculture design, creating a bridge between the two. We hold an annual event in which people from around the world come together to brainstorm on environmentally and socially friendly business models.

#### » **Do you think permaculture can ensure global food security and environmental sustainability?**

Oh, definitely! The challenge is to quickly make the transition from systems that degrade the environment to processes for cultural and environmental regeneration. The longer we wait, the harder the transition will be.

#### » **You are an agronomist. How did you end up studying agroecology?**

I have been an environmentalist for as long as I can remember. My concern for food sources arose from the environmental degradation that occurs when peoples' needs go unmet. When people suffer, so does the environment. Through permaculture and agroecology, I discovered how people can meet their needs while restoring paradise here on Earth.

» **What role have farmers played in your learning process?**

I am very proud that my name, Jorge, means “farmer.” No amount of reading or teaching can replace direct contact with nature. My experience with farmers has helped me unlearn the nefarious idea that we are separate from nature, the sad and unfortunate notion that human beings are not intimately and infinitely connected to the Earth. Climate change at the macro level (in that what we burn on one side of the planet affects the rest) and advances in microbiology (which have revealed that inside and out, our bodies are just clusters of microbial ecosystems) are showing us what farmers already knew: that the Earth and human beings are inseparable.

» **You are also an artist. What role does your camera play in all of this?**

I use my camera to document everything I do. It is also one of the alternative currencies I barter with!

» **When did you realize you were interested in the environment? Was it in school? What made you decide to study and work for the environment?**

I grew up surrounded by horses and cows in the beautiful subtropical forest of Tegucigalpa. I had my first compost pile when I was 10, and I don’t even remember when I learned how to climb trees. I see everything through those lenses, including my studies and work. Everything in our world is affected by the environmental crisis.

» **Can you make much money working for the environment? What job opportunities are out there?**

Every day, there are more job opportunities in ecology, both in the academic world and in companies that are looking to go green. I would like to turn your question upside down a little: money is only one type of capital. ... The path I have chosen gives me the financial capital I need to live, just like any other job. However, what I gain in emotional, intellectual, social, spiritual, and living capital from the living systems I support enriches me in ways that cannot be quantified (yet!).

» **What major challenges and obstacles have you faced in your career?**

Feeling a bit like the Lone Ranger is inevitable, at times. Our culture has been slow to heed what many have been saying for a while now, long before my colleagues and I. What may be very clear to one person may have to be lovingly explained to others, because our cultural programming sometimes doesn’t allow us see the things that are staring us in the face. How can I embrace change in our transitioning world without losing the ability to enjoy life’s beauty? Nature lovers have to live with contradictions like having to climb down from a perfect tree branch to spend time crunching numbers and preparing a lecture (as the computer battery dies!).

» **What personal qualities does a person need to pursue a career like yours?**

You simply have to love Mother Earth. Instead of considering which field to choose for your professional career, think about whether ecology is something you truly like to do. It’s about having a cosmology of unity with nature, an ethic of kindness toward living beings (including oneself), principles of converting waste into prime materials and challenges into opportunities, closing cycles and cultivating interrelationships and symbiosis.

» **What would you tell young people who are interested in careers in environmental stewardship?**

That we especially need to protect social and economic relationships and structures. Nature can regenerate itself with little help from us, but social relationships trip us up. In this regard, I highly recommend Marshall Rosenberg’s Nonviolent Communication and Charles Eisenstein’s The Ascent of Humanity and Sacred Economics. These books help keep us aligned with regeneration paradigms in the social and economic spheres. I also recommend that people of all ages (9–90) consider learning about permaculture, because it helps break apart these concepts and teaches us to be resilient and stay connected.

» **Some people who are interested in working on the environment don't have access to a college education. What would you suggest to them? What opportunities are there in education and in the workplace?**

First, think about what you would do if money didn't matter. It's hard to do, because it involves introspection. But once you're clear, then ask for help! Every year, some scholarships go to waste; between institutions, families, and your own sweat and effort, I am sure that no one has to go uneducated. Learning to learn is the most important thing you can do, because, like it or not, having a college degree is no guarantee that you'll find a job.

The Internet can teach us anything we want to learn, so the most important thing is learning how to do something and enjoying it. Then we can offer our skills and labor in exchange for training. Many Latin American governments offer scholarships to Zamorano, where half of the curriculum is learning by doing. I also recommend connecting with the World Wide Opportunities on Organic Farms network, which offers agroecological production farm workers shelter, food, and education in exchange for labor. When the time comes to look for work, the work experience you've gained arms you with valuable skills and environmental ethics. Gaia University also teaches us to document and support our learning (and unlearning) to earn a college degree while we work.

» **Is there anything else you would like to talk about in this interview?**

All that is left to do is thank you sincerely and leave you with this pearl of wisdom from the master Fukuoka, one of the great leaders of agriculture for nature: "The primary goal of agriculture isn't food production, but rather the cultivation and perfection of human beings."



## Environmental Management: Liliana Davila

Liliana Davila is pursuing a Master's degree in environmental management at Yale's School of Forestry and Environmental Studies. She has

seven years of international experience in project management and technical assistance on climate change and sustainable development in areas such as Reducing Emissions and from Deforestation and Forest Degradation (REDD+), adaptation, sustainable forest management, climate change action plans, and sustainable production and consumption. Her areas of expertise include: (1) consulting on adaptation measures to reduce the risk of rising sea levels and storm frequencies on vulnerable islands, (2) analyzing alternative visions for sustainable development, (3) supporting the Mexican government in the development of a REDD+ national strategy, (4) implementing and managing climate change projects and showing public policy results, (5) establishing relationships with governments, U.N. agencies and nongovernmental organizations in Latin America and the Caribbean, and (6) designing and delivering communications strategies and coordinating media exposure for projects.

"Knowing how ecosystems and ecological processes work isn't enough; you also have to be able to put your knowledge into practice and implement activities effectively," says Davila.

### For more information go to:

» **Our Climate Is Changing and Sustainable Cities for Smart Urban Growth at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

» **What does environmental management entail? Why is it useful?**

Environmental management encompasses aspects of various environmental and social science disciplines and focuses on the complex relationships among the sciences, management, and politics. It provides a scientific understanding of ecological and social systems for both a political and a management context. With a Master's degree in environmental management, you can work in politics and environmental analysis, sustainable business, design and planning, conservation and environmental stewardship, education, consulting, or journalism.

» **Why are careers in environmental protection more important today than they were a few years ago? Is this a passing fad?**

Environmental science cannot be separated from the social, economic, and political sciences, like we used to think. It's an interdisciplinary subject that tries to make sense of the complex relationships that exist between society and the environment. We are slowly realizing that we put the future of the planet at risk if we continue to view environmental issues in isolation. We have begun to ask whether our lifestyles and economic systems affect the availability and state of our natural resources. We're unlikely to find answers to environmental problems if we keep encapsulating them. We need a paradigm shift in our development as human beings. In that regard, studying the environment more holistically helps us better understand how to support ourselves as a society. This isn't a fleeting fad. On the contrary, sustainability is a cross-cutting subject that must be addressed in everything we do.

» **When did you realize you were interested in the environment? Was it in school? What made you decide to study environmental management and work for the environment?**

I've cared about environmental protection since I was a child. My interest in environmental issues was probably a natural response to the influence of my social environment. Living in Mexico City, which is one of the world's most highly populated and polluted cities, I grew up being constantly exposed to high

levels of air pollution, water shortages, and poor quality water. I felt the need to do something about it. In elementary and high school, I became involved and participated in activities such as recycling contests, science fairs, building green homes, and taking field trips to parks, especially in my senior year. I took a course in environmental science, and the discussions on the effects of climate change increased my interest in studying these issues.

» **Can you make much money working for the environment? What job opportunities are available in environmental management?**

Working in the environmental sector gives you great leeway to get involved in various professions at many levels. From working as a consultant on renewable energies at the national level, to managing a forest in a protected natural park at the regional level, to implementing local fishing projects, or lobbying for international environmental policies to protect biodiversity. There are a wide variety of job opportunities for "environmental managers." The state of our natural resources demands that professionals take a holistic approach that fits with the socio-ecological dynamics of our times. The more people who are thinking about, working on, and influencing environmental processes, the more effective we will be at finding solutions to the many complex problems.

» **What major challenges and obstacles have you faced as an environmental manager?**

The biggest challenge environmental managers face is being able to implement solutions with an interdisciplinary vision. Finding effective solutions to complex problems takes having a broad understanding across disciplines. Knowing how ecosystems and ecological processes work isn't enough; you also have to be able to put your knowledge into practice and implement activities effectively. Is it useful to have scientific knowledge about how to generate solar power if effective policies and incentives aren't in place to support its implementation? The manager's role is to have a holistic view that enables the implementation of effective long-term actions.

» **What personal qualities does a person need to pursue a career like yours?**

In addition to having a scientific understanding of social-ecological systems, environmental managers must have good leadership and management capabilities to be successful. Many colleges offer courses in leadership, negotiation, conflict resolution, and effective communication, which are crucial for effective managers.

» **What would you tell young people who are interested in careers in environmental stewardship?**

I'd say that they made a great choice! It's a great career for people who are dissatisfied with the way we've been doing things and who want to get involved in improving the state of our natural resources and our society. Environmental managers look for opportunities to create change and think holistically about how to implement changes. It's a career for people who want to fight for a healthy planetary system, who do not give up easily, and who have a vision and ideal for building a better world.

» **What types of undergraduate and graduate scholarship opportunities are available in environmental studies? Which countries are most advanced in this area and why?**

Countries such as Mexico, the United States, Canada, and in Europe support students in this field, because they place a high priority on environmental issues. I'm not sure about the undergraduate level, but at the graduate level there is plenty of support for students in environmental fields.

In terms of which countries are the most advanced, I think Europeans are at the forefront on environmental issues, but developed countries such as Japan, Australia, and the United States are also well-known for their work in this sector. Some countries have exhausted their natural resources and have had to develop mechanisms to restore the damage. In Latin America, however, several countries—including Mexico, Brazil, Costa Rica, and Chile—have advanced research and education capabilities.

» **Is there anything else you would like to talk about in this interview?**

Environmental management is a relatively new field, and those who practice it continually look for ways to improve processes. This reflects our society's evolution. We are slowly leaving behind the Cartesian approach to studies, and we are moving toward a comprehensive, holistic vision. Environmental managers are key players in the search for new development paradigms, so I would like to extend a broad invitation to young professionals to join us in this global challenge.



**Designer for Reuse:  
Angeles Estrada**

**A**ngeles Estrada has a degree in industrial design from the University of Buenos Aires. Her interest in socially responsible design led her

to create Minimahuella (which means "Tiny Footprint") in 2006, one of Argentina's first sustainable design programs.

She has coordinated reuse and recycling projects in collaboration with several cooperatives and has led workshops on the subject at collection and education centers. Currently, she heads a consulting firm that provides design, innovation, and strategic environmental process solutions and products to companies. Her design work has been exhibited in Buenos Aires, Paris, London, Tokyo, and other cities.

"When I finished school and started working, I realized that my work had to be about more than just creating new objects to add to the many other useful and not-so-useful objects that surround us," says Estrada, referring to how she started her career.

### For more information go to:

» **Intelligent Consumption and Sustainable Cities for Smart Urban Growth at [www.iadb.org/riseup](http://www.iadb.org/riseup)**

#### » **You studied industrial design. When did you become interested in reusing objects and materials in your designs?**

When I finished school and started working, I realized that my work had to be about more than just creating new objects to add to the many other useful and not-so-useful objects that surround us.

My first professional assignment was to create points of sale and stands. This got me thinking about the “why” of products: the reasons why they’re created, needed, and used. Right away I began reusing the most accessible materials at the time (in 2004) as a way to reduce environmental impact.

#### » **Why reuse?**

Everyone can reuse things. Reusing doesn’t require a huge investment; it just takes some ingenuity and creativity. While reuse is one alternative, it may not always be the best one, because we should really try to avoid generating waste in the first place, instead of looking for a way to use waste after it’s already here. The good thing about reuse is that it transforms a discarded item into a new product, taking advantage of the item’s previous properties. I’m not sure if I’m making sense; the idea is to add value to a given product, beyond its original value. Ideally, an item should be kept in its original form throughout its life cycle to take advantage of all the production processes that were used to make it.

#### » **What types of items, things, and materials can be reused at home?**

I can think of many! The first that come to mind are packages, such as shampoo and detergent bottles or food packaging. Any of these objects can be transformed into

containers, flowerpots, lamps, or even hydroponic gardens. The possibilities are endless, depending only on one’s creativity. Reuse gives an item was destined for the garbage a second life.

#### » **What is required to create a culture of reuse in Latin American and Caribbean homes?**

Primarily awareness. Education is the only way to reach people at home. Children (who can be spokespeople!) and women can be taught how to separate trash by its origin and consider the extensive possibilities for its reuse. Things that have been made by reusing items don’t have to look reused. You can transform items in ways that make it very difficult to detect their origin, and this pleasantly surprises people.

#### » **Is there a market for products made from reused materials or items? Don’t people prefer to buy “new” things?**

When we first started, we had to explain what we meant to people. But today, people understand what it means to reuse things, although they often confuse it with recycling. The market has grown, and more innovative products are being developed.

As I said earlier, reuse is one alternative, but it is not the best one. It’s essential to consider each material’s relevance when creating a product as well as the item’s life cycle. Reuse has become a fad, and that is dangerous. We need to work at making it more of a tradition than a fad. Also, people often think that because we’re using waste materials, the products should be cheaper. We need to explain to consumers that this isn’t always the case.

#### » **Do you think instilling a culture of reuse would make it possible to have zero waste in Latin America and the Caribbean?**

The culture of reuse is not a solution in itself, but it may be a step in the right direction. It can help us reduce waste; but to achieve zero waste, consumers must consciously take responsibility for their consumption.

» **How can be done to make people more mindful of their consumption, when the marketplace, advertising, and society constantly pressure us into buying things?**

We have to educate consumers and help them understand the need to be mindful. We also have to make companies understand that their waste comes at a cost and that they must take responsibility for the consequences.

» **Do you share any experiences and results you've had promoting reuse in a community?**

Yes, we work with a cardboard cooperative to make products using recycled cardboard. The impact on the community has been very good. The products have been widely accepted by consumers, and the producers (of the cardboard) are very proud of their work.

» **What personal qualities does a person need to pursue a career like yours?**

You have to have a lot of conviction! When you have a solid belief in what you stand for, you can be happy even when the journey is long and complex, because you are being true to your principles.

» **Some people who are interested in working on the environment don't have access to a college education. What would you suggest to them? What opportunities are available in education and in the workplace?**

I think there are many opportunities for them to reuse materials to make products and transform their work into a social enterprise. You don't need a professional degree to do this; all you need is ingenuity and creativity and a willingness to work. Research readily available materials, find out their characteristics, and think about what they can be transformed into.

» **Is there anything else you'd like to say to encourage young people to consider a career in environmental stewardship?**

I think that today practicing environmental stewardship is a differentiating professional trait, but tomorrow this trait will be

shared by all professionals. We can't keep pretending that our actions don't have any environmental impact. Before now we have been able to look the other way, but today we have so much more information, and natural events are clearly showing us the importance of considering this impact; in a few years, we won't be able to ignore it any longer. It just makes sense to be in the forefront and to start working in this area now, to prepare and become trained.

## Further reading and viewing

“Ted Talks” are ideas worth spreading. The ones listed below are all relevant to the themes of IDB’s Rise Up Against Climate Change. Look for them at [www.ted.com/talks](http://www.ted.com/talks).

- » Innovator Bill Strickland changes a neighborhood with a slide show. This very inspiring talk demonstrates that determination makes dreams come true. It also shows how having a plan and an overall picture of what we can do together builds healthier societies.
- » Taylor Wilson’s radical plan for small nuclear fission reactors. When he was only 14 years old, Taylor Wilson built an electricity-generating nuclear reactor that offers significant advantages compared to other nuclear power plants operating around the world today. In this video, filmed when he was 19 years old, he explains how his reactor works and how it is safer than other reactors as well as more efficient and more environmentally friendly.
- » Eben Bayer: Are mushrooms the new plastic? Green designer Eben Bayer demonstrates how he has used mushrooms to create a packaging material that is much more environmentally friendly than plastic.



- » Alex Laskey: How behavioral science can lower your energy bill  
In this talk, energy software maker Alex Laskey discusses how using behavioral science can change peoples' attitudes toward environmental protection. It provides an interesting approach for psychologists, sociologists, and other professionals who have an interest in sustainable development and adaptation.
- » Tim Jackson: An economic reality check  
Economist Tim Jackson encourages us to think about a new economy that reevaluates our lifestyle and social values and our relationship with the environment.
- » Rachel Botsman: The case for collaborative consumption  
In this talk, innovator Rachel Botsman encourages us to think about how we consume goods and offers an alternative to traditional consumption that is more environmentally responsible, strengthens our social networks, and improves our buying habits.
- » Alex Steffen: The shareable future of cities  
This talk from planetary futurist Alex Steffen teaches us how to develop sustainable cities. It presents projects with big ideas from around the world.
- » Ludwick Marishane: A bath without water  
In response to the water shortage on his continent, a young African entrepreneur, Ludwick Marishane, invented a product that lets people bathe without water.
- » Fahad Al-Attiya: A country with no water  
Qatar food security expert Fahad Al-Attiya shows how his country has grown in the midst of a water shortage by taking climate change and food security into account and developing its cities sustainably. He discusses the role of planning and public policy in the sustainable development process.

- » Saul Griffith: High-altitude wind energy from kites!  
Engineer Saul Griffith demonstrates his great invention, which transforms wind energy into electricity by using a large kite.
- » Josette Sheeran: Ending hunger now  
Josette Sheeran, executive director of the United Nations World Food Programme, urges us to learn about the realities of today's world and to use this knowledge in decision making. She discusses food security as well as worldwide hunger and the use of technology to circumvent it.
- » Birke Baehr: What's wrong with our food system?  
Filmed when he was 11, Birke Baehr discusses food security and food sovereignty, analyzes food systems in developed and developing countries, and encourages us to consume organic foods.

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