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Featured Interview

Study on tropical soils yields award from the Royal Society to researcher in Brazil

📅 September 17, 2018 📄 Essay

How do the various farming practices impact the soil quality of degraded pasture and how does it translate into monetary value? How can this value be perceived by farmers? How to convey this knowledge on a larger scale and influence public policies? The questions raised by Agnieszka Latawiec, the first teacher of a Brazilian teaching institution awarded by The Royal Society Newton Advanced Fellowship Award, of the oldest scientific academy in the world in operation, founded in 1660, are challenging .

Latawiec, who teaches at the Department of Geography and Environment of PUC-Rio, has just received the honor, along with funding of 66,700 pounds (about R \$ 354 thousand) from the Newton Fund for full investment in soil research tropical.

The name of the study presented is *Sustaining the land from below: developing a conceptual model of valuation of ecosystem services for tropical soils* . In addition to Latawiec, the scholarship will also allow the doctorate of the Department of Geography and Environment of PUC-Rio Aline Rodrigues to develop its research in partnership with major environmental research centers such as the School of Environmental Sciences, University of East Anglia; and the Universities of Cambridge and Aberdeen.

"The central objective is to evaluate the monetary value of some aspects of the soil and to bring this information to the producer and other actors. The project innovation is at the interface of the valuation of ecosystem services of soil and the application of results in practice," he says.

Another objective of the research - which is already giving results - is to prove that the field of Exact Sciences is also the territory of women.



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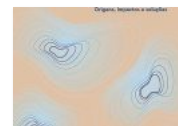


Agnieszka Latawiec

Agnieszka Ewa Latawiec is a professor at the Department of Geography and Environment of PUC-Rio and co-founder of the International Institute of Sustainability of Rio de Janeiro (IIS) and currently holds the position of Executive Director of the Institute, as well as coordinating the Center for Science of Conservation and Sustainability of Rio (CSRio). Specialized in soil and plant chemistry, she is also an associate professor in the Faculty of Production and Energy Engineering at the University of Agriculture in Krakow, Poland, her native country.

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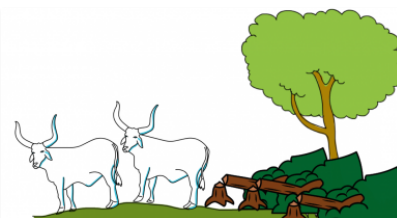
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Brazil is a world power in the agricultural sector and, at the same time, a power in the environmental field. In 2016,

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What motivated her to develop this research?

I am passionate about participatory applied research related to soils. This area still represents a niche in the field of research, both in Brazil and abroad. When, in 2006, I presented to my PhD advisor in England plans to join research in the soil laboratory with the Social Sciences, he was enthusiastic. But basically just him. I do not know how many times I have heard that it would not be possible to successfully join Exact and Human Sciences in practice. That these things are not talked about. But in 2009, when I finished my PhD that investigated pure soil chemistry with social research, I pointed out that this is possible. From then on, my research interests were focused around various aspects of applied soil science, always involving the actors potentially interested in the results of this research,

When will the research be completed and what will be discovered?

We have two years to carry out the activities, until 2020. The central objective is to evaluate the monetary value of some aspects of the soil and to bring this information to the producer and other actors. The innovation of the project lies in the interface of valuation of ecosystem services and the application of results in practice, but what we are going to find out I am also curious.

Particularly I am very excited to start analyzing the results of the field and to verify how several agricultural practices impact the soil quality of degraded pasture and how this translates into monetary value. I am also very curious about the perception of these values by producers and how to seek better ways to transfer this knowledge on a larger scale.

Is there little scientific knowledge about tropical soils? Does the great knowledge about soils that exists today refer to temperate climates?

I think there is a great deal of scientific knowledge about tropical soils, but this knowledge is lacking, both by landowners and by other decision-makers. In this way, the soil, the resource that we all depend on for our future and the future of the next generations is being degraded, ill treated, underutilized and not respected.

We need to recognize more ground value, and more rigid regulation to protect this resource. This is not only related to water and carbon services related to soils but also a regulation that deals with the abusive use of agrochemicals, since the scale application of these in Brazil is regrettable and alarming.

Do you know, basically, what are the differences between tropical and temperate soils?

Yes, from the chemical, physical and biological point of view of soil we already know a lot. But applied soil science is little explored in tropical countries. In temperate climates this type of research has gained interest in recent years, but there is still much to be done.

Does Brazil have a wide variety of soil types?

Yes.

How will research address this diversity?

The purpose of the project is not to deal with all types and in fact is not necessary. When we develop an appropriate conceptual model of ecosystem services, we can apply them to many other types.

What valuation tools will be used?

This will also be explored together with Brazil's collaborators - such as Embrapa Solos and Embrapa Agrobiologia - as well as researchers from England at the University of Cambridge and the University of East Anglia. At the outset, I intend to follow the most current trends proposed by leaders in this type of valuation such as Teeb - a global initiative focused on the valuation of ecosystem services - and according to conceptual models proposed by the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), but the idea is also to propose new solutions. This will be further investigated.

And for what kind of ecosystem service exactly? For example, soil quality, combating erosion?

When I developed the project, I thought of looking first for the carbon, water and fertility of pastures. But recently I had another idea to also assess the biological aspects. The work led by my PUC-Rio undergraduate student, Maiara Mendes, who is currently a master's student at the National Botanic Botanic School, showed in a recently accepted paper published in the scientific journal *Restoration Ecology* that few studies consider the biological value of ground.

“ The biological aspects of the soil have already been shown to be fundamental for the quality and productivity of soils, but they are still neglected, both in the practice of soil management and by the researchers.

When the conclusions are ready, how do you want to convey the message to agricultural producers and government agencies? And how to sensitize them to conservation efforts?

I have several ideas and I'm very excited to explore several alternatives.

“ With the producers, I would like to apply games, as they would know the monetary value of the soil through a more interactive and creative approach, instead of making one more awareness workshop. Another idea I would like to use is to use social media like YouTube, which in a modern and simple way shows opportunities and riches of the rural environment and synergies with conservation.

A similar approach was very successful in Poland and attracted a lot of attention, especially from young people leaving the countryside and migrating to cities. I am very curious to see if these approaches will also work here in Brazil. We have a channel of communication with government agencies and I believe that showing interest in a more sustainable agriculture from the bottom up, from a *bottom up approach*, will have a great impact.

What is the contribution of your research to the empowerment of women in science?

The participation of women in Exact Sciences is still under-represented, not only in Brazil. It has several initiatives in the world that encourage women to participate in disciplines such as Physics and Chemistry. This project specifically has the potential to show that women can lead the high impact projects in the area of Geography that explore the science of the earth.

More than that, this project, being interdisciplinary, has the opportunity to show a dialogue between the Natural and Social Sciences, which is quite challenging. I would also encourage and encourage them to follow their research interests. Women at first but, in fact, young researchers in general are often shy and listen to a lot of teachers saying "it does not." My research shows that the niche often represents an opportunity.

This project will also count on the participation of other female researchers, such as my doctoral adviser Aline Rodrigues. When, in early 2018, I advised Aline that she would apply for the Royal Society and would be able to include an assistant, she immediately expressed interest in participating and assisting in the development of the proposal. Now, through the project, Aline will spend a few months in England, at the most recognized centers in the world in the environmental sciences.

But I always like to stress that empowerment comes from hard work and nothing comes for free. I wrote this project losing my vacations and weekends and Aline was proactive and immediately became available to help, even with several other obligations. This effort is worth it and I hope we can propagate similar positions among other researchers and young researchers.

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