



Ndiaye Ndeye Aida

2021 One Planet Laureate Candidate

Position

Researcher

Institution

Joint Microbiology Laboratory (LCM) IRD/ISRA/UCAD at the Bel-Air Research Center, Senegalese Agricultural Research Institute (ISRA)

Country

Senegal

Education

PhD, Chemistry and Biochemistry of Natural Products, Cheikh Anta Diop University (UCAD), Dakar, Senegal

Mentor

Professor Moussoukhoye Diop, Associate Professor, Cheikh Anta Diop University (UCAD), Dakar, Senegal

Research Area

Environment; agroforestry land management.

Ndiaye Ndeye Aida is a postdoctoral researcher at the Joint Microbiology Laboratory (LCM) IRD/ISRA/UCAD in Dakar, Senegal.

Through her research, she aims to determine the best method for managing organic waste to limit greenhouse gas (GHG) emissions and increase crop yields. Ndiaye is working on recovering organic waste to produce energy and fertilizer.

Her main line of research is to determine the best direction for organic waste to limit the increase in GHGs released by this waste and resolve the energy problem and increase the yield of the population's crops.

Her work showed a strong bio-energetic potential of substrates (poultry droppings and fish feces) compared to controls (cow and horse dung) during her thesis. Some 80 percent of the samples produced significantly greater biogas than the control samples. And the proportions of methane (CH₄) exceeded 50 percent for all the samples (poultry droppings, fish feces, and controls).

Finally, greenhouse tests of digestates associated with arbuscular mycorrhizal fungi (AMF) showed that the intake effect varies according to the concentration and the target crop. In short, her results showed that the substrates chosen had good bioenergy and agronomic potential. This anaerobic digestion technique will allow small-scale farmers to have integrated farms, producing energy for pumps and crop fertilizer.

The use of digestates on crops improves yields and thus saves farmers money.

As part of her research work, she spent three months at Piloni University in Goa, India, on a mobility fellowship (CV RAMAN).

Born in 1985 in Dakar, the capital of Senegal, into a family of six children, Ndiaye completed her entire education there until obtaining her scientific baccalaureate in 2007.

Although her first choice was medicine, Ndiaye recognizes that nature has always interested her.

Suffering from allergies very early on, she is sensitive to the harmful effects of air pollution and prefers to be surrounded by trees. She loves the countryside where the air is pure.

She still remembers that a teacher at secondary school turned her away from her first choice of medicine, explaining that the medical studies were very long. Discouraged, she decided to change direction at the last minute.

Ndiaye smiles ironically because she knows now that the number of years of cumulative studies would have been the same if she had opted for medicine. However, she confirms that she does not regret anything.

Naturally curious, Ndiaye wanted to understand the origins and sources of pollution scientifically.

With a half-fee scholarship from the Senegalese state, she enrolled in the first year of natural sciences at UCAD.

Although the field interested her, she quickly realized that she did not have the right information to benefit from this course fully.

She successively obtained a foundation degree for a year a bachelor's for a year.

Then a master's in earth life sciences for a year. At the end of her second university cycle, Ndiaye wondered which direction to take for the rest of her university career.

Ndiaye resides in the peri-urban area of Dakar. In this coastal area, residents cultivate a lot, but human activities have made the area liable to flooding over time.

These recurring flooding phenomena prompted Ndiaye to look for answers, so she continued her studies by registering for a master 2 in chemistry and biochemistry of natural products.

Ndiaye believes that the knowledge and learning acquired at university up to the fourth year in general. For her, outside of education, professional opportunities remain limited. For various reasons of her own, she did not want to take this career path.

However, her younger sister is a primary school teacher like their now retired mother. Therefore, she decided to continue her studies for two reasons: to have more options in terms of career and to be able to tackle more detailed research work.

As her studies progressed, another subject piqued her interest: the poor management of solid waste in the city of Dakar.

Her master's subject is related to the methanization of waste. She now regrets having very little information on the subject. The topic aroused so much interest that she wanted to deepen her knowledge as much as possible in the area and wrote a thesis project on this theme to seek funding.

As part of this master's, she did an eight-month internship at the LCM.

Ndiaye benefited from a full scholarship from the second university year up to the third cycle. Therefore, it made sense for her to enroll in a thesis at the same university, and she defended her doctorate in chemistry and biochemistry of natural products in 2020.

Ndiaye's goal is to valorize organic waste to produce energy and fertilizer and to determine the best orientation of organic waste to limit greenhouse gas emissions and increase crop yields.

Another project is particularly close to her heart. Although it is a family one, it is directly linked to her research activities. Her retired civil servant father is planning the construction of an ecotourism hotel complex on the Saloum islands in the Saloum Delta, 200 km from Dakar. It is one of the most beautiful natural regions in Senegal. The project is more precisely located in Sipo, a small island located in the rural community of Toubacouta. Here, Ndiaye can see the opportunity to put into practice better management of organic waste, the production of green energies, and the strengthening of agricultural yields.

Ndiaye is not carrying out field activities therefore she does not yet work with rural communities, but she intends to in the near future because applied research is the *raison d'être* of her research work. Her main objective is to be in a position to influence the behavior of populations.

Today, Ndiaye lectures in practical work at the university. She derives some satisfaction from it and realizes that it is different from the image of teaching she had a few years ago.

She aspires to continue doing applied research and wishes to be admitted to a research institute as an associate professor in a university in Senegal or to obtain a permanent job as a researcher.

Ndiaye believes that at this level of her career, strengthening her interpersonal capacities will be beneficial and allow her to better exchange, share, communicate, and write research projects. She hopes to hone her leadership and communication skills to position herself as a competitive researcher.

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Ndiaye is convinced that with this program, she will contribute to the objectives of climate-resilient agriculture aimed at eliminating hunger and achieving food security, within which the challenges of climate change linked to agriculture and food security should be taken more into account.

For Ndiaye, the One Planet Fellowship will indirectly influence the research laboratory, and also the rural communities in the regions where she will have a presence because, for example, the lessons provided as part of the fellowship will help her to better disseminate her work and improve it on a scientific level.

At the level of the research institute, more efficient work will increase the visibility of the research laboratory. Regarding communities, increasing capacity will help to share results better.

The main challenge for her thesis was financial. Ndiaye received partial funding from the Senegalese state, but it wasn't enough. The working conditions turned out to be difficult. Fortunately, she benefited from continual financial support from her mother.

She had optimum supervision both in her laboratory and at the university. Still, due to lack of funding, she had to prioritize fieldwork in the thesis project and bypass certain other areas.

Ndiaye Ndeye Aida is one of the growing number of candidates selected to participate in the One Planet Fellowship. The One Planet Fellowship is a career development initiative that is building a robust pipeline of highly connected, inter-generational scientists equipped to use a gender lens to help Africa's smallholder farmers cope with climate change. The One Planet Fellowship is funded by the Bill & Melinda Gates Foundation, the BNP Paribas Foundation, the European Union and Canada's International Development Research Centre (IDRC). African Women in Agricultural Research and Development (AWARD) and Agropolis Fondation are jointly implementing the Fellowship.

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