

CHALLENGES TO FOOD PRODUCTION

Farming on thin ice

The Crawford Fund News
Bianca Das and Anika Molesworth

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Bianca Das (left) and Anika Molesworth (right) will be setting off to Antarctica later this year.

Later this year, two young agricultural researchers who are both former Crawford Fund scholars and now RAID Network members, will be setting off to Antarctica. They were selected to take part in an incredible 12-month program with a cohort of 95 women in STEMM (science, technology, engineering, mathematics and medicine) from around the globe. The Homeward Bound programme is a global leadership initiative to equip women in STEMM with strategic and communication capabilities in order to influence policy and decision-making regarding the sustainability of our planet.

Bianca Das is a soil scientist and agricultural systems modeller, and just started her PhD investigating computer modelling as a tool to enhance soil phosphorus efficiency in farming systems with The University of Queensland and the CSIRO. She was a Crawford Scholar in 2013, and is currently an Events Coordinator for the RAID Network central committee.

Anika Molesworth is undertaking her PhD with the Centre for Regional and Rural Futures at Deakin University. Her field trials have been conducted in the Riverina of NSW and lowlands of Laos and Cambodia, though Anika bases herself on her family's sheep farm in far west NSW near Broken Hill. Anika was a Crawford young scholar in 2015, is now a NSW Crawford Fund committee member, and is a NSW state representative for the RAID Network.

Here they answer a few questions about their motivations and interest in international agriculture. You can help them both in their quest to Antarctica by supporting their crowdfunding effort mentioned at the end of the article.

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How did you discover your love for ag and interest in international ag development?

Bianca:

Growing up in New Zealand, I developed a strong connection to the land and a passion for protecting the environment. But it wasn't until my undergraduate studies at Lincoln University that I discovered a passion for agriculture. New Zealand has struggled with nutrient management in waterways for decades and my classes were often wrought with debate over the difficulty of managing this problem at a practical level. With the help of some very inspiring soil science researchers, I learnt that efficient soil management can create 'win-win' strategies to help farmers reduce nutrient loss. This drove my passion for scientific research in agriculture.

As a first generation Kiwi, with Irish, English and Bengali heritage, I have always been fascinated with other cultures and international relations. I did a summer internship in rural Punjab, in northern India after my 2nd year at university. I helped in after school care, waste management and developing organic farming. Here I was confronted with the stark reality of helplessly trying to help. With little support, few resources, no funding and only knowing few works in Punjabi I realised – I had little impact. I learnt that working in international development is about enabling locals to achieve their goals, not doing it for them. Upon returning to my studies, I decided that I needed to build my skill set in soil science and agriculture to offer to those who need it. Since then I have, with RAID and the CSIRO, been able to help rural communities all over the world.

Anika:

My family purchased our outback sheep station in Far West NSW in the year 2000. I was 12 years old and it was the start of the decade-long Millennium Drought. We had fallen in love with this starkly beautiful piece of Australia and began curating our future on the farm – but then the rain stopped falling. It barely fell for the next 10 years. It was a steep learning curve into farming, and it opened my eyes to the fragility of our natural world, and how connected everything and everyone is to it.

Climate change means this part of Australia – my home – will become hotter and drier, and will experience more frequent and intense droughts and dust-storms. It was living through the Millennium Drought, having my eyes opened to its impacts and understanding that worse it yet to come that has cemented my commitment to farmers and my work to ensure their resilience in the face of climate change. This interest to understand climate change as it impacts agriculture and lessen its effects has taken me around the world, and has made me realise farmers in many other countries, particularly developing



Anika Molesworth

nations, stand much closer to the precipitous than we do in Australia. It's also helped me realise that transferring knowledge between countries, sharing ideas and working together on finding solutions is what is needed to overcome global challenges.

What do you see are the big challenges facing the sustainability of our planet?

Anika:

I see the big issues being feeding a rapidly growing global population with reduced environmental footprint on a backdrop of climate change. And these big issues have big challenges in engaging people to solve them. The most important topics of social and environmental sustainability can seem daunting and can trigger disengagement, and I think one of the biggest threats to our planet is the belief that someone else will save it. What each of us does makes a difference – from a mum grocery shopping to the highest of policy makers – we share responsibility for our common home. Owning that responsibility and agency is difficult, but we're in it together, and together we can successfully implement the solutions to these big challenges.

Bianca:

We are beginning to realise sustainability is not just an issue for conservationists anymore – it's a problem that affects all of us in our everyday life – our health, our income, our economy and our quality of life. We need more bold leaders to take action and strategic steps in policy-making. More specifically, I think nutrient management, water management, improving biodiversity and waste reduction are key factors we need to focus on to achieve sustainable agriculture and a sustainable planet. I believe there is currently a lack of quality leadership in sustainability at the higher level which is slowing progress on action. To improve leadership quality we need more diverse and credible leaders.

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What are you doing about tackling these challenges?

Bianca:

I believe in creating a healthy planet that nourishes all those who inhabit it. But I believe this isn't just up to our farmers – they need technical support and advocates to communicate their achievements to the wider public. I work on creating 'win-win' situations to support farmers to increase productivity by using their resources more efficiently and reduce losses to the environment. My PhD research is currently exploring computer modelling as a tool to help farmers find strategies to improve their phosphorus fertiliser efficiency. Other examples of my research include quantifying greenhouse gas emissions from dairy soils, restoring and revegetating saline-sodic soils, reducing nitrogen losses from sugarcane systems into reef catchments, understanding wheat yield gaps in Australia, and incorporating native vegetation onto farms to provide stock fodder and increase biodiversity. I also volunteer for OzHarvest and the RAID Network to promote sustainable use of food in Australia and around the world.

Anika:

The big challenges require all hands-on deck – people contributing ideas and skills from all sectors, all experience levels. My interest in better understanding the impacts of climate change on ag, and then communicating these topics to others has led me to undertaking a PhD in agricultural and environmental science, meeting royalty and global leaders, and talking on stages like TEDx in front of thousands of people. I am working to lift the voices of farming youth with the Young Farming Champions and the Youth Voices Leadership Team, and to advocate for strong climate and energy policies with Farmers for Climate Action so ambitious climate change strategies are put in place.

What is the role of women in agriculture?

Anika:

Women are powerful change agents. They play key roles in the health and wellbeing of their families, their children are often at the forefront of their minds, and so they are key in designing the settings that support them and the next generation.

I think women working agricultural and environmental research are particular gems because they are facing up to the big challenges. These challenges are difficult, but that's not because we don't have the ability to address them, they are difficult because we are setting out to answer questions that have never been answered before. To find new solutions and contribute new knowledge to our world. Bold, creative, critical-thinking women working agricultural and environmental research are expanding our knowledge, shaping the future and that's exciting.



Bianca Das

Bianca:

I think that women play an absolutely pivotal role in the future of agriculture. In Australia and in most developed countries – women are not 'seen' as farmers, though they are often seen as the backbone of any farming community. The stereotype that there is no role for women on the farm is being challenged. Today, women produce 49% of real farm income in Australia and indigenous women have more than 50,000 years of knowledge in living off the land. But women are grossly underrepresented on regional bodies such as in agricultural companies (7%) and councils (9%). The Invisible Farmer Project is an ongoing study that highlights these facts and the stories of the incredible women (like Anika) who are out working on the farm every day – and doing a fantastic job at it.

In developing nations, women make up nearly 50% of the labour force in agriculture, but benefit very little from their involvement. Recent statistics show that if women had the same opportunities as men, yields would be 20–30% higher. This means things like better education and access to medical support, decision-making power and ability to access credit to start a business.

While rural women are the key drivers of agricultural sustainability, I think that men are key factor in enabling their daughters and sisters to flourish. As the old saying goes, when you have a strong mother, you have a strong family, and strong families build strong communities.

Will you help Bianca and Anika on their exciting adventure?

Bianca and Anika are currently crowdfunding in order to raise the funds required to participate in the Homeward Bound programme.

If you would like to contribute to their fundraising efforts, please follow the links below.

[Bianca's crowdfunding page](#)

[Anika's crowdfunding page](#)