

My trip, study and stay in Japan by Agnes Aron Dube



My name is Agnes Aron Dube and I am a JICA AgriNet scholarship recipient who has had the honour to stay in Japan and study for a Master of Science in Global Dryland Science at Tottori University from October 2020 to October 2022. Allow me to take you on a journey of my time and exploits in Japan.

Arrival

This journey started amidst COVID-19, in mid-October 2020. I was quarantined for 2 weeks at JICA HQ in Tokyo. I never saw the sunlight in Tokyo, let alone talked to anyone there, save for the staff upon arrival and departure. Though the JICA personnel would stay in touch, it was not easy. I went to Tottori University at the end of October 2020 and I had to catch up the whole month I had lost due to the COVID restrictions and other challenges.

Life in Tottori

Generally, the people in Tottori are very welcoming and they love helping others, they may struggle to converse in English, but they will try by all means to assist. The weather in Tottori is commonly unpredictable, with extremely cold winters and extremely hot summers, the two extremes make staying in Tottori so unique and difficult at the same time. “You may forget your ‘lunch box’ but never your umbrella,” the Tottori people will advise you.



Study

My program of study was an MSc in Dryland Science. This is a special international program that equips students with knowledge and skills to deal with the challenges that hinder crop

productivity and production in drylands. It combines experiences and research from different parts of the world, especially where dryland crop production takes place. Limited supply of water, the expansion of arid lands, salinity, acidity, floods, droughts, and heat are amongst many challenges that are learnt through practical approaches tailored to fit different socio-economic conditions that farmers face in various parts of the world.

My research title was “Improvement of Nutrient Absorption and Carbon Accumulation by Clinker Ash in Sandy and Clay Loam Soils.” This study was inspired by an environmental challenge of coal ash. The increase in population across the world and the expansion of urbanisation has resulted in boosted demand for energy, especially electrical energy. This has forced governments to continue using unsustainable means such as burning of coal to generate electricity, at the same time generating ash that has become an environmental menace. The coal ash utilization is subdued especially in developing countries.

As coal burns to produce electricity, two types of ash are produced, namely fly ash which is smooth textured and clinker ash (bottom ash) which is rough and gritty in texture. Fly ash, because of its smoothness at world scale has been proven that it can be used in many sectors including agriculture. However, the use of clinker ash is not clear in literature. In this study,



Mixing the clinker ash and manure into the soil with a plough

clinker ash managed to change the pH of sandy soils from that of acidity to alkaline, depending on the amount of clinker ash applied. There was increased biomass of some of the crop species that were tested and in some species there was no yield improvement. However, it was established that clinker increased nutrient uptake, hence the increased biomass and the notable changes in carbon content of the soils.

Application of Study to Zimbabwe

About two thirds of agricultural soils in Zimbabwe are sandy soils. This means that these are soils that are poor in water, nutrient and fertility retention, which is one of the biggest hindrance to increasing crop productivity. Based on the research, clinker ash:

- Can increase pH of agricultural acidic soils.
- Improves plant nutrient uptake.
- Increases CEC and base saturation.

- Is a strategy to mitigate against greenhouse gases emissions as clinker ash can increase carbon content of soils which is key in sequestering atmospheric CO₂.
- Is a soil physical characteristics enhancer – improving water holding, bulk density etc.

Pictures in Tottori



Cooking school in Kurayoshi – Tottori



Experiencing eating out in Japan



In the field in Yoshioka, Tottori

Graduation photos



Returning to Zimbabwe



My return to Zimbabwe was a bitter sweet moment. I was happy to be coming back home and with all the knowledge I had amassed, and at the same time I was sad to leave Japan and its people, whose love had grown on me.

It was a pleasure meeting up and reporting back to the JICA Zim team, whose support

made my trip, study and stay in Japan quite enjoyable and worthwhile. I would recommend to anyone to apply for the fully sponsored scholarships offered by JICA and to study in Japan.

Acknowledgement

Firstly, I acknowledge the power, wisdom, and guidance of GOD ALMIGHTY throughout my period of study and in writing my thesis. I deeply appreciate the support I got from my supervisors, Prof. Eiji Nishihara, Prof. Sadahiro Yamamoto, and Prof Satoshi Yamada. I am grateful for the time they dedicated to teaching and giving me advice during the whole Masters' degree program. I extend my gratitude to the technical staff, both at the Faculty of Agriculture in Koyama campus and the team at Arid Lands Research Centre, for their technical support as I carried out my analysis. I also extend my appreciation to all my fellow lab mates for the support and help they gave me.

Finally, and not least, I would like to thank the Government of Japan through JICA for awarding me this scholarship to study in Japan. It was with comfort that I did my studies, I never had to think about financial challenges, all taken care of. Again, thank you so much.