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Council for Tropical and Subtropical Agricultural Research

ATSAF - CGIAR++ Junior Scientists Program Final Report

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Country: Ivory Coast
Supervisor at IARC: Dr. Kazuki Saito
Start and end date of stay at IARC: -
Start and end date of remotely supervised project: 16 Apr 2021 - 08 Apr 2022
Title: Genotype by Environment Interactions in Lowland Rice

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My research project was in collaboration with the CGIAR AfricaRice on the topic 'genotype by environment interactions in lowland rice'. Due to the Covid crisis it was not possible for me to travel to one of their research centres in Africa. Instead, I worked from home office.

Activities and Experiences

During the project, my activities consisted mainly of doing literature research, finding an entry into the data set, doing data analysis which in the end resulted in the creation of a new rice phenology model. I worked with data collected from Rice Garden Trials conducted between 2013 and 2017 at five of AfricaRice's research centres across sub-Saharan Africa. There were in total 25 sowing dates with each 80 varieties, thus resulting in 2000 data lines. Besides data on phenology, spikelet sterility and yield, there was daily meteorological data and some data from micro-climate plots. I started by doing basic literature research on rice growth and phenology. Next I read into phenology modelling and which factors influence rice phenology. At the same time I tried to find an entry into this large data set, which was distributed over several files. This was challenging; Where to start? I tried out several ways, but often found that I was missing essential data. For example, I would be best to look at water temperature, since the meristem is below water level for the majority of time between sowing and flowering. However, this data was largely missing. One can model water temperature based on air temperature and LAI. However, LAI data was also largely missing. This is just an example to illustrate that the way forward was not so clear and often obstructed. I learned to deal with missing data and to instead look at the data that I did have and that was complete. It took me some time to see the possibilities of the data set rather than the limits. But, once you see those, there are many possibilities. An essential step to find a way into the data, was to create the overview table, where all data is combined in one spreadsheet with 2000 lines and about 60 columns. The data set is a true gem, and I am sure that more theses and articles can be written based on it. In the end I only looked at phenology and meteorological data, while there is so much more that can be investigated e.g. GxE interactions on grain yield and spikelet sterility.

My experience was different from the usual JSP experience. I never got to see the research centre, the rice garden trials or meet any of AfricaRice's researchers. However, I saw rice growing in the greenhouses at Hohenheim University while I was assisting as a Hiwi (student assistant) with research on osmotic stress in rice. It was interesting to observe, take care of and measure the rice plants, but it is still completely different from being in the tropics or subtropics, seeing rice cultivation in the field and experiencing the country and the culture. I believe fieldwork is an essential element of doing research. This missing link made the project quite abstract. This abstraction made it, at times, hard to remain motivated and keep a clear vision towards the end goal.

It was clear from the beginning that it would be unlikely that I could travel to Africa. Despite this, I was happy to take on a project that could be done remotely, since I was planning to move to Sweden before the end of this project. Of course, Germany and Sweden are both foreign countries to me, a citizen of the Netherlands, and living in both has given me multicultural experiences in their own way. I have explored the surroundings, experienced the different landscape, made international friends and learned the languages. However, these are still closely related countries. Thus, this experience is not comparable to visiting an African country and research centre for some time.

From this project I learned that I need a combination of working with my hands and with my brain, a mixture of sowing, planting, weeding, harvesting, measuring and laboratory analysis on the one hand, and data analysis, statistics and literature research on the other. This research project only focussed on the latter, which allowed me to improve my skills in data analysis, statistics and working with several software programs. I am glad I learned these useful skills. However, I also learned that for my future career I will look for jobs that combine practical with theoretical work.

Support from ATSAF and supervisors

There was not much need for contact with ATSAF during my research project. This may have been different if I would have visited an IARC. However, they were always available to answer my questions. I am grateful for the financial support ATSAF has given me.

My main supervisor, prof. Asch, is also the head of ATSAF. However, I would not categorize our contact as support from ATSAF, but rather as guidance by my main supervisor. In the beginning the contact was difficult. Many topics were new to me, and in the beginning I felt lost and, due to miscommunication, left alone. I was trying to do what prof. Asch suggested but got stuck every time. When we had meetings, he would give so much input that at the end I felt even more lost. After a few months of trying, and trying again, I was about to give up. I felt like I had not achieved anything after four months. After a good conversation I decided to continue. We had weekly meetings in which he coached me through the data analysis. We found an entrance into the data set and a narrative. We also decided to keep it (relatively) simple – no computer coding or higher statistics. Prof. Asch always came up with many ideas of what I could try next, which taught me to see the possibilities of the data rather than the limits. He gives a lot but also expects a lot. In the end I have put in more time and work than commonly necessary for a master thesis, but I am happy that we managed to get a clear result: a new rice phenology model. Without those weekly meetings, I would not have been able to finish the project.

I had little contact with my IARC supervisor, Dr. Saito. I only met him once, virtually, at the beginning of the project. He is a busy man and I got the idea that he does not have a clear idea about what he wants to achieve with analysing this data set. Therefore, I mainly had contact with prof. Asch. If I had questions to Dr. Saito, he would usually answer his emails quickly, although sometimes incomprehensibly. If he did not have the answer, he made sure to check with his colleagues. He did not ask for updates during the project.