



Masters of Advanced Studies in Integrated Crop Management

Annual Review – 2019

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Why is a course on integrated crop management so important?

The global population is increasing. Experts predict numbers will exceed 8.5 billion people by 2030, at which time we will need 50% more food, 50% more energy and 30% more water. How we feed the world in a healthy and sustainable way is a challenge we must therefore urgently address.

The uptake of science-based agricultural knowledge can help farming communities tackle global challenges like climate change and apply sustainable farming practices in a way that helps them grow more food with the natural resources available.

The Masters of Advanced Studies in Integrated Crop Management (MAS ICM) course gives students from developing countries a solid foundation in sustainable agriculture and demonstrates that integrated crop management (ICM) can be applied to any crop, anywhere in the world.

During the nine-month course, agricultural professionals from around the world investigate and learn environmentally-friendly food production

practices that promote crop health, food safety and food security. Participants take theoretical and practical classes on agronomic topics such as pest management, soil health, and crop, land and water management. The study programme also addresses the wider implications of ICM, particularly the socioeconomic and ecological aspects, which form the backdrop of this holistic agricultural production system.

Following graduation, students are then in a position to apply their knowledge and skills of sustainable agriculture to real-life problems in their communities back home, and to offer solutions – for example, to farmers and policymakers.

Since its inception in 2015, the MAS ICM programme has trained 59 agricultural specialists from 21 countries across Africa, Asia and Latin America.

In March 2019, 12 students began the programme in Delémont, Switzerland, jointly coordinated by CABI and the University of Neuchâtel.

The course is supported by:



Schweizerische Eidgenossenschaft
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Swiss Agency for Development
and Cooperation SDC

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 **plantwise**

Meet the students

Click on each student for their full biography.



Salley Alhassan
Ghana



Miriam Kumwenda
Malawi



Sérgio Mabasso
Mozambique



Rosine Manishimwe
Rwanda



**Zacchaeus Mukasa
Nsubuga**
Uganda



**Sylvia Misengo
Tembo**
Zambia



**Abrham Mulatu
Mammo**
Ethiopia



**Peruth
Murekeyimana**
Rwanda



Cyrus Njoroge
Kenya



**Udeni Bandara
Piyatissa**
Sri Lanka



Wilson Nabakwe
Kenya



Khaing Wai Phu
Myanmar

What did the course cover?

The MAS ICM course gives students the opportunity to learn about sound crop management principles and to explore solutions that can help address problems in home countries.

The course content and thematic modules are chosen to support professionals in agriculture, helping them to understand the concept and principles of ICM, and how to successfully adapt and apply the approach within local contexts. Topics covered include soil management, seed selection, crop nutrition, cropping strategies, integrated pest management (IPM), landscape management, water management, statistics, agricultural policies, and rural economics. Reflecting the rationale of ICM, topics not only

address direct technical crop production aspects, but also include relevant issues concerning the agro-ecosystem.

For example, the 'landscape management' module emphasizes the importance and economic value of ecosystems services such as pollination and natural biological control in crop fields, such as pollination and natural biological control in crop fields. Sustainable agricultural production aspects like these are often neglected in traditional farming approaches. Through practical examples, students learn how to establish and manage non-crop areas at the farm and landscape level to increase biodiversity and promote the delivery of ecosystem services.

Between March and July 2019, the MAS ICM students were guided through 11 thematic modules, an international workshop entitled 'visions for a sustainable agriculture,' and a final case study session on building an ICM strategy. These elements of the course were taught using participatory approaches, creating a space for participants to learn from one another's knowledge and experiences. The sessions involved experts from CABI and the University of Neuchâtel, and interdisciplinary guest lecturers from around the world. During the final three months, students prepared a written thesis.

"The whole course was useful but integrated pest management, landscape management, crop nutrition and water management were particularly useful for me. In Kenya we do a lot of agriculture and export a lot of these crops but, of late, we have faced challenges where our produce was rejected by outside markets because of the presence of chemical residues, diseases and pests. What I have learned here on IPM will be of great use in terms of how to control pests and diseases, and how to manage the environment."

Cyrus Njoroge, Kenya



A man with short dark hair and a goatee, wearing a dark suit, white shirt, and dark tie, is smiling broadly. He is wearing a green lanyard with the 'CABI' logo. The background is slightly blurred, showing other people in a conference setting.

"This is the right course for anyone who wants to pass impactful knowledge on to their farmers and it's the course for addressing many of the challenges in developing countries, including the challenges of climate change."

Wilson Nabakwe, Kenya



Students' MAS theses

During the final three months of the course, students dedicated their time to preparing a thesis. Students carried out desk studies to explore topics that had a direct, practical application to their own work settings. Findings from these, combined with knowledge gained from the course were applied to students' theses, which, in turn, lead to skills and recommendations that can be used and shared in their home countries and elsewhere.

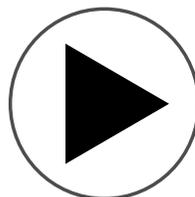
Thesis topics in 2019 included integrated production guidelines for fava beans, citrus fruits, strawberries and tomatoes; other students analysed aspects of national extension systems, such as the quality of advice to farmers regarding pest problems and the application of plant protection measures, or the role social media plays in plant health services.

Supervised by lecturers, and regularly engaging in exchange with co-participants, the 2019 students refined their ideas and developed the necessary analytical and writing skills to produce their theses. This process helped to improve their communication and presentation skills.

A full list of thesis titles and abstracts from the 2019 MAS ICM course can be accessed here: www.cabi.org/2019-mas-icm-theses-titles-abstracts

"My topic of research is the integrated production of tomato in Rwanda. I aim to help farmers to produce tomatoes in high quantities and of good quality. I will share sound crop management principles with my supervisor and policymakers and I will ask them to incorporate them into Rwandan agricultural policies, with the aim of boosting agriculture and addressing the critical problems faced. If production goes up, our farmers will have a better life, Rwanda will export more and receive more revenue, and this will boost our economy."

Peruth Murekeyimana, Rwanda



"The purpose of my thesis was to contribute to improving pesticide management in Mozambique by encouraging the implementation of measures that promote sustainable use through IPM. Drawing on reviews and research, I made recommendations to develop national policies that promote IPM, good agricultural practices and organic agriculture, together with the training and certification of all users and distributors on the management of pesticides."

Sérgio Mabasso, Mozambique

"As a staple crop, rice is significant in Myanmar, not only for domestic consumption but also for export markets. However, reliance on pesticides negatively influences paddy cultivation. My thesis identifies the barriers to practice and knowledge of the adoption of biocontrol, and recommends the training of extension staff and plant doctors on biological control as a tool for improving pest management and the performance of existing crop clinics."

Khaing Wai Phu, Myanmar



What did students think of the course?

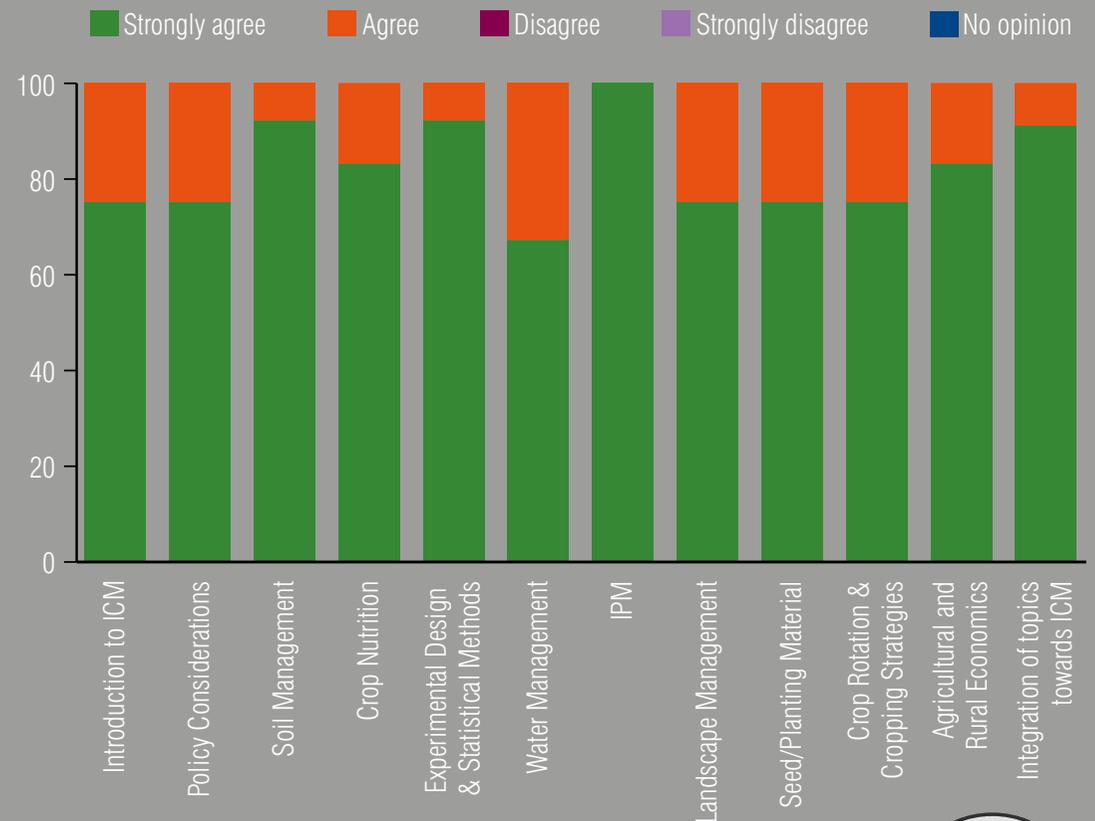
After each course module and after completing the MAS ICM course, CABI and the University of Neuchâtel ask participants to reflect on individual modules and their overall learning experience. Every year this valuable feedback is used to assess and improve the course content and administration, and together with the exam and thesis results, it indicates the significant knowledge and skills students develop during the course. When they graduate, the students are better equipped to address production and productivity challenges, and to contribute to the development of agricultural policy in their home countries.

The overall rating of the modules by the students in 2019 was “excellent” or “good”. The students also “strongly agreed” or “agreed” that the modules were interesting and of good quality.

Students were also asked if the module content will be relevant to their future work. Again, the students “strongly agreed” or “agreed” that it would, with all of the students strongly agreeing that the IPM module will be relevant. See Figure 1.

Overall, the course assessment shows that the MAS ICM course improves participants’ motivation, builds their confidence and relevant skills, and provides them with a sound basis for tackling the challenges of food safety and food security in their home countries.

Figure 1: Answers to survey question “Is the module content relevant for future work?”



"This is a good course because it takes you through the practical aspects of ICM. You don't just learn in the class and finish there: I'm 99% sure the knowledge you gain on the course will help you to change your mindset when you return to your country."

Miriam Kumwenda, Malawi

Graduation day 2019

The MAS ICM students graduated and received their degrees during a ceremony held in Engelberg, Switzerland. Attendees included academics from the University of Neuchâtel and CABI staff. Students were congratulated on their success before they returned to their home countries.

The 12 graduates, from ten different countries, were extremely happy to have successfully completed nine months of comprehensive learning activities, which involved both classroom learning and innovative field exercises.

At the ceremony, speeches were given by representatives of the University of Neuchâtel and CABI.

"The health of a population is mainly determined by the socioeconomic status of its people, and by the environment in which they live. This socioeconomic status also directly affects the way people eat and drink. Promoting sustainable agriculture is therefore crucial for the future of human health."

Professor Olivier Guillod, Vice Rector Legal Affairs, and Director of the Institute of Health Law, at the University of Neuchâtel

"I congratulate the graduates and am pleased that previous MAS ICM students have continued to apply their knowledge to bring about positive changes to agricultural practices in their respective countries. It's really fascinating to hear about the next steps in the students' careers after they finish the course. I'm looking forward to hearing about their achievements in the months and years to come."

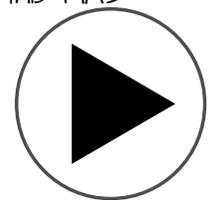
Dr Ulrich Kuhlmann, CABI's Executive Director of Global Operations

"This course is unique. Being based in Africa, I frequently meet former students in various meetings and they say this course has left an indelible mark in their minds. They value having participated in a course that they say is very practical and highly relevant to what they do."

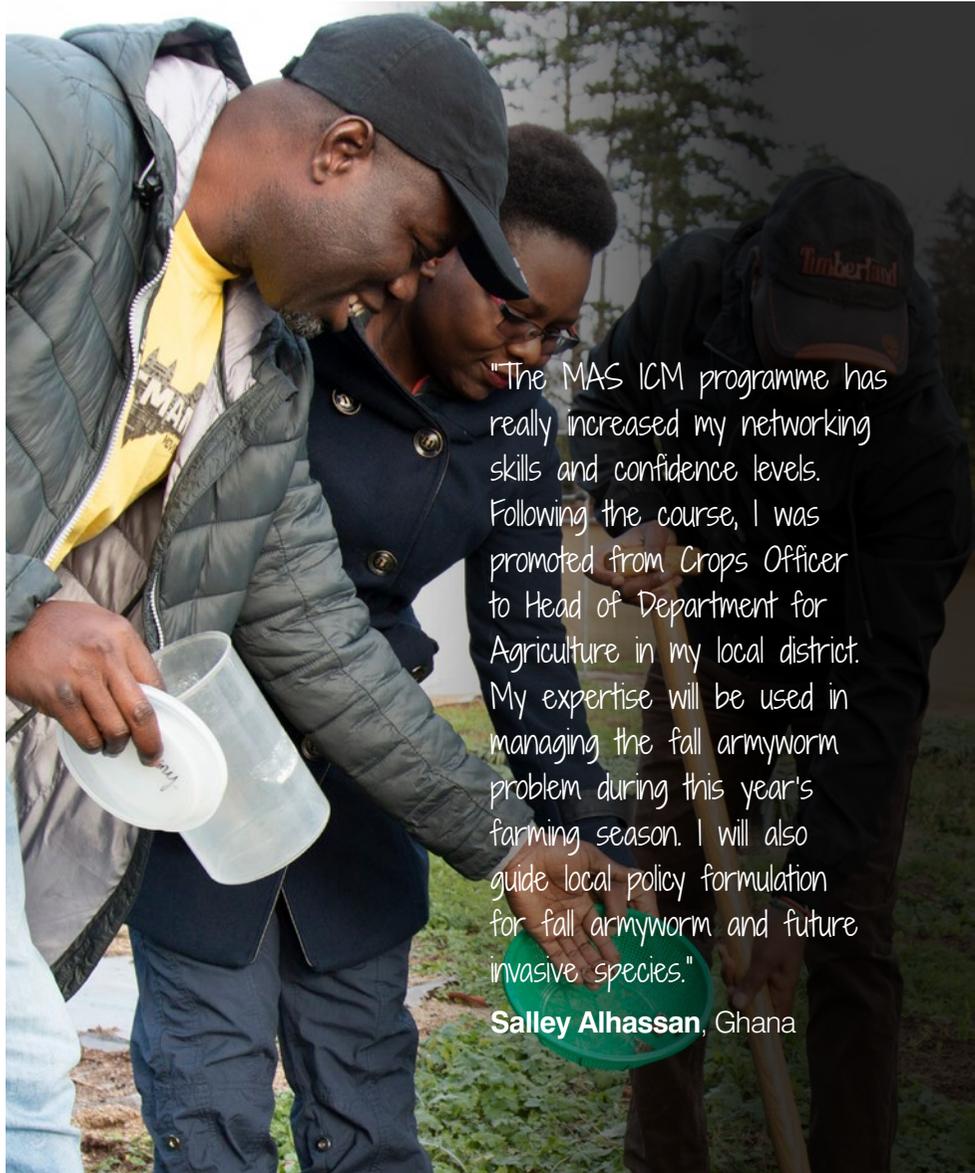
Dr Washington Otieno, CABI Plantwise Programme Executive

"I feel so excited. It's been nine months of hard work and dedication. I'm glad I've made it through and graduated. After graduating with this MAS ICM I will go back to my country and share this knowledge at different levels. I plan to share it with my colleagues - I know it will enrich them, and in turn it will help the farmers."

Wilson Nabakwe, Kenya

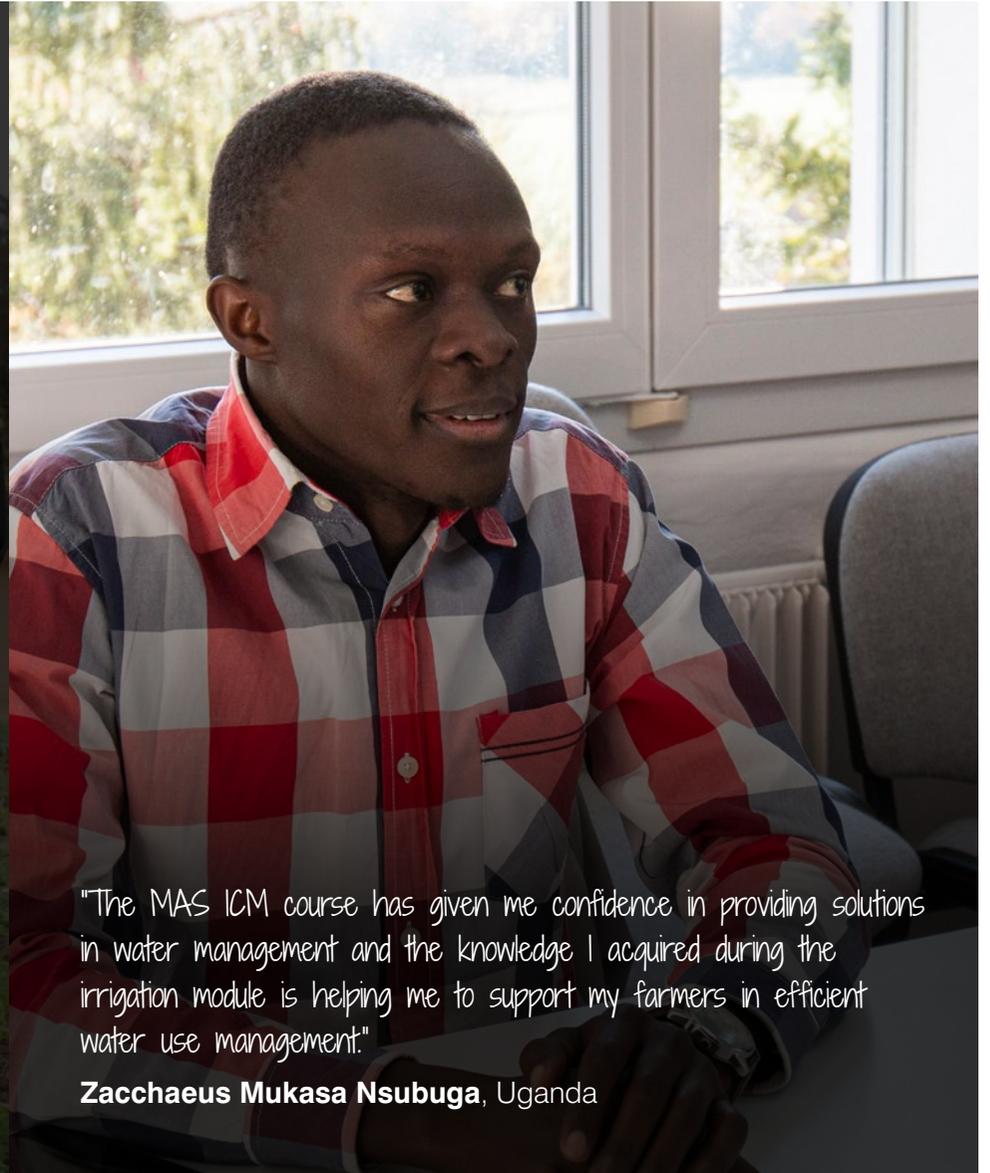


Feedback from 2019 MAS participants



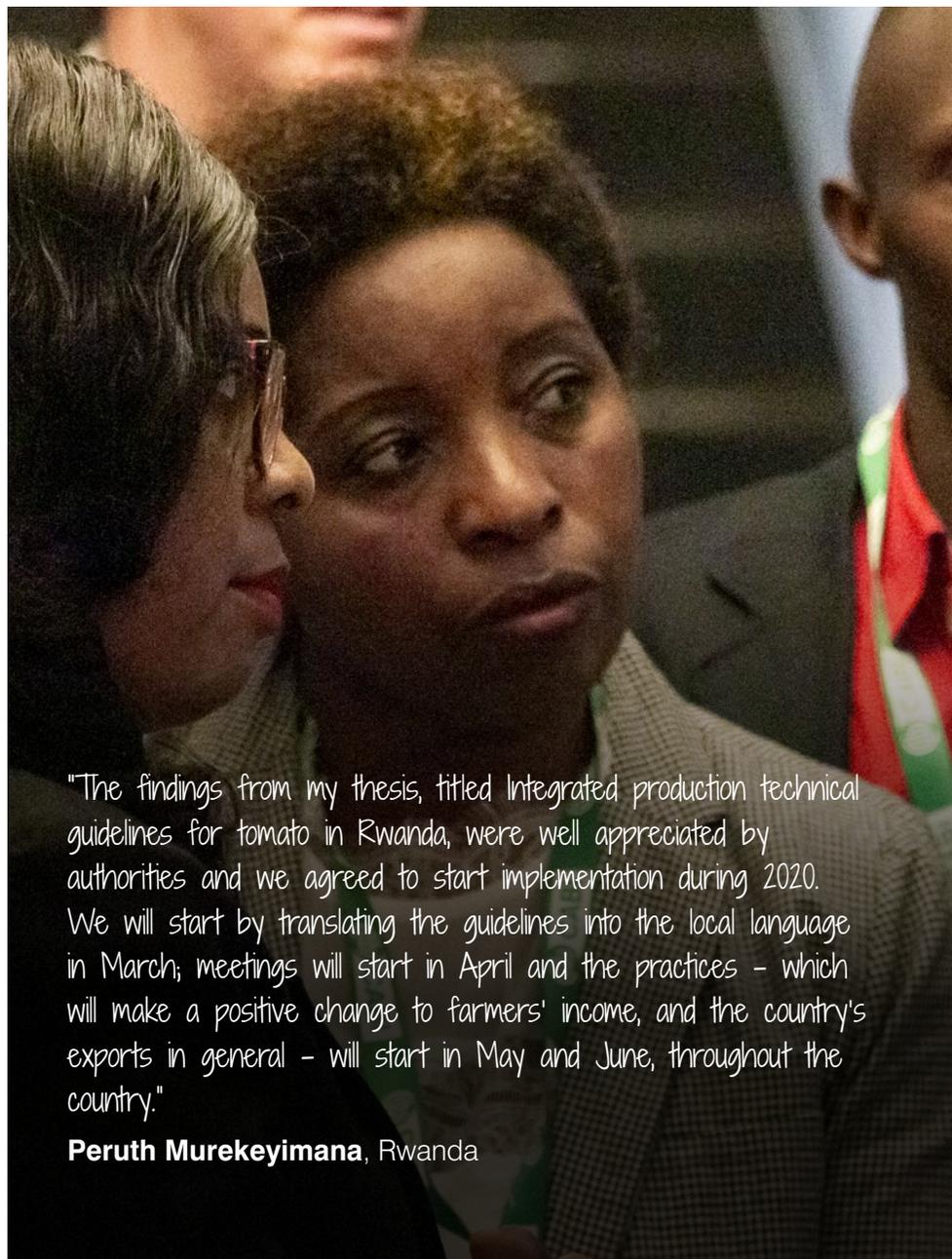
"The MAS ICM programme has really increased my networking skills and confidence levels. Following the course, I was promoted from Crops Officer to Head of Department for Agriculture in my local district. My expertise will be used in managing the fall armyworm problem during this year's farming season. I will also guide local policy formulation for fall armyworm and future invasive species."

Salley Alhassan, Ghana



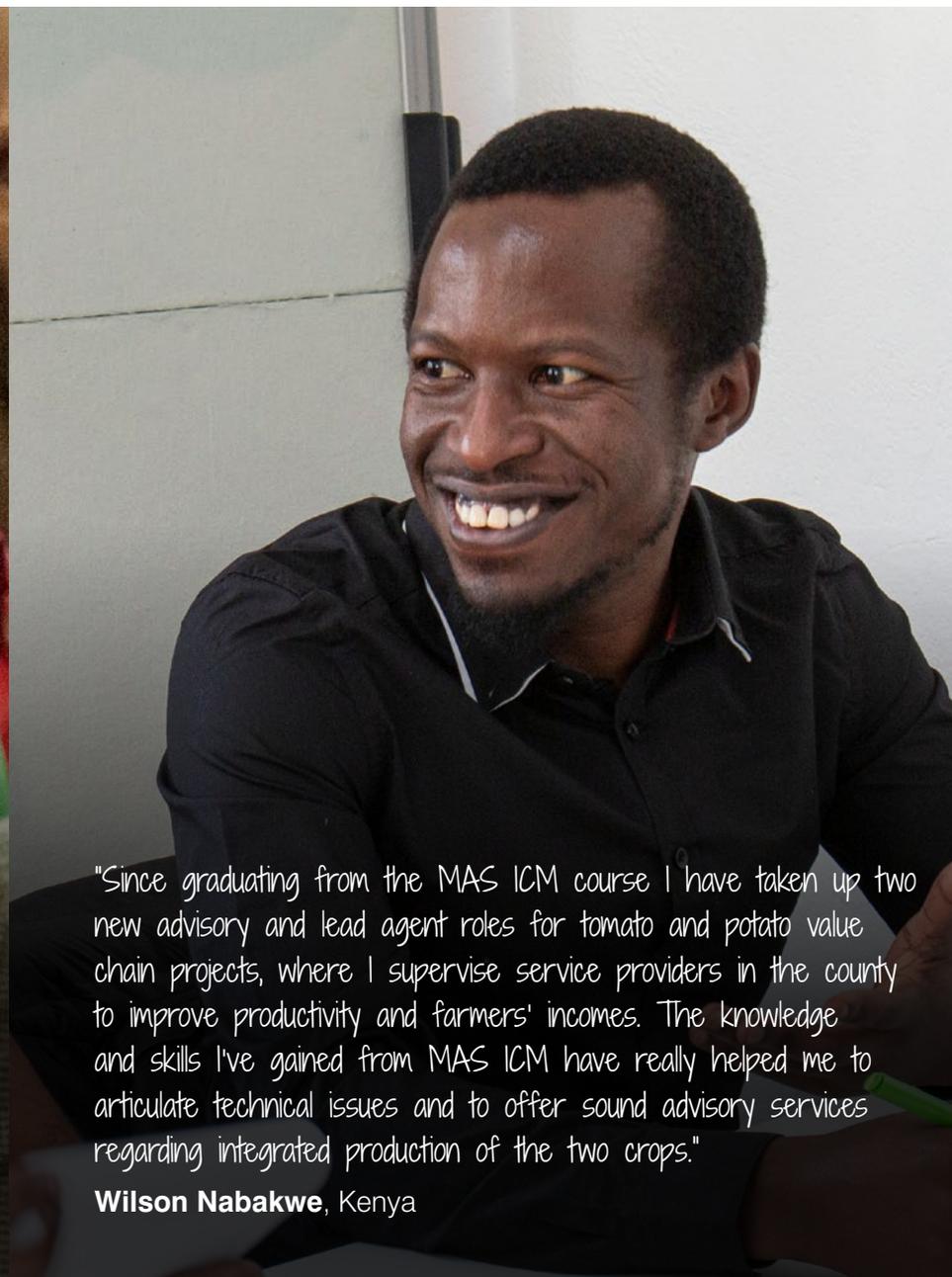
"The MAS ICM course has given me confidence in providing solutions in water management and the knowledge I acquired during the irrigation module is helping me to support my farmers in efficient water use management."

Zacchaeus Mukasa Nsubuga, Uganda



"The findings from my thesis, titled Integrated production technical guidelines for tomato in Rwanda, were well appreciated by authorities and we agreed to start implementation during 2020. We will start by translating the guidelines into the local language in March; meetings will start in April and the practices - which will make a positive change to farmers' income, and the country's exports in general - will start in May and June, throughout the country."

Peruth Murekeyimana, Rwanda



"Since graduating from the MAS ICM course I have taken up two new advisory and lead agent roles for tomato and potato value chain projects, where I supervise service providers in the county to improve productivity and farmers' incomes. The knowledge and skills I've gained from MAS ICM have really helped me to articulate technical issues and to offer sound advisory services regarding integrated production of the two crops."

Wilson Nabakwe, Kenya

Feedback from 2015–2018 MAS participants

"Not only did the knowledge and skills gained through the MAS ICM course enable me to perform my job effectively, but I am also transferring them by working with different research students who are under my supervision."

Muhammad Rizwan Khan, Soil Scientist, Pakistan

"Upon viewing my thesis, published on ResearchGate, I was approached by a team of scientists from Wageningen University, who I worked with to develop a pesticide management programme for Rwanda. Some aspects of the MAS ICM module in Landscape Management are in the process of being integrated into the curriculum on Crop Production at my host university in Rwanda, alongside Modules 1 and 2 of the CABI Plantwise training materials."

Alexandre Rutikanga, Director of Research and Consultancy and Lecturer in Crop Protection Modules at the University of Technology and Arts, Byumba (UTAB), Rwanda

"The MAS ICM course enriched my understanding of climate-smart agricultural technologies that result in increased crop yields for maize, our staple crop. The skills and knowledge from MAS ICM have enabled me to change farmers' mindsets about applying chemicals at the first sight of any pest – they are able to determine the thresholds before action, and chemical control is applied as the last resort. Preference is first given to environmentally safer options, before the use of highly biodegradable agro-chemicals."

Erick Haraman, Programme Manager – Blantyre Agricultural Development Division, Malawi



"As a specialist and supervisor on the joint 'Dragon Fruit in Vietnam' project, I used the data from my MAS ICM 2018 thesis to help build electronic consultancy software on dragon fruit."

Nguyen Thi Kim Ngan, Expert and Supervisor:
Pilot e-Consultation on Dragon Fruit, Vietnam

"Since graduating I have taken on responsibility for managing a sizeable project: the Ghana Agricultural Sector Investment Programme (GASIP), in Mion District. The MAS ICM course has been very useful as I now adopt ICM practices in my extension activities with farmers and I have prepared ICM guides for many crops. I now plan to source funds to develop ICM production guides for crops for which there are currently no ICM guides in Ghana."

Mohammed Sherif Abubakari, Senior Agricultural Extension Officer, Ghana

"A lot of changes have happened since my completion of the MAS ICM course. Before the course my job role was Researcher - I, but afterwards I was promoted to Researcher - II and given the position of Coordinator of the National Barley Research Programme."

Ermias Teshome, Researcher - II and Coordinator of National Barley Research Programme, Ethiopia

"The biggest challenge right now in Uganda is climate change. I have found the MAS ICM soil nutrition and soil management modules to be the most useful in training farmers to be resilient to climate change and the effects of it, which are hitting us hard. I am also influencing the reforestation approaches applied by residents and investors along the Kalagala offset - a section of the Nile River here in Kangulumira - to plant indigenous tree species to control the run-off into the river, instead of exotic trees, some of which have already been invasive in the area."

Alex Semakula, Agricultural Officer, Kayunga District Local Government, Uganda



Working with us on the course

Working on the course from the University of Neuchâtel (UniNE) and CABI:

Co-Directors:

Ted Turlings, Professor, Institute of Biology, University of Neuchâtel

Ulrich Kuhlmann, Executive Director, Global Operations, CABI

Course coordination:

Manfred Grossrieder, CABI

Ricarda Knetsch, **Sara Santi**, University of Neuchâtel

CABI Switzerland:

Dirk Babendreier (modules 4, 5)

Melanie Bateman (module 2)

Anna Wood (module 3)

René Eschen

Manfred Grossrieder (modules 1, 11, 13)

Justice Tambo (module 12)

Luca Heeb

Keith Holmes (module 9)

Wade Jenner

Urs Schaffner (module 10)

Stefan Toepfer (module 8)

Philip Weyl

CABI UK:

Rob Reeder

Philip Taylor

UniNE:

Saskia Bindschedler

Philip Brunner (module 6)

Daniel Hunkeler

Violaine Ponsin

Jean Pierre Husi

Pilar Junier

Sergio Rasmann

Betty Benrey

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Claudio Screpanti, Syngenta, Switzerland

Lucius Tamm, Research Institute of Organic Agriculture (FiBL), Switzerland

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Lucius Tamm

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Christiane Wassmer

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Matthias Ofner

Matthieu Raemy

Aurelia Passaseo

From Andermatt Biocontrol, Switzerland:

Gisela Brand

Felix Dubach

Johanna Häckermann



"As a crops officer and plant doctor I intend to share this knowledge with farmers in the field. I will also train extension officers on improved IPM measures and landscape management. At district level, I will help to shape policy."

Salley Alhassan, Kenya



"When I return I will pass on the knowledge that I have learnt in the areas of crop rotation, IPM and agricultural policies, and equipped with this knowledge my colleagues can help farmers. I will participate in farmer field schools and training of trainers programmes by sharing knowledge."

Khaing Wai Phu, Myanmar



Salley Alhassan, Ghana

I am a Crops Officer for the Berekum Municipal Assembly in Ghana where I have been involved in the management and control of the fall armyworm outbreak in Ghana, providing advice to farmers on preventive and curative measures. I have 14 years' experience in the field of agriculture at the Ministry of Food and Agriculture in Ghana.

I am also a plant doctor. I have facilitated Plantwise activities by establishing plant health clinic sessions and I have provided advice to farmers on how to control and prevent pests and diseases. I hold a Master's degree in Integrated Water Management from the University of Queensland.



Miriam Kumwenda, Malawi

I am an Agricultural Officer (crop protection) with the Ministry of Agriculture, Irrigation and Water Development, Malawi, and hold a Bachelor of Science degree in Agricultural Extension from the Bunda College of Agriculture at the University of Malawi.

I have 15 years' experience in the field of agriculture, with my core activities being in planning, implementing, monitoring and evaluation of crop production and research programmes. I am also the Plantwise cluster coordinator for the Thyolo District Agriculture Office, in which capacity I supervise plant clinics, and I have been trained as a Plantwise data validator.



Sérgio Mabasso, Mozambique

I work in the National Agricultural Extension Directorate of the Ministry of Agriculture and Food Security, Mozambique. As an Officer for Technology in Vegetable Production and Plant Protection, I support extension agents on plant protection. This includes collaborating with researchers in the promotion of sustainable vegetable production systems and small-scale irrigation systems, as well as promoting and strengthening producer organizations through training, technical assistance and the dissemination of climate change adaption technologies.

I am also a master trainer of plant doctors and provide monitoring and backstopping support within the Plantwise programme. I hold a Bachelor of Science degree in Agricultural and Natural Resource Management from the EARTH University, Las Mercedes de Guácimo, Costa Rica.



Rosine Manishimwe, Rwanda

I hold an MSc in Agribusiness from the University of Rwanda and I work as an Assistant Lecturer at the University of Technology and Arts of Byumba (UTAB). My role as a Plantwise plant doctor includes providing plant health services to farmers in UTAB's community outreach programme.

Previously, I was involved in implementing national agriculture policy (the provision of extension services to farmers, the management of crop pests and diseases, and public awareness of new agricultural technologies) at the sector level in Gicumbi District in Rwanda, as an Agriculture and Natural Resources Officer.



Zacchaeus Mukasa Nsubuga, Uganda

I work as an Agricultural Officer in the Department of Production and Marketing, Kayunga District Local Government, Uganda. I hold a Bachelor's degree in Agriculture from Gulu University, Uganda.

Since 2011, I have worked in rural communities where I have focused on providing agricultural advisory services in the areas of pest and disease management, agronomy, technology and innovation transfer services.

Through my work, I have experienced unique agricultural challenges in addressing climate change issues related to prolonged drought, the emergence of new pests and diseases, and soil erosion, amongst others.



Sylvia Misengo Tembo, Zambia

I work as a Principal Technical Research Assistant at the Zambia Agriculture Research Institute (ZARI) which operates under the Ministry of Agriculture. I hold a Bachelor of Science Degree in Agriculture (general agriculture) from Mulungushi University in Zambia.

My main duties in the Entomology Section, under the Plant Protection and Quarantine Division of ZARI, are to equip farmers with various information and technologies in soil, water and crop management for controlling insect pests and diseases to improve food security at household and national levels. Within the Plantwise programme, I work as a plant doctor and help to develop extension materials.



Abrham Mulatu Mammo, Ethiopia

I am a Senior Entomologist at the Ministry of Agriculture and Natural Resources, Ethiopia. I hold a Bachelor of Science degree in Dryland Crop and Horticultural Science (Agronomy) from Mekelle University in Ethiopia.

I have over 10 years' experience at different levels within the Ministry and continue to look to develop expertise in agriculture, focusing on crop production and protection. My role within the Plantwise programme is to provide national coordination support.



Peruth Murekeyimana, Rwanda

I work as a Traditional Cash Crops Production Specialist at the Rwanda Agriculture and Animal Resources Development Board. I hold a Master's degree in Development Studies, obtained from Kigali Independent University.

I have over 15 years' experience in the field of extension in crop production and protection. My current work focuses on helping farmers to improve agriculture products by minimizing crop losses. In this role, I prepare, participate in, lead and monitor seasonal activities for traditional crops. I work closely with local governments, stakeholders, farmers and producer groups to increase traditional cash crop quantity and quality.



Cyrus Njoroge, Kenya

Since 2008, I have been working in the Ministry of Agriculture as a Sub-county Crops Development Officer, Kwanza Sub-county, Trans Nzoia County in Kenya. I hold a Bachelor's degree in Agricultural Education and Extension from Egerton University, Kenya.

My duties include providing technical assistance to staff offering extension services to farmers, promoting modern technologies in agriculture and identifying areas of research for relevant institutions. I am also a plant doctor and a plant doctor trainer, and I have been involved in coordinating Plantwise plant clinic activities.



Udeni Bandara Piyatissa, Sri Lanka

I work as a Development Officer attached to the Plant Protection Service of the Department of Agriculture in Peradeniya, Sri Lanka. I hold a BSc degree in Zoology from the University of Peradeniya, Sri Lanka.

Under the Plantwise programme I am mainly responsible for coordinating Plantwise activities in Sri Lanka, including the organization of technical workshops, monitoring and evaluation, plant doctor training, and data management. I am also involved in a programme to control invasive alien plant species in Sri Lanka, the testing of herbicides at farm level and the control of sudden pest outbreaks in the country.



Wilson Nabakwe, Kenya

Since 2009, I have worked for the County Government of Elgeyo Marakwet as an Agricultural Extensionist, working with rural communities to improve food security and livelihoods through agriculture.

I coordinate county-level crop development programmes, capacity building and backstopping on crop management and development, collating, analysing, storing and disseminating crop production information. My activities also extend to promoting compliance with crop production standards.

I hold a Bachelor's degree in Agricultural Education and Extension from Egerton University, Kenya.



Khaing Wai Phu, Myanmar

I work as a Deputy Assistant, Staff Office, for the Plant Protection Division under the Ministry of Agriculture, Livestock and Irrigation. I hold a Bachelor's degree in Agricultural Science from Yezin Agricultural University.

Since 2017, I have focused on analysing and harmonizing the plant clinic data as a National Data Manager in the Yangon Region. I have also worked as an assistant to the National Data Manager for the Plantwise programme.

Thank you to our partners



For more information, please visit:

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