



The CocoaSoils Program (a Norwegian Government-NORAD funded initiative), a public-private consortium has been created to address the issues of decline in productivity in cocoa and improve the livelihoods of smallholder cocoa farmers, while avoiding deforestation. The program has two main arms: Research for Development (R4D) and Partnership for Delivery (P4D). The R4D focuses on developing the protocols, establishing trials as well as data collection and management, while the P4D focuses on disseminating the recommendations from these trials in order to empower farmers and improve their livelihoods. In this edition of the Gazette, we focus on updates of some activities undertaken in the first quarter of 2020.

## Second Annual CocoaSoils Forum

The Second edition of the CocoaSoils Forum took place on January 23, 2020, at Hotel Mont Fébé in Yaoundé Cameroon. The forum was attended by more than 140 participants from different backgrounds, including private sector companies, research institutes, farmer organisations, public institutions and many more. The forum was part of a week-long Science Committee meeting, in which researchers and representatives from all key partners, donors as well as the media met to review the progress of the two key components (Research for Development – R4D and Partnership for Delivery – P4D) of the project.

This year's annual forum aimed at building a common understanding of the CocoaSoils program by sharing the progress so far, and engaging partners to further strengthen agronomic research and dissemination in West and Central Africa.

## OVERVIEW:

- Second Annual CocoaSoils Forum
- Satellite Validation Training for Enumerators - Cameroon, Cote d'Ivoire, Ghana, Nigeria
- Scientific Papers:
  - Selection of pesticides to reduce human and environmental health risks: a global guideline and minimum pesticides list
  - Variations in yield gaps of smallholder cocoa systems and the main determining factors along a climate gradient in Ghana
- MSc Research Thesis :
  - Comparing Classification of Ghana's Complex Agroforestry Land Cover by a Random Forest and a Convolutional Neural Network with a Small Training Set
  - Integrated Soil Fertility Management in Ghana - Understanding cocoa farmers' motivation and unpacking adoption of ISFM practices
  - Shade trees, disease and cocoa production in Western Ghana – a case study
- Profiles - Leonard Rusinamhodzi (PhD)



Group picture of all participants at the Annual Forum  
(Photo credit: IITA - Accra)

The program which is funded by the Norwegian Agency for Development Cooperation NORAD is poised to translate the results from the research into practice by highlighting public-private partnerships as an essential part of the program. The forum was a platform not only to speak to the audience on the outputs of the program but also to gain inputs from various experts to improve the program.

As part of this year's activities, our panellists included Daniel van Gilst, Senior Agriculture Advisor to NORAD, who explained how the sustainable food system is dependent on biodiversity. He also, elaborated on the objectives of the CocoaSoils Program with a 30% increase of production by cocoa farmers and improving the livelihoods of 90,000 cocoa farmers in the targeted areas.

Mr Noé Woïn, Director General at IRAD, emphasised how cocoa production represents Cameroon's second source of revenue. He stated that about 600,000 farmers and more than 50% of the farmer population depend on cocoa for their livelihood. Therefore, making cocoa, a very strategic trading commodity.

Mr Michael Ndoping, Managing Director at ONCC, continued that in 2014, the Cameroonian government instituted the increase production target which has not yet been met due to poor soil management, among other reasons. Cameroon has the potential of improving production, but one major challenge is connecting research to farmers. Thus, the importance of the CocoaSoils program to Cameroon.

Honourable Gabriel Mbairrobe, the Cameroonian Minister of Agriculture and Rural Development officially opened



From L-R: Daniel van Gilst (Senior Agriculture Advisor at NORAD), Dr May-Guri Saethre (Deputy Director-General, Research for Development (R4D) at IITA), Gabriel Mbairrobe (Minister of Agriculture and Rural Development – Cameroon), Dr Thomas Dongmo (Director of Scientific and Technical Cooperation – MINRESI – Cameroon), Ken Giller (Professor with the Plant Production Systems at Wageningen University & Research), Michael Ndoping (Managing Director at ONCC), Noé Woïn, (Director General at IRAD)

the forum. In his opening speech, the Minister lauded the efforts of the organising partners IITA, IDH and the University of Wageningen and expressed his certainty that the CocoaSoils program together with other

individual initiatives/programs of the partners will bring a new face to the cocoa sector in Cameroon. He concluded by assuring that the Government of Cameroon will actively support the CocoaSoils program, as its objectives are in line with Cameroon's agricultural priorities.

The program was then introduced in plenary by Dr Richard Asare, the Program Coordinator for CocoaSoils. He outlined the objectives of the program and explained its two components, before dividing participants into groups to discuss the potential benefits of the program for their respective organisations.



Dr Richard Asare - Project Coordinator – CocoaSoils  
(Photo credit: IITA - Accra)

Ken Giller, Professor with the Plant Production Systems at Wageningen University & Research, introduced the R4D component of the CocoaSoils Program. He highlighted an overview of the research outputs for the CocoaSoils program. He further gave an introduction to the Living Income debate that is very present in the cocoa sector and how the CocoaSoils program relates to this. He showed a simulation that is based on the current data of current income levels and the Living Income gap in Ghana and Côte d'Ivoire and what would happen if yield or price would be increased. The simulation showed that by increasing yield, many more farmers would close the living income gap rather than by increasing yields. He, therefore, emphasised that CocoaSoils has a crucial role in research for sustainable intensification of cocoa production and farmer income.

Ken Giller continued with the 'Connecting the Dots' session by dividing participants into parallel groups to work on various topic. These topics were distributed as follows:

- Adapting cocoa production to climate change (Facilitated by Christian Bunn from CIAT with Ann Degrande from ICRAF)
- Green Cocoa Landscape Program - Reduce pressure on forests (facilitated by Joël Owona from IDH with Marieke Sassen from UNEP-WCMC)

- Increasing cocoa yields through ISFM as part of best management practices (facilitated by Leonard Rusinamhodzi from IITA with Alphonsine Nhiomog from Yara)
- Increasing cocoa smallholder incomes (Facilitated by Verina Ingram from CIFOR and Theresa Ampadu-Boakye from IITA)

In plenary, the representatives of the above working groups briefed the audience on their group recommendations.



*Prof. Ken Giller: Professor with the Plant Production Systems at Wageningen University & Research (Photo credit: IITA - Accra)*



*From L-R: Dr Leonard Rusinamhodzi - IITA, Verina Ingram - CIFOR, Joel Owona - IDH Cameroon, Christian Bunn - CIAT (Photo credit: IITA - Accra)*

Jean-Paul Nlend-Nkott, the CocoaSoils P4D Coordinator then presented the P4D component of CocoaSoils in detail. He explained that Integrated Soil Fertility Management (ISFM) recommendations are a vital driver to reverse the vicious trend of poor return on investment in cocoa farming. Increasing cocoa yields could contribute to halting forest degradation and deforestation to a more resilient cocoa livelihood with sustained forest conservation and management. The linkage between P4D and R4D in the four targeted countries of the program (Cameroon, Côte d'Ivoire, Ghana, Nigeria) is created through the establishment of national Partnership Committees, which aims to validate recommendations developed by the Research Committee and give guidance on program recommendations. He then introduced the 'Deep Dive on the national context' session, where participants divided themselves into four groups that were facilitated by the

chairs of each national Partnership Committee. In these breakout groups, the participants discussed the context of each committee in detail and shared feedback with the chair to improve their work plans for 2020.



*Participants discussing during group sessions (Photo credit: IITA - Accra)*



*Jean-Paul Nlend Nkott (center) - CocoaSoils P4D Coordinator, with the P4D Chairs from the different countries (Photo credit: IITA - Accra)*

The facilitators of the sessions joined a panel discussion, to discuss the challenges, opportunities and future plans. This session was moderated by Theresa Ampadu-Boakye, Monitoring and Evaluation Expert from IITA.

Jonas Mva Mva, Program Director Cocoa at IDH, concluded the day by announcing the winner of the poster session. Miss Marente Lokin was adjudged the winner and awarded with a bag of chocolate sponsored by Barry Callebaut.



*Urcil Kenfack Essougong (R), receiving the best poster award on behalf of Lokin et al., (Photo credit: IITA - Accra)*

Dr May-Guri Saethre, Deputy Director-General, Research for Development (R4D) at IITA closed the event. In her closing remarks she pointed out that the



Dr May-Guri Saethre, Deputy Director-General, Research for Development (R4D) IITA (Photo credit: IITA - Accra)

presence of the Minister at the forum is a strong indication of the importance of cocoa production in Cameroon. She stated that "25% of the cocoa tree population produces 2/3 of the cocoa production, thus the need to promote intensification". She added that the presence of over 40 institutions at this forum is an opportunity to create synergies as each participating institution indicates a role they can play.

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## Satellite Trials' Validation Training for Enumerators

The Satellite Trials under the CocoaSoils project will be implemented in carefully-selected, existing cocoa plantations, which will provide quick results in relation to primary nutrient constraints over larger production areas. The Satellite Trials aim to evaluate the effect of improved nutrient recommendations and fertiliser formulations on growth and yield response in mature trees, and interactions with shade and management practices. This training was to orient the enumerators and technicians for the field activity of validating selected sites/farms for the Satellite Trials that will be hosted by the various partners.

### CAMEROON

The training was held in Yaoundé from February 12-13, 2020. A total of 13 enumerators, five OLAM technicians, participated in the training exercise. The first day was theoretical, where the participants were taken through the purpose of the site validation, and the various processes and tools that would be used in the validation. Participants were engaged in activities to calculate the shade percentage as well as how to record management practices.

The second day was a trip to one of the selected sites in Ayoa (137 km or ≈2.5 hours' drive from Yaoundé) for field practice. The participants were taken through the process from field mapping (using the KoBoCollect tool), DBH measurement of shade trees, recording of management practices, to the demarcation of the 0.64 ha area that would be used for the trial. Review of the training was done after the field exercise, and issues of concern were addressed accordingly.

The participants agreed that the training content was appropriate to their learning needs, and gave reasons such as the ODK and KoBoCollect App being essential for their work as field technicians. The training was facilitated by the Baseline coordinator - Dr. Precillia Tata Ngome, Abigail Tettey and Urcil Kenfack.



Partner technicians in the field measuring shade cover and the DBH of the tree (Photo credit: IITA - Accra)



Partner technicians in the field measuring shade cover and the DBH of the tree (Photo credit: IITA - Accra)

### COTE D'IVOIRE

The training was held in Gagnoa on February 1-2, 2020. The training was coordinated by Dr Mahyao Adolphe of CNRA, Mr. Boris Kouassi of (IITA-Cote d'Ivoire) and Mr. Rich Kofi Kofituo (IITA -Ghana) for nine enumerators who took part in the baseline survey. Enumerators were trained on the aim of the Satellite Trials, basic requirements for farm selection, the scope of the validation work, the use of the CanOvalator App and the KoboCollect tool for ground-truthing. A practical session was then carried out for each enumerator for hands-on practice on carrying out the validation activity.



Mr. Kofituo (IITA) taking participants through the training session  
(Photo credit: IITA - Accra)



Participants in the field for hand-on data collection session  
(Photo credit: IITA - Accra)

## GHANA

The training was held in Kumasi from February 24-27, 2020. A total of 47 technicians and field supervisors were trained on the Satellite Trials' implementation and management protocols, plot delineation and initial site characterisation. The technicians were from the four partner companies (i.e. Kuapa Kokoo, OLAM, Mondelez, Rockwinds/TransRoyal) who are hosting the Satellite Trial sites, and were also involved in the site validation exercise. The training included classroom and field activities. The classroom training involved an exposure to the concept of the CocoaSoils and the Satellite Trials, plot establishment, initial site characterisation, data collection protocols, and tools to be used.



Dr. Hauser taking participants through the training session  
(Photo credit: IITA - Accra)

The field activity involved a hands-on practice where participants were trained in plot delineation and site

characterisation. There was a review of the entire training programme, and issues of concern were discussed. The training was coordinated and facilitated by Dr. Stefan Hauser (IITA), Dr. Leonard Rusinamhodzi (IITA), Ekatherina Vasquez (WUR) and Abigail Tettey (IITA).



Group photo of participants with facilitators in Ghana  
(Photo credit: IITA - Accra)

## NIGERIA

The training was held from February 11-12, 2020 in Akure. The training began with an introduction by Dr. Stefan Hauser (IITA), who spoke briefly on the aim of the Satellite Trials, basic requirements for farm selection and the scope of the validation work. Two facilitators, Dr. Leonard Rusinamhodzi (IITA) and Mr. Rich Kofi Kofituo (IITA) gave presentations on the criteria for selecting satellite plots, the use of the CanOvalator App and the KoboCollect tool for ground-truthing. A visit was made to a cocoa farm for a practical session. The team seized the opportunity to visit the CocoaSoils Core Trial site at Owena. A total of 28 participants took part in the training. These included participants from CRIN, OLAM and IITA. The training was coordinated by the Baseline Coordinator, Dr. Kayode Oluyole and Dr. Moses Ogunlade, the Core Trial Manager from Nigeria (CRIN).



Dr. Rusinamhodzi taking participants through the hands-on session in the field (Photo credit: IITA - Accra)

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## Scientific Papers

### ***Selection of pesticides to reduce human and environmental health risks: a global guideline and minimum pesticides list***

In a recent article published by Lancet Planetary Health, the risks of the use of certain pesticides and its effects on human and environmental lives have been assessed and classified, while providing a list of pesticides that pose minimum risks to end-users.

This study ranked 659 pesticides by acute and chronic risks to human health (e.g., respiratory and carcinogenic effects) and by environmental hazards, including biomagnification and atmospheric ozone depletion and threats to aquatic life, terrestrial wildlife, and pollinators.

The classification, including the list of pesticides with minimum health and environmental risks, has been used in the treatment and management of the fall armyworm in both Africa and Asia.

[See full paper here](#)

*A study by Jepson, P.C., Murray, K., Bach, O., Bonilla, M.A., Neumeister, L.*

### ***Variations in yield gaps of smallholder cocoa systems and the main determining factors along a climate gradient in Ghana***

In this recently published paper co-authored by some members of the CocoaSoils team, the variations in yield gaps of cocoa among smallholder farmers and the determining factors for yield gaps across three different climate suitability are highlighted. According to the study, low yield in cocoa under marginal climate suitability could be attributed to the unwillingness of farmers to intensify their management practices due to both socioeconomic and climatic constraints.

This yield gap could be bridged through sustainable intensification in the climatically suitable regions to avoid future cocoa production losses while improving yield in the West African cocoa region.

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*A study by Issaka Abdulai, Munir P. Hoffmann, Laurence Jassogne, Richard Asare, Sophie Graefe, Hsiao-Hang Tao, Sander Muilerman, Philippe Vaast, Piet Van Asten, Peter Laderach, Reimund P. Rotter*

## MSc Research Thesis

### ***Comparing Classification of Ghana's Complex Agroforestry Land Cover by a Random Forest and a Convolutional Neural Network with a Small Training Set***

Anne-Juul Welsink, an M.Sc. student, working on comparing the classification of Ghana's elaborate agroforestry land cover by random forest and convolutional neural network with a small training set, has completed her M.Sc. thesis. This thesis was conducted in collaboration with CIAT and supervised by it's Terra-i team led by Louis Reymondin with support from Thibaud Vantalou. Anne-Juul successfully defended her dissertation at Wageningen University.

[See completed thesis here](#)

### ***Integrated Soil Fertility Management in Ghana - Understanding cocoa farmers' motivation and unpacking adoption of ISFM practices***

Marente Lokin, an M.Sc. student, working on the topic entitled, "Integrated Soil Fertility Management in Ghana - Understanding cocoa farmers' motivation and unpacking adoption of ISFM practices", has completed her M.Sc. thesis. This research was conducted in Wageningen University in collaboration with IITA-Ghana and Kuapa Kooko, and supervised by Maja Slingerland, Urcil Kenfack Essougong and Harro Maat. Marente Lokin successfully defended her dissertation at Wageningen University.

[See complete thesis and presentation here](#)

### ***Shade trees, disease and cocoa production in Western Ghana - a case study***

Miguel Correia Castillo Leitão an M.Sc. student, working on shade trees, disease and cocoa production in Western Ghana, has completed his M.Sc. thesis. This research was conducted in Wageningen University in collaboration with IITA-Ghana and the Cocoa Research Institute of Ghana (CRIG), and supervised by Marieke Sassen, and Danaë M.A. Rozendaal. Miguel successfully defended his dissertation at Wageningen University.

[See complete thesis and presentation here](#)

# Profiles

## Leonard Rusinamhodzi (PhD)



His work involves advanced analyses to study the effects of sustainable intensification on system productivity, soil quality, water and nutrient use efficiency and livelihoods across diverse farming systems.

Leonard has previously worked for CIMMYT from 2015 to 2019 as a Cropping System Agronomist initially based in Nairobi, Kenya and later Kathmandu, Nepal. He also worked for CIRAD as a Post-Doctoral Scientist from 2013 to 2014, studying the possible future impact of climate change on cropping systems in southern Africa with the aid of models. Leonard was initially trained as a Soil Scientist (BSc. and MPhil.) at the University of Zimbabwe (2002 & 2006) and later diversified into agronomy and systems analysis through a PhD (2013) in Production Ecology and Resource Conservation from Wageningen University and Research Center, The Netherlands.

Leonard has extensive experience in participatory research in smallholder farming systems, with a deep understanding of the complex barriers to improved crop productivity. He is particularly interested in learning and managing science that develops and uses tools that combine social, economic and biophysical aspects of farmers with improving productivity and reducing hunger for smallholder farmers in Africa and beyond. Leonard has published widely in high impact journal articles.

Dr. Leonard Rusinamhodzi is a multi-talented Systems Agronomist with expertise in the meta-analysis, systems modelling, field research on integrated soil fertility management, scientific writing and graduate student supervision.

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## CocoaSoils Discussion Forum

What are your burning questions about enhancing cocoa production, maintenance of soil fertility, the challenges facing smallholder cocoa farmers, etc?

The CocoaSoils team has access to a very wide range of scientific and business expertise through the many partner institutions and companies who are collaborating. Please pose your questions to the coordinator at [R.Asare@cgiar.org](mailto:R.Asare@cgiar.org) and we are open to a discussion in the next edition of our newsletter.

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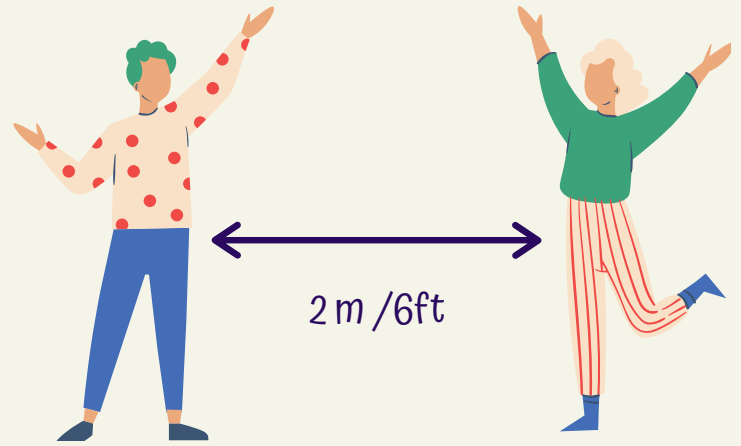


# STOP THE SPREAD



## WASH YOUR HANDS FREQUENTLY

Regularly and thoroughly clean your hands with an alcohol-based hand sanitizer or wash them with soap and water.



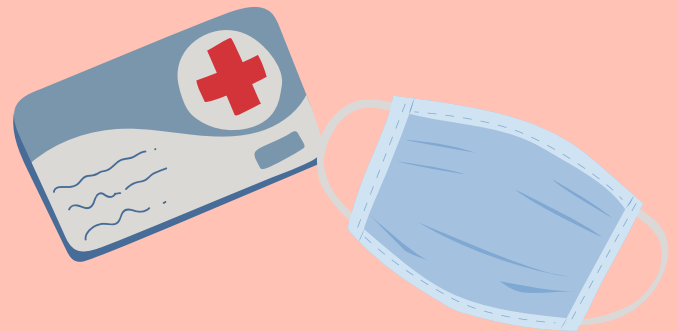
## MAINTAIN PHYSICAL DISTANCING

Maintain at least a 2 metre (6 feet) distance between yourself and anyone who is coughing or sneezing.



## AVOID TOUCHING EYES, NOSE AND MOUTH

Hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to your eyes, nose or mouth.



## IF YOU HAVE A FEVER, COUGH AND DIFFICULTY BREATHING, SEEK MEDICAL CARE EARLY

Stay home if you feel unwell. If you have a fever, cough and difficulty breathing, seek medical attention and call in advance.