Establishing a World Leading Research Organisation for Underutilised Crops

Phase One: 2012-2017
www.cffresearch.org
PHASE ONE: 2012-2017
Establishing a World Leading Research Organisation for Underutilised Crops
MESSAGE FROM THE CEO

Launched in 2011, CFF is the world’s first organisation dedicated solely to research on underutilised crops for food and non-food uses. Its purpose is to help diversify global agriculture beyond the narrow range of commodity species and monocultures on which humanity currently depends.

CFF’s research focuses on how agricultural diversification can enhance agricultural systems and their sustainability, address changing climates, increase food and nutritional security and improve economic well-being. These huge challenges require bold and imaginative solutions and active partnerships; business-as-usual on the world’s major crops will not be enough.

CFF has set out a Roadmap from its establishment in 2011 until 2030. By that date, CFF and its partners will have contributed to a Global Action Plan for Agricultural Diversification (GAPAD) with the goal of transforming agriculture for good.

Since its inception, CFF has come to play a unique and increasingly important role in global agricultural research. It has established an international alliance of partners, developed novel products that can be rapidly scaled up and initiated the first Global Knowledge Base for underutilised crops. These are major achievements. However, by themselves, they are not enough. We need advocates, champions, investors and sponsors. Most of all, we need partners who believe in what we are doing and are willing to help us achieve our common goal.

Professor Sayed Azam-Ali
Chief Executive Officer
Crops For The Future
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The Perfect Storm

“It is predicted that by 2030 the world will need to produce around 50% more food and energy, together with 30% more fresh water, whilst mitigating and adapting to climate change. A ‘Perfect Storm’ of food shortages, scarce water and insufficient energy resources threaten to unleash public unrest, cross-border conflicts and mass migration as people flee from the worst affected regions.”

Sir John Beddington
Former UK Government Chief Scientific Adviser

The Green Ocean

It’s been decades since Norman Borlaug’s green revolution changed the face of agriculture. It’s time for another revolution.

Whilst major crops might continue to feed humanity, can they, by themselves, nourish us on a hotter, more vulnerable planet? New thinking can extend beyond simply growing more crop species and include smarter cropping systems that optimise the use of rural and urban landscapes. New solutions can transform agriculture – for the good of humanity, the planet and for future generations.

We need novel and diverse ways in which we produce food, deliver knowledge, advance technologies and attract a new generation of farmers and investors. The diversification of agriculture with more crops and smarter cropping systems provides a huge opportunity to transform agribusiness into enterprises that the planet can afford.
Our current food systems depend on a handful of “major” crops grown in a few exporting countries. However, throughout our history, humans have cultivated over 7,000 crops. Why then do so few crops now feed so many people?

Are all other crops grown locally for millennia useless or have we simply overlooked them? The decline in diversity of our food systems is recent, rapid and risky. We all increasingly depend on a handful of major crops for their yields, supply chains and uses in processed foods. If any link in the chain fails, our globalised food system is at risk.
CROPS FOR THE FUTURE
Until now there has been no coordinated effort to improve the many hundreds of underutilised crops that have supported local communities around the world for millennia. In 2010, Malaysia was chosen to host a new global entity ‘Crops For the Future’ (CFF), a non-profit research organisation for the world’s underutilised and neglected crops.

CFF is the world’s first organisation dedicated solely to research and development of underutilised crops for food and non-food uses.

**Vision**
To be recognised as a world leader producing excellent, innovative research on underutilised crops that is development focussed.

**Mission**
To develop solutions to diversity agriculture using underutilised crops to improve food and nutritional security and livelihoods.

**Vision and Mission**

CFF plays a significant role in global agricultural research. It offers a unique opportunity to address complex agricultural challenges through multidisciplinary, outcome-based research on underutilised crops. This approach transcends geographical and scientific boundaries, leverages on existing and new capacities and drives innovation.

By 2030, CFF will have contributed to the 2030 United Nations Agenda for Sustainable Development through a Global Action Plan for Agricultural Diversification (GAPAD) with the vision to help transform agriculture for good.

**Roadmap 2030**

1. **Vision and Mission**
2. **Vision**
3. **Mission**
4. **Roadmap 2030**
   - **A WORLD-LEADING RESEARCH ORGANISATION**
     - CFF builds a global home, establishes an alliance of partners and drives a value chain approach for research on underutilised crops from their genetics to potential markets.
   - **DELIVERING GLOBAL RESEARCH**
     - CFF delivers research outcomes to global stakeholders. Its research becomes self-sustaining through pipeline products, external support and partnerships. CFF activities align with the targets of GAPAD.
   - **TRANSFORMING AGRICULTURE FOR GOOD**
     - CFF helps transform agriculture for good and demonstrates how underutilised crops contribute to the United Nations 2030 Agenda for Sustainable Development through GAPAD.
“I have no doubt that this new Crops For the Future Research Centre will do much to nurture the next generation of Norman Borlaug’s”

YAB Dato’ Sri Mohd Najib bin Tun Abdul Razak
Prime Minister of Malaysia
27 June 2011
“Crops For The Future is the need of the hour”

Professor M.S. Swaminathan
“Indian Father of the Green Revolution”
and World Food Prize Laureate
27 June 2011
What they said about Crops For the Future

“Important research for the future of the planet.”

Professor Shearer West
Vice-Chancellor, University of Nottingham

“I was very much impressed by the work you are doing to revive the forgotten crops and transforming Agriculture to produce food for future in this era of global climate change. It is high time we appreciated the Agricultural reforms globally to embark on the forgotten crops that can stand the challenges of climate changes.”

HE Stephen Mubiru
The former High Commissioner of Uganda to Malaysia

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Sir David Bell KCB
Vice-Chancellor, University of Reading

“It was hugely interesting and informative and I left full of admiration for the great work that you and your team are doing. It really is research with impact, with the potential to enhance the lives of millions of people on the planet. What a motivation!”

Sir David Bell KCB
Vice-Chancellor, University of Reading

“The Global Action Plan for Agricultural Diversification (GAPAD), initiated by CFF will showcase Muslim leadership in meeting the increasing challenges in food security and changing climates which will impact on Muslim countries across the world and humanity in general.”

YABhg Tun Abdullah Ahmad Badawi
Fifth Prime Minister of Malaysia

“Your team clearly has the vision and capability to be able to translate these research findings into practical applications that will enhance economic growth nationally in Malaysia, regionally in South East Asia and globally for many developing countries around the world.”

Dr Trevor Nicholls
Chief Executive Officer
Centre for Agriculture and Bioscience International (CABI)

“The process of developing GAPAD through a comprehensive programme of symposia over a three-year period will build new knowledge, foster leadership, strengthen existing capacities, enhance networks and partnerships and generate new collaboration and undertakings.”

HE Rhoda Peace Tumusiime
Commissioner of Rural Economy and Agriculture
African Union Commission (AUC)

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Original artist’s impression of the CFF headquarters by Kumpulan Akitek Sdn Bhd

Aerial view of the actual CFF headquarters
Building a global centre in Malaysia

2012

Earthworks were started on the CFF HQ containing three iconic ‘domes’ with laboratories, a visitor centre, offices for staff and visitors and surrounding landscapes.
Between 2012 and 2015, CFF established its global headquarters near Kuala Lumpur. CFF can now conduct research that links genetics, crop selection and field studies with nutritional and sensory evaluation and market testing of novel products from underutilised crops.

The headquarters includes a Central Administration Dome and a Research Support Dome that houses CFF’s researchers and visiting scientists. A third, Laboratory Dome, includes world class laboratories, controlled-environment chambers, processing, analytical and sensory suites and related equipment.

Using smart concepts and green technologies, the CFF HQ uses locally-sourced biomaterials to minimise its carbon footprint. Its domes contain gardens to showcase CFF’s research on underutilised crops.
A Green Building

The CFF HQ uses locally-sourced biomaterials and is designed to monitor and maximise energy efficiency and showcase green technologies that minimise its carbon footprint. The Green Building Index (GBI) awarded CFF HQ a Silver rating for Design Assessment. The assessment is based on (1) Energy Efficiency (2) Indoor Environment Quality (3) Sustainable Site Planning and Management (4) Materials and Resources (5) Water Efficiency (6) Innovation. Key design features include the use of sustainable timber, natural light and energy saving fittings and equipment. Its landscapes of gardens and green rooftop planting produce an internal dome environment that is nearly 4°C cooler than the ambient external temperature.

Food Development Laboratory

The laboratory, funded by Yayasan Sime Darby, is used to develop novel foods and cuisines from underutilised crops. In addition to food preparation and cooking facilities, it also has a sensory suite to evaluate attributes such as taste, texture, appearance and aroma. The functionality, compositional analysis and nutritional content of ingredients and products from underutilised crops can also be tested in ancillary facilities.
Climate Change Controlled-Environment Chambers

The ‘crown-jewel’ of CFF’s laboratory dome is its suite of 16 controlled-environment chambers in which temperature, light intensity, humidity and carbon dioxide can be controlled to generate a range of climate change scenarios. The 2m high chambers allow the growth of crop plants through to maturity to test the effects of climate change on the growth, yield and nutritional content of a range of underutilised crops against their major crop counterparts.
Indoor Garden in Dome A

The “Scents and Spices Garden” containing plants that are used as key ingredients in cooking. The garden also holds a large collection of ginger species donated by YBhg Datuk Seri Lim Chong Keat. Other notable plants include: kaffir lime, curry leaf and screw pine.

Indoor Garden in Dome B

The “Rainforest Garden” provides an environment for shade tolerant plants. Notable examples include: wild banana, jackfruit and ambarella.
The Field Research Centre (FRC) provides a proof-of-concept transition from an oil palm plantation to a diversified, sustainable and economically viable field research facility for experiments on underutilised crops and cropping systems.

The FRC includes laboratories and equipment for field and environmental measurements, offices for field-based staff and students, workshops and storage facilities. The FRC is presently hosted on a 50 ha area of ageing oil palm plantation, rented from the Boustead Holdings Group and approximately 2 km from the CFF headquarters.
CFF’s guarantors are the Government of Malaysia and the University of Nottingham in Malaysia. The Government of Malaysia provided a grant of RM120 million (approximately USD46 million) to cover CFF’s operational and development costs until the end of 2017. Through a Service Level Agreement, the University of Nottingham provides CFF with access to physical resources and expertise at its campuses in the UK, China and Malaysia.
With YB Dato’ Sri Ismail Sabri Yaakob
Minister of Agriculture and Agro-based Industry (2013-2015)
(centre) and former Chair of CFF Board Datuk Dr Abdul Shukor
Abdul Rahman (left)

With YB Dato’ Sri Ahmad Shabery Cheek
Minister of Agriculture and Agro-based Industry (2015-present) and
with former Chair of CFF Board YBhg Datuk Seri Dr Hj Bakar (centre)
and Provost of UNMC Professor Graham Kendall on the right

(From left to right):
• Professor Sayed Azam-Ali, Chief Executive Officer of CFF
• YBhg Datuk Dr Sharif Haron, Director-General of MARDI
• Professor George Rothschild
• Professor Datuk Sir David Greenaway
• YBhg Datuk Seri Dr Ismail Hj Bakar, Secretary-General of Ministry of
Agriculture and Agro-based Industry
• YBhg Datuk Dr Umi Kalsom Abu Bakar, Chair of CFF
• YBhg Dato’ MV Akbar bin AS Moidunny, Company Secretary
• Professor Graham Kendall, Provost of University of Nottingham
Malaysia Campus

2017 Board of Directors Meeting at Kuala Lumpur Teaching Centre, University of Nottingham
A Global Alliance for Agricultural Diversification

No single institution can diversify the world's agriculture. CFF has built a Global Alliance of over 50 partners, each committed to agricultural diversification. These include members of the Association of International Research and Development Centers for Agriculture (AIRCA) – a global consortium that serves more than 60 countries from across the Americas, Africa and the Asia-Pacific. In 2017, the CEO of CFF was elected as chair of AIRCA.

CFF has also joined the Asia-Pacific Association of Agricultural Research Institutes (APAARI), Global Alliance for Climate-Smart Agriculture (GACSA), Global Drylands Alliance (GDA), Global Forum for Agricultural Research (GFAR) and Tropical Fruit Network (TFNet). These links provide CFF access to over 300 institutional members, diverse global locations and world-class researchers with multiple skills and expertise that can be applied to the improvement of underutilised crops.

CFF also has partners in Malaysia, most notably MARDI, other national agencies, universities and private companies that wish to contribute to its global effort and deliver its products to end-users.
Global Forum on Agricultural Research (GFAR) Steering Committee 2017
AIRCA 2016 Annual Meeting in Costa Rica

AIRCA members with the Director-General of the UN Food and Agriculture Organisation (FAO), Dr José Graziano da Silva

MoU with Oman Animal and Plant Genetic Resource Centre. Witnessed by HE Riyadh Mohamed Abdul Nabi Macki from the Sultanate of Oman Embassy in Kuala Lumpur

Collaborative Partnerships

International
1. Southern Cross University, New South Wales, Australia
2. University of Development Studies (UDS), Ghana
3. CSIR - Crops Research Institute (CSIR-CRI), Ghana
4. University of KwaZulu-Natal, South Africa
5. University of Muhammadiyah Sleman (UMS), Indonesia
6. Sabaragamuwa University of Sri Lanka (SUSL)
7. Feeds & Fculo Nutrition Research Centre (FFNRC), Pukyong National University, Busan, South Korea
8. Farm Radio International (FRI) Ottawa, Canada
9. Agricultural Research Council (ARC), Pretoria, South Africa
10. De La Salle University (DLSU), Manila, Philippines
11. University of The Free State, South Africa
12. Institute of Forestry and Environmental Sciences, Chittagong University, Chittagong, Bangladesh
13. International Institute of Tropical Agriculture (IITA), Oyo State, Nigeria
14. Centre for Coordination of Agriculture Research and Development for Southern Africa (CCARDESA), Gaborone, Botswana
15. University of Agriculture Faisalabad (UAF), Faisalabad, Pakistan
16. The International Centre For Research in Agroforestry (ICRAF), Nairobi, Kenya
17. YFY Inc., Taipei, Taiwan
18. University of East London, UK
19. Washington State University, USA
20. The University of Queensland, Brisbane, Australia
21. The World Vegetable Centre, Taiwan
22. Bogor Agriculture University, Indonesia
23. PT. Musim Mas, Indonesia
24. National Taiwan Ocean University, Taiwan
25. The Research Council, Oman Animal and Plant Genetic Resources Centre, Oman
26. National Agriculture Research Organization (NARO), Uganda
27. Islamic Organization for Food Security (IOFS), Kazakhstan
28. CIHEAM-Instituto Agropecuario Mediterraneo Bari (CIHEAM-Bari, Italy

Malaysia
29. Feida Agricultural Services Sdn Bhd
30. Konpro Group
31. Malaysian Agricultural Research and Development Institute (MARDI)
32. Sarawak Agriculture Department
33. C-Fera SA-Easter Capital Inc
34. ACC Agriculture and Biotechnologies Sdn Bhd
35. CIHEAM Research Sdn Bhd, Sarawak
36. Green World Genetics Sdn Bhd
37. Tropical Rainforest Conservation & Research Centre
38. Human Life Advancement Foundation (HLAF)
39. Eureka Synergy Sdn Bhd
40. Yayasan Sime Darby
41. Malaysian Bioeconomy Corporation
42. National University of Malaysia (UKM)
43. Sime Darby Research Sdn Bhd
44. Centre of Underutilized Crops, Faculty of Agriculture, University of Brunei
45. University of Nottingham in Malaysia (UNiM)
“The facilities are truly impressive and it is wonderful to see what we viewed in images for so many years has become a reality. The potential is enormous, and if we get it right, it could be a ‘game changer’.”

Professor Datuk Sir David Greenaway
Vice-Chancellor, University of Nottingham
2008-2017
“I must say I had the good fortune, on a recent trip to Malaysia last autumn, to visit Crops for the Future, where they are conducting valuable research into underutilised crops. I was enormously impressed with the research that the centre is undertaking”

HRH The Prince of Wales
at the Reception for The Crop Trust
Clarence House
30 January 2018
CFF has established ‘exemplar’ research programmes that show how underutilised crops can contribute to human and animal nutrition, diversification of agricultural systems and global knowledge systems. Its research spans a Value Chain from sowing of particular underutilised crops to their harvesting, transport, processing, marketing and end-uses.

Resources for research on underutilised crops are limited and the need for tangible outputs is urgent. As well as being of world quality, CFF research delivers outputs on underutilised crops that can respond to emerging global challenges such as climate change, population growth and limited diets.

CFF research programmes show how underutilised crops can add value to global food and non-food systems. These include ‘disruptive’ innovations, scalable prototypes, new knowledge and technology transfer for the wider adoption of underutilised crops. CFF programmes act as ‘exemplars’ of how research on particular underutilised crops can be used to develop sustainable value chains for other promising underutilised species.

A Food Systems Approach to Research Delivery

Meeting Societal Challenges

Resources for research on underutilised crops are limited and the need for tangible outputs is urgent. As well as being of world quality, CFF research delivers outputs on underutilised crops that can respond to emerging global challenges such as climate change, population growth and limited diets.

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CropBASE is the first web-based knowledge system for underutilised crops. It links databases and models to provide user applications that allow growers to select diversification options that best suit their needs. CropBASE will become the trusted global evidence-base for underutilised crops.

CFF outputs also include publications that span social sciences relating to farmer adoption of innovative practices, genomics and computational science underpinning data acquisition and analysis.

Global Knowledge Systems

CFF has built a global knowledge base on bambara groundnut – a nutritious and drought tolerant legume. BamYIELD shows how bambara groundnut’s resilience, nutritional value and ability to fix nitrogen make it an ideal crop for changing climates. Using CFF expertise, bambara groundnut production will be expanded and novel markets developed. BamYIELD provides a model of how other underutilised crops can be evaluated and their markets expanded.

Food Security
Human Nutrition

FoodPLUS is developing and evaluating a range of nutritious and marketable products that contain ingredients from underutilised crops. Its research focuses on techniques to maximise micronutrient availability, reduce postharvest losses, develop niche products and promote novel cuisines. The FoodPLUS team works closely with the Forgotten Foods Network.

Animal Nutrition

FishPLUS is developing high-value fish feeds from locally grown plant species. It has shown that insects fed on underutilised crops can replace fishmeal in aquaculture feed. This disruptive technology requires research to be scaled up to major aquaculture systems. Experience gained in FishPLUS will be used to develop novel feed ingredients for poultry and livestock.
CONNECT delivers proof-of-concept value chains that span genetic resources through to markets for crops that are currently underutilised.

CONNECT allows stakeholders to compare diversification options that include underutilised crops against current agricultural systems.

As well as the most suitable crops at any location, CONNECT provides a mechanism to develop new food products and identify their potential markets.
Global Action Plan for Agricultural Diversification

This is an initiative to support the United Nations Sustainable Development Agenda and transform agriculture for good. Agricultural diversification will expand the current food systems through increasing species diversity and more resilient agricultural ecosystems that include new crops for food and non-food uses. This will eventually contribute to achieving Sustainable Development Goal (SDG) 1 – No Poverty. GAPAD will address the following SDGs:

- **Food:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- **Energy:** Ensure access to affordable, reliable, sustainable and modern energy for all.
- **Consumption:** Ensure sustainable consumption and production patterns.
- **Climate:** Take urgent action to combat climate change and its impacts.
- **Ecosystems:** Protect, restore and promote sustainable use of terrestrial ecosystems.
- **Partnership:** Build and ensure partnerships, including North–South, South–South and triangular cooperation, among others who share a common vision.
The Declaration on Agricultural Diversification

The Declaration on Agricultural Diversification was launched and signed in Paris by world renowned research leaders alongside the meeting of the United Nations Framework Convention on Climate Change (UNFCCC) COP21. The Declaration, which aims to build agricultural resilience and food security for future climates, will underpin the Global Action Plan for Agricultural Diversification (GAPAD).

The GAPAD initiative, led by CFF, has the support of fellow AIRCA institutions and other international agencies. GAPAD will lead global efforts in agricultural diversification, climate change mitigation and green growth to meet national commitments to the 2030 UN Sustainable Development Agenda, UNFCCC and the Convention on Biological Diversity (CBD).

YABhg Tun Abdullah Ahmad Badawi, fifth Prime Minister of Malaysia, signed the Declaration on Agricultural Diversification.

“A most welcome and timely initiative to which the CBD secretariat will give its full support….the mainstreaming of biodiversity in the agricultural sector will be the main agenda item in the next CBD COP in Cancun, Mexico in December 2016”

Dr Braulio Ferreira de Souza Dias
Executive Secretary
UN Convention on Biological Diversity (CBD)
21 - 22 March 2016
SDG 7: Roundtable Forum at CFF Headquarters, Malaysia

The forum identified the potential contribution of agricultural diversification to SDG 7 of the United Nations Sustainable Development Agenda 2030: Ensure access to affordable, reliable, sustainable and modern energy for all.

Max Herriman, Head of GAPAD Secretariat Task Force addresses the importance of agricultural diversification.

25 - 26 October 2016
SDG 2: Roundtable Forum in Nairobi, Kenya

The forum identified the potential contribution of agricultural diversification in the implementation of SDG 2 of the UN Sustainable Development Agenda 2030: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

HE Rhoda Peace Tumusiime, Commissioner of Rural Economy and Agriculture, African Union Commission.

Dennis Rangi of Centre for Agriculture and Bioscience International (CABI).
HE Eng Hani Salem Sonbol of Islamic Development Bank (IsDB) to address the role of agricultural diversification in meeting Sustainable Development Goal 13: Take urgent action to combat climate change and its impact.

Professor Sayed Azam-Ali and Dr. Ismahane Elouafi, Director-General of International Center for Biosaline Agriculture were among key leaders at the high-level planning meeting.

**14 November 2016**

**SDG 13: Planning Meeting in Marrakech, Morocco**

A high-level meeting hosted by Islamic Development Bank (IsDB) to address the role of agricultural diversification in meeting Sustainable Development Goal 13: Take urgent action to combat climate change and its impact.

**4-5 September 2017**

**SDG 2: Planning Meeting in Rome, Italy**

Crops For the Future (CFF) and the International Fund for Agricultural Development (IFAD), with the support of the Association of International Research and Development Centers for Agriculture (AIRCA), co-hosted a meeting on the role of Dietary Diversification in addressing the United Nations Sustainable Development Goal 2 (SDG2): Zero hunger.
The global diet – energy rich and nutrient poor – is inextricably linked with an increase in the incidence of non-communicable diet-related diseases (NCDs). The double-burden of over and undernutrition is a major concern globally. Over 1.5 billion people suffer from ‘Hidden Hunger’ due to micronutrient deficiencies caused by decreased dietary diversity. We increasingly recognise that a healthy diet contains a diversity of fruits and vegetables, wholegrains, nuts and seeds, and fewer sugary snacks and beverages, processed meats and salt. However, we have not yet considered the role that underutilised crops can play in achieving this diversification of diet. Recent research has focussed on incremental nutritional improvements of the main staples while our abundant agricultural biodiversity is largely ignored. Whilst they may not achieve the yields of major staples, underutilised crops often contain more vitamins, minerals and phytometabolites than found in cereals.

Around the world, supermarket shelves are stacked with thousands of food products. However, careful inspection will show that these contain the same ingredients, often blended into processed products that are transported across the world. This diversity of products, but not their ingredients, means that thousands of ‘forgotten foods’ are displaced by a modern, uniform and processed global diet. Forgotten foods can include ingredients from neglected crops, animals and even insects. If we can rediscover such foods we can test the suitability of the crops from which they derive and make products and cuisines from them that are nutritious and desirable. This needs a global effort that links our culinary heritage with scientific studies and new technologies.

Forgotten Foods Network
Rediscovering our culinary heritage

For more information
www.forgottenfoodsnetwork.org
Launch of Forgotten Foods Network

In November 2017, HRH The Prince of Wales launched the ‘Forgotten Foods Network’ (FFN) at CFF’s HQ in Malaysia. This global initiative shares information on foods, recipes and traditions that are part of our common heritage to create a library of forgotten foods. The culinary knowledge and scientific evidence linked through FFN will build on the ‘Food Forever’ initiative launched by the Crop Trust to secure the genetic resources of the world’s crop species.

Examples of Forgotten Foods

Khuaj Jam
Rice mixed with over 25 types of herbs and aromatic roots
Origin: Southern Thailand

Aash
Chickpeas, black-eyed beans, lentils and turnip
Origin: Iran, Azerbaijan

Kerabu Tembikai
Salad made from unripe watermelon, chilli and shrimp paste
Origin: Northern Malaysia
CFFPLUS Doctoral Training Partnership

The University of Nottingham is a research-led university that is amongst the top 1% of global higher education institutions. It is also a world leader in research in agriculture and food systems. The University of Nottingham provides supervisory support, facilities and intellectual guidance for research students registered for PhD or Masters qualifications.

CFF and the University of Nottingham have established the CFFPLUS Doctoral Training Partnership (DTP) as the world’s largest scholarship scheme for research training on underutilised crops. With over 300 ‘years’ of postgraduate scholarships with the University of Nottingham, CFFPLUS offers a unique model that meets both the academic requirements of the student and timely and cost-effective research delivery.

CFF wishes to expand the DTP model for research training on underutilised crops through partnerships in Malaysia and throughout the world.

![Graph showing publications in top journal percentiles](image)

**Publications in Top Journal Percentiles**

*Note: data up to 19 September 2017, SCOPUS**
To broaden the impact of its research, CFF has established ‘FutureCrop’ as an education and outreach unit. Its role is to provide educational resources for CFF’s activities and to raise wider awareness of the values of agricultural diversification and underutilised crops. Currently, there are very few educational resources on agricultural biodiversity in mainstream school and university curricula. The purpose of FutureCrop is to develop such materials and, wherever possible, link these with educational and community initiatives.
Workshops

Since its inception, CFF has hosted numerous workshops that link experts from the private sector, research institutes, universities and NGOs, to engage in dialogue on sustainable agriculture.
Engagement

For the public and other stakeholders to understand the importance of agricultural biodiversity and underutilised crops, it is essential to effectively communicate these messages to our stakeholders in external events and exhibitions. We also actively engage with Ambassadors and High Commissioners in Malaysia to emphasise the global action needed to address agriculture sustainably.
Like human societies, agriculture is at a crossroads. We can either enforce and protect monocultures or facilitate and celebrate diversity. It is not a question of whether the Green Revolution has successfully fed most of us but whether this model can nourish us in the future. Whilst high input crop monocultures are easy to justify they are increasingly vulnerable in volatile climates. Our ‘yield-for-profit’ paradigm has meant that many crops grown for generations have been displaced, funding and advocacy for them curtailed and, as a consequence, crop diversity lost. Is this wise? Whilst diverse crops and cropping systems are complex, they provide greater resilience to changing environments, more products and are simply more interesting!

Underutilised crops can provide new livelihoods for communities and business opportunities for investors. As we move in ever greater numbers to cities and safe spaces, we need to see agriculture as a career for young urban professionals, livelihood for displaced communities and activity for you and me. If we eat we are involved in agriculture. The crops we grow need not only be major staples but can include a multitude of species supported by knowledge of their uses, cultural values and societal benefits for humanity and the planet.

For the future of food, we need a global effort to transform agriculture for good.
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