CABI and ACIAR Partnership

Annual report to ACIAR

2020

KNOWLEDGE FOR LIFE

CABI improves people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment

Contents

Supporting ACIAR's strategy – a foreword from CABI's CEO

ACIAR's funding allows CABI's core activities and research and extension programmes to address major issues of importance to both organizations. This report covers activities carried out in 2020 under ACIAR's partnership agreement with CABI and key programmes funded by ACIAR to support the delivery of the ACIAR 10-year Strategy. Despite the challenges caused by the COVID-19 pandemic, good progress was made towards achieving our mutual goals.

Improving food security and reducing poverty among smallholder farmers and rural communities

CABI's flagship **Plantwise** programme, in which 'plant doctors' are trained to provide advice to farmers at plant health clinics, achieved a cumulative reach of over 50 million smallholders during 2020. With support from ACIAR, Plantwise has improved livelihoods and food security by enabling farmers to lose less of what they grow to pests and diseases. During the COVID-19 pandemic, digital tools built to support this programme came to the fore, allowing its impact to be maintained. 2020 saw the inception phase of **PlantwisePlus**, a successor programme designed to build on the achievements of Plantwise and CABI's **Action on Invasives** programme, which specifically addressed the impacts of invasive species. The new programme will take a more holistic approach to food security and poverty reduction among smallholder farmers, and have a strong focus on predicting, preventing and preparing for threats to crops. This approach is also central to the Plantwise-affiliated **Pest Risk Information Service (PRISE)** which combines earth observation technology, plant health modelling and real-time field observations to enable farmers to reduce crop losses from pest outbreaks. In its target countries, the project contributes to a reduction in hunger, increased food security and increased farmer income. We also launched the **Global Burden of Crop Loss** initiative to quantify more accurately the scale of crop losses and help guide agricultural research, policy, funding and interventions to maximize impact.

Managing natural resources and producing food more sustainably, adapting to climate variability and mitigating climate change

CABI supports biodiversity by combatting threats to agriculture and the environment from pests and diseases, protecting natural habitats from invasive species and improving access to scientific knowledge. Biocontrol and integrated pest management (IPM) approaches continue to be key parts of our food security programmes, helping partner countries to grow more, and safer, food in a sustainable manner.

Two projects supporting climate-smart pest management in the maize value chain received part funding from the ACIAR-supported CABI Development Fund (CDF) in 2020 and we continued other work to implement our new climate change strategy. CABI also supported external peer organizations and multilateral bodies in developing innovative and scaleable climate-smart approaches.

Enhancing human nutrition and reducing risks to human health

CABI programmes have worked to reduce the use of chemical pesticides and encourage the uptake of biological control measures, reducing the risk of toxic pesticide residues in food. Face-to-face and online education activities have reduced the risk to farmers and production workers from exposure to pesticides and food contaminants and value chain work has improved the quality and safety of food reaching rural and regional markets.

During 2020, CABI helped support the global response to COVID-19 by providing free access to coronavirus-related content from our Global Health database, together with content about animal coronaviruses from CAB Abstracts.

Improving gender equity and empowerment of women and girls

Within CABI's latest Medium-Term Strategy, the drive to put smallholder farming onto a stronger business footing is coupled with a recognition that our activities need to do more to recognize and empower the role of women in agriculture and seek to engage the younger generations in farming for the future.

During 2020, driven by CABI's new Gender Co-ordinator, Bethel Terefe, we continued to incorporate actions on gender and youth into our activities and to examine and improve gender aspects of agricultural practices, including via a major ACIAR-funded value chain programme in Pakistan (see page 20). Gender analysis across multiple programmes revealed important differences in access to finance, technology and education and the way in which male and female farmers access information and respond to alerts. Recommendations have been developed for approaches to enhance women's agency and address systemic causes of inequality in future development projects, including PlantwisePlus.

Fostering more inclusive agrifood and forestry market chains, engaging the private sector where possible

CABI's value chain offerings include technical support to improve smallholder compliance with market requirements, provision of information and knowledge to inform decision-making by both agribusinesses and investors, and engagement with the private sector to build partnerships with, and enhance opportunities for, smallholder farmers. Using CDF funding, we explored the growing opportunity to strengthen and broaden our value chains work. A "pilot service" consultation with Member Countries was carried out which identified specific areas of priority for future value chain initiatives.

During 2020, work progressed well on the ACIAR-funded project "Strengthening Vegetable Value Chains in Pakistan", and a collaborative mid-term review led to further improvements in social mobilization and the engagement of female farmers in the project.

Building scientific and policy capability within our partner countries

CABI's publishing products are respected worldwide and we continue to develop new information resources and new ways to deliver them, so as to provide research materials, practical advice, information and professional development support. CABI's Open Access portfolio continues to grow, with 2020 seeing the launch of the CABI Agriculture and Bioscience journal and relaunch of agriRxiv, a global service for sharing preprints of research articles in agriculture and allied sciences.

CABI's Bioscience unit offers training and work experience opportunities, strategic advisory support and consultancy, as well as pest, fungi and bacteria identification services, access to a genetic resource collection, and microbial sample storage. Many of the services are available free of charge to developing country members.

Benefits to Australia

CABI's work on improving food security, trading opportunities and livelihoods for fellow Member Countries in the Indo-Pacific assists with creating stability in the region and reducing biosecurity threats.

CABI's work on crop pests and diseases supports Australian biosecurity onshore by reducing their international spread and the potential for devastating impacts on Australian agriculture. CABI has been closely involved, for example, with international and national responses to fall armyworm (FAW) since it first appeared in West Africa and has undertaken a range of activities related to forecasting, preparedness and response. In 2020, together with Australian partners cesar, Plant Health Australia, the Queensland Department of Agriculture and Fisheries, and the Commonwealth Scientific and Industrial Research Organisation, CABI was able to bring international experience to support the efforts of Australia's Grain Research and Development Corporation in biosecurity planning to tackle this devastating pest. CABI also directly supports the work of Australian agencies in biocontrol of cat's claw creeper and navua sedge.

As I take over as CEO from Trevor Nicholls, I would like to take this opportunity to thank ACIAR for its continuing support of CABI. I look forward to working with the ACIAR team to deliver our mutual goals.

Daniel Elger, Chief Executive Officer

Australia's membership of CABI

Established in 1910, and reconstituted as an intergovernmental and international organization in 1987, CABI is a unique and innovative not-for-profit international organization that improves people's lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. CABI conducts high-quality research, and translates that research into practice through development co-operation projects worldwide, implementing sustainable agricultural approaches and raising the incomes of poor rural farmers. This is reflected in the growing importance of the social and economic sciences in CABI's strategy, and is substantiated through rigorous monitoring and evaluation. CABI plays a unique bridging role in marrying the international development objectives of both high-income and emerging economies.

As a Founding Member, Australia plays an important role in influencing CABI's governance, policies and strategic direction, ensuring CABI's activities complement Australia's key strategic objectives.

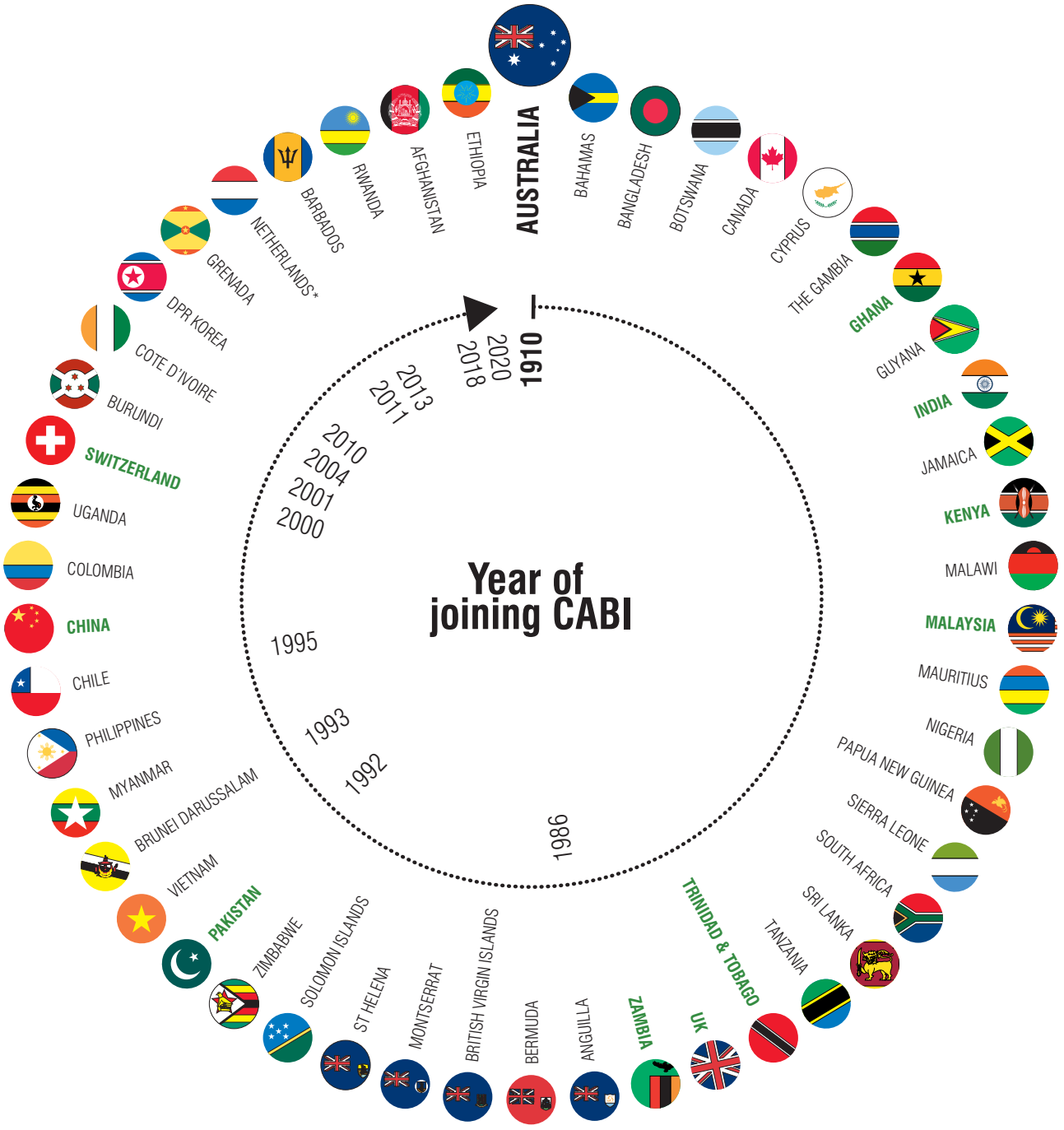

Diagram showing when Member Countries joined CABI
(Countries with a CABI centre shown in green text)

CABI membership fees are used to fund activities and services that are of direct benefit to CABI Member Countries, including pest and disease identification; expert consultancy; monitoring, evaluation and impact studies; project and policy development; proofs of concept; scoping studies; and pilot projects. Additional support is also provided to developing country members.

Core funding from membership fees is under 5% of CABI's operating costs. CABI uses profits from its publishing business to cover certain central costs and support its international development work. These amounted to around £4.3m (~AU$7.8m) in 2020, enabling the organization as a whole to record a modest surplus and strengthen its cash position despite the adverse impacts of COVID-19.

Australia's membership of CABI is administered by ACIAR, and the **ACIAR-CABI Partnership Agreement** was developed in 2018 to support the mutual priorities of high-impact, strategic research partnerships and to provide sustainable solutions to biosecurity challenges. The current ACIAR-CABI Partnership Agreement runs from 2019 to 2023 and establishes a shared vision of ACIAR and CABI working in close co-operation to fulfil their respective missions. Under this arrangement, ACIAR's contribution to CABI in 2020 was AUD 600,000. The funding was used to cover **CABI Membership**, and support for the **CDF** and **Plantwise** programmes.

As a Member Country, Australia has priority access to CABI resources, and via ACIAR, also funds the following food security programmes which are run by CABI with in-country partners:

- "Strengthening vegetable value chains in Pakistan for greater community livelihood benefits (2018–2021)", HORT/2016/012, with total life-of-project funding of AUD 2,895,669
- "Plant health – a major challenge to achieving sustainable 'green' agriculture in Myanmar (2019–20)", CROP/2019/103, with funding of AUD 250,000

Separate, and more detailed, Annual Reports on the CDF and Plantwise are provided to ACIAR, together with mid-term and final reports for ACIAR-funded programmes.

CABI's Medium-Term Strategy 2020-2022

CABI uses information and communication technologies to provide farmers, researchers, policymakers and other stakeholders with the information they need to make informed decisions, reduce poverty and protect biodiversity. We translate information into clear, understandable formats and deliver it through channels that are suitable for communicating to different end-users. This includes applying digital tools to provide scientific information and evidence to a wide variety of users, promoting data-driven development, engaging in data-focused research partnerships, engaging with stakeholders to build data literacy, supporting data collection and facilitating communication.

We are committed to playing our part in helping the world reach the **Sustainable Development Goals**. While pest management, crop protection and preparedness, control of invasive species and access to markets are priorities for much of CABI's work, gender equity and climate change are cross-cutting themes. CABI's publishing operations provide training and information products that are used in our programmes, and by the research community, academics and development professionals worldwide.

2020 marked the first year of CABI's current three-year Medium-Term Strategy. At the end of the year, around three quarters of the critical milestones set out in the strategy had been met, or were on track to be met. Almost a quarter were showing some minor variance from expected performance, largely due to delays in starting, progressing, evaluating and closing projects resulting from the COVID-19 pandemic.

CABI's Medium-Term Strategy 2020-2022: Theory of change

SUSTAINABLE DEVELOPMENT GOALS

1 NO POVERTY | 2 ZERO HUNGER | 4 QUALITY EDUCATION | 5 GENDER EQUALITY | 12 RESPONSIBLE CONSUMPTION AND PRODUCTION | 13 CLIMATE ACTION | 15 LIFE ON LAND | 17 PARTNERSHIPS FOR THE GOALS

IMPACT

Sustainable economic development, improved livelihoods and better nutrition through greater market access for climate-resilient agriculture in healthy ecosystems

STRATEGIC GOALS

- Improve access for smallholder farmers to sustainable value chains
- Build the capacity for climate-resilient food and nutrition security
- Help women and young people gain new opportunities in agriculture
- Promote balanced use and conservation of biodiversity and ecosystems

DELIVERING IMPACT AT SCALE

Policy Change | Knowledge Platforms | Partnerships & Alliances | Face-to-Face | Media | Digital | Print

KEY PROGRAMMES

CORE STRENGTHS

- Bridging the needs of developed and developing country partners
- Objective, science-based approach to putting research into use
- Knowledge management, communication and dissemination
- Deep scientific knowledge of plant pests and diseases
- Working in partnership with a broad international network
- Delivering value for money to donors and partners

CABI Development Fund

CABI Development Fund (CDF)

The **CDF** is supported by membership fees, as well as by additional contributions from several national implementing agencies of CABI Member Countries, including ACIAR and the UK's Foreign, Commonwealth & Development Office. The CDF is a small but valuable fund that shows an excellent return on investment from the activities it supports, and acts as a launch fund for major programmes. CDF funding allows CABI to respond rapidly to Member Country needs (for example, in response to natural disasters or unforeseen pest problems), develop novel technologies or approaches (Plantwise was originally funded by the CDF), provide co-funding where required by major donors, and to ensure continual monitoring and evaluation of CABI-run programmes. There are also elements of CDF funding that are specifically targeted at cross-cutting issues, such as scientific research and dissemination, and developing and sustaining partnerships - for example, the Association of Independent Research and Development Centres in Agriculture, which includes other ACIAR-funded centres, such as WorldVeg and the International Centre of Insect Physiology and Ecology.

In 2020, the CDF funded some 43 projects or studies, with a total value of £1,383,477 (around AUD 2.5m), as detailed fully in the separate CDF Annual Report for 2020. This included several invasive species projects which contributed to CABI's Action on Invasives programme, further work on climate change and value chain strategy implementation, and socio-economic impact studies.

Individual donor funds are not assigned to specific CDF projects. However, some of the work which is of direct relevance to ACIAR's objectives is highlighted in the following sections.

Digital development

Efforts to reach the Sustainable Development Goals in food security, nutrition and livelihoods are being hindered by crop loss, with around 40% of crop yields lost to pests and disease, worldwide. Part-funded by CDF, the **Global Burden of Crop Loss** initiative was launched in 2020 to collect, validate, analyse and disseminate data on the extent and causes of crop loss, with the aim of gathering sufficient and reliable data that can act as evidence to enable the prioritization of research and policy in plant health and improve our ability to predict the impact of emerging diseases.

Also launched in 2020, initially in Kenya, the **CABI BioProtection Portal** is a free web-based tool that enables users to discover information about registered biocontrol and biopesticide products around the world. Available online, with an offline version coming soon, the CABI BioProtection Portal helps growers and agricultural advisers to identify, source and correctly apply biocontrol and biopesticide products to tackle problematic pests in their crops. CDF funding enabled CABI's marketing and communications team to carry out digital campaigns to help support its use by farmers and extension intermediaries from both the private and public sectors, and help attract additional commercial and governmental partners.

CDF funding also enabled the marketing and communications team to carry out digital marketing campaigns to drive traffic to another open access tool developed by CABI, the **Plantwise Knowledge Bank**, which has served over 18.6 million users since its launch.

In addition, continued improvements were made to CABI's **Pest Risk Analysis Tool** and **Horizon Scanning Tool** and a feasibility study is underway for a new climate adaptation decision-support tool.

Monitoring and evaluation

Under the CDF, the CABI team assessed the outcomes and impacts of multiple projects, including the Masters of Advanced Studies in Integrated Crop Management training in Switzerland, a project focused on integrating remote agricultural advisory services with insurance in India (see more details below), the implementation of the Joint Laboratory for Bio-Safety in China and socio-economic studies across the Plantwise programme.

Evaluation of remote advisory services

Evidence shows that farmers, particularly women, are not able to travel to plant clinics due to distance and other constraints. Remote advisory services can therefore play an important role in filling the gap in accessing reliable plant health information, the need for which has been exacerbated by the current pandemic.

An evaluation of remote advisory services in India provided insights into how such services can contribute to pest and disease detection/control, supporting the development of a strengthened advisory network in Pudukottai and Thiruvaiyaru (Thanjavur District) in Tamil Nadu, India. The study adopted a quantitative method to collect the data through a structured questionnaire-based survey, covering three sets of farmers (240 paddy and groundnut farmers) who used advisory services, Plantwise and picture-based insurance.

Results showed that plant clinics are still the service most sought after by farmers, and that future remote advisories based on images will gain the farmers' confidence. In addition, when insurance is included alongside advisories, farmers' interest in services increases further. The farmers feel confident to apply the advice, as well as to invest more in agriculture, due to the insurance component.

Gender equity and women's empowerment

A gender analysis study was undertaken for the African Crop Epidemiology System project in Ethiopia and Kenya. Gender aspects of agricultural practices and participation, access to resources and assets, and beliefs and perceptions were examined. The gender analysis revealed many similarities between Kenya and Ethiopia, but also important differences regarding the way in which male and female farmers access information and respond to alerts. The analysis found that the design of early warning systems will need to consider how the alerts are translated into messages for both intermediaries and male and female farmers, and how those messages are delivered, interpreted and acted upon.

Within the Commercial Agriculture for Smallholders and Agribusiness project, a review of women's economic empowerment was conducted for commercial agriculture projects through the use of eight gender dimension indicators. The review found that most of the programmes integrated gender well, but those that focused on agri-business investment and infrastructure development needed more support to identify entry points to enable better gender inclusion. In addition, a recommendation was given to include approaches that enhanced women's agency, and that addressed systemic causes of inequality.

Invasive Species Management

During the current reporting period, CDF funding has supported projects, and the development of project proposals, on the control and management of invasive species, as well as attendance at workshops and conferences. CABI Invasives Coordinators continue to contribute to policy including expert involvement in the EU Pest Risk Analysis work relating to its Invasive Species Regulation, and a review of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services "thematic assessment of invasive alien species and their control".

A particularly important and successful project for CABI has been the work led by our Switzerland and Kenya centres on managing woody weeds in East Africa. Funding for the project coordinator is only possible through CDF funding (due to donor funding rules).

CABI's teams of invasive species experts have made further progress in 2020 on approaches to the control of FAW. A promising approach is augmentation: to mass rear natural enemies of FAW and release them in areas affected by the pest. To keep costs down for smallholder farmers, the team is investigating opportunities for local production of natural enemies in Kenya and Pakistan, and a training course on rearing techniques was held in Pakistan for agriculture officers and lab assistants.

Similarly, our team in India is working towards FAW control, through promotion and delivery of IPM techniques. Alongside the Indian Council of Agricultural Research's (ICAR's) National Bureau of Agricultural Insect Resources, research and awareness raising on IPM technologies is being carried out. Mass production of natural enemies is also continuing apace, with the development of successful protocols and evaluation of the relative effectiveness of different control agents.

Fall armyworm damage to maize crop, Ghana. © Daniel Adjokatcher, for CABI

Responding to Member Country requests

In addition to project work carried out in CABI Member Countries, our members enjoy a range of privileges, benefits and services relating to CABI's scientific expertise, products and resources. Among the benefits is CABI's offer of free consultancy time for policy and programme support, which is appreciated particularly by less developed Member Countries.

In 2020, CDF funding enabled CABI to fulfil this obligation and respond to requests for advice, technical back-stopping and capacity building, including:

- a scoping study on FAW in rice and other habitats in the Philippines
- the development of a funding proposal for sustainable management of FAW for Africa and Asia, including Kenya, Ghana, Myanmar and China
- the development of a proposal for implementing PRISE in the countries of the Caribbean region
- provision of guidance on establishing a molecular science laboratory in Rwanda, and the development of options for joint action to combat resurgent coffee pests and disease
- continued support for the development of a strong agricultural programme for plant protection in the Bahamas

Strategy development

During 2020, additional work in strategy implementation for the following CABI themes was undertaken.

- Value chains and trade
- Agriculture and climate change
- Gender
- Invasive species

CABI's science work has been fully reviewed during 2020 to gain an external perspective of the implementation of our Science Strategy (2017-2019) and assess the quality and focus of our science in relation to the last Medium-Term Strategy. Further details can be found in the CDF Annual Report 2020.

ACIAR's support of the CDF enables CABI to continually review programmes, respond to unforeseen emergencies and pilot approaches. Two major programmes initiated with CDF support, and now supported by multi-donor funding, are Plantwise and Action on Invasives. ACIAR has provided dedicated funding to Plantwise throughout the period of the Partnership Agreement. From 2021, the expanded PlantwisePlus programme, which builds on Plantwise and Action on Invasives, enters its pilot phase and ACIAR funding will contribute to the new programme.

Masai farmers with invasive Opuntia cactus in Laikipia, Kenya. ©Sarah Hilliar, CABI

Plantwise

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Plantwise

Plantwise is a global programme, led by CABI, to increase food security and improve rural livelihoods by reducing crop losses. Plantwise strengthens national plant health systems from within, enabling countries to provide farmers with the knowledge they need to lose less of what they grow and to feed more. Core to this are networks of plant clinics where farmers can receive practical plant health advice, reinforced by the Plantwise Knowledge Bank, a gateway to online and offline actionable plant health information. This includes diagnostic resources, pest management advice and a pest database to provide support for global pest surveillance. To enable work to continue despite the COVID-19 outbreak, implementation methods were adjusted, and structured monitoring, evaluation and learning ensured continual improvements to the programme.

In addition to ACIAR, the donors contributing to Plantwise in 2020 included the UK Foreign, Commonwealth and Development Office, the Directorate General for International Cooperation of the Netherlands, the Swiss Agency for Development and Cooperation, the International Fund for Agricultural Development, the Ministry of Agriculture of the People's Republic of China and the Koppert Foundation.

Plantwise operates across the Americas, Africa and South and Southeast Asia, including Myanmar, Vietnam and Cambodia. Partnerships on the ground are essential, as well as collaboration with government, private and farmer organizations. A review of Plantwise engagement with the private sector conducted in 2020 found 96 linkages, mainly with agro-input traders (including manufacturers, distributors and retailers) and trade hubs (farmer and trade associations and farmer co-operatives).

In 2020, Plantwise received its sixth international award through the International Integrated Pest Management Award of Excellence (Team category). Most of these awards relate to innovation in both processes and tools, distinguishing the programme from similar initiatives by other organizations.

Outcomes and impact

By the end of 2020, approximately 54.1 million farmers (cumulative) had been reached.

10 million farmers were reached in 2020, despite the COVID-19 restrictions. Of these, 275,308 (12% female farmers) attended plant clinics; 69,151 (52% female) attended plant health rallies and similar activities; and 1,655,719 were reached directly through mass extension campaigns. This was amplified by farmer-to-farmer sharing and was made possible by the quick adaptation by CABI and implementing partners in the use of innovative approaches and virtual programme activities. As a result, 1,441 plant doctors were trained and 359 new plant clinics were established. In 2020, the Plantwise Diagnostic and Advisory Service supported the identification of five new pests in two countries, in addition to providing diagnostic and advisory support through a number of social media plant doctor groups.

Evidence of the impact of Plantwise was gained through a study conducted in Rwanda to assess the effect of clinics on five food security indicators critical to Sustainable Development Goal 2 (zero hunger). Data was generated from 637 smallholder maize-producing households and analysis showed that participation in plant clinics is associated with a reduction in different aspects of household food insecurity. In general, plant clinics contributed to a one-month decrease in the months of household food insufficiency, reducing food insecurity by 15% and severe food insecurity by 88%. A comparison of female-headed and male-headed households indicated that users of plant clinic advice in female-headed households are likely to benefit more in terms of a decrease in the duration of the hungry season. Food insecurity scores improved for female-headed households (by 29%) and for male-headed households (by 11%).

A further study in Zambia showed that those adopting plant clinic advice experienced an increase in maize yield (86%) and maize income (89%) compared to non-adopters.

Clinic users in Rwanda and Zambia adopted 15% and 20% more FAW management interventions respectively, and are more likely to use other pest management techniques besides pesticides.

An **external evaluation of Plantwise and the Action on Invasives programmes conducted by the Royal Tropical Institute** reinforced the positive impacts of the programme in the implementing countries.

Delivering at scale

The programme's reach is determined through estimations of primary reach (farmers reached directly through Plantwise activities) and secondary reach (farmers reached indirectly, e.g. as a result of plant doctors operating outside of Plantwise and farmers receiving advice from peers who visited plant clinics). In addition to reporting cumulative numbers, reach is also segregated by method.

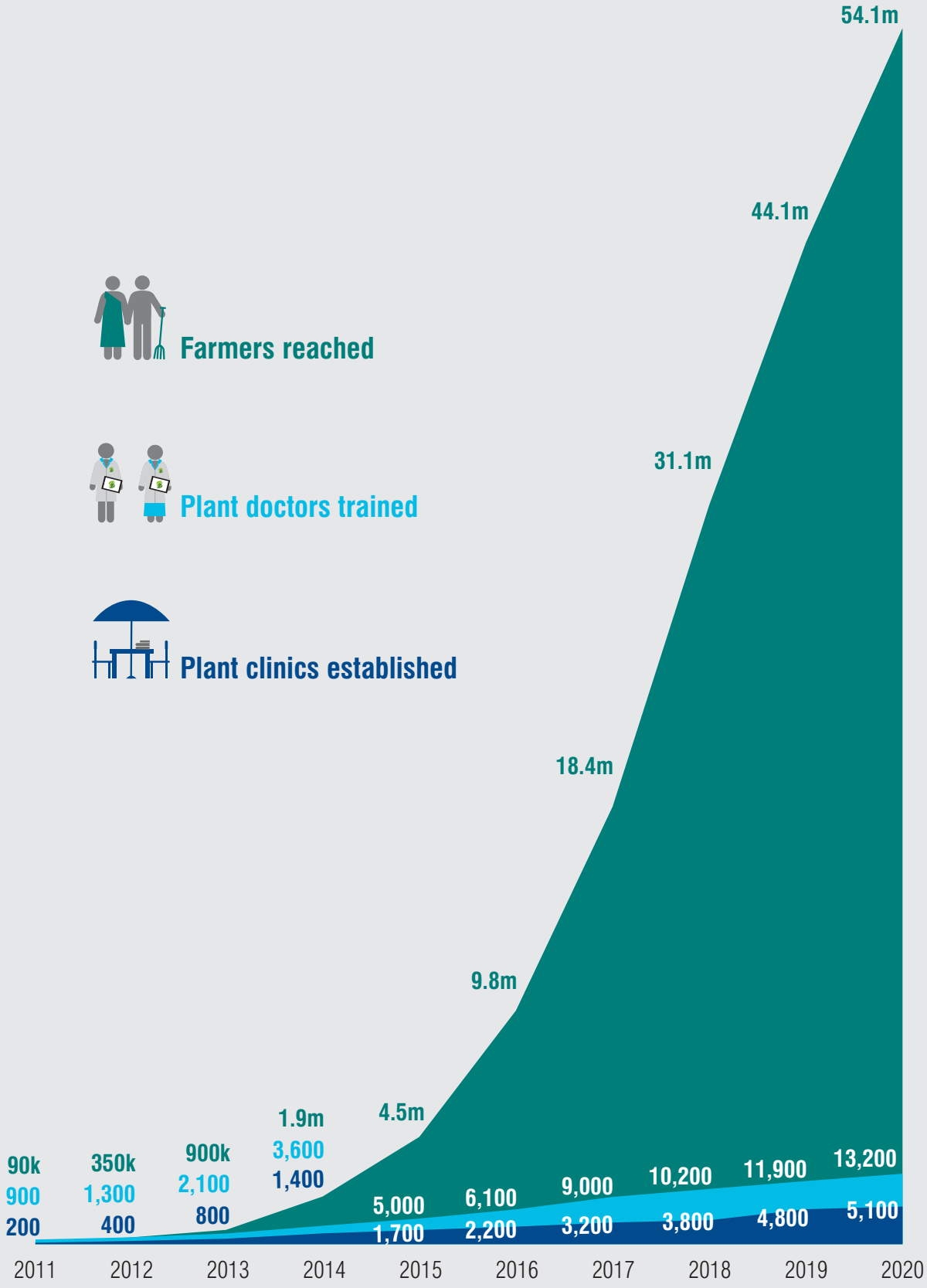

Diagram not to scale.

Digital innovation

There were several digital development activities in 2020:

- the **Data Collection App** account administration tool was redesigned to allow Plantwise plant doctors to more easily send high quality advice to farmers via SMS and make collecting plant health data during their regular clinics and farm visits more efficient;
- a mobile-responsive version of the **Plantwise Online Management System** (POMS) was launched, a key development as mobile phones are the preferred method of accessing the internet in many developing countries; and
- a **PowerBI dashboard** was incorporated into the POMS to allow users to access a well-designed, single-page visualization of data, giving them detailed metrics such as the most common pest problems and recommendations. Visits to the Plantwise information resources reached a cumulative total of 2.4m, with 288,964 of them in 2020.

The UK Space Agency-funded **PRISE** project, which is affiliated to Plantwise, has been introduced in Kenya, Ghana, Zambia and Malawi since its inception in 2017. Outputs from PRISE modelling have now been communicated to extension workers and farmers, informing them of the most appropriate time to act against specific pests. In 2020, six pest species were covered by the early warning messages with 59% of farmers who received alerts changing their farming practices based on message recommendations and 85% of farmers who received alerts preferring to continue receiving such messages in the future.

CUMULATIVELY

3,953

PLANT DOCTORS HAVE BEEN TRAINED IN THE USE OF TABLET COMPUTERS AT PLANT CLINICS IN **28 COUNTRIES**

911

ONLINE E-PLANT CLINICS ARE RUNNING IN **25 COUNTRIES**

THE CABI ACADEMY CROP PEST DIAGNOSIS E-LEARNING COURSE WAS PILOTED (IN ENGLISH AND SPANISH), ATTRACTING

4,650

USERS FROM 103 DIFFERENT COUNTRIES (83% FROM DEVELOPING COUNTRIES, MOST NOTABLY PLANTWISE COUNTRIES).

PLANTWISE TEAMED UP WITH UNESCO'S "WIKIMEDIAN IN RESIDENCE" TO UPDATE

19

PEST SPECIES ON **WIKIPEDIA**

Gender

Regarding work on gender, activities in 2020 consisted of in-depth studies in Ethiopia and India, both of which have been delayed due to travel restrictions caused by COVID-19 and evaluations required in other Plantwise countries.

Preliminary results from India show that engagement with Plantwise has resulted in an increase in women's knowledge of plant health and knowledge-seeking behaviours, as well as higher levels of female empowerment, thereby increasing their participation in pest management decision making within households. Women farmers from Pudokkottai District in Tamil Nadu stated that the information received from plant doctors via their mobile phones had enabled them to save their groundnut crop.

Evaluations of Plantwise's impact in Zambia showed that male clinic users saw an 18% increase in maize yields, while female users saw an increase of only 8%. However, the benefits to female users varied greatly based on their household structure: women in female-headed households experienced a 21% yield increase while women spouses saw a 3% increase, indicating the advantage conferred by women having decision making power. This difference may help to explain why, when considering all clinic users, female clinic users saw a 22-day reduction in food shortage compared with a 17-day reduction for male clinic users.

Similarly, a study of plant clinic users in Rwanda showed that food insecurity scores improved by 29% for female-headed households, compared to 11% for male-headed households. Female-headed households also saw an 87% reduction in the likelihood of being severely food insecure, compared to 83% for male-headed households.

Gender-focused studies are conducted under Plantwise to understand how best to ensure gender inclusivity in the programme. Their findings will inform CABI regarding what it needs to consider in order to more strongly integrate gender into its future development projects.

PlantwisePlus

PlantwisePlus

Smallholder farmers have increased incomes and grow safer, higher quality food through sustainable approaches to crop production.

The plant health system of the future needs to be more proactive and agile in identifying and responding to plant health problems and national responses need to be co-ordinated more effectively into area-wide management strategies.

The new development programme, **PlantwisePlus**, will use lessons learned from Plantwise and Action on Invasives to make another 50 million farmers more resilient to plant health threats. This will be achieved using sustainable approaches to crop production, increasing incomes through growing more, safer and higher quality food, over a 10-year period.

Successful fundraising and planning during 2020 has enabled PlantwisePlus to enter a proof-of-concept phase (2021–2023), where specific activities are being piloted in a small number of countries. Validated activities can then be upscaled for implementation in more countries. Meanwhile, existing Plantwise programmes will continue with in-country partners, with CABI continuing to provide support, technical advice and access to information and management tools.

PlantwisePlus will build on CABI's core strengths and collaborations with relevant partnerships in supporting countries to improve the quantity and quality of food production through four components:

1. strengthening detection and response to pest outbreaks
2. enhancing digital advisory tools to boost climate-smart plant health practices
3. increasing the availability of safer plant protection products
4. increasing the supply of and demand for safer, higher quality and locally produced food in domestic markets

The programme will give special attention to issues related to gender and climate change. The existing gender equality gap in agriculture will be reduced by improving women's access to advisory services and agricultural inputs and participation in agriculture enterprises. Female and male smallholder farmers will have the information and decision-support tools necessary to make appropriate decisions to adapt to climate change impacts. Sustainable plant health practices will enable large numbers of smallholders to continue to increase yields and incomes and grow safer food in spite of the increasing threats from climate change.

The collection of Plantwise digital tools developed under Plantwise and Action on Invasives will be enhanced under PlantwisePlus so that the information and learning is easily accessible for use in plant health monitoring and management.

The ultimate aim of **PlantwisePlus** will be to comprehensively support countries and farmers to grow the quantity of food required, and also to improve the quality of food grown, in a changing climate. The programme will help countries to predict, prepare for and prevent plant health threats, therefore reducing crop losses.

ACIAR-funded scientific programmes

ACIAR-funded scientific programmes

As well as providing multilateral support to global programmes, ACIAR commissions CABI to run in-country programmes in support of the SDGs and ACIAR's strategic objectives. Two such programmes were implemented in 2020 and are detailed here.

Strengthening vegetable value chains in Pakistan for greater community livelihood benefits (2018–2021): HORT/2016/012

ACIAR is contributing funds of AUD 2,895,669 over the life of this project.

The Strengthening Vegetable Value Chains in Pakistan (SVVCP) project focuses on developing model vegetable value chains that are inclusive, gender-friendly and equitable for smallholder vegetable farmers in Pakistan. Most value chain development activities in 2020 worked towards building the capacity of smallholder vegetable farmers to enable them to conduct and interpret value chain analysis, identify the opportunities along the value chain and design the interventions necessary to develop differentiated produce that meets consumer/customer requirements and fetches higher prices. A major focus was on creating new opportunities for, and enhancing participation of, rural women.

Empowering women

In the case of the **onion value chain**, the project team hired female social mobilizers and adopted a whole-family extension approach. This approach helped the team to interact with the female farmers and labourers through their social mobilizer to enhance engagement. The project team trained female farmers in safe pesticide handling at home, record-keeping harvesting, post-harvest handling and marketing of the onion crop. The female farmers and labourers also learned to adopt value chain thinking and understand the quality perspective of the customer. The enhanced skills helped women in farming families to take a leadership role and female farm labourers to earn an extra 20 rupees (AUD 0.17) per bag.

In the **potato value chain**, the same whole-family approach was adopted with a newly hired female social mobilizer and a female extension staff member improving gender engagement. This led to an increase in the participation of women and young people from farmer and labourer families in training sessions and other project activities, enabling them to develop skills in sowing, harvesting, sorting, grading, packing and record-keeping.

For the **tomato value chain**, a collaborative flagship initiative was started in 2020 with the Engro Foundation to develop the value chain and improve the engagement of women. A female trainer from the Engro Foundation was included in the project team, who engaged female farmers in training sessions on raising seedlings, filling trays and sowing seeds. Healthy tomato seedlings raised by SVVCP female farmers attracted farmers from surrounding villages due to a higher seed-germination rate, superior root and shoot growth and minimized frost damage. Two female farmers adopted “best practice” nursery raising practices to produce and market healthy tomato seedlings as a business to generate an additional income.

Accessing markets

The successful onion consignment proved that the value chain approach works well and empowers smallholder farmers to earn higher incomes. The project team shared the encouraging results with the project farmers, enhancing their trust in the approach, and training events were arranged to enable farmers to manage negotiations and delivery themselves. The team facilitated the development of market linkages and one retailer (from Karachi) visited the village to see the onion crop situation and discuss arrangements for future onion consignments. Four onion farmers delivered “best practice” onion consignments to selected retailers/wholesalers and received positive feedback regarding quality and shelf life. The farmers are satisfied with the outcomes of adopting the value chain approach to project interventions. Farmers and retailers now communicate with each other on how to further improve the product to meet customer requirements and plan to work together in the future.

In the potato value chain, the capacity of the farmers was built through several participatory training sessions and farmer field trials. The SVVCP team facilitated the development of market linkages and the potato farmers conducted a “best practice” potato consignment. The quality of the produce and the linkages with market actors were improved, resulting in increased economic benefits for smallholder farmers.

In the tomato value chain, farmers conducted a walk-the-chain activity (a walk-through experience from start to finish) to understand the existing marketing system and the quality requirements. The team helped these smallholder farmers understand the value chain and the customer’s perspective on quality and its importance for earning a better income. This helped them to plan for their tomato crop and identify critical control points that influence the quality and production of the tomato, and to design interventions that would improve the quality of produce to better meet customer requirements.

Work in 2021 will continue to improve market access and provide greater economic opportunities for smallholder farmers in Pakistan.

Plant health: A major challenge to achieving sustainable "green" agriculture in Myanmar (CROP/2019/103)

The rice industry remains the most important contributor to gross domestic product, income and employment generation in Myanmar. It is the key commodity for domestic food security and export income, with the country having the potential to become a major global food supplier. However, Myanmar is susceptible to crop losses; these are exacerbated by pesticide misuse, which pollutes water and soil and impacts upon food security, food safety, human health, access to international markets and non-target (beneficial) organisms.

This project worked with scientists in Myanmar to understand farmers' reliance on pesticides, with a focus on their use on rice and vegetables in major production regions such as in the Delta and Central Dry Zone areas.

Pesticide use and misuse

Overall, there were four sets of key findings and outputs:

1. Available information was fragmented and skewed, with a significant lack of published information on pesticide residues. More than 50% of the registered pesticides are banned in the EU and cheap, unregistered products, including illegal imports and counterfeits, are widely used. Quantitative information on losses due to pests in rice and vegetable production was missing, and there is little information, in particular for vegetables, on the effectiveness and costs of pesticides.
2. The baseline insecticide susceptibilities of major pesticides and the stability points were established for the two key pests (the rice brown planthopper and the diamondback moth).
3. Assessments of farmers' knowledge, attitudes and practices, their key beliefs and the factors driving their pest management practices suggested that 90% of the insecticides used in rice were misused; this misuse was driven by the belief that the rice crop at the younger stages needed insecticide protection and that during the first 40 days after sowing, pesticides should be used to prevent pests and diseases, whereas research showed that insecticides provided only marginal gains at this stage.
4. Evaluation of bio-based IPM demonstrated benefits compared with farmers' conventional approach as it reduced the number of insect pests and the number of sprays per season, yielded equivalent or higher yields and generated higher economic returns.

Integrated pest management

It was concluded that Myanmar farmers could use smaller amounts of pesticides or even no synthetic chemical pesticides at all. Their economic expectations and livelihoods would be intact and their produce would have a better chance of accessing wider markets. It is recommended that strategic structural reforms in plant protection services be carried out to professionalize plant protection. A greater focus needs to be given to tackling the "people dimension", especially in changing farmers' beliefs and their behavioural practices, supported by innovative knowledge tools, mobile apps and the media. Pilot-scale, bio-based IPM approaches could be further refined for scaling-up and scaling-out to underpin countrywide transformations from the current pesticide-driven system to one that caters more holistically to Myanmar's aspirations towards sustainability and the "greening" of its agricultural systems.

Contact CABI

Africa

Ghana
CABI, CSIR Campus
No. 6 Agostino Neto Road
Airport Residential Area
P. O. Box CT 8630
Cantonments
Accra
Ghana
T: +233 (0)302 797 202
E: westafrica@cabi.org

Kenya
CABI, Canary Bird
673 Limuru Road
Muthaiga
PO Box 633-00621
Nairobi
Kenya

T: +254 (0)20 2271000/20
E: **africa@cabi.org**

Zambia
CABI, 5834 Mwange Close
Kalundu
PO Box 37589
Lusaka
Zambia

T: +260 967619665
E: **southernafrica@cabi.org**

Americas

Brazil
CABI, UNESP-Fazenda Experimental
Lageado
FEPAF (Escritorio da CABI)
Rua Dr. Jose Barbosa de Barros 1780
Fazenda Experimental Lageado
CEP:18.610-307
Botucatu
Sao Paulo
Brazil

T: +55 (14) 3880 7670
E: **y.colmenarez@cabi.org**

Trinidad & Tobago
CABI, 59 Gordon Street
Curepe
St. Augustine
TUNAPUNA 331323
Trinidad and Tobago

T: +1 868 6457628
E: **caribbeanLA@cabi.org**

USA
CABI, One Lincoln Street
24th Floor
Boston
MA 02111

T: +1 (617) 682 9015
E: **h.jansen@cabi.org**

Asia

China
CABI, Beijing Representative Office
Internal Post Box 85
Chinese Academy of Agricultural Sciences
12 Zhongguancun Nandajie
Beijing 100081
China

T: +86 (0)10 82105692
E: **china@cabi.org**

India
CABI, 2nd Floor, CG Block
NASC Complex
DP Shastri Marg
Opp. Todapur Village
PUSA
New Delhi – 110012
India

T: +91 (0)11 25841906
E: **india@cabi.org**

Malaysia
CABI, PO Box 210
43400 UPM Serdang
Selangor
Malaysia

T: +60 (0)3 89432921
E: **cabisea@cabi.org**

Pakistan
CABI, Opposite 1-A
Data Gunj Baksh Road
Satellite Town
PO Box 8
Rawalpindi-Pakistan

T: +92 51 9292062
T: +92 51 8434979
E: **cabi.cwa@cabi.org**

Europe

Netherlands
CABI, Landgoed Leusderend 32
3832 RC Leusden
The Netherlands

T: +31 (0)33 4321031
E: **netherlands@cabi.org**

Switzerland
CABI, Rue des Grillons 1
CH-2800 Delémont
Switzerland

T: +41 (0)32 4214870
E: **europe-CH@cabi.org**

UK
CABI, Nosworthy Way
Wallingford
Oxfordshire
OX10 8DE, UK

T: +44 (0)1491 832111
E: **corporate@cabi.org**

UK
CABI, Bakeham Lane
Egham
Surrey
TW20 9TY, UK

T: +44 (0)1491 829080
E: **cabieurope-uk@cabi.org**
E: **microbialservices@cabi.org**

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