Bioversity International

Annual Report 2014

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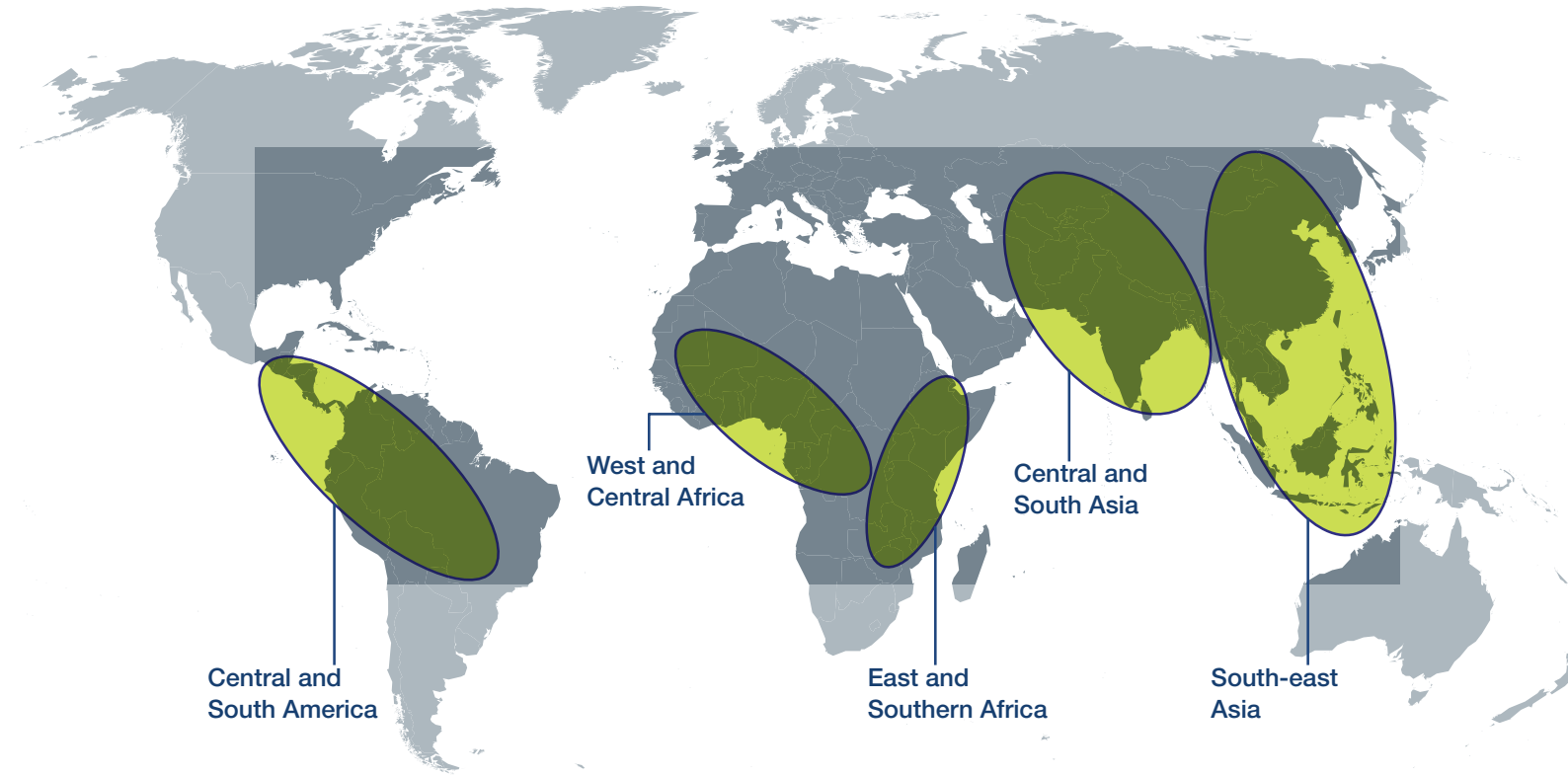


Foreword

In 2014 Bioversity International celebrated 40 years of research as the world agricultural and tree biodiversity research-for-development centre. The rise of nutrition, climate change adaptation, resilience and sustainability on the global agenda, as demonstrated in the United Nations Sustainable Development Goals, makes our research more relevant than ever.

The UN designated 2014 as the International Year of Family Farming – a theme that closely reflects Bioversity International's mission to deliver scientific evidence, management practices and policy options to use and safeguard agricultural and tree biodiversity to attain sustainable global food and nutrition security. Getting this knowledge into the hands of those people who need it most is at the heart of our work, whether it is to help farmers know what to plant in a changing environment, or to help inform policy decisions at the national or international level.

As a member of the CGIAR Consortium, we are part of a global research partnership that spurs innovation in agricultural development. In line with the reforms underway in the Consortium, we have reviewed our strategy to increase our impact on important policy processes and programmes. We are integrating our research portfolio into three major initiatives, which will contribute to the achievement of our strategic objectives focusing on consuming, producing, planting and safeguarding agricultural and tree biodiversity.

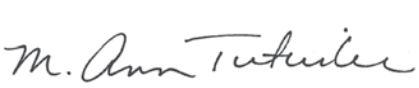
These objectives are beyond what Bioversity International can achieve alone. In 2014, we successfully enriched our research partnerships, including the signing of a 5-year agreement with Brazil's leading agricultural research organization – Embrapa – to boost sustainable food systems.

In addition to traditional OECD funding partners, we are grateful for the ongoing support from countries like India, Peru, Philippines, South Africa and Uganda, whose financial support strongly signals the relevance of our research to their domestic interests. In 2014, we also welcomed a significant new partnership with the Margaret A Cargill Foundation whose belief in our mission has manifested through generous financial support for institutionalization of our new strategy.

The Italian Cooperation's partnership with Bioversity International and commitment to stable core funding will underpin our research in the long-term to help ensure global food and nutrition security around the world. Our partnership with Italian Cooperation goes beyond research, however. We have worked together on the organization of events in Milan Expo 2015, the first universal exhibition entirely on food and nutrition, to raise policymakers' and public awareness on why using and safeguarding agricultural biodiversity matters, and the role that the private sector and other scientific institutions can play in this.

Governed by an international Board of Trustees, we welcomed our newest Board member, Brent Swallow, Professor of Resource Economics and Environmental Sociology at the University of Alberta, Canada, and take this opportunity to thank all our Board Members for their continued commitment. We are grateful for the continuous collaboration with our partners and the hard work of our scientists and support staff.

This report highlights some of our 2014 achievements carried out in collaboration with our partners. We hope it provides some insight into the innovative ways in which, through our research, agricultural and tree biodiversity can nourish people and sustain the planet.



M. Ann Tutwiler
Director General

Cristián Samper
Board Chair

2014 - An overview

2014 was declared the International Year of Family Farming by the UN. In her first blog post of the year, Director General M. Ann Tutwiler highlighted the vital role that smallholder farmers play in food security, poverty eradication, natural resource management and sustainable development, and how agricultural biodiversity is key to making family farms more resilient and productive.

2014 marked Bioversity International's 40 years of agricultural biodiversity research. Professor M.S. Swaminathan, the renowned plant geneticist who first conceived and laid the groundwork for Bioversity International, helped us celebrate with a special video message, highlighting the role of agricultural biodiversity as we face major challenges such as malnutrition and climate change. We are specially honoured by his kind words: "[...] I am sure that Bioversity International will be the flagship of the human quest for the conservation of genetic resources."

The *Resilience Conference* held in France in May drew attention to how ecosystem services contribute to agricultural productivity and what agricultural practices can improve the delivery of ecosystem services, illustrated in an infographic we developed for the event. It also highlighted the key role of traditional farming communities as stewards of resilience.

Bolivia also officially recognized custodian farmers as a strategic asset to help use and safeguard the country's valuable and rich crop diversity for nutrition and income security.

In June, *The State of the World's Forest Genetic Resources* report was released, representing a major step towards better conservation and sustainable management of the planet's precious forest genetic resources. Bioversity International worked closely with the Food and Agriculture Organization of the UN (FAO) and partners from other CGIAR centres in the preparation of the report.

We also highlighted the importance of protecting cacao diversity at *The World Cocoa Conference*. Also in June, we co-organized the *Enhanced genepool utilization - Capturing wild relative and landrace diversity for crop improvement* conference to raise awareness of why crop wild relatives are important for food security and adaptation to climate change. We also launched a new infographic and a video.

In July, in an article for Rural 21, M. Ann Tutwiler introduced Bioversity International's refreshed 10-year research strategy and the important role that agricultural biodiversity plays in enhancing the adaptability and resilience of family farms.

Bioversity International scientist Evert Thomas promoted forest restoration in *Nature*'s 'Correspondence' section. He discussed affordable, socially-inclusive and ecologically-sound forest restoration projects in Colombia, which could become a model for re-establishing forests and their biodiversity on millions of hectares of degraded lands.

In August, we received a recognition award from the Department of Agriculture - Bureau of Agricultural Research, a key national partner in the Philippines. The award recognized our contribution to strengthen partnerships and introduce technologies that benefit and improve the lives of banana farmers.

Also in August, more than 3,000 delegates – including many of our scientists – gathered in Brisbane, Australia, for the *International Horticultural Congress*. Through ProMusa, we co-organized a symposium devoted to banana research.

September started with the *Ecosystem Services Partnership Conference* in Costa Rica, followed by the *CGIAR Development Dialogues* in New York, which organized 'Talking Science', a blog competition. Our scientist Carlo Fadda received the highest

vote from the jury for his blog 'How local is local? Working with Ethiopian farmers to adapt to climate change'.

As part of our 40th anniversary celebrations, we opened the doors at our Rome Headquarters on the 20th September 2014, bringing together the local community to *Run for Biodiversity*.

In October, we participated in the Convention of Biological Diversity (CBD) 12th Conference of the Parties, showcasing how agricultural and tree biodiversity is contributing to meeting multiple Aichi targets. Through FAO and the Subsidiary Body on Scientific, Technical and Technological Advice to the CBD, Bioversity International researchers influenced CBD's decision to urge parties "to give due attention to both native species and genetic diversity in conservation and restoration activities, while avoiding the introduction and preventing the spread of invasive alien species".

We also celebrated 20 years of the European Forest Genetic Resources Programme (EUFORGEN) with a short film.

In November, Ann Tutwiler and the Crop Trust Executive Director Marie Haga shared their perspectives in a co-written op-ed on Thomson Reuters website about how the Middle East can help feed the world.

Bioversity International scientists and a group of experts launched the Ecosystem Services and Resilience Framework, which guides all activities of the CGIAR Research Program on Water, Land and Ecosystems.

On 24 November, Bioversity International and Embrapa – the Brazilian Corporation of Agricultural Research, signed a 5-year agreement to work closely together to expand the knowledge base on how to use agricultural biodiversity to develop sustainable food systems.

And finally, in December, Bioversity International scientists highlighted the importance of forest restoration in climate adaptation and resilience at the *Global Landscapes Forum* in Lima, Peru.

To access the resources mentioned above, please visit http://bit.ly/2014overview

Farmer harvesting *Garcinia indica,* also known as kokum fruits, in the forest near Kalgadde Kanchigadde, India. Credit: Bioversity International/E. Hermanowicz

Kenyan farmer growing traditional leafy vegetables. Credit: Bioversity International/S. Mann

Healthy diets from sustainable food systems

Diverse local Vietnamese foods – nutritious and delicious

Bioversity International is working on a nutrition initiative to assess the potential of diverse local foods in Vietnam. We are looking at the potential of using diverse local foods to improve diet quality and diversity, especially for women of reproductive age and for children between 12-23 months.

Malnutrition rates are high in Vietnam with a lack of dietary diversity thought to be a crucial factor. In the developing world diets often consist of starchy staples, with not enough nutrient-rich foods, such as the nutrients that come from animal source foods, legumes, fruit and vegetables. The prevalence of undernutrition for children under five for stunting, underweight and wasting in Vietnam in 2012 was 27%, 16% and 7% respectively with the proportion of infants and young children (6-23 months) who did not achieve minimum dietary diversity at 13%.

When looking at diet quality and diversity, it is important to consider food systems as a whole. This means considering all the complex dimensions of a food system: production to processing; the marketability of local foods; natural resource management; and resilience to external stresses such as climate change. Taking this perspective helps us understand how interventions can contribute to food systems in a sustainable and healthy way.

In Vietnam, Bioversity International and its partners are piloting a community-based approach that engages with the community members as research partners. This ensures not only that cultural preferences (such as taste, ease of processing, suitability to preferred cooking methods, etc.) are taken into account, but that diets are the result of collaborative knowledge-sharing between researchers and the community members. The added benefit of participatory research is that results belong to the community which helps to ensure the uptake of knowledge once the research is finished.

We have been working on a baseline study of agricultural biodiversity that is available and accessible both on and off the farm – not just what is grown on the farm and in home gardens but also wild foods and foods sold at the market. A key part of this research is interviewing women to find out their nutrition and diet knowledge and practices, and carrying out a 24-hour recall to estimate the average nutrient intakes of women and children aged between 12-23 months in the study area households. We are conducting the 24-hour recall twice, at different times of the year, to ensure that the information reflects changes in diets across seasons, which affects availability of foods and what is eaten.

Bioversity International has also facilitated a 3-day practitioner workshop with partners in Hanoi, Vietnam, to refine the 24-hour recall methodology that was piloted this year under the CGIAR Research Program on Humidtropics, and adapt it to suit our own research needs.

This article is adapted from a blog post by Jessica Raneri, Nutrition and Marketing Diversity Programme Specialist, Bioversity International.

This research is part of the CGIAR Research Program on Humidtropics.

Brazil brings diversity to children's plates

Brazil has high rates of malnutrition – for example, 1 in 3 children aged between 5 and 9 is overweight. It is one of the world's hotspots for biodiversity, much of which is edible and nutritious, but many of these traditional species have fallen off household menus and out of consumer shopping baskets in favour of a narrow range of energy-dense staple crops.

As part of the GEF 'Biodiversity for Food and Nutrition' initiative, coordinated by Bioversity International, Brazil will use information generated by the project on nutrition-rich species to inform their food and nutrition security policies. A crucial gap in the knowledge base is the scientific information on the nutritional content of promising native food species. Through the initiative, the nutritional content of around 150 underutilized native food species is being investigated.

One of the main drivers of biodiversity loss in the context of biodiversity for food and nutrition is a lack of appreciation of its value by both producers and consumers. In Brazil, as in the other countries of the initiative, efforts are being made to raise awareness of its importance and to improve market links to ensure its uptake. The Government in Brazil has established a school feeding programme to promote healthy eating education, reconnecting nature with food for school children who are part of the programme. Investing in education is critical as these children are the future food producers, consumers and protectors of biodiversity.

The programme has added a critical food procurement component which ensures that 30% of produce is bought from small-scale producers. This is resulting in the empowerment of producers not only through this income stream, which also pays a premium of 30% on sustainably produced local foods, but through the creation of cooperatives which often include marginalized producers, such as indigenous communities. It also encourages diversified production on the farm which in turn increases resilience, for example to extreme weather events such as drought which can destroy an entire harvest of a single crop. At the moment, the diversity count is low in terms of species being purchased through the programme but this also means there is a great opportunity to monitor how increasing the diversity produced, purchased and consumed will in the longer-term improve nutrition and affect the livelihoods of the small-scale producers involved.

Other highlights from the initiative in 2014 include the book *Diversifying Food and Diets - Using agricultural biodiversity to improve nutrition and health*, available to download for free through the Bioversity International website. The book, part of the Issues in Agricultural Biodiversity Series published by Earthscan/Routledge in association with Bioversity International, explores the current state of knowledge on the role of agricultural biodiversity in improving nutrition and food security. It also identifies research and implementation gaps that need to be addressed to promote the better use of agricultural biodiversity in food-based approaches that tackle malnutrition and food security. The book was our most downloaded publication in 2014.

This article has been adapted from a guest blog 'Why agricultural biodiversity must be embedded into sustainable development policies 'by Braulio Ferreira de Souza Dias, Executive Secretary, Convention on Biological Diversity, for the International Day for Biological Diversity 2015.

The GEF 'Biodiversity for Food and Nutrition' initiative (full name 'Mainstreaming biodiversity for nutrition and health') is led by Brazil, Kenya, Sri Lanka and Turkey and coordinated by Bioversity International, with implementation support from the United Nations Environment Programme (UNEP) and the Food and Agriculture Organization of the United Nations (FAO) and additional support from the CGIAR Research Program on Agriculture for Nutrition and Health.

Reaping benefits from the Barotse floodplain: men and women's perspectives

Many rural people derive their sustenance from sources embedded in their landscape – cropland, pasture, trees, forests, rivers. The diversity of food in people's diets can be closely linked to how they manage their landscape. Yet there are often significant differences in how men and women interact with their surroundings. Understanding these differences can provide important insights for promoting food and nutrition security.

Traditional survey-based research methods are not necessarily the best tools for capturing the different uses and knowledge of resources by men and women. In the Barotse region in southwest Zambia – a rural, poor and underdeveloped region subject to annual floods and droughts – Bioversity International researchers used gender-responsive methods in their plot sampling and participatory mapping tool to understand how diet and agricultural diversification can happen in an environmentally-, socially- and economically-sustainable way.

We conducted our participatory mapping activity with men and women separately, and asked them to draw and identify the areas where they go to tend crops, fish and graze cattle. We also discussed how they decide which crops are planted across the landscape. This information was then digitized into a scaled and geo-referenced map.

Results indicate clear differences between men and women, particularly for fishing activities. Women tend to fish in shallow ponds and canals, whereas men tend to travel further and go to deeper waters. These two ecosystems yield different fish: small fish in the canals and ponds, and larger fish in the deeper waters. As access to fish is different, so is access to the fish market, where fish size determines price and how a fish is consumed. For example, small fish caught by women are usually eaten at home. In Bangladesh and elsewhere, this has been shown to be an essential nutrient-rich component of the family diet, especially for women and children.

In terms of plots, land available for agriculture varies by season. Plots are usually shared at the household level between husband and wife and are not clustered around the family house, but rather spread out in the landscape. Some plots may even be far away, even more than 10 km from the family house, which can affect what farmers choose to plant there. Land types, which differ in elevation, soil and water content, also affect crop choices.

We found that knowledge and information about crops is often different between men and women. Overall, women listed more crops and land types planted during the dry and wet season. The type of crops mentioned were also different; women tended to name small trade crops or those used for home consumption.

The participatory mapping activity, which focused on local knowledge and use of different land types, provided important insights on choosing adapted crops and planting conditions to promote agricultural and diet diversification at different times of year. For example, *Sitapa* (lagoon gardens) have the highest organic matter and hence diversity of crops grown, but they also have the highest flooding risk. Some land types, like *Malako* (village gardens) are used differently by men and women and by different communities. Consequently, agricultural diversification has to be planned according to different land types or be context-specific.

Collecting good quality data does require researchers to spend time with communities and ensure they are familiar with the map, its scale and its direction, in relation to the community's orientation of the landscape. As participatory mapping collects information from shared knowledge, facilitators must be careful with sensitive questions and be conscious of engaging all participants.

In conclusion, geography and gender are important considerations for agricultural and diet diversification to improve nutrition and help farmers manage risk. Bioversity International's methodology documented local knowledge of the Barotse landscape and provided evidence on the different uses of the landscape by men and women. This information will help develop strategies with the communities on decisions such as which crops to plant in which location or land type. Planning in this way will not only potentially be more successful in terms of better yield, livelihood and nutrition security, but is likely to be more widely accepted by the community as it is based on shared and local knowledge.

This article is adapted from the blog post 'Using participatory mapping with a gender lens to understand how landscapes are used for nutrition' by Natalia Estrada-Carmona, Post-Doctoral Fellow at Bioversity International.

This research on nutrition-sensitive landscapes is embedded in the CGIAR Research Programs on Agriculture for Nutrition and Health and the CGIAR Research Program on Aquatic Agriculture Systems.

Participatory mapping of ecosystem services with rural communities in the Barotse floodplain, Zambia. Credit: Bioversity International/N.Estrada-Carmona

Understanding sustainable diets

Four papers, three published in high-impact peer-reviewed journals in 2014, further our understanding of sustainable diets. Each paper is co-authored by Bioversity International scientists from the Nutrition and Marketing Diversity Programme, including Programme Leader Dr Bruce Cogill and post-doctoral Research Fellow, Thomas Allen. The papers are a result of collaboration with key partners and include contributions from Jessica Fanzo, member of Bioversity International's Board of Trustees Inc. USA and expert in the fields of nutrition, immunology and biodiversity.

Speaking of the importance of this research, Programme Leader Bruce Cogill said: "Choosing food forces us to consider a wide range of issues. Cost, quality, taste, the impact on our nutrition and health, and the impact on the environment are just some of the issues we think about. What we are doing is looking carefully at sustainable food and diets, what it means, how to measure it and how best to provide the best evidence to policymakers, farmers, manufacturers and consumers for the choices to be made. We are concerned about the impact of climate change, increasing population and diversity loss. By studying sustainable food systems, we will be in a better position to deal with some of the determinants of these changes and threats to food and nutrition security. The study of sustainable food systems enables us to understand how producing and choosing the right foods that meet our nutritional needs and minimize the impact on the ecosystems that are critical to our future. These papers provide a conceptual and practical basis for what is a sustainable diet, how to measure it and what can be done to improve policies and programmes."

The four papers – 'Understanding sustainable diets: A descriptive analysis of the determinants and processes that influence diets and their impact on health, food security and environmental sustainability'; 'Agricultural biodiversity, socio-ecological systems and sustainable diets'; 'Sustainability and food and nutrition security: A vulnerability assessment framework for the Mediterranean region'; 'Metrics of sustainable diets and food systems. Technical brief' can be downloaded from Bioversity International website at http://bit.ly/1dbwfqD

Special issue of *Sustainability* features neglected and underutilized species

In early 2014, the open-access journal *Sustainability* featured three papers co-authored by Bioversity International scientists as part of a special issue on strengthening income opportunities and nutritional security through improved use and marketing of neglected and underutilized species.

Many communities around the world still depend on traditional food species for food and income that fall outside the narrow range of crops and commodities that dominate agricultural and food policies. Just three species – rice, wheat and maize – account for more than 50% of the world's plant-derived calorie intake, yet it is estimated that around 7000 plant species are cultivated or harvested from the wild for food.

These traditional food species are often more resilient than their staple crop counterparts as they can be better adapted to grow in marginal areas, and they can be more nutritious. Increasingly, these species are finding themselves once more in the spotlight as options to adapt to climate change, improve nutrition and establish sustainable livelihoods for farm households and rural communities.

The special issue includes six open-access papers, three co-authored by Bioversity International scientists:

- 'A Holistic Approach to Enhance the Use of Neglected and Underutilized Species: The Case of Andean Grains in Bolivia and Peru'. Stefano Padulosi, Karen Amaya, Matthias Jäger, Elisabetta Gotor, Wilfredo Rojas and Roberto Valdivia
- 'Conservation and Use of Genetic Resources of Underutilized Crops in the Americas – A Continental Analysis'. Gea Galluzzi and Isabel López Noriega
- 'Agricultural Biodiversity in Southern Brazil: Integrating Efforts for Conservation and Use of Neglected and Underutilized Species'. Rosa Lía Barbieri, João Carlos Costa Gomes, Adriana Alercia and Stefano Padulosi.

Read online the special issue *Underutilized Plant Species: Leveraging Food and Nutritional Security, and Income Generation* at http://bit.ly/1FD4dy6

Proud chef stands behind her traditional Sri Lankan dishes, paired with the vegetables used. Credit: Bioversity International/S. Landersz

Farmer in rice field, Vietnam. Credit: Bioversity International/J.Raneri

Productive and resilient farms and forests

Genetic diversity in forest restoration is essential, say global leaders

It is estimated that 13 million hectares of natural forest are lost each year worldwide. Along with the impacts of climate change and desertification, this represents serious deterioration of the planet's ecosystems, leading to ongoing loss of biodiversity.

In order to tackle the challenge posed by biodiversity loss, world leaders agreed in 2010 to work towards achieving Aichi Biodiversity Targets – global biodiversity conservation goals set by the Conference of the Parties to the Convention on Biological Diversity (CBD). One in particular – Aichi Target 15 – sets the bold goal of restoring at least 15% of degraded ecosystems by 2020.

As the halfway point approaches there is urgency to meet this Target. In October 2014, in PyeongChang, Korea at the 12th meeting of the Conference of the Parties (COP12), global environment leaders called for attention to a previously ignored aspect of ecosystem restoration – genetic diversity of tree species planted.

As a result of the meetings, the parties have agreed on the PyeongChang Roadmap designed to enhance the implementation of the Strategic Plan for Biodiversity and achievement of the Aichi Targets.

The spirit of Aichi Target 15 will not be achieved if tree species and genetic diversity are not taken into consideration. Simply restoring forest cover does not necessarily ensure restoration of the function and resilience of the forest. Aichi Target 15 also emphasizes the need to enhance resilience of ecosystems and their contribution to climate change mitigation and adaptation. These do not depend only on the extent of restored ecosystems but also on their diversity, including the diversity of tree species and their genetic diversity.

Genetic diversity provides the material for natural selection and its importance is only growing under progressive climate change. If trees are not able to adapt to the changing environment, they will also not be able to mitigate climate change through carbon sequestration in biomass growth or continue providing other ecosystem services.

A study published in 2014 by Bioversity International and the Food and Agriculture Organization of the UN to accompany the first ever *State of the World's Forest Genetic Resources* report stresses that preferential use of native species in ecosystem restoration contributes to the conservation of these species and their genetic diversity.

Native tree species have evolved together with other native flora and fauna of a given area. They may also correspond better to the needs and preferences of local people, many of whom may have in-depth ethnobotanical knowledge of these species. For example, in Colombia, Bioversity International researchers and partners have been racing to save the prized abarco tree (*Cariniana pyriformis*) from extinction – a species identified by the International Tropical Timber Organization as valuable for the restoration of degraded forests in South America.

Earlier this year, Bioversity International scientists took part in a series of regional capacity strengthening workshops leading to the 18th meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the CBD in Montreal, June 2014. They trained national CBD focal points in genetic considerations in restoration, based on the findings of the thematic study mentioned earlier.

Based on the recommendations from the regional workshops, the SBSTTA meeting recommended that COP12 adopt a decision that invites parties "to give due attention to both native species and genetic diversity in conservation and restoration activities, while avoiding the introduction and preventing the spread of invasive alien species." That decision has now been adopted at the highest level, as the delegates at the CBD COP12 agreed on its importance.

In response to SBSTTA's call, launched on 14 October, 2014, in the margins of COP12, the 'Forest Ecosystem Restoration Initiative' (FERI) aims to provide support to developing countries towards achieving Aichi Biodiversity Target 15, amongst others, by maximizing restoration efforts through knowledge sharing and implementation and technical support.

Decisions of both the SBSTTA and the Korea Forest Service (KFS) have been shaped by a successful collaboration with Bioversity International. With their feet firmly planted on the ground, Bioversity International's forest genetic resources scientists have been teaching about the importance of genetic considerations in ecosystem restoration and influencing future restoration efforts. After discussions with Bioversity International, KFS has added an emphasis on diversity and resilience in FERI.

This work is part of the CGIAR Research Program on Forests, Trees and Agroforestry.

Mixing it up in Uganda: biodiversity bugs pests

What do you do when a crop you are growing tastes good and sells well, but is frequently attacked by pests and diseases? You could apply an array of pesticides, herbicides and fungicides to your farm, but this could have long-term repercussions on your own health and the health of your soil. If you are a smallholder farmer, you might not be able to afford to buy these chemical inputs.

Recent findings from Bioversity International trials in Uganda confirm the effectiveness of one agricultural biodiversity tactic: mix it up! While intercropping to reduce pest and disease outbreaks is not a new practice; in Uganda, we have been investigating with our partners, how planting different varieties of the same crop in mixtures can also reduce pest and disease damage.

What have we found? That mixing varieties resistant to certain pests and diseases, with those which are more susceptible, significantly reduces the incidence of that pest or disease. In our trials with common bean varieties, we found that the highest decreases in damage are when at least 50% of a resistant variety is mixed into the plot – in this case, a traditional variety known as Kasirira.

We have had similar success with banana varieties. Ugandan farmers working with us have reported that the presence of weevils that attack banana plants reduced by 75%, and we are also discovering traditional varieties that are resistant to crippling banana diseases such as Black Sigatoka.

A key aspect of our research is tapping into the diversity of traditional varieties that exist in Uganda. Many farmers prefer traditional varieties to hybrid varieties because they taste better and are more suitable to their traditional ways of cooking and eating.

"Although the yield of this [hybrid variety] is good," said Teopista, one of the banana farmers we work with, "it is too hard when cooked and gets cold too fast. The market price is very low so I mostly brew it into a beer. The traditional variety sells at four times the price." This preference also means that it is easier to encourage farmers to grow traditional pest- or disease-resistant varieties.

Using diversity has other benefits too. Planting varieties with different maturing times means that farmers can maintain consistent cash flow and stable food availability throughout the year. "Part of our work includes training farmers on how to select better quality and clean seeds to guarantee better yields; when to plant certain crops or varieties, and how to keep a record of their yields," said Rose Nankya, Bioversity International's project manager in Uganda.

One of our trained farmers, Joy Mugisha, added, "I now write down how many bean pods I get per plant, how many kilos I get compared to what I planted and how much I sold it for. This helps me plan better for the next crop and I can negotiate better with my buyers because I can show them all the numbers."

"Knowing the difference between clean and diseased seeds has helped me a lot," reported farmer Jovaille Muhoozi. "Before I used to harvest 10kg from planting 5kg of seed. Now I get 40kg from every 5kg of seed I plant, so I've started planting 10kg of each different variety!"

As we continue to try different mixtures of beans and mixtures of banana in Uganda, we are also working with partners to improve access to and awareness of traditional resistant varieties and how they can help improve yields overall. Bioversity International has organized seed diversity fairs and established a community seedbank in Uganda's Sheema district, which now provides more than 200 farmers in the area with 30% of their common bean supply. A second seedbank welcomed and managed by communities has more recently been established in Nakaseke district, Central Uganda.

Different bean varieties in Uganda. Credit: Bioversity International/D.Jarvis

This work is part of a global programme working in China, Ecuador, Morocco and Uganda on using crop varietal diversity in integrated production and pest management. It is supported by the International Fund for Agricultural Development (IFAD), the Swiss Agency for Development and Cooperation (SDC), the Food and Agriculture Organization of the UN (FAO), and the United Nations Environmental Program (UNEP) Global Environmental Facility (GEF).

This work contributes to the CGIAR Research Program on Water, Land and Ecosystems.

Non-timber forest products: the way forward for rural women?

In the forest communities of Africa, a division of labour has long been clear among men and women. Women in Cameroon's forest-dwelling communities have typically been in charge of feeding the family through the cultivation of food crops and the collection of non-timber forest products, which they processed into culturally valued dishes. Non-timber forest products are fruits, nuts and other food products that are important for the livelihoods of rural men and women. Men, in turn, helped to clear the food crop plots and concentrated on hunting and on the cultivation of cash crops, such as cocoa. Agricultural crops and non-timber forest products were mainly reserved for household consumption.

But those days have gone! The improvement in transportation to remote areas, better access to urban markets and new income-generating opportunities have motivated women as well as men to be actively involved in the sale of non-timber forest products and agricultural products to earn more money.

Research on gendered knowledge, skills, interests, access and control of forest resources conducted in the East and South regions of Cameroon shows that men and women have similar access to non-timber forest products. Bush mango, moabi and njangsang can be found in the wild with restrictions occurring only on plots of land which are under cultivation or in fallows, where in general the landowner and close relatives have exclusive access to these products.

The men and women who took part in the participatory research organized by Bioversity International expressed different preferences for forest products. Women were more interested in non-timber forest products such as bush mango, which is used for food or medicinal purposes, and which they themselves gather, process and sell. Fewer men are involved in this activity as they prefer bush meat hunting and small-scale logging.

Although revenue earned from the sale of non-timber forest product is increasingly important to rural communities, Ms Ndimba, a Bulu native from a village in the South Region of Cameroon said, "We cannot rely solely on non-timber forest products for our survival. We can't eat only non-timber forest products every day, we need to add variety to our diet and moreover, money from non-timber forest product sales is not enough to provide income for the family throughout the year. As a result, we have expanded our agricultural activities, primarily for subsistence and secondly as a means of raising income for the household."

Due to the increasing cash flow from non-timber forest product gathering and food crop cultivation and sales, men are becoming interested in something that was traditionally seem as a 'woman's business'.

When asked why, Mr Menguele Jean, replied: "You can harvest cocoa just once a year and before production we need money for farm maintenance and my family's sustenance. We therefore decided to open larger plots to produce more food crops – mostly plantain and cocoyam – for sale."

This new drive for income over time has led to increased labour for the women who are expected to cultivate larger plots while maintaining their demanding daily agricultural, gathering and household chores.

Ms Adrienne recently married into the Melambo village, located in Cameroon's East Region. She laments that although she works more, she earns less than she thought she would. She explains that, "We the women, who do most of the labour, remain small-scale retailers of non-timber forest products and food crops with very little profit, but the men – natives and non-natives alike – have become involved in wholesale and are enjoying most of the profit without labouring as much as we do." As a result, she concludes, the respective share from the sale of non-timber forest products and agricultural products that goes to men and women needs to be renegotiated.

This story is a blog post by Yvonne Kiki Nchanji, Gender Research Fellow, Bioversity International, and is part of a special blog series by Bioversity International for International Women's Day.

This work is part of the CGIAR Research Program on Forests, Trees and Agroforestry.

Resilience toolkit – know the strengths and weaknesses of a landscape

How do we measure resilience? On some level, it is almost like asking someone to predict the future. How can we predict the way that a community will cope with an unidentified shock, whether it be an extreme weather event, natural disaster, political unrest or economic crises? What is different about communities that are able to bounce back after a shock, and continue to develop afterwards, innovatively?

In November at the IUCN World Parks Congress in Sydney, Australia, Bioversity International launched, in partnership with the Satoyama Initiative, the *Toolkit for the Indicators of Resilience in Socio-ecological Production Landscapes and Seascapes*. The toolkit aims to help researchers, development practitioners and most importantly communities, assess the landscapes they live in, understand better how resilient their system is, and work together to develop resilience-strengthening strategies.

The indicators start with the premise that humans and nature can interact in a way that is synergistic, maintaining or enhancing biodiversity while providing people with the goods and services needed for well-being. In fact, many such landscapes have traditionally existed and even have names such as *dehesa* in Spain and *satoyama* in Japan. It is when these synergies break down due to an array of possible factors, that the resilience of a community also deteriorates.

The toolkit is divided into four chapters, first familiarizing the reader with the relevant concepts of resilience and socio-ecological production landscapes and seascapes. It then introduces the set of 20 qualitative and quantitative indicators designed to capture key aspects of a system – ecological, agricultural, cultural and socio-economic, based on observations of the communities themselves.

The toolkit also provides practical tips for organizers and facilitators of workshops to assess resilience, and gives further support through examples from the field featuring Namibia, Fiji, Turkey and Kenya.

The full toolkit is available for download at http://bit.ly/1FasY1n

Genebank to genebank: technical guidelines for the safe movement of cacao

90% of world cacao production comes from smallholder farmers in developing countries across Africa, Asia and Latin America. Cacao production has always been plagued by serious losses from pests and diseases, with estimates ranging as high as 30% to 40% of global production. Scientists worldwide are looking for ways to produce cacao trees that can resist evolving pests and diseases, tolerate droughts, meet manufacturer's needs and produce higher yields.

The future of cacao production depends on the availability of genetic diversity and the sustainable use of this broad genetic base to breed improved varieties. The possibility to exchange cacao germplasm is an essential condition for use in research, plant breeding and agricultural development, but brings with it the potential risk of transferring of pests and diseases. The risk is particularly acute when germplasm is moved between cacao-growing regions that have different endemic diseases.

The *CacaoNet Technical Guidelines for the Safe Movement of Cacao Germplasm* provide updated information on the precautions and quarantine measures that can be taken to minimize the risk of spread of pests and diseases when cacao genetic resources are being moved. Based on the 1999 version, they have been revised and expanded by a group of experts set up within CacaoNet – the Global Cacao Genetic Resources Network coordinated by Bioversity International – taking account of new knowledge of the pests and diseases, including their current distribution, and advances in detection techniques.

The Guidelines are available in English, French and Spanish at http://bit.ly/1FD9sxP

The publication of these Guidelines has been supported by financial and in-kind contributions from Bioversity International, the CGIAR Research Programme on Forests, Trees and Agroforestry, the Cocoa Research Association Ltd., UK (CRA Ltd., a UK-based organization managing scientific cocoa research on behalf of Mars Mondelez International and the London Cocoa Trade NYSE-Liffe) and the University of Reading. CacaoNet has received additional financial support from Mars, the U.S. Department of Agriculture, Agricultural Research Service (USDA/ARS) and the World Cocoa Foundation (WCF).

Farmer overlooking agricultural landscape, Kenya. Credit: Bioversity International/Y.Morimoto

Sahelian farmers in diversity field forum in Mali focusing on the management of millet and sorghum varieties. Credit: Bioversity International/R.Vodouhe

Effective conservation and use of genetic resources

Farmers' varieties legally approved in Mali

In June 2014, farmers in Mali achieved a key milestone. Seeds of eight varieties of cowpea, fonio, millet and sorghum produced by farmers have now been certified by Mali's national seed laboratory – Laboratoire National des Semences (LABOSEM).

This is a significant step for Mali, where the trade of uncertified seeds is technically illegal, even though 92-99% of seed demand is supplied by the informal sector, i.e. farmers and their neighbours. Sometimes, informal exchange is the only option, as improved varieties do not always exist for important local crops such as Bambara groundnut. But certification of local seed varieties is difficult for farmers, mostly due to administrative barriers or limited capacity to produce varieties that meet the quality standards required for certification.

With that premise, Bioversity International has been working with partners in Mali since 1999 to encourage farmers to experiment and evaluate different varieties of local crops, strengthen the dialogue and support between the formal and informal seed sectors, and train farmers in quality seed production of varieties that are better adapted to local conditions. The training has certainly paid off – around 90% of the seed samples (1,937kg) submitted to LABOSEM by farmers in 2014 with help from the Genetic Resources Unit of Mali's Rural Economics Institute (IER-URG), were certified as good quality seeds. These farmers can now legally sell their varieties to others.

To reach this stage, Bioversity International and partners have been working with farmers through Diversity Field Fora, seed fairs and community seedbanks. Diversity Field Fora are experimental farm plots and meetings that allow farmers, extension agents and researchers to come together, exchange ideas, and evaluate the performance of different crop varieties. Knowledge about both local and improved varieties is mostly shared through diversity kits, which contain varieties gathered by farmers and researchers from different regions of the country. From the kits, farmers choose the varieties that they prefer to plant in the experimental plots. All varieties are evaluated with a set of criteria based on farmers' preferences. Those that perform well are then selected, multiplied and disseminated within and beyond the group. It is worth noting that men and women often choose varieties for different reasons. While men often select varieties based on yield quantity and market demand, women often choose those that cook better and are easier to process after harvest.

Mali is one of the most successful countries of the initiative, which also took place in Burkina Faso, Niger and earlier in Zimbabwe. Some farmers have formed their own seed production groups and set up community seedbanks to store local varieties. Farming techniques have also improved as the Diversity Field Fora provide opportunities to test, compare and improve on things such as seed treatment and soil and water management. Several villages in Mali have continued to maintain Diversity Field Fora without external financial support, and local leaders from some villages have decided to integrate the approach into their local development plans.

Most importantly, initiatives such as these increase farmer knowledge about available agricultural biodiversity and how to benefit from its use. They also reinforce the right of farmers to produce and provide quality seeds for themselves, strengthen the national seed system and help integrate formal and informal seed sectors.

This work is part of the Bioversity International-led projects: 'Empowering Sahelian farmers to leverage their crop diversity assets for enhanced livelihood strategies' and 'Reducing the risk of crop failure for poor farmers through enhancing traditional seed systems in Sahelian West Africa', both supported by the International Fund for Agricultural Development (IFAD).

Farmers flock to 'Seeds for Needs' field day in India

Bioversity International's 'Seeds for Needs' initiative is gaining momentum in India. In April 2014, in partnership with the Indian Agricultural Research Institute, a successful farmers' field day was organized in the state of Bihar, followed by various training workshops for farmers on seed selection and production in both Bihar and Uttar Pradesh.

1700 farmers were invited to the farmers' field day, which was also attended by the former Lieutenant Governor of Delhi, Tejendra Khanna and Vice Chancellor of Rajendra Agricultural University, R.K. Mittal, who acknowledged both the importance of biodiversity, and the strides that the Seeds for Needs initiative has made so far in empowering farmers and improving their livelihood security.

The field day included presentations by Bioversity International scientists on the background, progress and future plans of Seeds for Needs, which works with farmers to

Participants in the Seeds for Needs farmers' field day in Bihar, India. Credit: Bioversity International/A. Gupta

sample and evaluate crop varieties, and strengthen existing seed systems by giving farmers access to more diversity. Using a crowdsourcing approach, the initiative now has a network of 5000 farmers in India (3500 in Bihar and 1500 in Uttar Pradesh), who conduct trials on their own farms and give scientists feedback on the performance of different traits.

In fact, the showstoppers of the field day were the farmers themselves, who shared their experiences with the initiative so far. "We used to have only a few choices in wheat and rice farming," said one farmer. "Now we have come to know how many types are available for our use and some of them are really performing better than our regular ones, with bigger ears and shorter duration."

Shorter duration varieties are in high demand by farmers, who are already dealing with seasonal and rainfall shifts brought on by climate change. Traditionally, much of the wheat in India is grown during the Rabi season, which begins at the end of the monsoon (September or October) and over the winter for a spring harvest around March or April. Sudden heat spikes during flowering time or a weak monsoon, however, can have devastating consequences for farmers. Growing different varieties with different flowering and harvesting times is one way to minimize risk.

In 15 villages in Bihar and Uttar Pradesh a smaller group of farmers was also trained on how to be better at saving and producing seeds, both for their own use to minimize costs and sustain their own needs, but also for sale, in order to have another source of income and share diversity with their networks. In India, the government allows farmers to sell labelled seeds for their own and neighbours' use. Improving the quality and diversity of seeds shared can make a big difference in these communities, especially for those who live further from or cannot afford seeds from high-quality seed markets.

Farmers also visited nearby field trials hosting up to 20 wheat varieties and were trained on yield-improving management techniques, such as planting distance, identifying obnoxious weeds and recognizing off-types – individual plants that are underperforming compared to their counterparts, such as having stunted growth or poorly developed leaves; these should be removed.

The initiative is increasingly involving both men and women farmers in the crowdsourcing initiative and seed production training. Aside from the workshops mentioned, Bioversity International is also working with NGOs that help women's groups produce quality seeds for market.

This research is part of the CGIAR Research Program on Climate Change, Agriculture and Food Security.

Banana genetic resources now a click away

The Musa Germplasm Information System (MGIS) is the most extensive source of documentation on banana genetic resources. It contains key information on banana germplasm diversity – such as passport data, botanical classification, morpho-taxonomic descriptors, molecular studies, plant photographs and GIS information currently on 2,281 banana accessions managed in six genebanks around the world, including the 1,456 accessions conserved in Bioversity International's global *ex situ* banana collection at the International Transit Centre in Leuven, Belgium.

In 2014, the MGIS development team at Bioversity International and its MusaNet partners launched a new and improved version of MGIS. This new system properly acknowledges the many data providers on which MGIS depends on for data quality and completion.

Improvements include:

- All information on a single accession can be viewed in one page
- Taxonomic content of each collection is summarized graphically
- Insertion of diversity studies based on molecular markers
- Easier data filtering and export functions
- Users can share comments on any accession. Accessions can be requested online.

This new version was developed with the use of open-source technologies that allow management of multi-location experiments, to enhance a better integration with genomics-based data currently stored in the Banana Genome Hub and to facilitate connection with mobile devices for data capture. The website will continue to evolve in terms of features and content to meet the needs of its users.

For more information, visit the MGIS website (www.crop-diversity.org/mgis/)

In vitro banana collection at the Bioversity International Transit Centre, Belgium. Credit: Bioversity International/N. Roux

Plant Treaty and Nagoya Protocol – exploring ways to work better together

The International Treaty on Plant Genetic Resources for Food and Agriculture (known also as the Plant Treaty) and the Convention on Biological Diversity (CBD) and its Nagoya Protocol are international agreements that commit their member states to implement very different access and benefit-sharing (ABS) systems. One system, under the Plant Treaty, encourages international pooling and sharing of genetic diversity; the other system, under the CBD/Nagoya Protocol, maximizes each country's sovereign control over their genetic resources. Progress in domestic implementation of both systems has been relatively slow partly as a result of uncertainty about how to ensure that they are implemented in mutually supportive ways.

In collaboration with the ABS Capacity Development Initiative and the Secretariats of the Plant Treaty and the CBD, Bioversity International brought together national focal points from both agreements, to explore mutually supportive mechanisms for national-level implementation. The meeting was also supported by the CGIAR Research Programme on Climate Change, Agriculture and Food Security (CCAFS).

"In order to enhance the collaboration between the national focal points, the organizers asked for joint expressions of interest from both focal points in each country on the understanding that otherwise their applications wouldn't be considered," said Michael Halewood, head of the policy group at Bioversity International and CCAFS scientist. "We initially expected to have to chase after people, but in the end we got more applications than we could handle. We had 20 pairs of national focal points – one for the Plant Treaty, one for the CBD's Nagoya Protocol – coming from 20 countries."

At the meeting, held in Rome at the Food and Agriculture Organization of the UN from 3-6 June 2014, the national focal points interacted with resource people from seed companies and farmer organizations, research organizations, international and national genebanks, the Global Crop Diversity Trust and others concerning their practical experiences providing, receiving, managing genetic resources under the Plant Treaty and CBD/Nagoya Protocol as part of their conservation, breeding, natural resource management and climate change adaptation efforts.

"We have surveyed the national focal points about their experiences to date, and almost all have confirmed

Farmer in Nepal. Credit: Bioversity International/B. Sthapit

challenges related to coordinating mutually supportive implementation of the two access and benefit-sharing systems. There is a clear need for decision-making tools and coordination models. Those are the longer-term products resulting from the meeting. We also hope to be able to work closely with some of the participating countries to pilot some of the best practices identified," said Andreas Drews, Manager of the ABS Capacity Development Initiative. "This workshop was designed to respond to the need of national focal points, technical supporting agencies and donors to get out of our silos, and work to build solutions that span across the agricultural and environmental sectors."

"Indeed," Halewood concluded, "it is not realistic to be talking about developing long-term national strategies to respond to climate change, for example, if there is confusion at the interface of two such fundamentally important agreements related to access and benefit sharing. They have to be working in sync to facilitate progress."

Action needed to safeguard genetic diversity of the world's forests

Published in 2014, *The State of the World's Forest Genetic Resources* report constitutes a major step in building the knowledge base required for action towards better conservation and sustainable management of the planet's precious forest genetic resources. Bioversity International, the World Agroforestry Centre (ICRAF) and other partners have worked closely with the Food and Agriculture Organization of the UN (FAO) in preparation of the report.

According to the report, half of the forest species reported as regularly used by countries are threatened by the conversion of forests to pastures and farmland, over-exploitation, and the impacts of climate change.

"Forests provide food, goods and services which are essential to the survival and well-being of all humanity. These benefits all rely on safeguarding the rich store of the world's forest genetic diversity – which is increasingly at risk," said FAO Assistant Director-General for Forestry, Eduardo Rojas-Briales.

The contribution of forests and trees to boosting food security, reducing poverty, and promoting sustainable development depends on the availability of a rich diversity of tree species.

Biodiversity in forest genetic resources is essential to improving both forest species' productivity and the nutritional

value of the foods they produce – which includes leafy vegetables, honey, fruits, seeds, nuts, roots, tubers and mushrooms.

Genetic diversity allows breeders to increase their production in quality and quantity. A wide variability in desirable traits, such as fruit size, growing speed, oil composition and pulp proportion is a prerequisite for breeding and domesticating improved tree species.

At the same time, genetic diversity is needed to ensure that forests can adapt to changing environmental conditions, including those stemming from climate change, and also strengthens their resilience to stresses such as pests and diseases. Additionally, the inclusion of diverse tree varieties in agroforestry systems can reduce farmers' production risks and provide nutrients to consumers all year round, the report stressed.

The State of the World's Forest Genetic Resources – prepared under the guidance of FAO's intergovernmental Commission on Genetic Resources for Food and Agriculture – calls for urgent action to better manage forests and their genetic resources to ensure that rural people who depend on them for their nutrition, livelihoods and resilience will be able to rely on their benefits over the long term.

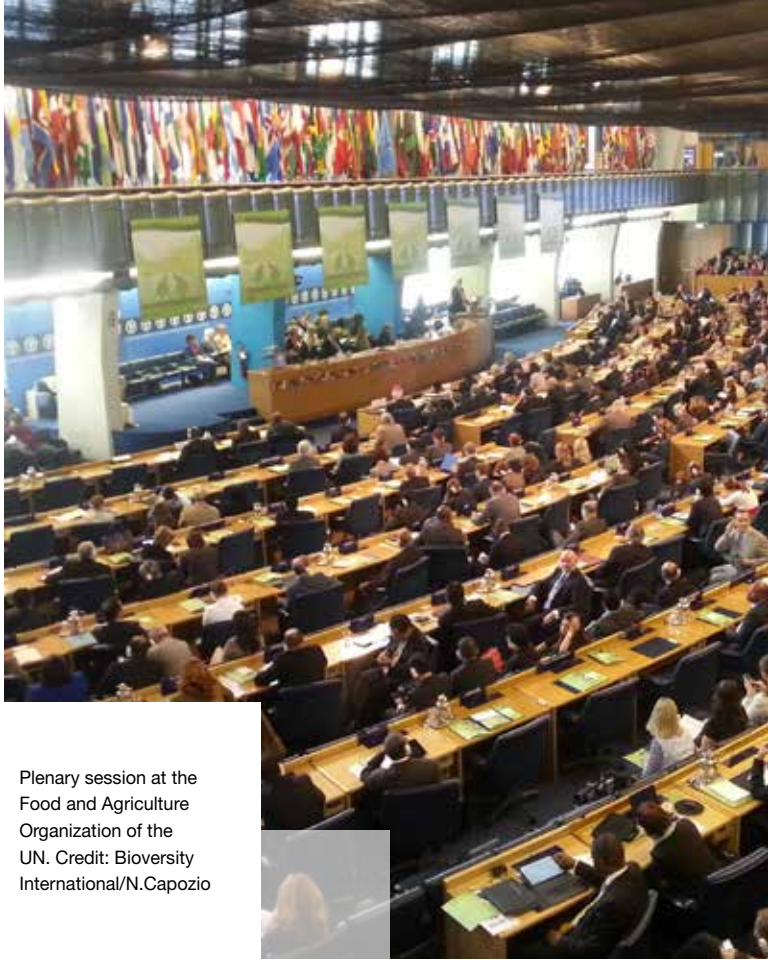
Linda Collette, Secretary of the FAO Commission on Genetic Resources for Food and Agriculture, said: "Data from 86 countries illustrates that insufficient awareness of the importance of forest genetic resources in improving forest production and enhancing ecosystems, often translates into national policies that are partial, ineffective, or non-existent."

Through the Global Plan of Action for Forest Genetic Resources, countries have committed themselves to improve the dissemination of, and access to, information on forest genetic resources, as well as to enhance collaboration to combat invasive species affecting forest genetic resources. Developing and reinforcing national seed programmes to ensure the availability of genetically-appropriate tree seeds is also vital. The report says that forest genetic resource conservation and management should be integrated into wider policies and programmes at the national, regional and global levels.

Text adapted from FAO press release published on 3 June 2014.

A tree rises above the cloud forest in Monteverde region, Costa Rica. Credit: Bioversity International/C. Zanzanaini

Nobel laureate calls for urgent action to implement the Plant Treaty



Plenary session at the Food and Agriculture Organization of the UN. Credit: Bioversity International/N.Capozio

"It is urgent to fully implement the international 'quasi-commons' prescribed by the International Treaty on Plant Genetic Resources for Food and Agriculture". That is one of the final recommendations from the editors, including Nobel laureate in economics Joseph Stiglitz, of a book published in 2014 by Oxford University Press on *Intellectual Property Rights – Legal and Economic Challenges for Development.*

In making this conclusion, Stiglitz and co-authors endorse the analysis of Michael Halewood, policy scientist from Bioversity International, in his chapter 'International efforts to pool and conserve crop genetic resources in times of radical legal change'. Halewood examines the challenges encountered by the international community over the last 40 years in its efforts to develop systems to ensure that plant genetic resources are conserved, pooled and shared in ways that promote food security. In particular, he focuses on the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty), highlighting its potential to overcome historical tensions that have undermined international coordination efforts.

Since the beginnings of agriculture, crops have moved around the world, driven (or followed by) imperialist expansion, colonialism, international trade, aid, agricultural research and changing food consumptions patterns and demands. Wheat and barley from Mesopotamia reached North Africa, and then Europe and Asia; in the XVI century beans, tomatoes, peanuts, potatoes, sunflower, maize and many other crops migrated from the Americas to Europe, Africa and Asia. This historical movement and use has led to a situation where all countries are interdependent on each other as sources of genetic resources linked to their own food security. This interdependence is increasing as a result of climate change – as climate patterns change, people need to access crops that suit their new circumstances.

The Plant Treaty is an international agreement designed to facilitate cooperation between national governments, genebanks, researchers, plant breeders, development agencies and farmers to conserve, add value to and exchange plant genetic resources and equitably share benefits associated with their use. Through the Plant Treaty's multilateral system of access and benefit-sharing, contracting parties agree to virtually pool a subset of the genetic resources of 64 crops and forages to be used for "utilisation and conservation for research, breeding and training for food and agriculture". Commercial users that incorporated genetic resources from the system in new products are required to pay a percentage of gross sales to an international benefit-sharing fund (if they simultaneously restrict others from using the same products for research and breeding).

The Plant Treaty came into force in 2004, and currently has 132 member states. During the 2013 meeting of the Plant Treaty's Governing Body, the member states decided to launch an intergovernmental process to revise the multilateral system, to increase the flow of money to the international benefit-sharing fund, and to increase the amount of plant genetic resources that can be accessed through the system. So far there have been two meetings wherein delegates have considered policy options. A third meeting will be held in Brazil in the first half of 2015.

As the negotiation process moves forward, Bioversity International hopes that the negotiators will be encouraged by the fact that Nobel laureates have joined among the ranks of farmers, breeders and agricultural research and development organizations to recognize the importance of the Plant Treaty, and the multilateral system of access and benefit sharing in particular.

This research is supported by the CGIAR Research Program on Climate Change, Agriculture and Food Security and the CGIAR Research Program on Policies, Institutions and Markets.

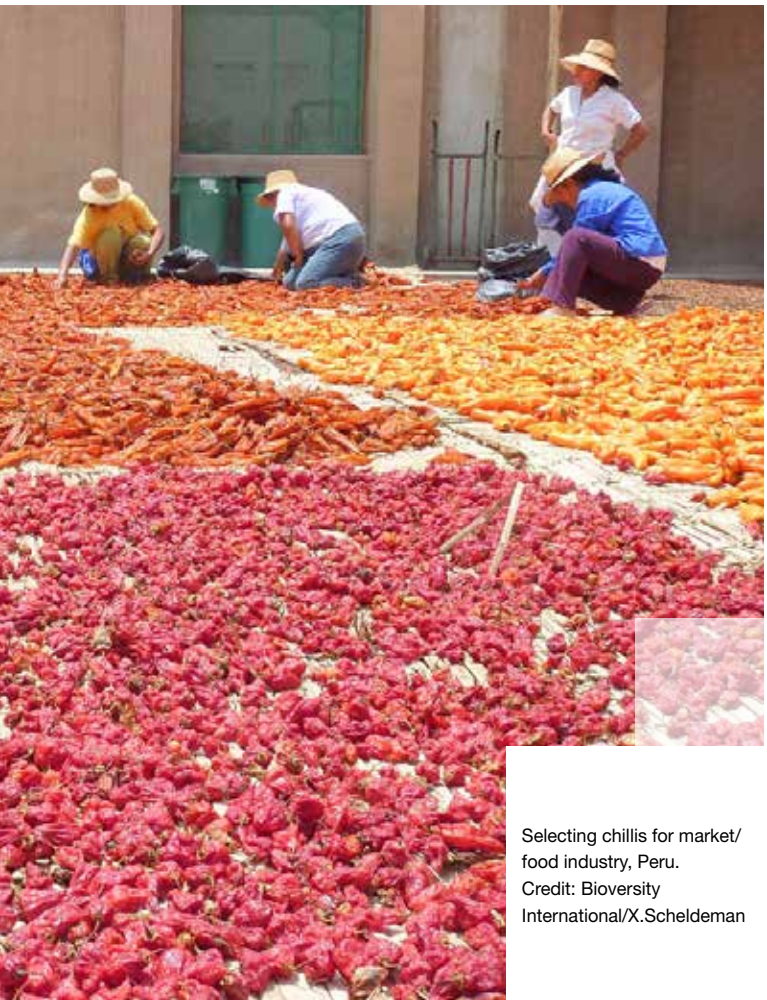
Financial information

Bioversity International's good financial health and stability continued in 2014. With robust internal controls and a risk management framework that engages the Board, management and staff, Bioversity International received an unqualified audit option from PwC systems and process assurance.

Revenue in 2014 amounted to US$ 42.5 million (2013 $39.3 million) against expenditure of $42.3 million (2013 $38.3 million) resulting in an operating surplus of $0.2 million for 2014. Financial support for our research programmes comes from a wide variety of government, foundation, corporate and private partnerships, with about half of our support received through our participation and membership in the CGIAR Consortium. A list of our funding partners can be found on page 29.

Our business plan focuses on strengthening our capacity over the next several years to deliver scientific evidence, management practices and policy options to use and safeguard agricultural biodiversity to attain sustainable global food and nutrition security.

In a challenging resource mobilization environment we are seeing positive signs that our funding partners continue to invest in the important agenda Bioversity International is pursuing.



Selecting chillis for market/ food industry, Peru. Credit: Bioversity International/X.Scheldeman

Some highlights of investments by funding partners include:

- The Government of Italy for renewed generous support for Bioversity International's entire research agenda
- The Government of India for significant support to Bioversity International's research agenda in the country and our strategic partnership with the Indian Council of Agricultural Research
- The Global Environment Facility for financing a wide range of initiatives, such as a project to use biodiversity as a buffer in the face of unpredictable environment change in the Nepalese Himalaya
- The International Fund for Agricultural Development for its expanded commitment to improving smallholder farmers' food and nutrition security through sustainable use and conservation of agricultural biodiversity
- The Government of Belgium for its steadfast partnership and major financing of the Bioversity International-managed International Transit Center (the banana genebank) and research on farming systems in the humid tropics
- The United States Government through its Development Innovation Venture is supporting assessment of the crowdsourcing crop improvement mechanism that Bioversity International uses to engage farmers as citizen scientists, helping to identify varieties best adapted to local conditions anticipated under climate change
- Government of the Netherlands continues to provide generous support to the 'Genetic Resource Policy Initiative', to support the multilateral system of access and benefit sharing under the International Treaty on Plant Genetic Resources for Food and Agriculture
- The European Union through the Secretariat of the Africa, Caribbean and Pacific Group of States (ACP)-EU Co-operation Programme in Science and Technology began support for two projects in 2014, one focused on *in situ* conservation of crop wild relatives in Mauritius, South Africa and Zambia, and the other on strengthening capacities developing value chains of neglected and underutilized crops in Africa
- The Margaret A Cargill Foundation for their institutional support for the implementation of our 10-year strategy to increase our development impact.

STATEMENT OF **FINANCIAL POSITION**

At 31 December 2014

(US dollar 000s)

	2014	2013
ASSETS		
Current assets		
Cash and cash equivalents	40,154	26,468
Investments	2,420	2,966
Accounts receivable		
Donors, net of allowance of $604 thousand in 2014; $525 thousand in 2013	6,866	8,098
Other CGIAR Centres	275	489
Others	277	415
Prepaid expenses	224	216
Total current assets	**50,216**	**38,652**
Non-current assets		
Property and equipment (net)	1,823	1,585
Investments	1,254	1,247
Total non-current assets	**3,077**	**2,832**
Total assets	**53,293**	**41,484**
LIABILITIES AND NET ASSETS		
Current liabilities		
Accounts payable		
Donors	9,762	9,204
Employees	1,474	1,442
Other CGIAR Centres	951	547
Others	5,953	7,602
Accruals	793	1,768
Funds in trust	13,992	687
Total current liabilities	**32,925**	**21,250**
Non-current liabilities		
Accounts payable		
Employees	7,406	7,501
Total non-current liabilities	**7,406**	**7,501**
Total liabilities	**40,331**	**28,751**
Net assets		
Undesignated	9,936	9,712
Designated	3,026	3,021
Total net assets	**12,962**	**12,733**
Total liabilities and net assets	**53,293**	**41,484**

STATEMENT OF **ACTIVITES**

For the year ended 31 December 2014 (US dollar 000s)

	2014				2013			
	Unrestricted	CRP*	Non-CRP	Total	Unrestricted	CRP	Non-CRP	Total
REVENUE AND GAINS								
Grant revenue								
Window 1 & 2		20,969		**20,969**		19,491		**19,491**
Window 3	147	2,262	3,675	**6,084**	441	1,769	71	**2,281**
Bilateral	1,651	9,782	2,198	**13,631**	1,327	12,115	1,817	**15,259**
Total grant revenue	**1,798**	**33,013**	**5,873**	**40,684**	**1,768**	**33,375**	**1,888**	**37,031**
Other revenue and gains	1,786			**1,786**	2,252			**2,252**
Total revenues and gains	**3,584**	**33,013**	**5,873**	**42,470**	**4,020**	**33,375**	**1,888**	**39,283**
EXPENSES								
Research expenses	2,516	22,760	1,480	**26,756**	1,871	22,378	1,523	**25,772**
CGIAR collaborators expenses		59		**59**		288		**288**
Non CGIAR collaborator expenses	87	5,587	4,148	**9,822**	53	6,325	118	**6,496**
General and administration expenses	752	4,607	245	**5,604**	1,085	4,384	247	**5,716**
Total expenses and losses	**3,355**	**33,013**	**5,873**	**42,241**	**3,009**	**33,375**	**1,888**	**38,272**
Surplus/(deficit) for the year	**229**	**0**	**0**	**229**	**1,011**	**0**	**0**	**1,011**

SCHEDULE OF **EXPENSES BY NATURAL CLASSIFICATION**

	2014				2013			
	Unrestricted	CRP*	Non-CRP	Total	Unrestricted	CRP	Non-CRP	Total
Personnel costs	4,736	11,700	973	**17,409**	4,641	11,646	1,082	**17,369**
CGIAR collaboration		59		**59**		288		**288**
Other collaboration	87	5,587	4,148	**9,822**	103	6,325	118	**6,546**
Supplies and Services	2,495	9,850	415	**12,760**	2,044	9,503	377	**11,924**
Travel	548	1,100	90	**1,738**	495	1,102	59	**1,656**
Depreciation	308	86		**394**	331	75		**406**
Subtotal expenses and losses	**8,174**	**28,382**	**5,626**	**42,182**	**7,614**	**28,939**	**1,636**	**38,189**
System cost (CSP)	33	24	2	**59**	26	52	5	**83**
Indirect cost recovery	(4,852)	4,607	245	**0**	(4,631)	4,384	247	**0**
Total operating expenses	**3,355**	**33,013**	**5,873**	**42,241**	**3,009**	**33,375**	**1,888**	**38,272**

*CRP represents funds allocated through a CGIAR Research Program.

Funding partners

CGIAR

CGIAR Fund (Includes: Abu Dhabi, Australia, Austria, Bangladesh, Belgium, Canada, China, Denmark, European Commission, Finland, France, Gates Foundation, IDRC, IFAD, India, Iran, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Portugal, Russia, South Africa, Spain, Sudan, Sweden, Switzerland, Thailand, Turkey, UK, USA, World Bank)

Center for International Forestry Research (CIFOR)

CGIAR Standing Panel on Impact Assessment (SPIA)

Generation Challenge Program

Harvest Plus Challenge Program

International Center for Agricultural Research in the Dry Areas (ICARDA)

International Center for Tropical Agriculture (CIAT)

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

International Food Policy Research Institute (IFPRI)

International Institute of Tropical Agriculture (IITA)

International Livestock Research Institute (ILRI)

International Maize and Wheat Improvement Center (CIMMYT)

International Potato Center (CIP)

International Rice Research Institute (IRRI)

International Water Management Institute (IWMI)

The World Agroforestry center (ICRAF)

WorldFish

Governments and intergovernmental institutions

Albania (Agricultural University of Tirana)

Armenia (Ministry of Agriculture)

Australia (Australian Center for International Agricultural Research, ACIAR)

Austria (Federal Ministry of Agriculture, Forestry, Environment and Water Management; Federal Ministry of Finance)

Azerbaijan (National Academy of Sciences)

Belarus (National Academy of Sciences)

Belgium (Ministry of Foreign Affairs, Foreign Trade and International Cooperation; Service Public Féderal Santé Publique, Sécurité de la Chaîne Alimentaire et Environnement Direction Générale Animaux, Végétaux & Alimentation)

Bosnia (Ministry of Foreign Trade and Economic Relations)

Brazil (through the Brazilian Agricultural Research Corporation, Embrapa)

Bulgaria (Institute Plant Genetic Resources 'K. Malkov'; Ministry of Agriculture and Food)

China (Chinese Academy of Agricultural Sciences)

Colombia (Secretaria de Agricultura y Desarrollo Rural de Antioquia)

Croatia (Ministry of Agriculture)

Cyprus (Ministry of Agriculture, Natural Resources and Environment)

Czech Republic (Ministry of Agriculture)

Denmark (Nature Agency under the Ministry of Environment; AgriFish Agency of the Ministry for Food, Agriculture and Fisheries)

Estonia (Ministry of the Environment; Ministry of Agriculture)

European Commission

Finland (Ministry for Foreign Affairs; Ministry of Agriculture and Forestry)

Food and Agriculture Organization of the United Nations (FAO)

France (Ministère de l'Agriculture, de l'Agroalimentaire et de la Forêt, Direction Générale de l'Alimentation; Ministère de l'Agriculture et de la Pêche)

Georgia (Georgian Academy of Agricultural Sciences)

Germany (Federal Ministry of Food and Agriculture (BMEL); Federal Agency for Agriculture and Food (BLE); Federal Ministry for Economic Cooperation and Development (BMZ); Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH)

Global Environmental Facility (through implementing agency FAO (FAO-GEF), and United Nations Environment Programme (UNEP-GEF))

Greece (Ministry of Environment, Energy and Climate Change; Ministry of Rural Development and Food)

Hungary (Ministry of Rural Development, Department of Forestry, Fisheries and Gaming; Ministry of Agriculture, Biodiversity and Gene Conservation Unit)

Iceland (Ministry of Industries and Innovation)

India (Ministry of Agriculture, Department of Agricultural Research and Education)

International Fund for Agricultural Development (IFAD)

Ireland (Department of Agriculture, Food and the Marine, National Crop Variety Testing Centre; COFORD Council for Forest Research and Development)

Israel (Ministry of Agriculture and Rural Development)

Italy (CRA - Centro di Ricerca per la Frutticoltura ; Ministero delle Politiche Agricole, Alimentari e Forestali ; Ministero degli Affari Esteri e della Cooperazione Internazionale, Direzione generale per la cooperazione allo sviluppo)

Japan (Ministry of Foreign Affairs, MOFA)

Korea, Republic of (Rural Development Administration)

Latvia (Ministry of Agriculture)

Lithuania (Lithuanian Institute of Agriculture; State Forest Service; Ministry of Environment)

Luxembourg (Administration de la Nature et des Forêts; Ministry of Finance)

Macedonia FYR (Ministry of Agriculture, Forestry and Water Economy)

Malaysia (Malaysian Agricultural Research and Development Institute, MARDI)

Montenegro (Phytosanitary Directorate)

Netherlands (Centre for Genetic Resources, the Netherlands; Ministry of Foreign Affairs)

Norway (Norwegian Forest and Landscape Institute; Norwegian Genetic Resources Centre)

Peru (Instituto Nacional de Investigación Agraria, INIA)

Philippines (Ministry of Agriculture)

Poland (Ministry of Agriculture and Rural Development; Ministry of the Environment)

Portugal (Instituto Nacional de Investigação Agrária e Veterinária (INIAV))

Romania (Ministry of Agriculture and Rural Development)

Serbia (Ministry of Agriculture and Environmental Protection)

Slovakia (Ministry of Agriculture and Rural Development, Foreign Coordination Department)

Slovenia (Ministry of Agriculture, Forestry and Food)

South Africa (Ministry of Agriculture)

Spain (Instituto Nacional de Investigacion y Tecnología Agraria y Alimentaria (INIA), Area de Relaciones Cientificas Internacionales)

Sweden (Ministry of Enterprise and Innovation, Ministry of Rural Affairs, Animal and Food Division)

Switzerland (Federal Office for the Environment, Forest Division; Federal Office for Agriculture; Federal Department of Economic Affairs, Swiss Agency for Development and Cooperation (SDC))

Thailand

Turkey (Ministry of Forest and Water Affairs, Forest Tree Seeds and Tree Breeding Research Directorate; Ministry of Environment and Forestry; Ministry of Food, Agriculture and Livestock, Agricultural Research and Policy; Aegean Agricultural Research Institute (AARI))

Uganda (National Agricultural Research Organization)

Ukraine (Yuryev Institute of Plant Production, National Centre for Plant Genetic Resources of Ukraine)

United Kingdom (Department for Environment, Food & Rural Affairs; Forestry Commission)

United States Agency for International Development (USAID)

United States Department of Agriculture (USDA)

Foundations

Bill and Melinda Gates Foundation

Catholic Relief Services (CRS)

Christensen Fund

Daniel and Nina Carasso Foundation

Margaret A. Cargill Foundation

Marin Community Foundation

McKnight Foundation

New Venture Fund

Prince Albert II de Monaco Foundation

Swift Foundation

Tamalpais Trust

Other funding partners

Associazione Italiana per l'Agricoltura Biologica (AIAB)

Barry Callebaut

Bayer CropScience

Belcolade

Bioversity International United Kingdom Fundraising Initiative

Centre Africain de Recherches sur Bananiers et Plantains (CARBAP)

Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)

Cocoa Research UK

Congo Basin Forest Fund (CBFF)

East West Seed ROH Ltd

EcoAgriculture Partners

Ecopetrol

Enza Zaden

Eucarpia

Fontagro (Regional Fund for Agricultural Technology)

Global Crop Diversity Trust

Global Forum on Agricultural Research (GFAR)

Grains Research and Development Corporation (GRDC), Australia

Graminor AS

HIVOS – Netherlands

Institute for Conservation & Improvement of Valentian Agrodiversity (COMAV)

InterAmerican Institute for Global Change Research (IAI)

KWS Saat AG

Limagrain

Mars Inc

National Institute of Agricultural Botany (NIAB)

Rijk Zwaan

Royal Melbourne Institute of Technology (RMIT)

Semillas Fitó, S.A

Syngenta Foundation for Sustainable Agriculture (SFSA)

Technical Centre for Agricultural and Rural Cooperation (CTA)

United Nations University Institute of Advanced Studies (UNU-IAS)

Universidad Politécnica de Valencia

University of Birmingham

Vilmorin & Cie

Wageningen University

World Cocoa Foundation

Research partners

Academy of Agricultural Science, Almaty, Kazakhstan

Academy of Sciences, Uzbekistan

ADEDRA Zagora, Marocco

Aegean Agricultural Research Institute (AARI), Turkey

Africa Rice Center (AfricaRice), CGIAR

Agency for Agricultural Quarantine (IAQA), Indonesia

Agricultural Botany Division (National Agricultural Research Council) (NARC)

Agricultural Research and Development Institute (ARDI), Tanzania

Agricultural Research and Extension Authority (AREA), Ministry of Agriculture, Republic of Yemen

Agricultural Research Council, Sudan

Agricultural Research Institute - Maruku, Tanzania

Agricultural Research Institute, Cambodia

Agricultural Research Organization (ARO), Israel

Agriculture Genetics Institute (AGI), Hanoi, Vietnam

Agrobiotec, Burundi

Agroindustrial Union and Association of Farmers, Kazakhstan

Argan Biosphere Reserve, Morocco

Asia Pacific Forest Genetic Resources Programme (APFORGEN) , Malaysia

Asociación de Agricultores de Quinua-Puno, Peru

Asociación de Agroindustriales de Granos Andinso (ASAIGA), Peru

Asociación de Productores de Azangaro (APROA), Peru

Asociación de Productores de Cacao de Alta Verapaz (APROCAV), Peru

Asociación de Productores de Plátano y Guineo de Rivas (APLARI), Nicaragua

Asociación Especializada para el Desarrollo (AEDES - Arequipa), Peru

Assam Agricultural University (AAU), India

Association des Conseillers Agronomiques du Sahel (ACAS - Gao), Mali

Association for Strengthening Agricultural Research in Eastern & Central Africa (ASARECA)

Association of Agricultural Research Institutes in Near East and North Africa (AARINENA)

Association of farmers - Abyan Governorate, Republic of Yemen

Association of herbalists - Hadramout Governorate, Republic of Yemen

AUGURA - Asociación de Bananeros de Colombia

Australian Council for International Agricultural Research (ACIAR), Australia

Austrian Research Center (ARC), Seibersdorf Research GmbH, Austria

Banana Research Station (BRS), Kerala, India

Bangladesh Agricultural Research Institute (BARI)

Belgium Government

Belize Banana Board

Biosphere Reserve Management Committee, Thailand

BOKU University of Natural Resources and Life Sciences, Austria

Bolama-Bijagos Archipelago Biosphere Reserve, Guinea - Bissau

British Cocoa, Chocolate and Confectionary Alliance (BCCCA)

Bureau of Plant Industry (BPI), Philippines

Bushyeni Farmers Association, Uganda

Bvumbwe Agriculture Research Station (BARS), Department of Agricultural Research Services, Malawi

CARE, Africare, Mozambique

CARE, Peru

Caribbean Plant Genetic Resources Network (CAPGERnet)

Case Western Reserve University (CWRU), United States of America

Center for Agricultural Biotechnology, Thailand

Center for International Forestry Research (CIFOR), CGIAR

Central Advisory Service on Intellectual Property (CAS-IP), CGIAR

Central Asia Trans-Caucasus Network on Plant Genetic Resources (CATN-PGR)

Central Food Technology Research Institute, India

Central Plantation Crops Research Institute, India

Central Research Institute for Field Crops, Turkey

Centre Africain de Recherc hes sur Bananiers et Plantains (CARBAP)

Centre de Recherche Agronomique de Loudima (CRAL), Congo

Centre de Recherche Public Gabriel Lippmann, Luxembourg

Centre for Genetic Resources (CGN), The Netherlands

Centre National de Gestion des Réserves de Faune (CENAGREF), Benin

Centre National de Recherche Agronomique (CNRA), Côte d'Ivoire

Centre on Science and Technologies under the Cabinet of Ministers of Uzbekistan

Centre Régional d'Enseignement Spécialisé en Agriculture (CRESA), Niger

Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), Costa Rica

Centro de Energia Nuclear na Agricultura (CENA), Brazil

Centro de Investication y Estudios Avanzados del IPN (CINVESTAV), Mexico

Centro de Investigacion Cientifica de Yucatan (CICY), Mexico

Centro de Investigación de Recursos Naturales y Medio Ambiente (CINRNMA), Peru

Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV-IPN), Mexico

Centro de Investigaciones Fitoecogenéticas de Pairumani (CIFP), Bolivia

Centro Nacional de Pesquisa de Mandioca e Fruticultura Tropical/ Empresa Brasileira de Pesquisa Agropecuária (CNPMF-EMBRAPA)

Centro para el Desarollo Agropecuaria y Forestal (CEDAF), Domenican Republic

Centro Regional de Investigación y Desarrollo Rural (CRIDER), Peru

CGIAR Genetic Resources Policy Committee (GRPC)

CGIAR Inter-center Working Group on Genetic Resources (ICWG-GR)

CGIAR System-wide Genetic Resources Programme (SGRP)

Chang Mai University - Faculty Of Agriculture, Thailand

CIP - UPWARD, Philippines

Cirad, France

Cocoa and Coconut Institute, Papua New Guinea

Cocoa Research Institute of Ghana

Cocoa Research Institute of Nigeria

Cocoa Research Unit of the University of the West Indies (CRU), Trinidad and Tobago

Coconut Research Institute, Sri Lanka

Comissão Executiva do Plano da Lavoura Cacaueira (CEPLAC), Brazil

Comité National Man and the Biosphere, Guinea-Bissau

Commission on Genetic Resources for Food and Agriculture, FAO, UN

Committee for Forestry and Hunting of the Ministry of Agriculture, Kazakhstan

Common Fund for Commodities (CFC)

Congressional Hunger Center, United States of America

Consorcio para el Desarrollo Sostenible de Ucayali (CODESU), Peru

Consortium on Spatial Information (CSI), Sri Lanka, CGIAR

Convention on Biological Diversity, Secretariat, UN

Cooperativa de Servicios Agroforestal y Comercialización de Cacao (CACAONICA), Nicaragua

Cooperativa Huacullani, Bolivia

Cooperativa Irpa Chico de la Comunidad de Jalsuri, Bolivia

Cooperative Research Center for Tropical Plant Pathology, Australia

Coordination Nationale du Projet parc W, Burkina Faso

Cornell University, United States of America

Corporación Bananera Nacional (CORBANA), Costa Rica

Corporación Colombiana de Investigación Agropecuaria (CORPOICA), Colombia

Council for Scientific & Industrial Research, Plant Genetic Resources Centre (CSIR-PGRC), Ghana

Cuban Institute for Fundamental Research on Tropical Agriculture (INIFAT)

Cuban Man and Biosphere National Committee

Délégation générale à la recherche scientifique et technologique (DGRST), Congo

Department of Agricultural Research & Technical Services (DARTS), Malawi

Department of Agriculture - Bureau of Agricultural Research, Philippines

Department of Agriculture, Tanzania

Department of Agriculture, Thailand

Department of Science and Technology, Philippines

Departments of Ministries of Agriculture & Environment Protection in the Almaty, Jambyl & South Kazakhstan provinces

Desarrollo Integral Campesino (DCI), Bolivia

Desert Research Center (DRC), Egypt

Deutsche Gesellschaft fuer Technische Zusammenarbeit (GTZ) GmbH, Germany

Direction de la Faune, de la Pêche et de la Pisciculture (DFPP), Niger

Directorate General for Development Cooperation, Belgium

Diversity Arrays Technology (DArT), Austalia

Ecoregion for Paramos, Ecuador

Embrapa Genetic Resources and Biotechnology, Brazil

Empresa Altiplano, Peru

Empresa Brasiliera de Pesquisa Agropecuaria (Embrapa), Brazil

Empresa Fortigrano, Peru

Escuela Agrícola Panamericana Zamorano, Honduras

Escuela Superior Politécnica del Litoral (ESPOL), Ecuador

Estacion Biologica del Beni, Bolivia

Estación Experimental Andenes (INIA, Cuzco), Peru

Estación Experimental Illpa (INIA, Puno), Peru

Estación Experimental Santa Catalina, Ecuador

Ethiopian Agricultural Research Organization (EARO)

European Commission

European Cooperative Programme for Plant Genetic Resources (ECPGR)

European Forest Genetic Resources Programme (EUFORGEN)

Facultad de Agronomía de la Universidad Mayor de San Andrés (UMSA), Bolivia

Federal Ministry of Agriculture, Development and Marketing, Ethiopia

Federal Ministry of Food, Agriculture and Consumer Protection, Germany

Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Austria

Federal University of Santa Catarina, Brazil

Field Crop Research and Development Institute, Department of Agriculture (FCRDI-GLORC), Sri Lanka

Fondation pour le Développement du Sahel (FDS), Mali

Fondo Ecuatorianun Populorum Progressium, Ecuador

Fontagro

Food and Agriculture Organization (FAO), UN

Forest Research Centre of the National Institute for Agriculture and Food Research and Technology (CIFOR-INIA), Spain

Forest Research Institute Malaysia (FRIM)

Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria, South Africa

Fundación Hondureña de Investigación Agrícola, Honduras

Fundación para el Desarrollo Agropecuario (FUNDAGRO), Ecuador

Fundación Promoción e Investigación de Productos Andinos (PROINPA), Bolivia

Fundacion Servicio para el Agricultor, Venezuela

G.B. Pant University of Agriculture and Technology, Hill Campus, Ranichauri, Uttaranchal, India

Garrygala Research and Production Centre of Plant Genetic Resources, Turkmenistan

Gatsby Cameroon

General Office of Forestry under the Ministry of Agriculture and Water Resources, Uzbekistan

Generation Challenge Program, International Maize and Wheat Improvement (CIMMYT), CGIAR

Global Crop Diversity Trust

Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture, UN

Graz Technical University

Guangdong Academy of Agricultural Sciences, Fruit Tree Research Institute (GAAS-FTRI), China

Guittard Chocolate Company, United States of America

HarvestPlus Challenge Programme, CGIAR

Haut Commissariat aux Eaux et Forêts, Morocco

Honduran Coffee Institute (IHCAFE)

Horticultural Crop R&D Institute (HORDI), Department of Agriculture, Agricultural Research Station, Sri Lanka

Horticulture Research Institute, Thailand

INDACO S.A., Peru

Indian Council of Agricultural Research (ICAR), India

Indian Institute of Horticultural Research (IIHR), India

Indonesia Fruit Research Institute (ITFRI)

Indonesian Center for Estate Crops Research and Development (ICECRD), Indonesia

Indonesian Centre for Horticultural R&D (ICHORD), Indonesia

Insituto Nicaraguense de Tecnologia Agropecuaria (INTA), Nicaragua

Institut Agronomique et Veterinaire Hassan II, Morocco

Institut Centrafricain de la Recherche Agricole (ICRA), Central African Republic

Institut d'Economie Rurale (IER), Mali

Institut de l'Environnement et de la Recherche Agricole (INERA), Burkina Faso

Institut de la Recherche Agricole pour le Développement (IRAD), Cameroon

Institut de Recherche Agronomique de Guinée - Sérédou (IRAG)

Institut de Recherche Agronomique et Zootechnique (IRAZ), Burundi

Institut de Recherche en Ecologie Tropicale (IRET), Gabon

Institut de Recherche pour le Développement (IRD), France

Institut de Recherches Agronomiques et Forestières (IRAF), Gabon

Institut des Sciences Agronomiques du Rwanda (ISAR)

Institut National d'Etudes et de Recherches Agricoles (INERA), Congo

Institut National de la Recherche Agronomique, Algeria

Institut National de la Recherche Agronomique, Morocco

Institut National de Recherche Agronomique (INRAT), Tunisia

Institut National de Recherches Agricoles du Bénin (INRAB/CRA - SB)

Institut National des Etudes et des Recherches Agricoles (INERA), Burkina Faso

Institut National des Recherches Agronomiques du Niger (INRAN)

Institut National pour l'Etude et la Recherche Agronomique (INERA Mvuazi), Democratic Republic of the Congo

Institut Sénégalais de recherches agricoles (ISRA), Senegal

Institut Togolais de Recherche Agronomique (ITRA), Togo

Institute for Genomic Research, United States of America

Institute for the Promotion of Horticultural Exports, Sudan

Institute for Tropical and Sub-Tropical Crops (ARC-ITSC), South Africa

Institute of Agricultural Research and Higher Education (IRESA), Tunisia

Institute of Biodiversity Conservation (IBC), Ethiopia

Institute of Botany of the Tajik Academy of Sciences (IAP), Tajikistan

Institute of Crop Germplasm Resources (CAAS), Chinese Academy of Agricultural Sciences

Institute of Experimental Botany (IEB), Czech Republic

Institute of Genetics and Plant Experimental Biology, Uzbekistan

Institute of Plant Breeding, University of Philippines Los Baños

Instituto de Biotecnología de las Plantas (IBP), Cuba

Instituto de Ecologia de la Universidad Mayor de San Andres (UMSA), Bolivia

Instituto de Innovación Tecnológica y Promoción del Desarrollo (PIWANDES), Peru

Instituto de Investigação Cientifica/ Centro de Ecofisiologia, Bioquimica e Biotecnologia Vegetal (IICT), Portugal

Instituto de Investigación Agropecuaria de Panamá (IDIAP), Panama

Instituto de Investigaciones Agrícolas y Forestales (IDIAF), Domenican Republic

Instituto de Investigaciones de Sanidad Vegetal (INISAV), Cuba

Instituto de Investigaciones en Fruticultura Tropical (IIFT), Cuba

Instituto de Investigaciones en Viandas Tropicales (INIVIT), Cuba

Instituto de Investigaciones Fundamentales en Agricultura Tropical (INIFAT), Cuba

Instituto de Investigaciones y Facultad de Ciencias Agrarias de la Universidad Nacional del Altiplano (UNA), Peru

Instituto Nacional Autónomo de Investigaciones Agropecuarias (INIAP), Ecuador

Instituto Nacional de Innovación Agraria (INIA), Peru

Instituto Nacional de Investigaçao e Tecnologia Apligada, Guinea - Bissau

Instituto Nacional de Investigacion Agraria (INIA), Spain

Instituto Nacional de Investigación Agrícola (INIA), Bolivia

Instituto Nacional de Investigación y Extensión Agraria (INIEA), Peru

Instituto Nacional de Investigaciones Agricolas (INIA), Venezuela

Instituto Nacional de Investigaciones Agrícolas (INIAP), Ecuador

Instituto Nacional de Investigaciones Agropecuarias (INIAP), Ecuador

Instituto Nacional de Investigaciones Forestales y Agropecuarias (INIFAP), Mexico

Instituto Nacional de Pesquisa Agraria (INPA), Guinea-Bissau

Instituto Nacional de Tecnología Agropecuaria (INTA), Argentina

Integrated Rural Development Center, China

Inter-American Institute for Cooperation on Agriculture (IICA)

International Center for Agricultural Research in the Dry Areas (ICARDA), CGIAR

International Center for Tropical Agriculture (CIAT), CGIAR

International Cocoa Organisation, United Kingdom

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), CGIAR

International Development Research Centre (IDRC), Canada

International Food Policy Research Institute (IFPRI), CGIAR

International Fund for Agricultural Development (IFAD), UN

International Institute of Tropical Agriculture (IITA), CGIAR

International Livestock Research Institute (ILRI), CGIAR

International Maize and Wheat Improvement Center (CIMMYT), CGIAR

International Potato Center (CIP), CGIAR

International Rice Research Institute (IRRI), CGIAR

International Union for Conservation of Nature (IUCN)

Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, UN

Kastom Gaden Association (KGA), Solomon Highlands

Katholieke Universiteit Leuven, Belgium

Kazakh National Agrarian University, Kazakhstan

Kenya Agricultural Research Institute (KARI)

Kenya Forestry Research Institute (KEFRI)

Kerala Agricultural University (KAU), India

Khorezm Academy of Mamun, Uzbekistan

Khorog State University named after Acad. M. Nazarshoev of the Ministry of Education, Tajikistan

Kunming Institute of Botany of CAS, China

La Central Piurana de Cafetaleros (CEPICAFE), Peru

La Coronilla, Bolivia

La Universidad je Zulia (UZ), Venezuela

Lapanday Foods Corporation, Philippines

Latin American Forest Genetic Resources Network (LAFORGEN)

Local Initiatives for Biodiversity and Development (LI-BIRD), Nepal

M.S. Swaminathan Research Foundation (MSSRF), India

Makerere University, Uganda

Malaysian Agricultural Research and Development Institute (MARDI), Malaysia

Malaysian Cocoa Board, Malaysia

Masterfoods, United Kingdom

Max Planck Institute for Chemical Ecology, Germany

McGill University, Canada

Michigan State University, United States of America

Ministerio do Meio Ambiente Secretaria de Biodiversidade e Florestas, Brazil

Ministry of Agriculture and Water Resources Management, Uzbekistan

Ministry of Agriculture, Kazakhstan

Ministry of Agriculture, Land and Marine Resources, Trinidad Tobago

Ministry of Agriculture, Malawi

Ministry of Agriculture, Tajikistan

Ministry of Agriculture, Turkmenistan

Ministry of Agriculture, Water Resources Management and Processing Industry, Kyrgyzstan

Ministry of Ecology and Emergency, Kazakhstan

Ministry of Economics, Uzbekhistan

Ministry of Education and Science, Kazakhstan

Ministry of Education, Syrian Arab Republic

Ministry of Environment and Natural Resources, Sri Lanka

Ministry of Environment Protection, Kazakhstan

Ministry of Environment, Cuba

Ministry of Environment, Ecuador

Ministry of Forestry and Soil Conservation, Nepal

Ministry of Nature Protection, Turkmenistan

Movimondo, Italy

MTT Agrifood Research, Finland

Musa Instituto Politecnico Loyola, Domenican Republic

Myanmar Agriculture Service, Ministry of Agriculture and Irrigation, Department of Agricultural Planning (MAS - DAP), Myanmar

N.I. Vavilov Institute of Plant Industry (VIR), Russian Federation

National Academy of Science, Kazakhstan

National Agricultural Research Coordinating Council (NARCC), Sierra Leone

National Agricultural Research Institute (NARI - LALOKI), Papua New Guinea

National Agricultural Research Organization (NARO), Uganda

National Board on Plant Genetic Resources (NBPGR), India

National Forestry Resources Research Institute (NFORRI), Uganda

National Genebank of Tanzania (TPRI)

National Horticultural Research Institute (NIHORT), Nigeria

National Institute of Agrobiological Sciences (NIAS), Japan

National Parks, Wildlife and Conservation Department (DNP), Thailand

National Plant Genetic Resources Centre, Tanzania

National Quarantine and Inspection Authority (NAQIA), Papua New Guinea

National Research Centre for Banana (NRCB), India

National Research Centre on Banana (NRCB), Indian Council of Agricultural Research (ICAR), India

National Science Foundation (NSF), United States of America

Nebek Municipality, Syrian Arab Republic

Nepal Agriculture Research Council (NARC)

Netherlands Ministry of Foreign Affairs (DGIS)

Nicaraguan Agricultural Research Center (INTA), Nicaragua

Nordic Genetic Center (NordGen)

Office Régional de Mise en Valeur Agricole de Ouarzazat (ORMVAO), Morocco

Office Régional de Mise en Valeur Agricole de Tafilalet (ORMVAT/TF), Morocco

Oregon State University, United States of America

Outma Nature Conservation Association, Republic of Yemen

Pairumani, Bolivia

Philippine Coconut Authority (PCA)

Philippine Council for Agricultural Research and Natural Resource Development (PCAARRD)

Phu Ho Fruit Crop Research Center (PHU HO FCRC), Vietnam

Plant Genetic Resource Network for South American Tropics (TROPIGEN)

Plant Genetic Resources Centre (SADC), Zambia

Plant Genetic Resources Network for North America (NORGEN)

Plant Protection Research Institute (PPRI), Vietnam

Plant Research International, Wageningen University, Netherlands

Pro Mundo Humano (PMH), Germany

Programa Campesino a Campesino, National Agrarian University, Nicaragua

PROMARENA Project, Bolivia

Proyecto de Investigación en Waru Warus (PIWA), Peru

Queensland Department of Primary Industries (QDPI - South Johnstone), Australia

Queensland Department of Primary Industries and Fishery (QDPI&F), Australia

Queensland Horticultural Institute (QHI), Australia

Queensland University of Technology (QUT), Australia

Quirino State University, Philippines

Rainforest Alliance (NGO), Ecuador

Red Andina de Recursos Fitogenéticos (REDARFIT), Venezuela

Red de Recursos Geneticos del Cono Sur (REGENSUR)

Red Mesoamericana de Recursos Fitogeneticos (REMERFI)

Republican Self-Sustained Association 'Tajiknikholparvar' of the Ministry of Agriculture, Tajikistan

Research and Production Association, Tajikistan

Research Institute for Economy of Agroindustrial Complex and Development of Rural Territories, Kazakhstan

Research Institute for Fruits, Agency for Agricultural Research and Development (RIF - SOLOK), Indonesia

Research Institute of Botany and Phytointroduction, Kazakhstan

Research Institute of Farming, Kazakhstan

Research Institute of Horticultural and Viticulture of the Research and Production Centre of Processing and Food Industry of the Ministry of Agriculture, Kazakhstan

Research Institute of Plant Physiology, Genetics and Bioengineering, Kazakhstan

Réseau des Association de la Réserve de Biosphère de l'Arganeraie, Morocco

Reserva de la Biosfera Cuchillas de Toa, Unidad de Servicios Ambientales de Guantánamo, Cuba

Reserva de la Biosfera Sierra del Rosario, Centro de Investigaciones y Servicios Ambientales Ecovida, Cuba

Rural Development Administration, National Institute for Agricultural Biotechnology, Republic of Korea

Samah Agriculture Cooperative, Dhamar, Republic of Yemen

Save the Children, United Kingdom

SCC - Vi Agroforestry Project, Uganda

Secretaria del Estado de Agricultura, Domenican Republic

Secretariat of the Pacific Community (SPC)

ServiceXS BV, Netherlands

Servicio Nacional de Sanidad Agraria (SENASA), Peru

Sichuan Academy of Agricultural Sciences, China

Silo National des Graines Forestières (SNGF), Madagascar

Sime Darby Technology, Malaysia

Sociedad Peruana de Derecho Ambiental (SPDA), Peru

Sociedad Productora de Quinua (SOPROQUI), Bolivia

South China Agricultural University, Tropical and Subtropical Fruit Research Laboratory (SCAU)

Souther Africa Development Community (SADC), Namibia

Stanfilco, Dole, Philippines

State Committee for Nature Protection and Forestry, Tajikistan

State Committee for Nature Protection, Uzbekistan

State Forest Service, Kazakhstan

Stellenbosch University, South Africa

Stichting Dienst Landbouwkundig Onderzoek - DLO (Foundation for Agricultural Research Service), Netherlands

Strategic Initiative on Urban and Periurban Agriculture (Urban Harvest), CGIAR

Sub-Saharan Africa Challenge Programme, Malawi, CGIAR

Sub-Saharan Africa Challenge Programme, Mozambique, CGIAR

Sub-Saharan African Forest Genetic Resources Programme (SAFORGEN)

Supreme Council of Science, Syrian Arab Republic

Taiwan Banana Research Institute

Tajik Academy of Agricultural Sciences, Tajikistan

Tajik Institute of Forest Research and Management of the State Committee for Nature Protection and Forestry, Tajikistan

Tajik Research Institute of Economics and Agricultural Production of the Tajik Academy of Agricultural Sciences, Tajikistan

Tajik State Commission on Agricultural Crop Varieties Testing and Variety Protection of the Ministry of Agriculture, Tajikistan

Tamil Nadu Agricultural University, India

Tanzania Forest Research Institute (TAFORI)

Tashkent State Agrarian University, Uzbekistan

Texas A&M University, United States of America

The John Innes Centre, United Kingdom

The Mickey Leland International Hunger Fellows Program, Congressional Hunger Center (NGO), United States of America

The Scientific and Technological Research Council of Turkey

Third World Network, China

U.S. Agency for International Development (USAID)

Union of Indigenous Organization from Cotacachi (UNORCAC), Ecuador

United Nations Development Programme (UNDP)

United Nations Educational, Scientific and Cultural Organization (UNESCO)

United Nations Standing Committee on Nutrition (UNSCN)

United States Department of Agriculture (USDA)

Unity and Cooperation for Development of Peoples (UCODEP),Italy

Universidad Católica Boliviana (UCB), Bolivia

Universidad EARTH, Costa Rica

Universidad Nacional Autónoma de Nicaragua - León (UNAN - León), Nicaragua

Universidad Nacional de la Selva, Peru

Universidad Nacional del Altiplano (UNA), Peru

Universidad Rey Juan Carlos (URJC), Spain

Universidade Católica de Brasília (UCB), Brazil

Università degli Studi di Perugia, Italy

Université Catholique du Graben, the Democratic Republic of the Congo

Université de Agadir, Faculty Of Agronomy, Morocco

Université de Kisangani (UNIKIS), the Democratic Republic of the Congo

University Central Florida, United States of America

University of Aden, Republic of Yemen

University of Agricultural Sciences, Bangalore, India

University of Agricultural Sciences, Dharwad, India

University of Aleppo, Syrian Arab Republic

University of Birmingham, United Kingdom

University of Biskra, Algeria

University of Bonn, Germany
University of Cambridge, United Kingdom
University of Costa Rica
University of Damascus, Syrian Arab Republic
University of Frankfurt, Germany
University of Gembloux, Belgium
University of Georgia, United States of America
University of Ghana
University of Gottingen, Germany
University of Halle, Germany
University of Hannover, Germany
University of Hohenheim, Germany
University of Kassel, Germany
University of Kinshasa, Democratic Republic of Congo
University of Leicester, United Kingdom
University of Liege, Belgium
University of Malawi
University of Malaysia
University of Mauritius
University of Minnesota, United States of America
University of Nottingham, United Kingdom
University of Panama
University of Philippines – Los Banos
University of Puerto Rico
University of Queensland, Australia
University of Reading, United Kingdom
University of Samarqand, Uzbekistan
University of Sana'a, Republic of Yemen
University of Tuscia, Italy
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Volunteer Efforts for Development Concerns (VEDCO), Uganda
Washington State University, USA
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Women Economics Empowerment Association (WEEA), Republic of Yemen
World Agroforestry Center (ICRAF), CGIAR
World Cocoa Foundation, United States of America
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2 Self Help Group Associations from Namakkal, Tamil Nadu State, India
3 Self Help Group Associations from Balia, Jeypore Orissa State, India
3 Self Help Group Associations from Padasolai, Kolli Hill, Tamil Nadu State, India

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Farmer Patrice Kagisye stands amongst intercropped climbing beans and maize on her farm. Credit: Bioversity International/P.Lepoint

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Cover photo: Farmer Enid Tumusiime discussing with Bioversity International scientist William Tinzaara about banana Xanthomonas wilt disease management, Uganda.
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