联合国粮食及农业组织

粮食和农业植物遗传资源国际条约

暂定议程议题 16.4

管理机构第十届会议

2023 年 11 月 20 – 24 日，意大利罗马

根据《国际条约》第 15 条与管理机构签订协定的机构报告

内容提要

管理机构第九届会议要求根据《国际条约》第 15 条签订协定的机构继续提交协定执行情况报告。

本文件对所收到的报告进行了汇总分析，并介绍了秘书为支持第 15 条机构所开展活动的最新情况。

征求指导意见

提请管理机构审议本文所载报告及其他信息，并结合附件所载决议草案内容，提供进一步指导。

联合国粮农组织—《粮食和农业植物遗传资源国际条约》（《国际条约》）文件可访问：
http://www.fao.org/plant-treaty/meetings/meetings-detail/zh/c/1618930/

NN607/Ch.

I. 引言

1. 根据《国际条约》第 15 条签订的协定规定，持有作物种质收集品的国际机构应在多边系统中提供收集品，同时可获得经济和技术援助，以保管并和改良这些收集品。管理机构根据《国际条约》的规定，对这些机构所持有的非原生境收集品提供总体政策指导。

2. 管理机构定期收到根据第 15 条签订协定的国际机构（“第 15 条机构”）就多边系统条款下种质管理和流通转让情况编制的报告。报告还介绍了在《国际条约》框架下有序保管收集品和开展合作活动的情况。

3. 管理机构第九届会议要求第 15 条机构继续向管理机构例会提交报告[1]。截至本文件发布之日，秘书收到了下列机构向管理机构第十届会议提交的报告：

- 西印度群岛大学可可研究中心（持有特立尼达国际可可基因库）；
- 科特迪瓦（国际椰子遗传资源网络下非洲和印度洋国际椰子基因库东道国）；
- 热带农业研究和教育中心；
- 国际生物耐盐农业研究中心；
- 国际农业研究磋商组织签订第 15 条协定的 11 个中心；
- 巴布亚新几内亚（国际椰子遗传资源网络下南太平洋国际椰子基因库东道国）。

4. 本文件附录 1-6 所载报告按收到的原文提交管理机构。如果秘书在本文件发布后收到其他报告，将以增补的形式提供这些报告。

5. 本文件对所有已收到的报告作了综述，并介绍了秘书在管理机构第九届和第十届会议间隔期间为支持执行第 15 条协定而开展的活动情况，包括履行《国际条约》第 15 条第 1 款(g)项职责，保护获悉面临威胁的收集品。本文件还向管理机构通报了秘书为推动与更多机构签订协定所做的努力。

II. 收到的报告摘要

6. 西印度群岛大学可可研究中心的报告是自 2009 年根据《国际条约》签订第 15 条协定以来向管理机构提交的第一份报告。报告介绍了可可遗传材料的获取、繁殖和种植情况，以及为确定核心和战略收集品而对种质材料进行形态和遗传特征鉴定情况。正如报告所述，持续对收集品开展了评估，以确定有价值的特征，但在国家育种计划中，用来改善农民生计的做法还比较有限。报告呼吁为基因库提供支持，以便为育种机构提供优质种质、DNA 指纹识别和分子标记服务，并支付与收集品基因侵蚀、对新出现植物疫病易感性、卫生检测、灌溉和备份有关的费用。

[1] www.fao.org/3/nk250en/nk250en.pdf，第 14-15 段。

7. 西印度群岛大学可可研究中心的报告进一步解释了英国雷丁大学国际可可检疫中心（为全球可可育种计划提供服务）转让国际基因库种质的情况。据报告，国际基因库根据《标准材料转让协定》以植物芽体的形式将种质转让给植物检疫机构。经过两年的检疫期后，该机构再根据《标准材料转让协定》将种质转让给接收方。

8. 关于对可可遗传资源的上述转让做法，需要指出的是，迄今为止，尚无任何机构根据提供方在《标准材料转让协定》下的义务，向管理机构报告有关已签订《标准材料转让协定》的信息。因此，秘书将与相关官员采取后续行动，与西印度群岛大学和雷丁大学讨论此事。

9. 科特迪瓦的报告载列了关于国际椰子基因库地点和材料，以及为保管和开发该收集品而投入的人力和物力信息。报告还介绍了 2020-2023 年期间开展的研究活动和种质交换情况，强调了对种质作进一步研究和繁殖更新的必要性，并呼吁支持这方面的工作。

10. 与可可收集品的情况类似，尚无任何机构向管理机构报告有关已签订椰子收集品《标准材料转让协定》的信息。在此方面，将会同负责管理基因库的机构合作来解决这一潜在问题。

11. 热带农业研究和教育中心提交了 2022 年 8 月至 2023 年 6 月期间的活动报告，介绍了实地收集品和冷藏室保存的种质材料信息，并指出为此有必要更新实地收集品清单。报告还介绍了在作物信托基金和《国际条约》秘书处支持下，在哥斯达黎加一个新地点繁殖更新咖啡种质材料的情况。这种支持有助于落实全球咖啡种质材料保护战略。正如报告所述，德国国际合作机构正在为繁殖更新更多咖啡种质材料提供进一步的资金支持。报告还介绍了根据《标准材料转让协定》转让种质材料的情况。

12. 国际生物耐盐农业研究中心的报告介绍了 2022-2023 年基因库种质获取、种子存活率测试、繁殖更新和特征分析活动，阐明了该中心种子流通成本回收的政策，并列出了流通转让数据。

13. 关于国际生物耐盐农业研究中心的粮食和农业植物遗传资源的流通转让情况，秘书指出，在与该中心的工作人员进行多次磋商后，该中心最近开始报告已签订《标准材料转让协定》的情况。

14. 国际农业研究磋商组织下属各中心的报告介绍了基因库种质的数量和流通近况。关于接收方的地理位置，报告指出，80%的种质材料流向了发展中国家和经济转型国家。关于 2019-2022 年国际农业研究磋商组织以外的接收方类型，报告指出，最大的群体是高级研究机构和大学，以及国家农业研究组织和国家基因库。报告还向管理机构通报了安全备份活动以及国际农业研究磋商组织下属各中心实现基因库绩效目标的情况。

15. 国际农业研究磋商组织下属各中心的报告举例说明了各自对原生境保护和农民（尤其是妇女）权利的贡献。报告重点介绍了发展中国家新启动的能力共享项目。一些项目着重指定政策措施和标准业务程序，以实施获取和惠益分享多边系统并指导在多边系统下运作。此外，还提供子集设置工具操作培训，便于更好地确定国际农业研究磋商组织基因库中可能有用的材料。其他项目支持改进基因库运作，包括对基因库活动人员进行培训。

16. 国际农业研究磋商组织下属各中心的报告进一步总结了国际农业研究磋商组织参与《国际条约》和《生物多样性公约》获取和惠益分享相关进程的情况。报告对若干问题提出了关切，包括富裕和贫困国家在生成和使用数字序列信息方面的技术能力差距；要求从使用数字序列信息中分享利益的新规范对开放科学的潜在影响等。

17. 巴布亚新几内亚的报告向管理机构通报了将实地基因库中的种质材料从马当省 Stewart 研究站的现址迁至米尔恩湾省 Punipuni 新址的进展情况。此次迁址是为了消除感染植原体波吉亚椰子综合症（BCS）的威胁。迁址战略之一是利用目前基因库收集品的部分种质材料，为受波吉亚椰子综合症影响地区农民提供种植材料。报告载列了最新的种质材料清单，并阐明了在斐济和萨摩亚备份种质材料的计划，包括在惠益分享基金项目的支持下实施计划。同时还指出，计划开展种质交换，利用巴布亚新几内亚和太平洋其他地区以及椰子种植国的种质材料，丰富新基因库的种质多样性。这些举措与国际椰子遗传资源网络全球椰子遗传资源保护战略密切相关。

III. 秘书处的活动

磋商

18. 根据管理机构第九届会议的要求，秘书继续与第 15 条机构就各项协定和政策指导的落实情况，包括《标准材料转让协定》下的种质材料转让事宜，进行定期磋商。秘书处代表与国际生物耐盐农业研究中心阐明了关于《标准材料转让协定》运作和数字对象标识符的问题，并出席了与国际农业研究磋商组织基因库和“同一个国际农业研究磋商组织”改革有关的正式会议和磋商。

获取收集品

19. 管理机构第九届会议注意到，目前正在开展工作，确保有序保管面临风险或威胁的国际收集品。会议要求秘书继续履行职责，根据《国际条约》第 15 条要求提供支持，酌情与东道国政府密切合作，并与其他有能力提供经济、技术和其他必要支持的有关政府和相关机构建立伙伴关系 [2]。会议还强调，必须确保国际农业研究磋商组织第 15 条基因库的长期安全，确保国际农业研究磋商组织各中心和其他第 15 条基因库“托管”的种质

[2] 第 17 段。

流通顺畅，并通过加强《国际条约》和全球作物多样性信托基金的参与，为所有第 15 条基因库找到长期解决方案 [3]。

20. 秘书与作物信托基金合作，通过建立联合供资机制筹措资源，支持第 15 条收集品的保管工作，尤其是实地收集品。更多信息载于 IT/GB-10/23/16.2 号文件“与全球作物多样性信托基金的合作”。

国际椰子共同体和国际椰子遗传资源网络的收集品

21. 2022 年 11 月，秘书处的一名代表出席了第五十届国际椰子技术大会和国际椰子遗传资源网络指导委员会会议。这两次会议都由国际椰子共同体组织，会上成立了一个保护技术咨询小组。在这两次会议上，以及在与国际椰子共同体的定期磋商中，秘书处推动了对国际椰子基因库的评估和关于亚洲地区收集品的可能重组的讨论；马来西亚和菲律宾的一些收集品也因此有望得到国际认可。

22. 秘书处与国际椰子共同体合作，正在组织与国际椰子遗传资源网络成员代表的对话，讨论椰子收集品（包括具有国际地位的收集品）管理的实际政策和法律限制。在澳大利亚国际农业研究中心的支持下，秘书处的一名代表还将出席 11 月下旬在菲律宾举行的国际椰子研究与发展科学会议。

热带农业研究和教育中心的国际咖啡收集品

23. 秘书继续就国际咖啡收集品保护问题（见上文第 11 段）与热带农业研究和教育中心进行联络洽谈。在热带农业研究和教育中心对收集品进行繁殖更新的同时，美国农业部在波多黎各马亚圭斯推进相关计划，备份一部分独特基因型的收集品以及子集核心收集品。秘书和作物信托基金与世界咖啡研究组织举行了讨论，探讨如何根据《标准材料转让协定》继续提供收集品。世界咖啡研究组织管理着一个由各国研究所（包括哥斯达黎加咖啡研究所）组成的全球育种网络。

新协定

24. 管理机构第九届会议要求秘书继续开展工作，确保与其他相关国际机构达成符合《国际条约》第 15 条要求的协定。

25. 秘书处参加了 2022 年 11 月举行的国际油橄榄理事会会议，并继续与该理事会代表进行联络洽谈，探讨根据《国际条约》第 15 条指定国际橄榄树收集品为国际收集品的可行性。为了将第 15 条协定纳入橄榄种植业现有种质交换做法的主流，秘书处还在 ClimOliveMed 项目下与国际油橄榄理事会和法国国际发展农业研究中心合作，收集并分析有关当前各种项目和网络中橄榄遗传资源交换方式的数据 [4]。

[3] 第 23 段。

[4] umr-agap.cirad.fr/en/research/main-projects/climolivemed.

全球植物超低温保存倡议

26. 管理机构第九届会议对全球植物超低温保存倡议表示欢迎，该倡议旨在为克隆作物提供安全支持。会议提请支持该倡议的国际农业研究磋商组织各中心和全球作物多样性信托基金为超低温保存的有效运作提供能力建设和培训。会议还提请国际农业研究磋商组织各中心与技术专家和潜在捐助方联络，进一步发展完善该倡议[5]。

27. 在国际农业研究磋商组织基因库平台框架下，该倡议继续通过各区域英才中心（“超低温保存中心”）取得进展，其中欧洲的英才中心设在生物多样性联盟和国际热带农业研究中心；拉丁美洲的英才中心设在国际马铃薯中心；非洲的英才中心设在国际热带农业研究所。2017 年独立报告中建议的倡议运作治理和政策安排似乎仍有待正式制定[6]。

IV. 征求指导意见

28. 提请管理机构结合附件所载决议草案内容，审议本文件所载报告和信息，并提供指导。

[5] 第 26 段。

[6] www.croptrust.org/fileadmin/uploads/croptrust/wp/wp-content/uploads/2018/02/Feasibility-study_Expert-report_Public-version_02_FEB.pdf.

Appendix 1

International Cocoa Genebank, Trinidad – Trinidad and Tobago

Professor Path Umaharan, Director, Cocoa Research Centre, Curator, International Cocoa Genebank, Trinidad. The University of the West Indies, Trinidad and Tobago.

Background

The International Cocoa Genebank, Trinidad (ICGT), is regarded as the largest and most diverse cacao (Theobroma cacao L.) collection in the public domain with over 2300 accessions of cacao held as a field collection in Trinidad and Tobago. The Cocoa Research Centre of the University of the West Indies (CRC-UWI; www.sta.uwi.edu/cru) is the custodian of this international cacao collection. This along with the cacao collection at CATIE, Costa Rica (abbreviated IC3) are the only two cacao collections in the public domain supporting global cacao breeding programmes. The ICGT was established through consolidation of a number of historic collections held in local estates originating from expeditions carried out during the period 1935-1970 into countries that are part of the centre of diversity of cocoa (eg. Peru, Ecuador and Colombia). The 34 ha land, in which the cacao field collection is held, is part of the La Reunion Estate, Centeno, Trinidad and Tobago; and was generously provided to the University of the West Indies by the Government of the Republic of Trinidad and Tobago (GORTT) under a 99-year lease arrangement. The collection was initially established with support from the European Development Fund through a project carried out during the period 1981-86. The collection was incorporated under Article 15 of the International Treaty on Plant Genetic Resources for Food and Agriculture. Subsequently (post 1990), accessions were added through collections from other parts of Latin America and the Caribbean region under various projects, particularly from French Guiana and other Caribbean countries. The genebank actively supports cacao breeding programmes through supply of germplasm and germplasm services.

Conservation

The Collection: At present the collection contains a total of 2300 plus accessions of T. cacao, 22 crop wild relatives belonging to the Theobroma species, including Herrania species. The collection is divided into 5 fields with paved roadways separating the fields to provide easy accessibility. Cocoa being an understory tree species, permanent shade is provided to cacao by immortelle (Madre de Cacao; Erythrina poepiggiana) planted at a spacing of 40 x 40 m. The accessions held at the genebank site (at Centeno) was initially planted in plots of 16 clonal trees per accession, but later acquisitions were planted in plots of 8 clonal trees each, to reduce the space requirement and maintenance costs. Every plot and every tree within a plot are labelled meticulously with aluminium labels tied to the trees with copper wire. The plots have more permanent labels.

When germplasm is acquired, it is first grafted onto proven rootstocks and maintained in large 16-inch pots in Cocoa Research Centre's greenhouses at University Campus at St. Augustine. They are then propagated by grafting and planted at the University campus fields or in a nursery plot at the genebank site (four clonal trees per plot). Budwood collected from these trees are then propagated ***by*** rooted cuttings (rooting response varies with genotype and can be challenging) and planted in germplasm plots with temporary shade provided by banana (Musa acuminata). There is hence always a lag between the acquisition of cocoa accessions and their introduction into the field collection at the genebank site, as clones generated through rooting of cuttings. Propagation by rooted cuttings, although more challenging, ensures that during lean periods rootstock of grafts does not replace the intended variety. We also maintain the nursery plots containing grafts as a precaution as some accessions are susceptible to root borne diseases such as Ceratocystis wilt (CA. *Ceratocystis cacaofunesta*) and can succumb to this disease over time; and need replacement from time to time.

Duplication:- We have partial duplication of the accessions in nursery plots (described earlier) as well as over 100 'at-risk' accessions are held in the maintenance greenhouse as grafted plants in pots. We are at present duplicating the strategic collection (500 accessions) in another adjacent field supported by the MOCCA project funded by USDA-FAS and executed by Technoserve and LWR. We have also established

a 'partnership in conservation' programme, where we are distributing small subsets of the collections to be established in partner farmer fields for safe keep. This provides an additional measure of duplication. We have applied to the Government of Trinidad and Tobago's greenfund to accelerate this programme.

Supporting Infrastructure: The collection is accessible by paved roads but due to disrepair of a short bridge across the Caroni River, access at present is through a circuitous mud road. The internal roads with the field genebank were kindly paved by the Government of Republic of Trinidad and Tobago (GORTT). The collection is situated in the banks of the Caroni River, that provides the collection a year-round water supply. Since restrictions are placed on extracting water from the river during the dry season by the GORTT, two water reservoirs were constructed to supplement the water supply in the dry season. The genebank is also equipped with a subterranean irrigation system with hydrants placed in a 100' x 100' grid. This has allowed for irrigation of every part of the genebank field site. The two water reservoirs and the subterranean irrigation system were established with support from The Dutch Ministry of Agriculture, Nature and Food Quality (LNV) during the 2004-2008 period. During the dry season irrigation is provided by flooding the drains around plots that provides an effective way to mitigate against drought induced tree losses. Following a freak storm that damaged trees in 2003, wind breaks of Pomerac or Malay apple (Syzygium malaccense) were planted around the fields to provide protection against strong winds. A fire trace has been established around the field site and is maintained, annually. This along with a 24-hour fire watch instituted during the very dry months has mitigated the risk due to fires in the neighbourhood spreading into the genebank site.

The genebank at Centeno is supported by greenhouse infrastructure at the UWI, St. Augustine campus (25 km away from the genebank site). This includes a propagation greenhouse (equipped with a mist irrigation system and hardening facility; kindly provided under a USDA Food for Progress Project – MOCCA; 2019-2022), a maintenance greenhouse, where grafted germplasm and 'at-risk accessions' are maintained and two additional greenhouses used for screening germplasm for disease resistance (black pod disease & witches' broom disease) or other agronomically important traits such as drought tolerance, cadmium uptake or supporting germplasm enhancement programmes.

Curation of the collection

General maintenance: The collection is subjected to 5-6 rounds of underbrush removal and weed control, yearly. Sanitary pruning is done once every 1-2 years, resources permitting, with removal of witches' brooms, blackpods and chupons (basal suckers). The collection is subjected to a tree survey to determine the tree counts per accession plots every other year. During the survey, number of missing trees, health of existing trees and status of tree labels are assessed. This is followed by a plot and tree labelling exercise to replace damaged or lost labels, removal of termite nests, etc. Accessions 'at-risk' of genetic erosion are identified, grafted and maintained in the maintenance greenhouse. Where trees are lost, rooted cuttings are generated for replacement. This process however is lagging behind due to lack of resources. An up-to-date plot and tree databases have been developed for the collection and maintained. Recently, we have begun a process of GIS mapping of plots and trees and a barcoding system.

During the dry season, during the months of February to May, the plots are irrigated weekly. Fire traces are cleared and during the severe part of the dry season, 24-hour fire watch is established as neighbouring farmers, burn their rubble during the dry season.

Characterising of the collection: This is a very critical exercise to rationalise the collection and to better utilise the collection. CRC-UWI has morphologically characterised every accession within the collection for 22 highly heritable morphological traits from the IPGRI descriptor list; and the information has been shared globally through the International Cocoa Germplasm Database (ICGD). Although the information is useful in differentiating accessions morphologically, it has not proven effective in differentiating between closely related accessions. As an adjunct to the morphological characterisation, CRC-UWI has established a validated 182 SNP DNA fingerprinting panel to effectively distinguish between the accessions. Using the SNP panel CRC-UWI has completely DNA fingerprinted all the 2300 plus accessions. This has allowed the determination of the ancestry of every accession within the collection and has enabled them to be placed within the 10 genetic groups established by Motomayor et al (2008) or as interpopulation hybrids. The study shows that the ICGT collection has a good representation of

accessions from every known cacao genetic group. Based on the results we have developed a core collection and a strategic collection (500 accessions). We have also used the SNP DNA panel to verify the fidelity of trees in the plots. The study has identified mislabelled trees within plots (due to errors that may have occurred during the establishment of the genebank field collection between 1982-onwards). These mislabelled trees have been earmarked for replacement. Using the comprehensive DNA fingerprint database that we have generated we are offering a global DNA fingerprinting service, that has been used by every cocoa growing country.

Evaluation of germplasm: The collection has been and is continuously being evaluated for a number of agronomically important traits (as resources become available) including tree vigour, pod index, number and size of cacao beans, resistance to important diseases such as Ceratocystis wilt, witches' broom disease (C.A. Monoliophthora perniciosa) and blackpod disease (C.A. Phytophthora palmivora), light tolerance, pod development period, flowering time, diversity in flavour, resistance to important diseases such as cadmium uptake etc. Standardized screening methods have been established and validated for various traits and has been shared with the international community. These are being carried out as part of various projects funded by both public as well as private industry funding. Notably the development of screening methods for witches' broom resistance and subsequent screening of cacao germplasm and genetic study was supported by World Cocoa Foundation during the period 2000-2015. Similarly, identification of genetic variation for cadmium uptake and mitigation approaches in cocoa was supported by the Joint Research Fund of ECA/CAOBISCO/FCC during the 2016-2022 period. For every trait evaluated the collection has unearthed considerable genetic variation.

Utilisation of the collection: Despite the considerable diversity established for various traits within ICGT, the utilisation of the diversity to improve farmer livelihoods has not progressed well. Hence farmers continue to suffer from poor yields and losses associated with biotic and abiotic stresses; which threatens the cacao industry as a whole. The genebanks need to be resourced to better serve the cacao breeders globally, by providing enhanced germplasm, DNA fingerprinting and molecular marker services. These are particularly important for a tree crop such as cacao where breeding is long-term and therefore requires resources and multigenerational commitments. To support national breeding efforts, CRC-UWI has established two population enhancement programmes one for blackpod resistance and another for witches' broom resistance. Promising clones from the enhanced populations have been used to improve the resistance of cocoa within the national breeding programme. The genetics of various traits have also been investigated and molecular marker studies are underway to develop validated molecular markers for various traits using genome-wide association analysis or QTL mapping; with the aim of developing genomic selection strategies to support breeding and utilisation of the collection. If adequately resources the ICGT can become an important source of knowledge and services to support global cacao breeding.

Acquisition and distribution of germplasm

ICGT at present acquires and distributes germplasm to cacao breeders worldwide through the International Cocoa Quarantine Centre at the University of Reading. ICGT has a strict policy with regards to quarantine requirement for acquisition and distribution of germplasm. Up to 2008, CRC-UWI operated a quarantine facility in the neighbouring island of Barbados, where land for the establishment of the quarantine facility was kindly provided by the Government of Barbados. Barbados was ideally suited for a quarantine station, as this island does not have a cocoa industry and therefore does not pose a risk. This quarantine facilitated acquisition of germplasm from the Latin America and the Caribbean region as well as distribution of primary and improved materials to countries in the region. The closure of the quarantine facility in 2008 due to inadequate financing (as the financing for the centre has not increased in par with inflationary costs) has greatly impeded our ability to acquire germplasm from the Latin America and the Caribbean region as well as to distribute primary germplasm and newly bred varieties to the region.

At present the ICGT uses only one quarantine facility to support the global distribution of cacao germplasm to support cacao breeding i.e. International Cocoa Quarantine Centre, Reading (ICQC,R). It is managed by the University of Reading, U.K which provides this very important service to global cacao breeding programmes. At this facility, cacao germplasm is held in quarantine for a two-year period to be verified as disease-free before being transferred to recipient countries. Germplasm is transferred as budwood by the genebanks to the ICQC,R under an SMTA. The ICQC, R after a quarantine period of two years, transfers budwood to recipient countries under an SMTA. While ICQC, R has served its purpose in

preventing movement of cacao diseases between continents – SE Asia, Africa and Latin America and the Caribbean, there are new emerging challenges that genebanks and quarantine facilities have to address.

The challenges can be categorised into four areas (a) intra-regional movement of germplasm (2) new acquisitions (3) linkage between breeders and germplasm collections (4) emergences of private sector breeding and intellectual property arrangements.

(a) Intra-regional movement of germplasm – Cocoa breeding is an expensive and long-term exercise. Hence within regions that share similarities in environments and risk factors, it is desirable to have cooperation in breeding and deployment of varieties in farmer fields. Further, given the similarities within a region, it is possible to shorten the quarantine period required for movement. Shorter distances also make germplasm movement much easier. Lack of regional quarantine facilities have therefore been a deterrent to cooperation in breeding and sharing of genetic resources; critical for the development of the cocoa industry. This has been identified as an impediment by the Latin America and the Caribbean Cocoa Breeders' Network. New quarantine arrangements may have to be developed to nurture regional breeding efforts.

(b) New acquisitions of germplasm – The rapid loss of genetic resources in the centres of diversity is a concern and requires focussed collection and conservation efforts of unexplored diversity. However, the increasing national protectionist policies have made it difficult to acquire germplasm for conservation by the international genebanks. Genebank managers need to have the agility to negotiate the acquisition and conservation of germplasm under various arrangements. Having the quarantine under the control of the genebanks may be helpful in developing trust within parties and developing and executing joint bilateral projects focussed on collection and long-term conservation of germplasm.

(c) Linkage between breeders and germplasm collections - This is a critical relationship that needs to be fostered for each of these to be relevant to their customers. Germplasm collections require feedback from breeders around the world regarding the performance of shared primary germplasm or enhanced populations. The genebanks can provide additional services to breeders such as screening protocols, DNA fingerprinting or molecular marker services, build unique enhanced populations or develop joint projects as well as provide tacit knowledge to support breeding. At present germplasm is sent to ICQC,R under SMTA by genebanks, and the ICQC,R after a quarantine period maintains its own collection and supports breeders by sending materials to them under an SMTA. This affects the ability of genebanks to build a relationship with breeders.

(d) Private Sector Breeding – Cocoa breeding has been lagging behind other crop breeding efforts largely due to lack of resources that has affected the continuity of breeding efforts. To bring greater private sector resources into cocoa breeding it is critical that intellectual property arrangements have to be developed so that genebanks and quarantine facilities can develop processes to maintain confidentiality and transfer resources to countries at a cost.

Financing

At present the conservation efforts of the International Cocoa Genebank is supported by the Cocoa Research Association of the UK, which receives its funding from returns from an endowment established by Cadbury (now managed by Mondelez) and additional funding from Mondelez, Mars-Wrigley and ICE. More recently additional cacao industries have supported this fund. Additional support for staff of the Cocoa Research Centre and maintenance of the supporting greenhouse infrastructure at the University of the West Indies is provided by the Government of the Republic of Trinidad and Tobago through a subvention.

Other challenges

A costing of the conservation of accessions at the ICGT was done in 2015 using the CGIAR Costing Tool by Daniela Horna (IFPRI,2007). The available funding at present for the curation of the ICGT is less than 22% of that indicated by the costing tool. While it allows for the general maintenance operations including, acquisition and introduction, 6-7 rounds of weed control over the year, pruning, irrigation, fire watch and some characterisation, it does not allow for managing critical challenges as described below.

1. Attrition of trees leading to genetic erosion

Although the genebank was planted with 16 trees per accession at the beginning and later with 8 trees per accession, trees die due to various reasons including pests and diseases (Ceratocystis wilt, Phytophthora canker; termites), freak storms, extreme dry spells etc. Some genotypes are more susceptible than others. On average we have lost over 50% of the trees in plots over the years due to various causes. Although we have a replanting exercise, given the resources it is not keeping up with the attrition rate. When the numbers in plots reach critically low levels (1-2 trees per plot) we graft them and maintain them in the maintenance greenhouses as a precaution against genetic erosion. We have around 300 accessions in the greenhouse that need to be repropagated and replanted in the collection.

2. Health testing
   At the time of the costing we didn't think health testing was important and therefore in Table -1 no cost was provided for this. In 2017 (Chingandu et al, 2017), we identified two badnaviruses in the collection, which were mild virus but of quarantine importance. Later we have developed tools to screen for the viruses with collaborators in Arizona and the University of the Reading, UK. We have not however screened the germplasm to identify the dispersion of these viruses.

3. Irrigation ponds
   The establishment of the irrigation pond in 2005 allowed for minimising losses due to drought events during the dry seasons. Over the years the capacity of the ponds have declined due to silting and needs to dredged. With climate change the wet and dry events during the year have become more severe and therefore there is an urgent need to dredge the ponds.

4. Climate change and the emergence of Witches' Broom Disease
   Due to unusually extreme wet events in the Caribbean over the past two years which the meteorological office attributes to climate change, there has been an emergence of a witches' broom epidemic throughout the country. The production has fallen to one third of the usual production levels. This is also seen in the genebank where wide range of genetic materials are held, many of them, susceptible to witches' broom disease. We have an epiphytotic in the collection at hand which requires frequent sanitation pruning. The usual pruning cycle which happens every 2 years in the genebank, which has proven to be inadequate under the epidemic. The witches' broom disease if not kept under control, depletes the carbohydrate reserves in the tree leading to eventual death. This is an urgent requirement

5. Duplication of the collection
   Using DNA fingerprinting we have identified a core collection that also included a number of strategic clones identified with promising traits (resistance to blackpod, witches' broom, frosty pod, drought tolerance, low cadmium uptake, light tolerance, pod development period, flowering time, pod index etc). We had cleared a land to duplicate this strategic collection. We need additional resources to duplicate this collection. This collection can also be used to identify potential molecular markers for various traits using genome wide association studies. Hence is of strategic importance to the industry.

Outreach

Planting material pipelines: Cocoa Research Centre and the ICGT has supported outreach developmental activities of many countries (Jamaica, Haiti, Dominica, St. Lucia, Grenada, Colombia, Ecuador, Peru etc) in the Latin America and the Caribbean region in particular (with support from other funding resources) to support the establishment of planting material pipelines in countries. These includes support to identifying superior germplasm and characterisation, set up clonal and seed gardens, fidelity testing of seed gardens and clonal gardens (DNA fingerprinting), assistance with setting up national collections or fidelity testing of national collections, training and setting up propagation and distribution infrastructure, assistance with deployment of cacao varieties in farmer fields.

Germplasm services: In addition to distribution of primary and enhanced germplasm to breeders, CRC also offers a global DNA fingerprinting service to countries and organisations.

Information dissemination and training: Information from the characterisation and evaluation of the cocoa genetic resources is transferred globally through International Cocoa Germplasm Database (ICGD) managed by the University of Reading (http://www.icgd.rdg.ac.uk/). CRC-UWI also offers short courses on

germplasm management, morphological characterisation and DNA fingerprinting to national conservation effort (sta.uwi.edu/cru/). CRC-UWI also has twitter, facebook and other social media presence.

Conclusion:

To facilitate a sustainable cocoa economy, the livelihood of cocoa farmers has to be improved. Genetic improvement of cocoa plays an important role in supporting sustainable cocoa production. The genebanks should play an important role in supporting the dispersed breeding efforts in cocoa producing countries through the provision of enhanced material, DNA and molecular marker services to support utilisation. Field genebanks provide the opportunity to evaluate germplasm for better utilisation but require consistent funding to modernise support to plant breeders.

Appendix 2

RAPPORT ANNUEL 2022 - 2023

COLLECTION INTERNATIONAL DE COCOTIER (*Cocos nucifera* L.) POUR L'AFRIQUE ET L'OCEAN INDIEN EN COTE D'IVOIRE : ETATS DES LEUX ET PERSPECTIVES

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(CNRA)
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Introduction

Le Traité International sur les Ressources Phytogénétiques pour l'Alimentation et l'Agriculture (TIRPAA) vise à assurer la sécurité alimentaire par la conservation, l'échange et l'utilisation durable des ressources phytogénétiques, tout en garantissant le partage équitable des avantages. Le cocotier fait partie des 64 cultures et plantes fourragères considérées comme les plus importantes pour la sécurité alimentaire et incluses dans le système multilatéral d'accès et de partage des avantages du traité.

Plus de 1 000 accessions de noix de coco représentant plus de 400 accessions sont conservées dans cinq banques de gènes internationales. La Collection Internationale pour l'Afrique et l'océan Indien (ICG-AIO) érigée en 1999 par la FAO et Bioversity International, est abritée par la Côte d'Ivoire et installée à la Station de recherche Marc Delorme sur le cocotier. Créée en 1949 par l'Institut de Recherche pour les Huiles et Oléagineux (IRHO), la station est gérée depuis 1998, par le Centre National de Recherche Agronomique (CNRA) qui est désormais sous la tutelle du Ministère d'Etat, Ministère de l'Agriculture et du Développement Rural (MEMINADER).

La collection ICG-AIO représente un atout indéniable pour la filière cocotier en Côte d'Ivoire et dans le monde. Le présent rapport consigne les activités de la filière cocotier et répond aux exigences de l'application du traité international en Côte d'Ivoire.

I. Description de la collection internationale de cocotier et de la Station Marc Delorme

Tant du point de vue du contenu (127 accessions naines et grandes) que de la diversité des origines (Afrique, Pacifique Sud, Extrême-Orient, Océan Indien, Amérique Latine) la collection internationale de cocotier pour l'Afrique et l'Océan Indien couvre une superficie de 998 ha et est installée sur la station de recherche Marc Delorme, constituée de 2 sites : (i) une concession de 788 ha, appelée "Bloc Génétique 500 ha" basée dans la commune de Port-Bouët, à Abidjan, et (ii) une concession de 210 ha, appelée "Annexe d'Assinie-Canal" localisée dans la périphérie de la ville de Grand-Bassam.

La station de recherche Marc Delorme s'est rapidement imposée comme un élément moteur essentiel du développement du cocotier en Côte d'Ivoire, en Afrique et dans le monde. En effet, le matériel génétique et les techniques culturales appropriées mises au point ont véritablement "révolutionné" la culture du cocotier en Côte d'Ivoire et dans le monde. De plus, la Station a établi une connexion internationale à travers le réseau international sur les ressources génétiques du cocotier (COGENT) et ses participations aux activités de la Communauté internationale du cocotier (ICC).

La station Marc Delorme à travers le programme de recherche sur le cocotier et en se basant sur la collection internationale continue d'assurer ses missions qui visent les points suivants :

- Assurer la vocation internationale de la station de recherche par une gestion efficace de ses ressources génétiques en collection ;
- Créer des hybrides performants: Tall x Dwarf, Tall x Tall, Dwarf x Tall, Dwarf x Dwarf;
- Permettre au matériel végétal mis au point d'exprimer son meilleur potentiel de production en développant des itinéraires techniques agricoles appropriées et des méthodes de lutte efficaces contre les insectes ravageurs et les maladies ;
- Assurer la formation des opérateurs de la filière cocotier, des élèves et des étudiants sur les bonnes pratiques agricoles afin d'améliorer la production du cocotier ;
- Contribuer à la valorisation des produits et sous-produits du cocotier.

La station de recherche Marc Delorme du Centre National de Recherche Agronomique (CNRA) est située au Sud-Est de la Côte d'Ivoire, entre 5°14' et 5°15' de latitude Nord et 3°54' et 3°55' de longitude Ouest (Figure 1). La Station repose sur des sols qui sont oxydes, de types ferralitiques lessivés en bases. Le sol est composé à 96% de sable grossier. Jusqu'à une profondeur d'échantillonnage de 40 cm, le pH de l'eau est de 4,63, la teneur en carbone total

(C) est de 0,24 % et la teneur en azote total (N) est de 0,04 %, le phosphore assimilable (Pass) est de 65,8 ppm. Les teneurs en calcium (Ca^{2+}), potassium (K^{+}) et magnésium (Mg^{2+}) échangeables sont

respectivement de 0,202, 0,017 et 0,196 meq/100g. La capacité d'échange cationique (CEC) est de 1,17 meq/100g.

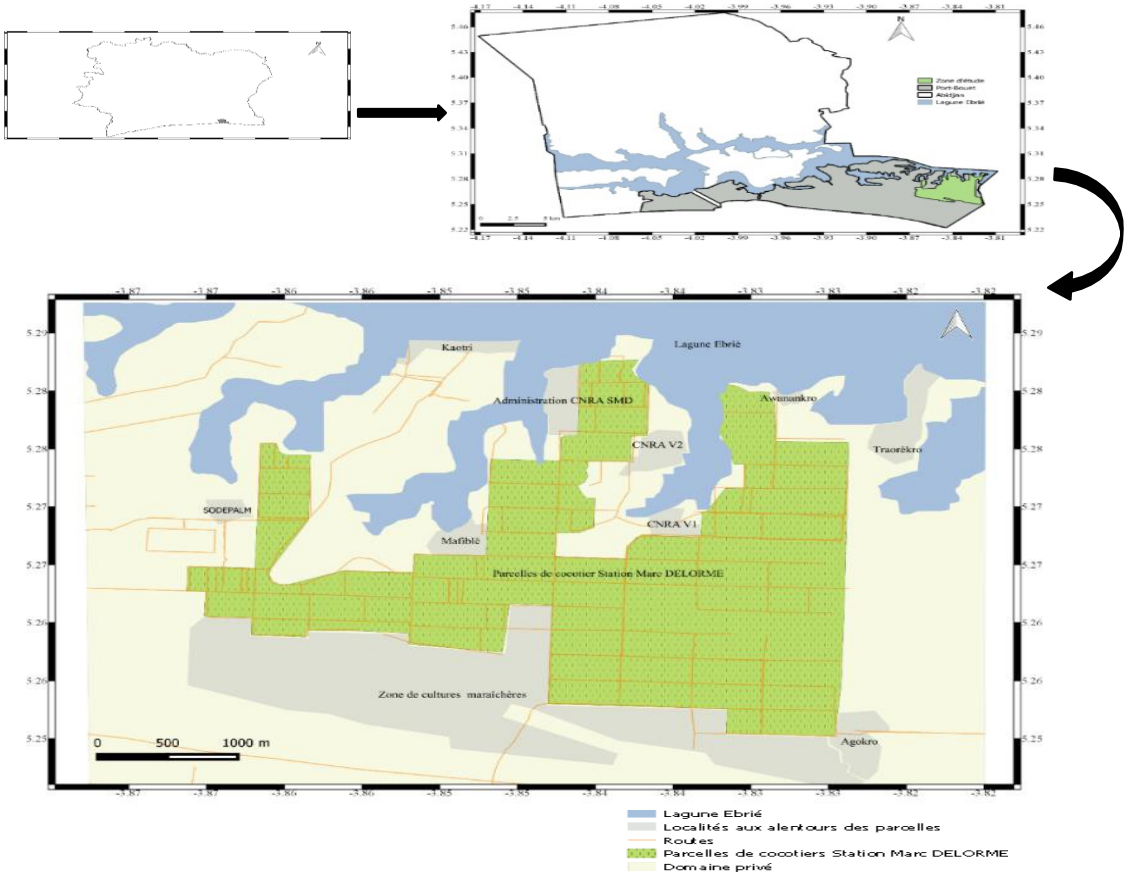


Figure 1. *Location de la station Marc Delorme*

II. Moyens de la Station cocotier Marc Delorme

2.1. Moyens humains

A ce jour, la liste du personnel comprend 123 permanents dont 9 chercheurs et 81 occasionnels, soit 204 travailleurs. Cet effectif est insuffisant pour assurer un bon fonctionnement de la station. Le tableau 1 consigne la liste et les coordonnées des chercheurs intervenant sur le cocotier.

La station Marc Delorme encadre actuellement cinq thèses de Doctorat et deux masters. Les sujets de recherche traités sont : i) la fertilisation des tomates en association culturale avec le cocotier à l'aide d'engrais organiques ; ii) la culture intercalaire de noix de coco et de bananes plantains ; iii) les effets des engrais organiques et du régime de gestion de l'eau sur la production du cocotier ; iv) la culture intercalaire avec le cocotier noix de l'artémisia, et v) l'influence de la variabilité climatique sur la production de différents hybrides de cocotier.

Tableau 1 : Noms et contact des chercheurs du programme cocotier

Nom et prénoms	Fonction	Email
Dr HALA N'Klo(*)	Directeur de la station Marc Delorme, Entomologie	fnhala@gmail.com
Dr DOUBI Bi Tra Serges(*)	Chef de Programme Cocotier, Génétique	doubitraserge@yahoo.fr / serges.doubi@cnra.ci
Dr DJAHA Konan(*)	Resposable de la division agronomie, Agrophysiologie	senadke@yahoo.fr

Dr OCHOU Germaine Elisabeth Cynthia(*)	Resposable de la division entomologie, Entomologie	germainelisabethcynthiaochou@gmail.com
Dr LEKADOU Tacra Thierry	Responsable du Département, Agropédologie	thierry_lekadou@hotmail.fr
Dr ALLOU Kouassi	Responsable du Département,	kouassiallou62@gmail.com
Dr KONAN KONAN Jean Louis	Directeur de la Recherche et de l'Innovation, Génétique	konankonanjeanlouis@yahoo.fr
Dr OKOMA Djeya Muriel	Technologue, conservation et transformation des produits agricoles	Muriel.okoma@gmail.com
SILUE Oumar	Biotechnologie, vitroculture	silueoumarnatogoma@gmail.com

(*) chercheurs résidant sur la station Marc Delorme

2.2. Infrastructures

L'inventaire des infrastructures fait état de 138 logements, un centre de santé, un groupe scolaire composé deux écoles primaires de 6 classes chacune et une école maternelle. En outre, il y aussi 5 édifices religieux, 29 bureaux et salles de réunion, 5 laboratoires (agronomie, génétique, défenses des cultures, Biotechnologie et technologie) et 17 salles de service.

2.3. Ressources phytogénétiques

Actuellement, la Côte d'Ivoire a réactivé ses activités dans le domaine de la culture *in vitro* d'embryons de cocotier. Ainsi, le laboratoire de biotechnologie situé à Adiopodoumé dispose d'équipement nécessaire a régénéré et conserver *in vitro* 22 accessions de types grands issues de la collection internationale et deux accessions introduites du Sri Lanka.

Sous forme vivante en parcelle, la collection internationale contient 127 accessions de types grands et nains issues de 58 principales variétés introduites à partir de toute la zone intertropicales (tableau 2).

Tableau 2. Ressources génétiques de cocotier dans la collection internationale pour l'Afrique et l'Océan indien à la station Marc Delorme

Numéro d'ordre	International cultivar name	Population	Marc Delorme	
			Nombre d'accession	Effectif arbre
1	Andaman Giant Tall		2	241
2	Andaman Ordinary Tall		2	256
3	Aromatic Green Dwarf		1	11
4	Baybay Tall		1	97
5	Brazilian Green Dwarf		2	243
6	Cambodia Tall	Battambang	2	150
7	Cambodia Tall	Kampot	2	139
8	Cambodia Tall	Koh Rong	2	142
9	Cambodia Tall	Kompong Trach	3	70
10	Cambodia Tall	Kopal Tani	2	11
11	Cambodia Tall	Ktis Battambang	1	15
12	Cambodia Tall	Ream	2	194
13	Cambodia Tall	Sre Cham	2	123
14	Cambodia Tall	Tuk Sap	2	172
15	Cambodian Green Dwarf		1	36
16	Cameroon Kribi Tall		2	226
17	Cameroon Red Dwarf		3	425
18	Catigan Green Dwarf		2	84
19	Comoro Moheli Tall		2	467
20	Equatorial Guinea Green Dwarf		2	232
21	Gazelle Peninsula Tall		2	303

22	Ghana Yellow Dwarf		3	445
23	Kappadam Tall		2	217
24	Karkar Tall		3	259
25	Kinabalan Green Dwarf		1	59
26	Laccadive Micro Tall		1	123
27	Laccadive Ordinary Tall		2	275
28	Madang Brown Dwarf		1	68
29	Malayan Green Dwarf		1	110
30	Malayan Red Dwarf		3	391
31	Malayan Tall		2	239
32	Malayan Yellow Dwarf		3	333
33	Markham Valley Tall		1	85
34	Mozambique Tall		3	471
35	Niu Leka Dwarf		3	288
36	Palu Tall		2	286
37	Panama Tall	Aguadulce	2	206
38	Panama Tall	Monagre	2	228
39	Pilipog Green Dwarf		2	50
40	Rangiroa Tall		2	250
41	Rennell Island Tall		2	668
42	Rotuman Tall		2	171
43	Solomon Islands Tall		3	263
44	Sri Lanka Green Dwarf		3	331
45	Sri Lanka Tall	Ambakelle	2	357
46	Tacunan Green Dwarf		1	57
47	Tagnanan Tall		3	1525
48	Tahitian Red Dwarf		1	31
49	Tahitian Tall		2	229
Numéro d'ordre	**International cultivar name**	**Population**	**Marc Delorme**	
			Nombre d'accession	Effectif arbre
50	Takome Tall		2	187
51	Tenga Tall		2	269
52	Ternate Brown Dwarf		1	78
53	Thailand Green Dwarf		1	131
54	Thailand Tall	Ko Samui	2	249
55	Thailand Tall	Sawi	3	558
56	Tonga Tall		2	199
57	Vanuatu Tall		2	487
58	West African Tall		2	203

III. Activités de recherche du programme cocotier

Au cours des cinq dernières années, le programme de recherche sur le cocotier était axé sur 13 activités de recherche : la gestion des ressources génétiques, la duplication des ressources génétiques en vue d'assurer leur sécurisation, la sélection de matériel performant (tolérant au jaunissement mortel, haut producteur, tolérant à la sécheresse,) l'étude des associations à base de cocotier, la gestion de l'eau et de la fertilité des sols sous cocoteraies, l'évaluation des effets du changement climatique sur la productivité du cocotier, l'étude du mécanisme de la transmission de la maladie du jaunissement mortel, la mise au point de méthodes de luttes intégrées contre les maladies et les ravageurs, l'amélioration des techniques de transformation des produits et sous-produits du cocotier, la détermination des caractéristiques physicochimiques, nutritionnelles et sensorielles des noix des cocotiers affectés par le jaunissement mortel du Cocotier (JMC), la valorisation des résultats de recherche et le renforcement des capacités des acteurs de la filière. L'ensemble des activités ont été déclinées en 25 actions de recherche. Ce qui a permis de montrer par exemple, que le JMC ne se

transmet pas à partir des embryons, qu'il y a des huiles essentielles qui permettent de traiter certains ravageurs tels que *Oryctès*, et que des sources de tolérances au JMC et à la sécheresse existent dans la collection internationale de Marc Delorme.

IV. Utilisation des ressources phytogénétiques et la filière cocotier en Côte d'Ivoire

L'utilisation judicieuse des ressources génétique en collection a permis à la recherche de sélectionner plusieurs hybrides selon les besoins des filières nationales et internationales. En Côte d'ivoire, les hybrides PB121 amélioré (figure 2) et PB113 amélioré permettent d'accroître les rendements qui sont passés de 0,6 t/ha/an à 4 t/ha/an en moyenne, ce qui a permis à la Côte d'Ivoire d'être le premier pays ouest africain exportateur noix de coco vers l'Union Européenne.

Ces deux hybrides sont utilisés dans plusieurs plantations ivoiriennes, africaines et internationales. En effet, le cocotier couvre une superficie de 50 000 hectares en Côte d'Ivoire pour une production annuelle de 57 millions de tonnes de coprah, soit 456 milliards de noix. Toutefois il existe encore quelques plantations de la variété locale *Grand Ouest Africain*. La culture du cocotier a une importance vitale pour des milliers de producteurs qui l'exploitent de multiples façons (noix de coco fraîche, huile alimentaire, matériau de construction, combustible, peat, huile dans le cosmétique, sucre de cocotier, etc.) (figure 3). La culture du cocotier, bien que représentant la principale culture de rente des populations du littoral ivoirien, demeure confrontée à l'urbanisation galopante et au Jaunissement Mortel du Cocotier.

Grâce à ses champs semenciers, à ses laboratoires de productions de pollens, la Côte d'Ivoire fournit du matériel végétal à tous les demandeurs de cocotier (tableau 3) aussi bien pour les besoins de recherche que pour le développement.

Tableau 3 : Liste des pays demandeurs de matériel génétique de 2020 à 2023

N°	Accession name	Pays demandeur	Forme de germplasm partagé (Noix / pollen / embryons etc)
1	Hybride amélioré PB121+	Cameroun, Serra Leone, Bénin, Guinée, Sénégal, Nigéria	Noix semences
2	Hybride PB113+		
3	Nain Vert de Brésil (NVB)	Cameroun	Noix semences
4	Nain Rouge de Cameroun	Cameroun	Noix semences
5	Nain Brun d'Indonosie (NBO)	Autralie	Embryons
6	Nain Brun de Papouasie Nouvelle Guinée (NBN)	Autralie	Embryons
7	Nain Nui Leka (NNL)	Autralie	Embryons

Figure 2 : Hybride amélioré PB121 en diffusion en Côte d'Ivoire

Figure 3 : Vue d'une unité d'exportation de noix de coco à Jacqueville

V. Perspectives

Bien d'activités de recherche devront être poursuivies pour soutenir la filière cocotier au niveau national et international. Aussi le programme de régénération de la cocoteraie qui a été suspendu en financement, devrait reprendre afin que les accessions devenues grandes, vieilles et inaccessibles puissent être utilisées par la recherche. La duplication des ressources génétiques en vue d'assurer leur sécurisation a besoin d'être soutenue pour être complète. La lutte contre le Jaunissement Mortel du Cocotier pour sélectionner du matériel tolérant et maintenir ce fléau isolé dans la zone d'infestation devrait pouvoir se poursuivre. Tous ces aspects ont besoin d'être accompagnés par une organisation de la filière cocotier afin que cette plante soit mieux valorisée et plus rentable pour les acteurs.

Conclusion

Le cocotier demeure la principale culture de rente des populations du littorale où aucune spéculation ne peut être bien rentabilisée. Le développement du cocotier est soutenu par un programme de recherche qui a l'avantage de disposer de la collection internationale pour l'Afrique et l'Océan Indien. Ce germoplasme reste à la disposition de tout utilisateur potentiel pour les besoins de recherche et/ou développement. L'essor de cette filière en Côte d'Ivoire est confronté à l'urbanisation galopante où les plantations sont abattues, les terres sont vendues pour les constructions de logement. Il est aussi confronté à la maladie du jaunissement mortel qui est pour l'instant isolé dans la zone de Grand-Lahou, où elle a détruit plus de 10 000 ha de cocoteraie et continue d'appauvrir les populations. Heureusement, des nouvelles plantations se développent en moyenne en Côte d'Ivoire et la recherche travaille sur le sujet.

Appendix 3

Informe anual de CATIE sobre la Implementación del Acuerdo en virtud del Artículo 15 del Tratado Internacional sobre los Recursos Fitogenéticos para la Alimentación y la Agricultura (TIRFAA)

1) Antecedentes

El Centro Agronómico Tropical Investigación y Enseñanza (CATIE) estableció desde finales de la década del 40, colecciones de germoplasma como una estrategia para enfrentar la creciente pérdida de diversidad de algunos de los cultivos de mayor importancia en la región mesoamericana. Las principales labores de nuestro banco de germoplasma es adquirir, conservar, caracterizar y distribuir el germoplasma que por sus atributos, son consideradas de interés prioritario para fortalecer y asegurar la seguridad alimentaria de la región, además de aportar conocimiento científico orientado a la optimización de la conservación de especies de importancia para la alimentación y la agricultura. En mayo de 2004 la gran mayoría del germoplasma fue puesto por CATIE bajo los auspicios de la FAO y desde el 16 de octubre de 2006 en virtud del Acuerdo bajo el Artículo 15, el acceso al germoplasma, (tanto para cultivos del Anexo 1 como para aquellos que no pertenecen al Anexo 1 del TIRFAA) se rige por el Tratado Internacional de Recursos Fitogenéticos para Alimentación y Agricultura (TIRFAA) y su distribución se realiza bajo los términos descritos en el Acuerdo Normalizado de Transferencia de Material (ANTM) en virtud del Artículo 15. Previo a cada reunión del Órgano Rector del TIRFAA las instituciones firmantes de este acuerdo deben someter un informe reportando las actividades de relevancia para la implementación dicho acuerdo para el período correspondiente.

2) Período del informe

Este informe proporciona una actualización de la implementación del Tratado, así como de las actividades e iniciativas de CATIE para el período comprendido entre agosto 2022 a junio 2023.

3) Conservación

3.1) Conservación en campo

Según los últimos inventarios, realizados en café (2019), cacao (2023) y otras colecciones de campo (2014), CATIE conserva un total de 4.497 accesiones.

A continuación, se detalla las cantidades de accesiones por taxón:

Colección	**Cantidad de accesiones conservadas**
Café (*Coffea spp*.)	1.928
Cacao (*Theobroma spp*.)	1.251
Pejibaye (*Bactris gasipaes*)	592
Achiote (*Bixa orellana*)	105
Sapotaceae	123
Sapindaceae	12
Myrtaceae	106
Cítricos (*Citrus spp*.)	65
Macadamia (*Macadamia integrifolia*)	17
Arecaceae	83
Varios Taxones	101
Jardín Botánico	114
Total	4.497

A excepción de café y cacao, es necesario para CATIE tener un inventario actualizado para conocer el estado real de conservación especialmente para *Bactris gasipaes, Bixa orellana* y las familias Sapotaceae y Myrtaceae, ya que por falta de recursos no ha sido posible hacerlo en los últimos 9 años. El estado sanitario de muchas accesiones de estos cultivos está en estado crítico y una probabilidad de pérdida de accesiones debido a la limitación de recursos.

3.2) Conservación de semillas ortodoxas en cámara fría (-18°C)

En cámara fría se conservan un total de 6.201 accesiones de varios taxones, según el inventario recientemente.
El detalle se presenta en el siguiente cuadro:

Familia botánica	**Cantidad de accesiones**
Cucurbitaceae	2332
Fabaceae	1688
Solanaceae	1482
Poaceae	412
Amaranthaceae	271
Malvaceae	8
Otras familias	8
Total	**6201**

Durante el período 2022-2023 se adquirieron y dejaron de conservar las siguientes cantidades de accesiones:

Colección	Adquiridas durante el período 2022-2023	Dejadas de conservar durante 2022-2023
Semillas ortodoxas	0	0
Café	0	0
Cacao	0	12
TOTAL	0	12

4) Dejadas de conservar

Durante el período de este informe se perdieron 12 accesiones de Cacao: 5B; LCTEEN-37/1; PMCT-11; B6/3; LCTEEN-127; PMCT-29; B-9/10-32; LCTEEN-237; NA-246; CRIOLLO-19; T-79/501; TSA-654.

5) Regeneración

Gracias al apoyo financiero del Crop Trust y del Tratado Internacional, durante el período del informe se regeneraron y establecieron en un nuevo sitio un total de 168 accesiones de café que estaban en riesgo de pérdida.

Figura 1. Accesiones de café regeneradas y reestablecidas en un nuevo sitio.

Con fondos del proyecto Biodiversity for Opportunities, Livelihoods and Development (BOLD) del Crop Trust, durante el período comprendido entre agosto 2022 a junio 2023 se han regenerado un total de 266 accesiones de los cultivos tomate, chile y ayote.

El detalle de accesiones regeneradas por cultivo se presenta en el siguiente cuadro:

Taxón	**Cantidad de accesiones con regeneradas**
Cucurbita	150
Lycopersicum	72
Capsicum	44
Total	**226**

6) Caracterización

Se caracterizaron morfológicamente 20 accesiones de cacao, quedando pendiente por caracterizar 1215 accesiones.

7) Duplicación

Durante el período entre agosto 2022 a junio 2023 no hubo duplicaciones de germoplasma.

8) Distribución

Usando el Acuerdo Normalizado de Transferencia de Material (ANTM), se distribuyeron 201 accesiones a 7 países.

A continuación, se detalla las cantidades y destinos del germoplasma distribuido:

Colección	Accesiones distribuidas	Países receptores
Café	97	Costa Rica, Honduras, Taiwán, Estados Unidos, Italia y Ecuador.
Cacao	10	Reino Unido
Semillas ortodoxas	94	Costa Rica y Estados Unidos.

Los receptores de este germoplasma incluyen agricultores, empresa privada e instituciones de investigación. El detalle de las especies, cantidades, países y otros detalles del material genético distribuido se presenta en el siguiente cuadro:

Tipo de colección	Tipo de Receptor	Cultivo	País	N° Accesiones
Semillas Ortodoxas	Agricultor	Amaranthus	C.R	2
Semillas Ortodoxas	Agricultor	Canavalia	C.R	1
Semillas Ortodoxas	Agricultor	Capsicum	C.R	12
Semillas Ortodoxas	Agricultor	Capsicum	USA	3
Semillas Ortodoxas	Agricultor	Coix	C.R	1
Semillas Ortodoxas	Agricultor	Crotalaria	C.R	1
Semillas Ortodoxas	Agricultor	Cucumis sativa	C.R	1
Semillas Ortodoxas	Agricultor	Cucurbita	C.R	15
Semillas Ortodoxas	Agricultor	Cucurbita	USA	3
Semillas Ortodoxas	Agricultor	Mucuna	C.R	2
Semillas Ortodoxas	Agricultor	Pachyrhizus	C.R	3
Semillas Ortodoxas	Agricultor	Phaseolus	C.R	8
Semillas Ortodoxas	Agricultor	Solanum betaceum	C.R	1
Semillas Ortodoxas	Agricultor	Solanum lycopersicum	USA	4
Semillas Ortodoxas	Agricultor	Solanum pimpinellifolium	C.R	1
Semillas Ortodoxas	Agricultor	Vigna	C.R	2
Semillas Ortodoxas	Agricultor	Zea mays	C.R	7
Semillas Ortodoxas	Centro de Investigación	Cannavalia	C.R	3
Semillas Ortodoxas	Centro de Investigación	Capsicum	C.R	4
Semillas Ortodoxas	Centro de Investigación	Cucumis metuliferus	C.R	1
Semillas Ortodoxas	Centro de Investigación	Oryza	C.R	3
Semillas Ortodoxas	Interno	Cajanus	C.R	6
Semillas Ortodoxas	Interno	Cannavalia	C.R	5
Semillas Ortodoxas	Interno	Pachyrhyzus	C.R	3
Semillas Ortodoxas	Interno	Vigna	C.R	2
Total colecciones de semillas ortodoxas				**94**
Tipo de colección	**Tipo de Receptor**	**Cultivo**	**País**	**N° Accesiones**
Cacao	Universidad de Reading	Cacao	Reino Unido	10
Total colección de cacao				10
Tipo de colección	**Tipo de Receptor**	**Cultivo**	**País**	**N° Accesiones**
Colección Internacional de Café	Agricultor	Coffea arabica	C.R	2
Colección Internacional de Café	Agricultor	Coffea arabica	Honduras	13
Colección Internacional de Café	Agricultor	Coffea arabica	Taiwan	39
Colección Internacional de Café	Agricultor	Coffea liberica	USA	2
Colección Internacional de Café	Agricultor	Coffea racemosa	USA	1
Colección Internacional de Café	Centro de Investigación	Coffea arabica	C.R	21
Colección Internacional de Café	Centro de Investigación	Coffea arabica	USA	9

Colección Internacional de Café	Centro de Investigación	Coffea liberica	C.R	3
Colección Internacional de Café	Centro de Investigación	Coffea pzeudozanguebariae	Italia	2
Colección Internacional de Café	Empresa privada	Coffea arabica	Ecuador	5
Tipo de colección	Tipo de Receptor	Cultivo	País	N° Accesiones
Colección Internacional de Café	Agricultor	Coffea arabica	C.R	2
Colección Internacional de Café	Agricultor	Coffea arabica	Honduras	13
Colección Internacional de Café	Agricultor	Coffea arabica	Taiwan	39
Colección Internacional de Café	Agricultor	Coffea liberica	USA	2
Colección Internacional de Café	Agricultor	Coffea racemosa	USA	1
Colección Internacional de Café	Centro de Investigación	Coffea arabica	C.R	21
Colección Internacional de Café	Centro de Investigación	Coffea arabica	USA	9
Colección Internacional de Café	Centro de Investigación	Coffea liberica	C.R	3
Colección Internacional de Café	Centro de Investigación	Coffea pzeudozanguebariae	Italia	2
Colección Internacional de Café	Empresa privada	Coffea arabica	Ecuador	5
Total colección de café				97

Además, CATIE distribuyó a 1 usuario mediante un Acuerdo de Transferencia de Material las 6 variedades de cacao mejoradas institucionalmente.

El detalle de esta distribución se presenta a continuación:

Tipo de Receptor	Variedades	País	Cantidad de variedades mejoradas
Agricultor (Agrícola Industrial la Lydia S.A)	CATIE-R1, CATIE-R4, CATIE-R6, CC-137, ICS-95, PMCT-58	Costa Rica	6

9) Financiamiento para la conservación y uso de los recursos genéticos

La mayoría de los fondos para el manejo agronómico de las colecciones ha sido aportado por CATIE. Además, algunas instituciones y empresas privadas han colaborado para el mantenimiento de las colecciones de café y cacao y regeneración de los cultivos de semillas ortodoxas, dentro de las cuales se puede mencionar las siguientes:

Cultivo	Instituciones y empresas privadas colaboradoras
Cacao	• Cocoa Research Assocation Ltd., UK • MARS WRYGLEY
Café	• Crop Trust • TIRFAA

Semillas ortodoxas	• Crop Trust

Para el caso de “Otras colecciones de campo” en los últimos dos años, el financiamiento no ha sido suficiente para dar un buen mantenimiento y algunas presentan un estado de salud crítico.

10) Colaboraciones interinstitucionales

El grupo de trabajo interinstitucional conformado por CATIE (Rolando Cerda, Carlos Araya, y William Solano), Crop Trust (Luigi Guarino, Hannes Dempewolf y Luis Salazar) y la Secretaría del Tratado (Alvaro Toledo y Daniele Manzella) en seguimiento a las acciones definidas en la Estrategia Global de Conservación de Recursos Genéticos de Café, logró ejecutar satisfactoriamente el proyecto “**Cleaning of 5 hectares of land, establishment and management of 168 accessions (1008 plants) rescued**”

Entre los principales logros del proyecto se pueden destacar las siguientes:

1. Un total de 1008 plantas, 6 por accesión, fueron injertadas sobre el portainjerto Nemaya y desarrolladas en vivero hasta que estuvieron listas para el campo.

2. Las 168 accesiones de café que fueron identificadas como en riesgo de pérdida se establecieron satisfactoriamente en el nuevo sitio.

3. Se limpió completamente de toda vegetación un terreno de 5 ha que será utilizado para el traslado de la colección internacional de café.

4. Se colocaron tuberías en el nuevo sitio de la colección de café con el fin de tener agua disponible para riego y manejo agronómico.

5. Las 168 muestras rescatadas fueron etiquetadas individualmente.

6. La compra de insumos y equipos fueron útiles para mejorar la eficiencia del trabajo de manejo agronómico de las plantas de las accesiones rescatadas en el nuevo sitio y de la colección completa.

Este grupo de trabajo ha logrado el financiamiento para iniciar el restablecimiento sistemático de la colección de café hacia el nuevo sitio. Los fondos provenientes de GIZ serán destinados en el período 2023-2024 para traslado de 400 accesiones lo que equivale a un 30% del total de accesiones de la colección racionalizada de café.

Appendix 4

Biennial report (2022-23) by ICBA on the implementation of the agreement under Article 15 of the International Treaty on the Plant Genetic Resources for Food and Agriculture (ITPGRFA)

ICBA joined ITPGRFA as signatory

On 10th March 2019, ICBA signed an agreement during an awards ceremony of the Khalifa International Award for Date Palm and Agricultural Innovation in Abu Dhabi in the presence of H.H. Sheikh Nahayan Mabarak Al Nahayan, Minister of Tolerance of the UAE, within the framework of Article 15 of the FAO International Treaty on Plant Genetic Resources for Food and Agriculture. After the agreement to the article 15, the crop germplasm collection stored in ICBA's gene bank formally became a part of the Multilateral System (MLS) of Access and Benefit-sharing (ABS), adding to the world's largest global gene pool of plant genetic material, available to farmers, plant breeders and scientists for the sustainable production of food from plants. This accord between the two institutions helped the researchers and other stakeholders to access the data on seeds of different crops/plants conserved in the ICBA genebank.

After signing the accord, the ICBA genebank complies with all the rules and regulations set by the treaty.

Seed Acquisition

ICBA has been collecting and conserving seeds of proven or potentially salt- drought and heat-tolerant plant species for research purposes at ICBA and other institutes with similar research interests. All seed samples added to the genebank collection have been acquired legally with relevant technical documentation. Most of the seeds ICBA has in its genebank have been obtained from international organizations, like ICARDA, CIMMYT, USDA, ILRI, which follow the prevailing international rules of seed dissemination. During 2022-23, ICBA collected seeds of more than 945 accessions belonging to 16 crops (Table-1). After receiving, the germplasm was properly documented and conserved in the genebank.

Table-1. Crop accessions obtained during 2022-23

S.N.	Crop	Species	Accessions
1	Barley, hulless	*Hordeum vulgare*	102
2	Barnyard millet	*Echinochloa sp.*	282
3	Camelina	*Camelina sativa*	43
4	Chickpea	*Cicer arietinum L.*	1
5	Colocynth	*Citrullus colocynthis* (L.) Schrad.	21
6	Common bean	*Phaseolus vulgaris* L.	1
7	Common vetch	*Vicia sativa* L.	1
8	Faba bean	*Vicia faba* L.	277
9	Oat	*Avena sativa*	1
10	Pea	Pisum sativum L.	4
11	Proso millet	*Panicum miliaceum*	164
12	Rice	*Oryza sativa*	1
13	Semitic poppy	*Papaver umbonatum* Boiss.	2
14	Single-flowered vetch	*Vicia articulata* Hornem.	1
15	Tepary bean	*Phaseolus acutifolius* A. Gray	31
16	Wheat	*Triticum spp.*	13

Seed Viability Tests

The viability of the seed accession is a measure of how many seeds are alive and could develop into plants that will reproduce themselves, given the appropriate conditions. It is essential to know that the seeds that are stored in a genebank will grow to produce plants. Therefore, they must have high viability (>85%) at the start and during storage. ICBA genebank uses standard germination tests for various crops to find seed viability and rejuvenate those seed stocks whose germinability is dropped below the threshold of 85%. For this purpose, hundreds of accessions of different crops are tested for their viability every year. During 2022-23, seeds of about 1,450 cultivars that represent 8 crops tested for their viability (Table-2)

Table-2 Seed germination tests during 2020-21 at ICBA

S.N.	Crop	Species	# of accessions
1	Barley	*Hordeum vulgare*	215
2	Quinoa	*Chenopodium quinoa*	22
3	Safflower	*Carthamus tinctorius*	342
4	Sorghum	*Sorghum bicolor*	342
5	Wheat	*Trticum aestvum*	6
6	Triticale	× *Triticosecale*	94
7	Mung bean	*Vigna radiata*	222
8	Lathyrus	*Lathyrus sp.*	207

Seed Regeneration

The most critical part of material conservation is that the seeds maintained in the genebank should be true to the type and show the accession's representative characteristics. Therefore, rejuvenation of the accession is necessary and must be carried out in the correct way to maintain the characteristics of the original population. Regeneration is also essential when the seeds' amounts go below a critical level. ICBA genebank works on regenerating crop accessions with lower viability or a lower number of seeds. The seeds of more than 1,500 accessions of 15 different crops multiplied during 2022-23 at ICBA field research facilities (Table-3).

Table -3. Seed multiplication of various crops at ICBA during 2022-23

S.N.	Crop	Species	# of accessions
1	Barnyard millet	*Echinochloa sp.*	282
2	Cowpea	*Vigna unguiculata*	1
3	Flax	*Linum usitatissimum*	121
4	Hulless barley	*Hordeum vulgare*	102
5	Lablab	*Lablab purpureus*	1
6	Leptochloa	*Leptochloa sp.*	1
7	Mung bean	*Vigna radiata*	205
8	Oat	*Avena sativa*	1
9	Pigeonpea	*Cajanus cajan*	1
10	Quinoa	*Chenopodium quinoa*	330
11	Sorghum	*Sorghum bicolor*	60
12	Sporobolus	*Sporobolus sp.*	65
13	Trifolium	*Trifolium sp.*	10
14	Triticale	× *Triticosecale*	315

15	Wheat	*Triticum sp.*	12

Characterization of Crops

Characterization of germplasm by its agronomic and morphological traits indicates the expression/variation of the botanical features. It is extremely important for the gene bank to enable the global research community to hunt and narrow down the search for genotypes/donors with the desired traits. It is also helpful for its taxonomical classification, which ultimately helps select the suitable cultivar for different purposes. Nevertheless, it is essential to accurately describe its characteristics, relationship with the environment, and usage. ICBA characterized more than 450 accessions of four important corps during 2022-23 (Table-4).

Table-4. Characterization of crops at ICBA

Crop	Species	# of accessions
Flax	*Linum usitatissimum*	142
Proso millet	*Panicum miliaceum*	200
Barley, hulless	*Hordeum vulgare*	102
Wheat	*Triticum sp.*	15

Seed Distribution

The ICBA is a non-profit institute; hence its genebank is not a commercial distributor of the seed it possesses. However, based on the U.N. list of Country Development Index (CDI), ICBA may charge the production cost of the seed to the requesters from the developed countries. The seeds of different accessions are accessible free of cost to any government/public sector, international research organizations and/or non-profit organizations from under-developed/developing countries user around the world for research and education purposes. ICBA followed the standard rules (national and international) to distribute crop/plant seeds to stakeholders in the UAE and other countries of the world. ICBA genebank supplied more than 840 seed samples of 25different crops (Table-5) to eighteen countries (Burkina Fasso, Botswana, Brazil, France, Gambia, India, Kazakhstan, Liberia, Mali, Morocco, Mozambique, Oman, Pakistan, Saudi Arabia, Togo, UAE, UK, Uzbekistan) around the world.

Table-5. Seed distribution by ICBA genebank during 2022-23

S.N.	Crop	Species	Seed samples
1	Amaranth	*Amaranthus cruentus*	1
2	Barley	*Hordeum vulgare*	18
3	Barnyard grass	*Echinochloa crus-galli*	1
4	Blue panic	*Panicum antidotale*	1
5	Buffel grass	*Cenchrus cilians*	1
6	Cowpea	*Vigna unguiculata*	152
7	Finger millet	*Eleusine coracana*	1
8	Foxtail millet	*Setaria italica*	2
9	Ghaf	*Prosopis cineraria*	1
10	Japanese millet	*Echinochloa frumentacea*	1
11	Jungle rice	*Echinochloa colona*	1
12	Lablab	*Lablab purpureus*	158
13	Melilotus	*Melilotus sp.*	1
14	Pearl millet	*Pennisetum glaucum*	153

15	Pigeon pea	*Cajanus cajan*	2
16	Proso millet	*Panicum miliaceum*	164
17	Quinoa	*Chenopodium quinoa*	13
18	Rice	*Oryza sativa*	6
19	Safflower	*Carthamus tinctorius*	3
20	Salicornia	*Salicornia bigelovii*	2
21	Samphire	*Salicornia europaea*	2
22	Sesbania	*Sesbania sesban*	1
23	Sesbania	*Sesbnia sesban*	1
24	Sorghum	*Sorghum bicolor*	155
25	Wheat	*Triticum aestivum*	1

Documentation of ICBA Genebank Accessions

Data on ICBA genebank accessions have been prepared according to the Multi-Crop Passport Descriptors [MCPD] standard. ICBA updates its data on genebank accessions every December and sends them to the FAO (PGRFA). The last update on the accessions preserved in the ICBA genebank was done on 31 December 2022 and sent to the PGRF (Link).

Appendix 5

CGIAR Report Concerning Centers' Implementation of their Article 15 Agreements: a submission to the Tenth Session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture

Contents

Executive summary

This report provides an update on the status, as of December 31, 2022, of the plant genetic resources for food and agriculture (PGRFA) collections maintained by the eleven CGIAR Centers that signed Article 15 agreements with the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty) in 2006. As of December 31, 2022, these Centers held almost 713,000 accessions of crop, forage and tree germplasm which they maintain in their genebanks and make available under the standard material transfer agreement (SMTA).

During the 16 years of their operation under the Plant Treaty framework, from January 2007 to December 2022 inclusive, CGIAR Centers' genebanks and breeding programs distributed close to 6 million PGRFA samples under more than 62,000 SMTAs. Thirty-two percent of those samples were sent to recipients in Asia, 21% to recipients in Africa, 15% to Latin America and the Caribbean, 14% to Europe, 12% to the Near East, and 5% and 1% to North America and Southwest Pacific respectively.

The report includes examples of CGIAR Centers contributions to *in situ* conservation of PGRFA, as well as to the implementation of farmers' rights, with a focus on women farmers, and in accordance with article 9 of the ITPGRFA. It also provides highlights of new capacity sharing projects with national partners that are being supported by the CGIAR Genebank Initiative.

Since the Ninth session of the Governing Body in 2022, CGIAR has been actively engaged in various international processes on access and benefit-sharing (ABS), including the process for the enhancement of the multilateral system of the ITPGRFA and the discussions on ABS and digital sequence information (DSI) under the Convention on Biological Diversity (CBD) and its Global Biodiversity Framework

Introduction

CGIAR regularly makes reports to the biennial meetings of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture (Plant Treaty), concerning the CGIAR Centers' operations under the framework of their 2006 Article 15 agreements with the Governing Body, and their contributions to the implementation of the Plant Treaty more generally[7].

These reports always include core information about holdings and distributions of PGRFA by the Centers under the Plant Treaty framework, and CGIAR contributions to Treaty-related activities and outcomes over the previous biennia.

In addition, CGIAR takes advantage of these biennial reports to periodically highlight additional aspects of our management and use of PGRFA both by genebanks and the breeding programs. For example, the CGIAR report to the Eight Session of the Governing Body featured additional information about the Centers' efforts to develop genebank Quality Management Systems, and to use genomic information to analyze genetic diversity within accessions. In our report to the Ninth Session of the Governing Body, we presented approaches and tools to add value to CGIAR Centers' collections, manage them more efficiently, and increase their use. We also included information about Centers' crop and forage pre-breeding and breeding activities in recent years. This report includes illustrative examples of CGIAR Centers' activities that contribute to *in situ* conservation of PGRFA and the recognition and implementation of farmers' rights. It also describes recent capacity building activities for national agricultural research organizations under the CGIAR Genebank Initiative.

CGIAR is also submitting two other reports to this session of the Governing Body with the following titles:

(i) *The status of implementation of the CGIAR Intellectual Assets Principles*[8] and

(ii) *Technical assistance to strengthen national agricultural research organizations' capacity to use digital sequence information: A submission from CGIAR.*[9]

[7] CGIAR reports to the Second, Third, Fourth, Sixth, Seventh, Eighth and Ninth Sessions of the Governing Body are available at www.fao.org/3/a-be157e.pdf, www.fao.org/3/a-be109e.pdf, www.fao.org/3/a-be118e.pdf; www.fao.org/3/a-mo439e.pdf; www.fao.org/3/a-mu437e.pdf; www.fao.org/3/nb776en/nb776en.pdf; and www.fao.org/3/ni851en/ni851en.pdf respectively

[8] Available at www.fao.org/3/cc7705en/cc7705en.pdf

[9] Available at hdl.handle.net/10568/131562

Past reports from CGIAR concerning the Centers' management of the Article 15 collections to the Plant Treaty's Governing Body[10], and to other international bodies, including the UN FAO's Commission on Genetic Resources for Food and Agriculture (CGRFA) and its Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture (ITWG-PGRFA) are available online. In particular, we encourage delegates to this Tenth session of the Governing Body to review the CGIAR reports to the Eleventh Session of the ITWG-PGRFA[11], held in May, 2023, and the Nineteenth Regular Session of the CGRFA[12], held in July 2023. These reports describe CGIAR Centers' activities that are relevant for the implementation of the CGRFA's Multi Year Programme of Work, and in particular CGIAR Centers involvement in:

- the preparation of the Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture
- the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture, with details about how Centers' activities contribute to advance all the groups of Priority Activities of the Second Global Plan of Action: *In situ* conservation and on-farm management; *Ex situ* conservation; Sustainable use; and Building sustainable institutional and human capacities
- the application of the Genebank Standards for Plant Genetic Resources for Food and Agriculture
- research and development activities focusing on the use of PGRFA for mitigating climate change.

We have chosen to reproduce only a few sections from those earlier reports here, partly because they are easily accessible online, following the links provided, and out of the felt need to keep this report relatively short.

Holdings and distributions under the Plant Treaty framework

Holdings by CGIAR Centers' Genebanks

The eleven CGIAR Centers that signed Article 15 agreements with the Governing Body of the Plant Treaty in 2006 currently conserve and make available, using the standard material transfer agreement (SMTA), a total of 712,938 accessions of crop, tree and forage germplasm. Details concerning the Centers, crop collections and numbers of accessions available for distribution under the SMTA are included in Table 1.

Table 1: PGRFA conserved and made available by CGIAR Centers' genebanks pursuant to their Article 15 agreements with the Governing Body

CENTER	CROP	ACCESSIONS AVAILABLE WITH SMTA
AFRICARICE	Rice	19,696
BIOVERSITY	Banana	1,690
CIAT	Beans	37,934
	Cassava	5,965
	Forages	22,662

[10] CGIAR reports re implementation of their Article 15 agreements to the Second, Third, Fourth, Sixth, Seventh, Eighth and Ninth Sessions of the Governing Body are available at www.fao.org/3/a-be157e.pdf, www.fao.org/3/a-be109e.pdf, www.fao.org/3/a-be118e.pdf; www.fao.org/3/a-mo439e.pdf; www.fao.org/3/a-mu437e.pdf; www.fao.org/3/nb776en/nb776en.pdf; and www.fao.org/3/ni851en/ni851en.pdf respectively. In addition, annual reports of the CGIAR Genebank Initiative are available at www.genebanks.org/resources/annual-reports/.

[11] CGIAR report to the Eleventh Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture is available at www.fao.org/3/cc4983en/cc4983en.pdf.

[12] CGIAR report to the Nineteenth Regular Session of the Commission on Genetic Resources for Food and Agriculture is available at www.fao.org/3/cc6722en/cc6722en.pdf.

CIMMYT	Maize	28,694
	Wheat	123,219
CIP	Andean roots and tubers	1,178
	Potato	7,362
	Sweet potato	6,149
ICARDA	Barley	31,851
	Chickpea	15,229
	Faba bean	9,594
	Forages	25,360
	Grasspea	4,301
	Lentil	14,342
	Pea	4,591
	Wheat	43,350
ICRAF	Fruit trees	8,246
	Multipurpose trees	6,744
ICRISAT	Chickpea	20,487
	Groundnut	15,237
	Pearl millet	24,533
	Pigeon pea	13,492
	Small millets	11,694
	Sorghum	42,814
IITA	Banana	392
	Cassava	3,184
	Cowpea	17,069
	Maize	1,561
	Misc legumes	6,868
	Yam	5,809
ILRI	Forages	3,914
IRRI	Rice	127,727
	Total	712,938

Source: Global Crop Diversity Trust/CGIAR On-line Reporting Tool, covering period up to December 31, 2022.

Distribution of PGRFA by CGIAR Centers

Overall picture

The CGIAR Centers have distributed more than 5,930,000 PGRFA samples under more than 63,000 SMTAs during the 16 years they have been operating under the Plant Treaty framework. The majority of the PGRFA distributed were improved materials from the Centers' breeding programs. While it varies from year to year, 20-25 % of the materials distributed are from the genebanks. Table 2 provides details of materials distributed (from both genebanks and breeding programs[13]) by each CGIAR Center.

Table 2: CGIAR Centers' transfers of PGRFA with SMTAs, 2007 to 2022/23. PUD stands for PGRFA under Development.

Center	SMTAs	Samples	PUD	From	To
AfricaRice	620	56,746	31,872	3/5/2007	12/8/2022
Bioversity	580	8,999	865	1/24/2007	12/14/2022
CIAT	3,077	298,291	36,646	1/5/2007	2/24/2022
CIMMYT	27,217	3,315,680	-	3/16/2007	1/10/2023
CIP	839	23,540	12,602	1/19/2007	8/7/2023
ICARDA	11,866	1,044,809	908,109	2/13/2007	1/9/2023
ICRAF	433	2,341	-	9/3/2011	8/8/2023
ICRISAT	6,482	324,095	106,034	12/7/2006	12/31/2022
IITA	1,240	52,154	-	3/7/2007	12/12/2022
ILRI	990	14,529	-	2/22/2007	3/1/2023
IRRI	9,730	792,018	456,092	1/4/2007	6/29/2023

Source: Plant Treaty Secretariat. Eighty percent of the materials referred to in Table 2 were sent to recipients in developing countries and countries with economies in transition. Twenty percent was sent to recipients in developed countries. More details concerning regional distributions of PGRFA by CGIAR Centers are provided in Figure 1.

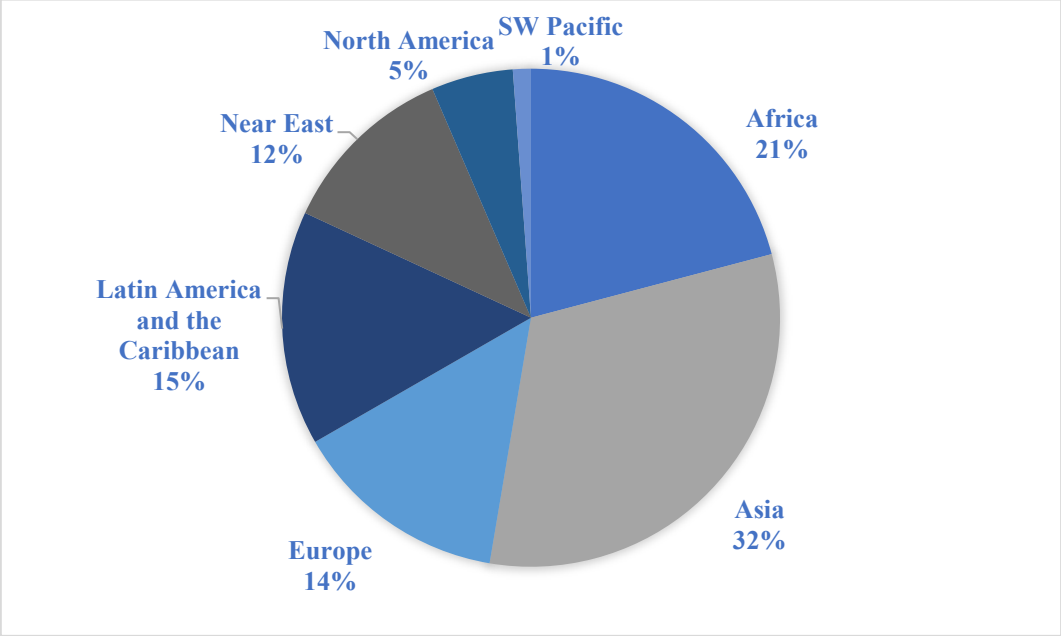


Figure 1: Regions of recipients of germplasm samples from CGIAR Centers' genebanks and breeding programs 2007-2022/23 inclusive.

[13] Not all Article 15 Centers have breeding programs, e.g., Bioversity, ICRAF, ILRI.

Transfers from CGIAR Centers' genebanks

There is considerable fluctuation, from year to year, in the ratio of materials the CGIAR Centers' genebanks send to recipients within the CGIAR (mainly breeders) and to recipients outside the CGIAR, as can be seen in Figure 3. Since 2017, the Centers' genebanks have been distributing more materials to recipients outside the CGIAR than internally. Some Centers do not have crop breeding programs (e.g., Bioversity, ILRI), so they have very few, or no, internal transfers. Most of the Centers do not fill out new SMTA for internal transfers, since doing so would mean entail a legal entity making a legal agreement with itself. Nonetheless, all such transfers are considered pursuant to the terms of the SMTA and all recipients of materials within Centers are bound by its terms and conditions.

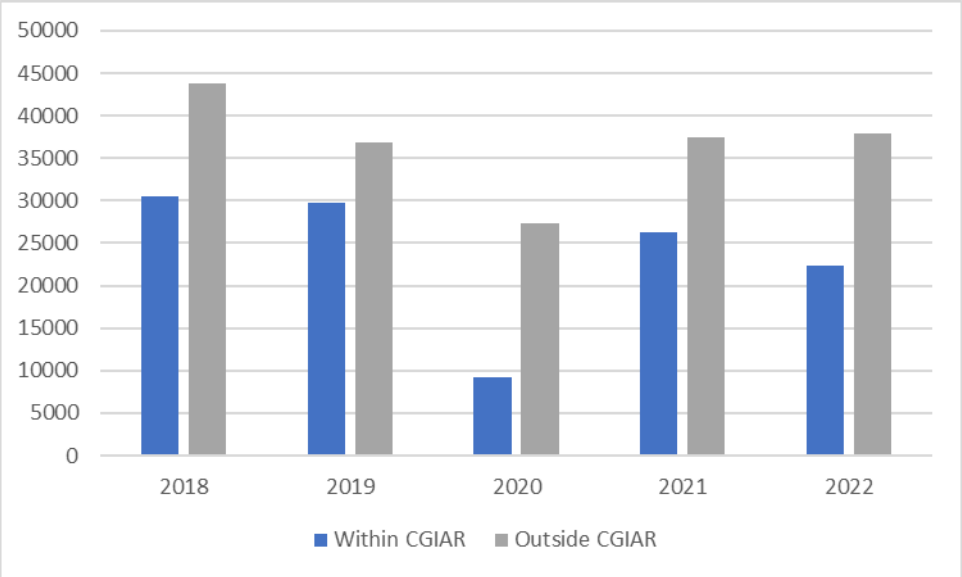


Figure 2: Accessions distributed annually with the SMTA by CGIAR Centers' genebanks from 2018 to 2022. Source: 2022 Annual Technical Report of the CGIAR Genebank Initiative; and ICRAF and ICRISAT genebank managers.

Figure 4 provides percentages for each type of recipients of samples from the CGIAR Centers' genebanks to recipients outside CGIAR, for years 2019-2022, with the largest groups being advanced research institutes and universities, and national agricultural research organizations and national genebanks. Transfers to commercial sector represented 13%, 15%, 7% and 6% of CGIAR Centers' genebanks' transfers in 2019, 2020, 2021 and 2022 respectively. Transfers to NGOs and farmers' groups have fluctuated considerably over these years: From 14% in 2019/20 to 4% in 2021/22.

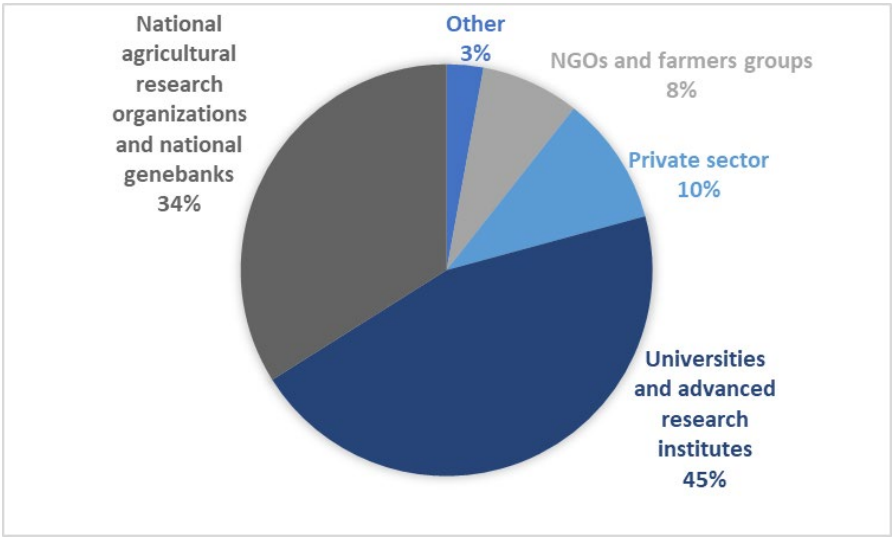


Figure 3: Types of recipients of germplasm samples distributed by CGIAR Centers' genebanks 2019-2022 inclusive. Source: 2022 Annual Technical Report of the CGIAR Genebank Initiative; ICRAF and ICRISAT genebank managers.

Distribution of non-Annex 1 materials

Only 1% of the PGRFA samples distributed by the Centers belong to non-Annex 1 crops. That said, out of ICRISAT's eleven mandate crops, six are non-Annex 1 crops. Since the establishment of the ICRISAT genebank and until 2007, 17.2% of the external distributions were of non-Annex 1 crops. Since 2009, when ICRISAT adopted the use of the SMTA for non-Annex 1 crops under the Plant Treaty, distribution of those non-Annex 1 crops has gone down but still continues above 10.0%. ILRI and CIAT forage collections and ICRAF collections of trees include many non-Annex 1 species too.

In the last 11 years (2012-2022/23), CGIAR Centers have distributed an average of 5,400 samples per year of approximately 140 species of non-Annex 1 crops, forages and trees; with annual figures fluctuating from 3,300 in 2012 to 8,000 in 2019. Groundnut, soybean, Bambara groundnut, foxtail millet and various forages have the highest numbers of distribution.

Following the decision of the Second Session of the Governing Body in 2009, the CGIAR Centers have been using the SMTA to distribute non-Annex 1 materials from their in-trust germplasm collections and other materials acquired with permission from the providers for the Center to make it available using the SMTA. Since that time, the CGIAR Centers have communicated repeatedly to the Governing Body that they would like to continue this practice. While the amount of non-annex 1 materials distributed by the Centers is small, transaction costs associated with maintaining a system for distributing non-Annex 1 materials differently from Annex 1 materials would be significantly greater. The Centers appreciate the administrative efficacy of being allowed to use the same transfer instrument for both Annex 1 and non-Annex 1 materials.

Safety duplication of Centers' genetic resources

Notable in 2022, was the effort to safety duplicate accessions in long-term conservation conditions in the Svalbard Global Seed Vault (SGSV) and other host institutes. ICARDA alone succeeded in duplicating more than 10,000 accessions in 2022, including replacing accessions that had been previously deposited in SGSV. Even more striking, ICRISAT safety duplicated nearly 78,000 accessions in 2022. A further four CGIAR Centers duplicated nearly 10,000 seed accessions. In addition, clonal crop collections are safety duplicated on an annual basis. The total number of safety duplicated accessions is approaching the target of 90% and has substantially improved the security of the collections managed by CGIAR Centers.

Box 1: ICRISAT's PGRFA safety duplication

As part of its strategy to secure and make the collection available in perpetuity, ICRISAT Genebank deposits duplicate samples of each unique accession at two geographically distant locations as a 'black box' arrangement. These locations are at the Svalbard Global Seed Vault (SGSV) and in other genebanks. ICRISAT has so far deposited 121,713 (94.89 % of legally available accessions) samples in SGSV and 114,123 (88.97% of legally available accessions) at four genebanks, viz. International Institute of Tropical Agriculture (IITA) in Nigeria, International Center for Agricultural Research in the Dry Areas (ICARDA) in Morocco, World Vegetable Center (WorldVeg) in Taiwan, and USDA-ARS Fort Collins (Table 3). ICRISAT expects to achieve the target indicator of 90% by the year-end.

Details of the ICRISAT Genebank germplasm safety duplicated at the first and second levels as a 'black box' arrangement.

S. No.	Crop	No. of acc. in genebank	No. of acc. legally available	No. of acc. second level safety duplicated (SGSV)	No. of acc. first level safety duplicated (various genebanks)
1	Sorghum	42880	42814	41658 (97.3%)	30000 (IITA, Nigeria), 10,000 (ICARDA, Morocco)
2	Pearl millet	24663	24533	22722 (92.6%)	10,000 (IITA, Nigeria), 10,000 (ICARDA, Morocco)
3	Chickpea	20838	20487	18551 (90.6%)	19,600 (WorldVeg, Taiwan)

4	Pigeonpea	13559	13492	13026 (96.5%)	10,000 (USDA-ARS), 2517 (NBPGR, New Delhi)
5	Groundnut	15360	15237	14769 (96.9%)	10,000 (USDA-ARS), 2006 (Regional Genebank, Niamey)
6	Finger millet	7513	7463	6809 (91.2%)	6472 (USDA-ARS, Fort Collins)
7	Foxtail millet	1542	1535	1507 (98.2%)	1289 (USDA-ARS, Fort Collins)
8	Proso millet	849	835	822 (98.4%)	659 (USDA-ARS, Fort Collins)
9	Little millet	473	462	462 (100%)	413 (USDA-ARS, Fort Collins)
10	Kodo millet	665	656	654 (99.7%)	584 (USDA-ARS, Fort Collins)
11	Barnyard millet	749	743	733 (98.7%)	583 (USDA-ARS, Fort Collins)
Total		**129,091**	**128,257**	**121,713** (94.9 % of legally available accessions)	**114,123** (88.97% of legally available accessions)

Long term partnership agreements

Four genebanks have reached performance targets for all or part of their collections (i.e., seed collections of AfricaRice, CIAT, IITA and IRRI) and a further five will reach targets in the next two years (ICARDA-Morocco, CIMMYT wheat, CIAT, Bioversity and CIP clonal crop collections). In 2022, Centro Internacional de Agricultura Tropical (CIAT) and the International Institute of Tropical Agriculture (IITA) negotiated long-term partnership agreements (LPA) with the Crop Trust, which means that from 2023, a large part of the running costs to maintain CIAT, IITA, and International Rice Research Institute (IRRI) seed collections will be financed in perpetuity. Further LPAs are expected to be rolled out in the next few years.

CGIAR Centers' contributions to *in situ* conservation of PGRFA

The following paragraphs present some illustrative examples of CGIAR Centers' activities that contribute to articles 5.1 c) and d) of the ITPGRFA.

The Alliance of Bioversity and CIAT, in cooperation with the Plant Genetic Resources Center of the Southern African Development Community (SPGRC) coordinated the project 'Bridging agriculture and environment: Southern Africa crop wild relative regional network', supported by the Darwin Initiative. The project carried out national crop wild relatives (CWR) inventories and identified CWR hotspots at national and regional levels. It established genetic reserves in Malawi, Tanzania and Zambia. It provided training on techniques for *in situ* conservation of CWR and helped the partner countries prepare National Strategic Actions Plans. The project developed a white paper for the creation of a regional network for the conservation and use of CWR in the Southern African Development Community (SADC). This proposal was approved at the Joint Meeting of the SADC ministers responsible for agriculture, food security and fisheries and aquaculture. Two hundred seventy-one priority areas for *in situ* and *ex situ* CWR conservation in 13 SADC countries were identified to form part of the regional network.

From 2016 until 2021, CIAT, CIP and IITA, together with CIRAD, joined forces under the CGIAR Research Program Roots, Tubers and Bananas (RTB) to develop a Crop *In situ* Conservation Knowledge Base which is currently fully operational and available for any user on the website rtb.crop-diversity.org/. The aim of this website is to document and share knowledge about the species, landraces and genetic diversity of priority RTB crops (such as bananas, cassava, potatoes, sweetpotatoes and yams). This data can then be openly consulted, allowing for better conservation, management, and use of these resources, including for crop improvement.

For many years, Bioversity International has pioneered the implementation of projects involving payments for agrobiodiversity conservation services (PACS), in Bolivia, Ecuador, Ethiopia, India, Malawi, Nepal, Peru and Zambia. PACS involves setting conservation targets, facilitating access to threatened seed varieties, exploring value chain development for conserved varieties, and motivating and rewarding farmers for

undertaking *in situ* on-farm conservation services of threatened genetic resources. In 2014, the Peruvian Ministry of the Environment decided to expand Bioversity International's small-scale applications of PACS in quinoa to several Andean locations, first for quinoa and amaranth and then for potato. Since 2019, the Ministry has been scaling up the use of PACS in four Andean regions through the Global Environment Facility project "Sustainable Management of Agrobiodiversity and Vulnerable Ecosystems Recuperation in Peruvian Andean Regions Through Globally Important Agricultural Heritage Systems Approach". PACS interventions have been realized across 190 community groups, involving 1,630 farmers (42% female) working with maize, potato and quinoa. Participating farmers are compensated through in-kind rewards identified by the farmer groups themselves, training, and social recognition.

The International Potato Center (CIP) has been developing a series of initiatives to systematically monitor on-farm conserved landrace populations. First, a series of key hotspots have been identified, and CIP and partners are systematically documenting the landrace diversity in each site into baselines (e.g., CIP, 2021). These geo- and time-tagged baselines include spatial, genetic, morphological, nutritional, agronomic, red listing and ethnobotanical information about each landrace. Second, the multilevel semi-standardized methods used for generating the baselines and systematic field-level monitoring are gradually being published as part of an on-farm conservation toolbox. Each tool is described in a series of didactical flyers (e.g., CIP, 2022). Third, significant advances have been made towards involving youth in landrace monitoring through citizen science. The digital tool used is called VarScout, and the landrace observations are stored on a website called WikiPapa (see: wikipapa.org/). The combination of a well-established network of hotspots, robust monitoring tools and a decision support platform make it possible to conduct timeline comparisons and actively monitor the conservation status of landraces on-farm.

CIMMYT has conducted studies to understand the drivers of farmers discontinuing cultivation of landraces of maize. Using historic collection data, farming communities and families of those originally contributing maize into the ex-situ collections were surveyed to understand current farming and landrace cultivation practices. Multiple and varied, context specific drivers of landrace de-adoption were observed, with cultivation tending to cease as one generation of farmers handed over cultivation to the next[14]. This work offers insights into potential youth and landrace opportunity focused interventions that could slow or halt the de-adoption observed.

CGIAR Centers' contributions to implementation of Article 9 – Farmers' Rights with a focus on women farmers

Gender-responsive breeding

Since 2018, CGIAR scientists have worked on a so-called G+ approach for gender–responsive breeding. The approach builds on the concept of a "product profile", which describes the traits that different actors want in a new variety, giving plant breeders a target. Men and women farmers often express different trait preferences that reflect the gendered division of rights and responsibilities in farming. Two G+ tools are now at the disposal of breeders to ensure that decisions about which traits to prioritize in future varieties have considered gender differences in knowledge, assets and decision-making, including the potential for harmful outcomes. The G+ tools in breeding are:

- The G+ Customer Profile helps a breeding program include a gender dimension in the definition of its priority target customer segments.
- The G+ Product Profile helps a breeding program include a gender-responsive evaluation of plant traits into an existing or proposed product profile.

These tools are currently being piloted on a selected set of CGIAR breeding programs, including banana, cassava and common bean breeding programmes. [15]

[14] Reference: McLean-Rodríguez, F.D., Camacho-Villa, T.C., Almekinders, C.J.M. et al. The abandonment of maize landraces over the last 50 years in Morelos, Mexico: a tracing study using a multi-level perspective. Agric Hum Values 36, 651–668 (2019). doi.org/10.1007/s10460-019-09932-3

[15] Reference: CGIAR Research Programme on Roots, Tubers and Bananas. 2023. Gender and Breeding. gender-portal.rtb.cgiar.org/breeding/

Fodder grasses for women's climate resilience

In Kenya and Ethiopia, climate change impacts result in frequent and prolonged periods of feed shortage, which are putting pressure on small-scale livestock keepers. This is a problem especially for women livestock keepers, for whom livestock represent an important productive asset that they can own, accumulate and manage. In response, CGIAR researchers have been introducing Brachiaria—a cultivated forage that carries great promise for the African dairy industry. Researchers used a gender-sensitive approach and provided community trainings that introduced the new forage, improved management practices and discussions of men and women's roles in land and labor-related decision-making. With new knowledge and skills, women livestock keepers are able to produce more and higher-quality Brachiaria forages. This has led to greater availability of milk in the household, increased household income from sale of both forages and milk, and opportunities for women to control how income is used. [16]

Roles of women farmers in seed-sector development

As a follow up to the project "Seed Sector Development in South Sudan" (2017-2019), in 2022, the Alliance of Bioversity and CIAT and the University of Wageningen, together with partners from South Sudan, carried out a study focusing on the roles of women farmers in seed systems, as custodians and managers of seeds and seed-related information. The study noted that these roles are not always recognized, and rewarded; it proposes a number of seed interventions to empower farmers, especially women farmers. [17]

Highlights of new capacity sharing projects with national partners supported by the CGIAR Genebank Initiative

Working in close collaboration with the Plant Treaty Secretariat, the CGIAR Genebank Initiative is supporting capacity sharing partnerships with national partners from 15 countries.

One group of projects, with partners from Uruguay, Guyana, Togo, Nigeria, Mauritius, and Zimbabwe, focusses on developing policy measures and standard operating procedures to implement, and operate under, the Plant Treaty's multilateral system of access and benefit-sharing. These projects also include training on use of a sub-setting tool to identify potentially useful materials in the CGIAR genebanks.

A second group of projects supports improved genebank operations, with partners from Chad, Niger, Mali, Rwanda, Madagascar, Zimbabwe, Tunisia, Bangladesh, Papua New Guinea, and Honduras. The projects include training for genebank personnel with respect to important genebank activities, including gap analysis, collecting, characterization, regeneration, evaluation, conservation, and accession level data management.

For both sets of projects, a 'medium length list' of potential partners was developed by reviewing the capacity building needs those countries expressed in their national compliance reports to the Plant Treaty's Compliance Committee and Governing Body. Invitations for expressions of interest were sent to those same countries' Plant Treaty National Focal Points. The top ranked expressions of interest were used as a basis for developing letters of agreement with lead partners from the countries listed above.

ICRISAT provided technical backstopping for four major projects operating across Africa: Sowing Diversity= Harvesting Security, Seeds for the Future, Seeds for Resilience and a GIZ project for food security in Chad and the Central African Republic. Capacity building and training provided by ICRISAT through these projects covered topics from the establishment of community seedbanks and seed production, to routine genebank operations and regeneration and characterization of accessions. Reaching new geographies, ICRISAT trained seeds center staff of Jazan Agricultural Research Center, in Saudi Arabia, on germplasm collection, conservation, and characterization, with funding from FAO KSA project.

[16] Reference: CGIAR Gender Platform, 2023. Six agricultural technologies CGIAR researchers have designed to work for women. www.cgiar.org/news-events/news/six-agricultural-technologies-cgiar-researchers-have-designed-to-work-for-women/

[17] Reference: Subedi, A.; Ngalamu, T.; van Uffelen, G.J.; Vernooy, R. 2023. The roles of women in seed-sector development in South Sudan. Policy Brief No. 83. Wageningen (Netherlands): Wageningen Centre for Development Innovation/Rome (Italy): Bioversity International. 10 p

In Latin America, CIP has established a network for cryopreservation and is now constructing a CryoVault that will conserve safety copies of clonal and recalcitrant seeds on behalf of the countries in the region. As part of this effort, a series of capacity building events have been organized. In 2022 and 2023, CIP has provided capacity building on in vitro and cryopreservation to staff from genebanks and research organizations from Argentina, Brazil, Colombia, Chile, Cuba, Ecuador, Guatemala and Panama.

Moving forward, CGIAR is working to respond to priorities expressed in the draft national reports on the implementation of the Second Global Plan of Action on Plant Genetic Resources, in the Global Crop Conservation Strategies and at the meetings of the CGRFA and the ITPGRFA. We underscore that that CGIAR genebanks are in a position to respond to some of the expressed needs for the repatriation of lost farmers varieties and landraces, for hosting safety duplicates, for gap analyses, cryopreservation and support in ensuring germplasm health and the regeneration of crop wild relatives.

CGIAR involvement in access and benefit-sharing related processes since the Ninth session of the Governing Body

Enhancement of the functioning of the Multilateral System of Access and Benefit-Sharing

Since the Ninth Session of the Governing Body's decision to relaunch negotiations to enhance the multilateral system, CGIAR participated in the 'Informal Consultative Process on DSI and Other Key Issues' held in Prangins, Switzerland, May 30-June 1, 2023. CGIAR scientists made presentations to that meeting which are available here. CGIAR also participated in the Tenth Session of the Open Ended Working Group to Enhance the Functioning of the Multilateral System of Access and Benefit-sharing held in Rome, Italy, July 11-15, 2023.

Under the framework of the CBD and the Kunming-Montreal Global Biodiversity Framework

CGIAR actively monitored and participated in discussions over the last year concerning digital sequence information (DSI)[18] under the framework of the Convention on Biological Diversity, including the Fifteenth Conference of the Parties of the CBD in Montreal in December 2022, which adopted the Kunming-Montreal Global Biodiversity Framework. CGIAR felt it was important to engage in that process to contribute scientific evidence and experiences from agricultural research organizations. As part of that process, CGIAR made two submissions to the CBD COP (and more recently, the Open Ended Working Group on DSI) that we feel are equally relevant to the Governing Body as it considers ways to address DSI in the context of the enhancement of the MLS. These submissions are:

- *Digital sequence information is changing the way genetic resources are used in agricultural research and development: implications for new benefit-sharing norms*[19]
- *Issues for further consideration concerning digital sequence information: a submission from CGIAR*[20]

These papers include inputs from over 30 CGIAR scientists and research leaders. They analyze how CGIAR Centers use DSI in their efforts to conserve and sustainably utilize the world's most important crop and livestock genetic diversity. Based on that substratum of scientific information, the papers reflect on which benefit-sharing options would provide effective policy support for the continued use of DSI in agricultural research and development.

Regarding capacity strengthening

Like many contracting parties and observers to both the CBD and Plant Treaty processes, CGIAR is concerned about the gap in technological capacity between richer and poorer countries to generate and use DSI. Research and development organization like CGIAR already play an important role with respect to

[18] Here we use DSI as a placeholder term, according to international negotiations under the Plant Treaty and the Convention on Biological Diversity.
[19] Available at cgspace.cgiar.org/handle/10568/125749
[20] Available at www.cbd.int/notifications/2023-003 - see paper number 24, under 'Observers'

generating and sharing non-monetary benefits and 'addressing the technology divide'; however, we feel the research community can and should play a still more active role in pursuit of this objective. To that end, CGIAR very much appreciates the Governing Body's initiative, as expressed in Resolution 16/2022, to ask the Plant Treaty Secretariat to gather and synthesize information about both demand for, and supply of, capacity strengthening related to DSI linked to plant genetic resources for food and agriculture, with the overall objective of working to close the capacity gap between developed and developing countries. In response to the open call for submissions issued by the Treaty Secretariat, CGIAR submitted, to this Tenth Session of the Governing Body, a report entitled *Technical assistance to strengthen national agricultural research organizations' capacity to use digital sequence information: A submission from CGIAR*.[21]

Regarding multilateral approaches

CGIAR is concerned about the potential impact of newly created norms on open science. If new norms requiring benefit-sharing from use of DSI are developed, they must not interrupt availability and exchange of data for use in agricultural research and development nor involve significant transaction costs. They should give rise to increase monetary and non-monetary benefit-sharing without introducing complicated, avoidable, new benefit-sharing formula.

The simplest multilateral approach, at least from the perspective of international agricultural research organizations, would be for national governments to agree to assume responsibility for making payments to a centralized benefit-sharing mechanism on behalf of their constituent commercializers, based on a to-be-agreed formula, for example, annual seed sales in the country. The national government would collect from constituent companies through nationally appropriate mechanisms. With such an approach, DSI generation, sharing, and access could not be affected at all, and all commercial users would be included within the system.

An alternative approach would be to revisit the so-called subscription system what was under consideration during the negotiation of the WG-EFMLS, 2013-2016, on the understanding that subscription payments would cover value of both PGRFA and DSI. The potential downside of this approach is that it can potentially be avoided, and it opens up the possibility of needing to 'police' the boundaries of the multilateral system (both PGRFA and DSI databases) to ensure it is not being used by non-subscribers.

CGIAR is concerned about the possibly of ending up with two different regulatory regimes: one for PGRFA under the Plant Treaty and one for DSI derived from those PGRFA under the CBD. Whatever emerges from the next period of negotiations across the different international fora must be harmonized and in synch, keeping administrative burdens to a minimum for actors conserving, using, and sharing genetic resources and DSI.

Cooperation with the Plant Treaty Secretariat

Communications among CGIAR Centers and the Secretariat of the Treaty are frequent and ongoing. Here we list just a few examples of areas of cooperation in 2022 and 2023, wherein the Plant Treaty Secretariat:

- Participated as special guests/resource people in several of the live sessions that are part of the 40-hour, 8 module, on-line course developed in 2021 by the CGIAR Genebank Platform entitled 'Genetic Resources Policies for CGIAR Scientists'. As of July 2023, almost 150 CGIAR breeders, genebank managers, intellectual property experts and legal officers have taken this course.
- Participated online in the Annual Genebank Meeting convened under the CGIAR Genebank Initiative.
- Cooperated with the CGIAR Genebank Initiative to launch calls for proposals for two rounds of capacity sharing projects as described in the section *Highlights of new capacity sharing projects with national partners supported by the CGIAR Genebank Initiative.*
- Participated as resource persons in four face-to-face capacity building workshops, focusing on developing measures to implement and operate under the multilateral system, organized under the

[21] Available at hdl.handle.net/10568/131562

CGIAR Genebank Initiative along with national partners from Togo, Zimbabwe, Guyana, and Uruguay.

- Participated in various events organized as part of the International Year of Millets 2023, in collaboration with the Global Crop Diversity Trust and ICRISAT, including an International Panel Discussion various national events in India, and G20 Summits in New Delhi, Indore, Hyderabad.
- Participated, together with various CGIAR experts, in the Global Crop Trust convened "Crop Conservation Meeting", held in Bonn, Germany
- Attended the opening of the Future Seeds genebank of the Alliance of Bioversity and CIAT in Cali, Colombia.
- Worked with CGIAR staff to develop submissions to the Working Group on the Post 2020 Global Biodiversity Framework, with a particular focus on ensuring the new global framework recognizes, measures and promotes conservation, sustainable use and access and benefit-sharing under the Plant Treaty.
- Joined the Champions and Challengers Group of the CGIAR work area "Genetic Innovation"
- Responded to occasional requests for advice/feedback from the CGIAR Scientists who convene the CGIAR Genetic Resources Policy Helpdesk.
- Visited and reviewed projects that are supported by the Plant Treaty Benefit-sharing Fund that are coordinated by CGIAR Centers or in which CGIAR scientists are involved.
- Attended the First Workshop for cryopreservation of plant genetic resources organized by CIP in Lima, Peru.
- Organized with the cooperation of CIP the Regional Consultation for GRULAC in 2022 in Lima, Peru, in preparation for GB9.

Appendix 6

Biennial Report on the ITPGRFA Article 15 Status of the International Coconut Genebank for the South Pacific (ICG-SP)

Summary

Since 2009, the Kokonas Indastri Koporesen (KIK) has been managing the threat of infection by the phytoplasma, Bogia Coconut Syndrome (BCS see http://www.cogentnetwork.org/bogia-syndrome-disease) to the International Coconut Genebank for the South Pacific (ICG-SP) in Papua New Guinea (PNG) The phytoplasma is transmitted by insect vectors and also affects other plant species, including Areca palm and Banana (Musa spp).

Kokonas Indastri Koporesen is progressing the relocation of the ICG-SP accessions from the current site at Stewart Research Station in Madang Province, to the new site in Punipuni, Milne Bay Province. Currently, the genebank holds a total of 50 accessions in the field genebank (see table below). The relocation process will adhere to the recommended procedure to pass via a certified pre-entry quarantine coconut nursery, at Kelababala on Misima Island also in the Milne Bay Province.

The strategy in relocating the collection is to source the germplasm from the original collection sites to reduce the risk of further spread of the phytoplasma to new coconut growing areas. The first lot of 12 accessions collected from Sothern Region were raised at the quarantine centre and were declared free of the phytoplasma after tests were done and had since been field planted. However, the seedlings were planted at Bubuletta in Alotau district Milne Bay Province and not at Punipuni because the procurement process of the genebank site was not completed at the time the seedlings were ready for planting.

Status of the collection

Current list of Accessions:

Table 1 List of designated Germplasm and planted in ICG-SP at SRS, Madang, PNG

SI No.	Date planted	Code	Name of Accession	Site of collection
1	1994	BBT	Baibara Tall	Village in Central Province
2	1995	ELT2	Hawain Tall	Village in East Sepik Province
3	1995	ELT3	Yangoru Tall	□
4	1995	ELT4	Vokio Tall	□
5	1995	ETT	Etalata Tall	Village in Musau Island
6	1994	GLT1	Pellavarua Tall	Plantation in East New Britain Province
7	1994	GLT2	Raulawat Tall	□
8	1994	GLT3	Natava Tall	□
9	1994	GLT4	New Massava Tall	□
10	1995	GMT5	Natava Many Fruited Tall	□
11	1995	GRT & GYT	Gazelle Red Tall & Gazelle Yellow Tall	Plantation in East New Britain Province
12	1995	HLT	Hisihu Tall	Plantation in Central Province
13	1995	KKT1	Guanaga Tall	Plantation in Karkar island
14	1995	KKT2	Kinim Tall	□
15	1994	KKT3	Ulatava Tall	Plantation in East New Britain Province
16	1994	KWT1	Severimabu Tall	Western Province
17	1994	KWT2	Boze Tall	□
18	1995	MBT3	Siagara Tall	Milne Bay Province
19	1995	MBT4	Bubuletta Tall	□
20	1994	MLT1	Lawes Tall	Manus Province
21	1994	MLT2	Lako Tall	□

SI No.	Date planted	Code	Name of Accession	Site of collection
22	1994	MLT3	Baluan Tall	□
23	1995	MVT1	Markham Farm Tall	Morobe Province
24	1995	MVT2	Liara Tall	□
25	1995	TRT	Talasea Tall	West New Britain Province
26	1994	NLT1	Karu Tall	Plantation in New Ireland Province
27	1994	NLT2	Kenapit Tall	Village in New Ireland Province
28	1996	NLT3	Sohu Tall	□
29	1994	OLT1	Saiho Tall	Village in Oro Province
30	1994	OLT2	Ajoa Tall	□
31	1994	OLT3	Kikibator Tall	□
32	1994	PLT	Poligolo Tall	Village in Central Province
33	1994	RIT	Rennell Island Tall	Numondo Plantation, WNBP
34	1995	SLT2	Wutung Tall	West Sepik Province
35	1994	VLT1	Miha Kavava Tall	Village in Gulf Province
36	1994	VLT2	Keakea Tall	□
37	1994	VLT3	Iokea Tall	□
38	1994	WLT1	Gaungo Tall	West New Britain Province
39	1994	WLT2	Naviro Tall	□
40	1994	PBD	PNG Brown Dwarf	Madang
41	1995	MRD	Malayan Red Dwarf	Duplicate from Kervera, ENBP
42	1995	MYD	Malayan Yellow Dwarf	□
43	1995	NGD	Nias Green Dwarf	□
44	1995	NRD	Nias Red Dwarf	□
45	1994	NYD	Nias Yellow Dwarf	□
46	1994	RRD	Rabaul Red Dwarf	□
47	1994	PRD1	PNG Red Dwarf 1	Village in ENBP
48	1994	PRD2	PNG Red Dwarf 2	□
49	1995	PYD	PNG Yellow Dwarf	Villages in Milne Bay & Oro Provinces
50	1995	IRD	Ikoea Red Dwarf	Village in Gulf Province

Status of acquisitions, regenerations, duplications and distributions

The germplasm collection will be re-established in Punipuni as the new ICG-SP site, see Annex 1. Plans are also on foot to duplicate all accessions in Fiji and Samoa. A project funded through the 4th call of the ITPGRFA Benefit Sharing Fund (PR363-Fiji) "Safeguarding Threatened Coconut Diversity Within the Upgraded International Coconut Genebank for the South Pacific" that built on the previous Darwin Initiative Project. PGRFA information will be shared through GLIS and COGENT. Those initiatives are linked to the COGENT Global Strategy for the conservation and use of CGR.

Progress Report (2020-2022) on the ICG work by the Kokonas Indastri Koporesen of Papua New Guinea

1. Introduction

This progress report covers the period 2020- 2022 of activities by the Kokonas Indastri Koporesen (KIK) for the management of the current genebank at SRS and relocation of the International Coconut Genebank to Punipuni.

This report covers three major areas:

(i) Relocation of International Coconut Genebank from Madang to Punipuni, Milne Bay Province via pre-entry quarantine nursery.

(ii) BCS containment through on-going buffer zone maintenance around the immediate vicinity of the current genebank and prospection of BCS tolerant planting materials disease areas.

(iii) Utilization of the current Genebank collection as source of planting materials for BCS affected areas.

1.2 Project Activities & Achievements

(i) Genebank relocation

No.	Activity	Achievements
1	*In-situ* collection of tall accessions from original sites in PNG, excluding Madang Province	✓ Twelve (12) accessions originally from the southern region of PNG have been recollected, established in the pre-entry quarantine nursery and have been field planted. ✓ Plans are being drawn up to do collections from original sites in New Guinea Islands and Momase except Madang.
2	Pre-Entry Quarantine Nursery (PEQN) at Kelababala, Misima Island, Milne Bay	✓ Planted **341 seedlings (2.38 Ha)** from 12 Southern Region Accessions at Kelababala as per KIK MOU with Samarai-Murua District – completed initial phase and next phase still pending.
4	Punipuni Genebank, Milne Bay Province	✓ Land for the ICG site at Punipuni has already been purchased and the land title given to KIK in November 2022. It is KIK's responsibility to fast track the establishment. ✓ Hydrology and Contour Mapping, Pest Risk Assessment, Soil Analysis conducted for the site.

(ii) Containment exercise through sanitation and provision of tolerant seedlings for planting

No.	Activity	Achievements
1	BCS Tolerance Screening Trials	✓ Field planted 30 accessions with total of 252 seedlings (1.8 Ha) at a BCS Hotspot in Madang Province in 2021 ✓ Planned to establish 2 additional replicates for screening trials
2	Prospection for seednuts from surviving palms in 3 affected districts in Madang Province (Bogia, Sumkar and Madang Districts)	✓ Identification & selection of tolerant cultivars – Started prospecting in Bogia and Sumkar Mainland in December 2021 and field planted at Stewart Research Station as replicate 1. ✓ Activities to continue
3	ICG-SP in Madang sanitation and upkeep.	✓ Slashing, Spraying, bridge, drainage upkeep & maintenance of buffer zones – On going. ✓ Processing of nuts for copra to control overgrown sprouted coconut seedlings – Ongoing. ✓ Data recording – Ongoing, ✓ Sanitation in smallholder coconut blocks within the immediate vicinity of the genebank. ✓ Assisted several farmers (in Kananam area) on replanting exercises in Madang Province – Ongoing.

BCS Tolerance Trial and prospecting for tolerant planting materials

The aim of this activity is to identify and select surviving local cultivars in BCS affected areas and concurrently screen for tolerant cultivars to the coconut rhinoceros beetle (CRB).

The tolerant screening trial established at Wafen in Madang district consists of the current tall coconut accessions from the genebank. Continuous observations will be made for visual symptoms, vector presence and sample collection for possible disease transmission.

This work will pave the way forward for further breeding work on Tall x Tall Crosses or Dwarf x Dwarf Crosses or Tall x Dwarf Crosses in the near future to select for new varieties that are tolerant or resistant to BCS and possibly CRB as well.

(iii) Germplasm Utilization

The ICG-SP at Stewart Research Station (SRS) in Madang continues to provide alternate sources of planting material to farmers affected by Bogia Coconut Syndrome. Genebank coconuts accessions were identified and selected based on their yield potential. In the absence of other seed gardens in the region and despite the threat from BCS, the ICG-SP at SRS continues to disseminate seed nuts as planting materials to the pest and disease affected farmers of Madang Province.

Table 2. Kananam Sanitation and Replanting for BCS and CRB affected farmers using germplasm conserved at the ICG-SP, both Local Talls and Dwarfs

Cultivar name	Cultivar Code	Collection Site	Total
Baibara Tall	BBT	Baibara	95
East Sepik Tall	ELT3	Yangoru	47
East Sepik Tall	ELT4	Vokio	82
Gazelle Tall	GLT1	Pellevorua	70
Gazelle Tall	GLT2	Raulavat	170
Gazelle Tall	GLT3	Natava	101
Gazelle Many Fruited	GMT5	Natava	61
Hisiu Local Tall	HLT	Hisiu	121
Karkar Tall	KKT3	Ulatava	33
Kiwai Tall	KWT1	Severimabau	34
Kiwai Tall	KWT2	Bose	77
Manus Tall	MLT1	Lawes	69
Manus Tall	MLT2	Lakui	141
Manus Tall	MLT3	Baluan	85
Namatanai Tall	NLT2	Kenapit	102
Namatanai Tall	NLT3	Sohu	87
Oro Local Tall	OLT1	Saiho	78
Oro Local Tall	OLT2	Ajoa	105
Oro Local Tall	OLT3	Kikibator	50
Poligolo Tall	PLT	Poligolo	74
Vailala Local Tall	VLT1	Miha Kavava	88
Vailala Tall	VLT2	Keakea	37
Vailala Tall	VLT3	Iokea	50
West New Britain Tall	WLT1	Gaungo	44
West New Britain Tall	WLT2	Vario	109
Malaysian Yellow Dwarf	MYD	Exotic	32
Malaysian Red Dwarf	MRD	Exotic	4
PNG Brown Dwarf	PBD	Madang	9
Total			**1,806**

Table 3: Seednuts Supplied to Farmers in Madang Province (2020 & 2022)

No	Village Name	Cultivar Name	Code	Quantity
1	**Yoidig**	Raulawat	GLT2	100
		West New Britain local Tall- Naviro	WLT2	100
		Baibara Tall- Central	BBT	100
		Hishu Tall-Central	HLT	100
		Oro Local Tall-Saiho	OLT1	100
		Namatanai Local Tall-Kenapit	NLT2	100
		West New Britain local Tall-Gaungo	WLT1	100
		East Sepik Tall-Vokio	ELT4	100
		Sevrimabu Tall -Western	KWT1	100
		Namatanai Local Tall-Karu	NLT1	100
		Markham Valley Tall-Farm	MVT2	50
		Vailala Tall-Keakea	VLT2	50
		Wutung Tall-Sandaun	SLT2	100
		Karkar Local Tall-Kinim	KKT2	100
		Markham Valley Tall-Farm	MVT2	100
		Karkar Local Tall-Guanga	KKT1	100
	Total			**1500**
2	**Kablimas**	Namatanai Local Tall-Karu	NLT1	78
		East Sepik Tall-Yangoru	ELT3	22
		East Sepik Tall- Vokio	ELT4	100
	Total			**200**
3	**Baruedig**	Vailala Tall-Miha Kavava	VLT1	102
		Vailala Tall-Keakea	VLT2	100
		Sevrimabu Tall -Western	KWT2	50
	Total			**252**
4	**Bagildig**	Kakar Local Tall- Gaunga	KKT1	15
		Bougainville Large Fruit	BLF	5
		Gazelle Local Tall- Raulawat	GLT2	10
		Milne Bay Tall-Bubuletta	MBT4	20
		Gazelle Local Tall- New Massava	GLT4	20
		Poligolo Tall-Central	PLT	28
		East Sepik Tall-Yangoru	ELT3	8
		East Sepik Tall-Hawain	ELT2	12
	Total			**118**
5	**Kananam**	Markham Valley Tall-Liara	MVT1	5
		East Sepik Tall-Hawain	ELT2	15
		East Sepik Tall- Vokio	ELT4	2
		Karkar Local Tall-Ulatava	KKT3	2
		Baibara Tall- Central	BBT	2

		Poligolo Tall-Central	PLT	5
		Rennel Island Tall	RIT	5
		Wutung Tall-Sandaun	SLT	2
		Gazelle Local Tall- Pellavarua	GLT1	2
	Total			**40**
6	**Awaudig**	Karkar local Tall-Kinim	KKT2	28
		Rennel Island Tall	RIT	40
		Bougainville Large Fruit	BLF	32
	Total			**156**
7	**Barikas**	Karkar Local Tall-Gaunga	KKT1	51
		Gazelle Local Tall- Pellavarua	GLT1	25
		Bougainville Large Fruit	BLF	26
		Rennel Island Tall	RIT	5
	Total			**403**
8	**Sokaka**	Karkar Local Tall-Gaunga	KKT1	15
		Gazelle Local Tall- Raulawat	GLT2	10
		Bougainville Large Fruit	BLF	5
		Rennel Island Tall	RIT	3
	Total			**543**
9	**Sempi**	Rennel Island Tall	RIT	**3**
Total Seednuts Distributed To Farmers				**3,215**

Table 4: Seednuts Supplied to Nurseries in Madang Province 2020 & 2022

No.	Site	Cultivars Distributed					
		Talls	**Code**	**Quantity**	**Dwarf**	**Code**	**Quantity**
1	**Usino Nursery**	Gazelle Local Tall- Natava	GLT3	148			0
		Markham Valley tall-Liara	MVT2	155			
		Manus Local Tall- Lako	MLT2	191			
		East Sepik Local Tall-Vokio	ELT4	169			
		Wutung Local tall-Sandaun	SLT2/WTT	72			
		Hishu Local Tall- Central	HLT	129			
		Baibira Local Tall- Central	BBT	67			
		West New Britain Local Tall-Gaungo	WLT1	93			
		East Sepik Local Tall-Yangoru	ELT3	170			
		East Sepik Local Tall-Hawaiin	ELT2	191			
	Total			**1,385**			0

2	**ISD Nursery - Madang (SRS)**	East Sepik Local Tall-Hawaiin	ELT2	379	Malayan Red Dwarf	MRD	505
		East Sepik Local Tall-Yangoru	ELT3	342	Malayan Yellow Dwarf	MYD	543
		Markham Valley Tall-Farm	MVT1	337	PNG Brown	PBD	500
		Markham Valley Tall-Liara	MVT2	326	**Total**		**1,548**
		Rennel Island	RIT	0			
		Karkar locall Tall-Guanga	KKT1	362			
		Karkar locall Tall-Kinim	KKT2	331			
		Oro Local Tall-Kikibator	OLT3	170			
		Namatanai Local Tall-Sohu	NLT3	198			
		Gazelle Local Tall-New Massava	GLT4	356			
		Kakar Local Tall- Ulatava	KKT3				
		Gazelle Local Tall - Pellavarua	GLT1	363			
		West New Britain Local Tall-Naviro	WLT2	274			
		Vailala Local Tall-Keakea	VLT2	335			
		Oro Local Tall-Kikibator	OLT3	308			
		Etalata Local Tall	ETT	326			
		West New Britain Local Tall-Gaungo	WLT1	301			
		Hishu Local Tall- Central	HLT				
		Rennel Island Tall	RIT				
		East Sepik Tall - Vokio	ELT4	416			
		Namatanai Local Tall-Karu	NLT1	359			
		West New Britain Local Tall-Naviro	WLT2				
		Oro Local Tall-Saiho	OLT1	247			
		Oro Local Tall-Ajoa	OLT2	341			
		Total		**6,071**			
3	**Udisis**	Karkar Local Tall-Guanaga	KKT1	204	Malayan Red Dwarf	MRD	500
		Milne Bay Local- Siagara	MBT3	222	Malayan	MYD	500

					Yellow Dwarf		
		Vialala Local Tall- Iokea	VLT3	200	**Total**		**1,000**
		Gazelle local Tall- Raulawat	GLT2	200			
		Hishiu local tall- Central	HLT	200			
		Manus local tall- Lawes	MLT1	205			
		Karkar Local tall - Kenim	KKT2	234			
		Namatanai Local Tall- Kenapit	NLT2	200			
		Markham Valley Tall- Liara	MVT1	144			
	Total			**1,809**			

Soil Sample Analysis from the Germplasm Collection Sites

Soil samples were also collected and analysed to assess the basic nutrient status of the soils at the current ICG-SP sites in Madang Province in 2022 and early 2023 and the results are shown in the table below.

		Ca	CEC	N	pH	OC	Cl	SO4 3	B	Zn	Mn	P	K	Na	Mg
Lab Number	Sender Reference	(m.e%)	(m.e%)	(%)		(%)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(m.e%)	(m.e%)	(m.e%)
230046	T709T S2 (SRS)	15.7	29.5	0.327	6.48@25.6	3.43	32.8	3.4	0.15	2.65	13.1	2.3	0.547	0.345	3.92
230047	T709T S1 (SRS)	16.3	29.3	0.341	6.45@25.2	3.9	34.4	5.7	0.22	2.7	9.78	2	0.72	0.298	3.29
230048	T709D S1 (SRS)	16.6	30.1	0.323	6.19@25.5	3.74	33.6	8.7	0.13	3.39	10.9	3.3	0.82	0.314	3.93

Genetic Diversity assessment at the current ICG-SP

The assessment of genetic diversity physically at the current ICG-SP was too narrow with only 0.5 % significant difference using R-Statistics on Mahalanobis genetic distance assessment from the current 39 tall accessions and 11 dwarf accessions. The plan is once the Punipuni Genebank is fully established in Milne Bay Province, there will be new and additional accessions from within PNG and the Pacific regions as well as from other coconut growing countries through germplasm exchange. In Madang, the threat of BCS does not allow further improvement of new accessions, however, the study of tolerance continues from the accessions taken from surviving palms in BCS affected areas.

Figure 1 shows the Dendrograms of Local Tall accessions at ICG-SP (Trial 709) showing linkage between cultivars and the mahalanobis genetic distance by r-statistics analysis 2018-2022 data.

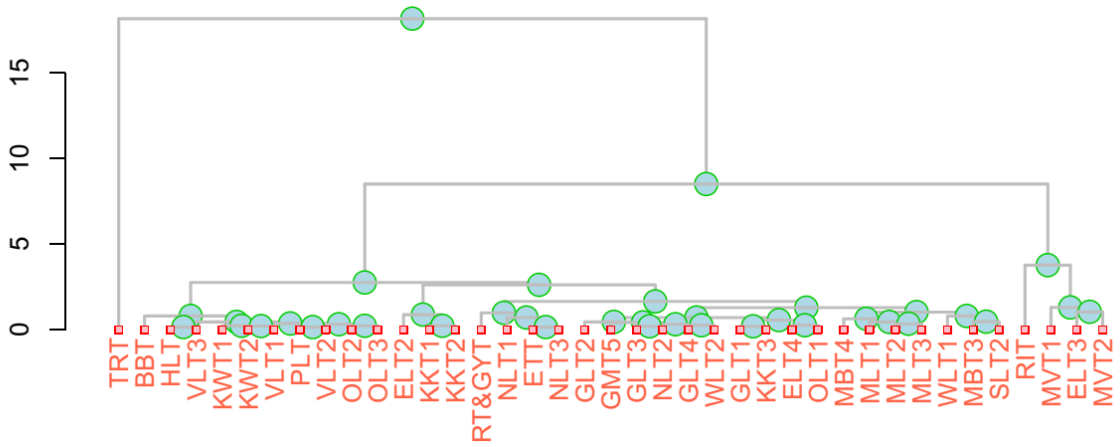


Figure 1. Dendrogram of Talls showing genetic distance between the different cultivars
(The value of Wilks statistics is p=0.03. p<0.05)

The results in the graph (Figure 1) above indicated that the local tall accessions at the current germplasm collection at the ICG-SP in SRS Madang are closely related. This result suggests that more collections must be undertaken within PNG, and the need to request for germplasm exchange from other member countries.

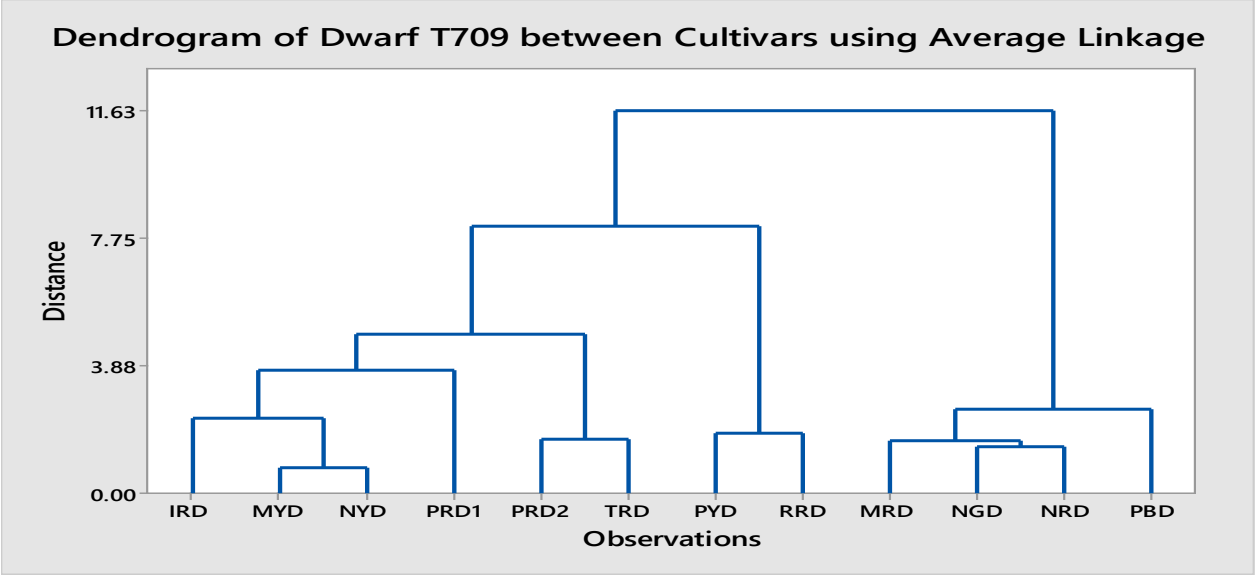


Figure 2. Genetic diversity amongst the dwarf accessions
(The value of Wilks statistics is p=0.009. p<0.05).

Figure 2 also showed that the dwarf accessions are closely related, therefore the need for further collections within PNG and germplasm exchanges through importation of exotic varieties to increase the genetic pool of diversity of the dwarf accessions.

PROGRAM 3: RELOCATION OF GENEBANK FROM MADANG TO PUNIPUNI, MILNE BAY

Objectives

The objectives are: (1) relocation of International Coconut Genebank from Madang to Punipuni, Milne Bay Province, and (2) establishment and management of Quarantine Nursery on Misima Island

Activity 1. Pre-entry quarantine nursery at Kelebabala, Misima Island

Progress

The aphid proof Pre-Entry Quarantine nursery sheds (3 sheds) is being maintained for the next recollection program of seed-nuts from the original sites after the procurement of the land at Punipuni.

In the last quarter of 2019, Research and Development team assisted our Industry Services Division with the establishment of the Coconut Seed Garden at Kelababala. A total of 341 seedlings from 12 accessions were field planted. The major reason is for the Seed Garden establishment is to cater for the provision of seedlings for the replanting program for the district. This is as per the MOU between KIK and Samarai-Murua District. The Seed Garden will be managed by the Coconut Development Officer for Milne Bay Province in collaboration with the District Rural Development Officer for Samarai Murua.

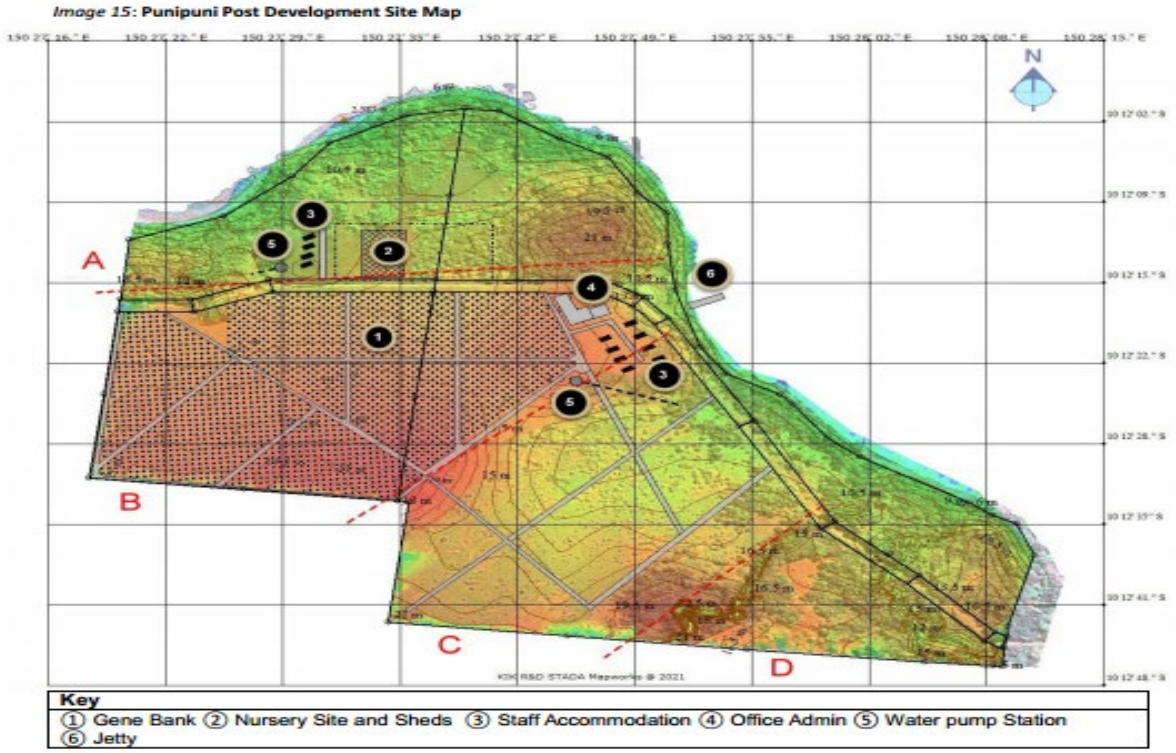
Activity 2. Development and Establishment of Genebank Infrastructures at Punipuni

The main objectives of this activity are (1) to establish infrastructure; staff houses, office complex, workshops, nursery area, drainage and roads in Punipuni and (2) to duplicate the ICG-SP and establish a Research Station in Milne Bay Province

Progress

In the fourth quarter of 2022, Punipuni plantation was finally procured by Kokonas Indastri Koporesen (KIK) from Maramatana Local Level Government (LLG) and the land title was handed over to KIK. The proposed development plan below **(**Figure 3) was compiled in the fourth quarter of 2022 in anticipation of development work to commence in 2023.

The International Coconut Genebank (ICG-SP) will have a similar design to the International Coconut Genebank at Stewart Research Station, Madang Province, however, with three replications. The plan will consist of Coconut Breeding and Coconut Farming Systems Trials. The proposed development plan designed below (Figure 3) will be implemented by R&D staff in the fourth quarter of 2023. The recruitment of key personnel for Punpuni is well underway.



Key A: Site 1, Key B: Site 2, Key C: Site 3, Key D: Site 4

Key 1 Gene bank site [plan lay out for 2077 new planting in a spacing of 9 x 9 covering a total area spacing of 40.37 ha.

Key 2 coconut nursery area allowing room for expansion.

Key 3 Staff accommodation planned 4 duplex unit located next to the nursery and eight senior staff accommodation.

Key 4 Office administration complex

Key 5 establish two (2) ground water pump station.

Key 6 Jetty

Building of a 6 km road network

Building of a 3.06km drain network.

Area site clearance 33.32 ha over burden @ 1/2m = 1,434,673.6 m³

Figure 3: Proposed Development Plan for Punipuni Plantation

附件

决议草案内容

（待纳入关于与其他国际组织合作的第/2023 号决议）**

第 15 条机构

管理机构：

忆及《国际条约》第 15 条第 1 款和第 5 款的规定，及其之前关于根据《国际条约》第 15 条签订协定的机构的决议；

1. **注意到**根据《国际条约》第 15 条签订协定的机构在报告中提供的信息，**赞扬**提交报告的机构所提供的宝贵内容，**提请**这些机构继续向管理机构今后例会提供类似信息；

2. **还赞扬**根据《国际条约》第 15 条签订协定的国际农业研究磋商组织下属 11 个中心向管理机构提交了一份联合报告，**进一步提请**这些机构继续向管理机构今后例会提交类似的联合报告；

3. **敦促**尚未提交任何报告的机构在管理机构第十一届会议上提交报告，并**要求**秘书向这些机构传达这一紧迫要求；

4. **还要求**秘书在财政资源允许的情况下，继续与根据《国际条约》第 15 条签订协定的机构定期举行磋商，讨论协议和政策指导的执行情况，包括与《标准材料转让协议》有关的收集品中粮食和农业植物遗传资源的转让，并向管理机构例会报告；

5. **注意到**为确保有序保管存在风险或受到威胁的安全而正在开展的工作，并**要求**秘书继续履行职责，根据《国际条约》第 15 条提供支持，酌情与东道国政府密切合作，并与其他有能力为这些工作提供资金、技术和其他必要支持的有关政府和相关机构合作；

6. **敦促**缔约方、捐助方和其他利益相关方提供必要的经济和物质支持，推动相关工作；

7. **再次**提请尚未根据《国际条约》第 15 条签订协定的国际椰子遗传资源网络国际收集品东道国政府签订协定，以便将网络中的所有国际收集品纳入《国际条约》的管辖范围，**还提请**国际椰子遗传资源网络收集品的有关东道国考虑根据《国际条约》第 15 条签订协定，以便建立新的国际收集品；

8. **要求**秘书再接再厉，根据《国际条约》第 15 条与所有相关机构签订协定；

9. **还要求**秘书与促进全球植物超低温保存倡议的国际农业研究磋商组织各中心、作物信托基金和其他相关利益相关方联络，以支持《国际条约》框架下的超低温保存治理和政策安排，并**提请**国际农业研究磋商组织相关中心和作物信托基金向管理机构第十一届会议报告该倡议的进展情况。