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Food and Agriculture Organization of the United Nations

International Treaty on Plant Genetic Resources for Food and Agriculture

INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

NINTH MEETING OF THE AD HOC TECHNICAL COMMITTEE ON CONSERVATION AND SUSTAINABLE USE OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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Addressing the bottlenecks and challenges to the implementation of Articles 5 and 6: examples from the Benefit-sharing Fund programme

I. Introduction

1. The Benefit-sharing Fund (BSF) of International Treaty on Plant Genetic Resources for Food and Agriculture (the International Treaty) is an essential element of the Funding Strategy and of the Multilateral System of Access and Benefit-sharing (the MLS).[1] The Benefit-sharing Fund is the Treaty's operational mechanism for receiving, utilizing and sharing the monetary benefits arising from MLS.

2. BSF facilitates the implementation of various mechanisms of the International Treaty, through the conservation and sustainable use of plant genetic resources for food and agriculture (PGRFA), and the inclusion of PGRFA and information in the Multilateral System and GLIS.[2] It supports the sustainable use, management and conservation of agrobiodiversity, thus contributing to the implementation of the provisions of Articles 5 and 6 of the International Treaty.

3. The *Background Study on Bottlenecks and Challenges to the Implementation of Articles 5 and 6 of the International Treaty on Plant Genetic Resources for Food and Agriculture* (the Background Study),[3] as presented at the Eighth Session of the Governing Body of the International Treaty, identifies specific bottlenecks and challenges to the implementation of Articles 5 and 6 in each of the FAO regions.

4. This information document was prepared to illustrate how the Benefit-sharing Fund operations and projects contribute to addressing specific bottlenecks, challenges and needs in the implementation of Articles 5 and 6. Section II of this document provides an overview of the BSF, including its priority areas of intervention and Results Framework. Section III analyses the BSF in the context of Articles 5 and 6 of the International Treaty and the relevant biodiversity frameworks, section IV provides concrete examples of how the projects funded in the Benefit-sharing Fund contribute to addressing specific needs and bottlenecks identified in the Background Study; section V provides a brief analysis of the main crops covered throughout the BSF project cycles in view of, inter alia, building linkages and collaborative synergies with the Global Crop Conservation Strategies.

[1] Annex 2 of the Funding Strategy of the International Treaty on Plant Genetic Resources for Food and Agriculture 2020-2025, available at www.fao.org/3/nb780en/nb780en.pdf paragraph 1

[2] Ibid paragraph 11

[3] IT/GB-9/22/12/Inf.2 Background Study to identify the bottlenecks and challenges to the implementation of Articles 5 and 6 available at https://openknowledge.fao.org/server/api/core/bitstreams/c6178c9a-49df-4950-bbc5-a46a76de224d/content

II. Overview of the Benefit-sharing Fund

5. The Benefit-sharing Fund is a funding mechanism that supports small-scale farmers in developing countries to improve livelihoods, food security and adaptation to climate change. The BSF was established in 2009 by the Governing Body of the International Treaty and is under its direct control. It is a progressively evolving mechanism, as the Governing Body has continually improved its operational procedures, selection process and priority areas of intervention.

6. The current *Benefit-sharing Fund: Operations Manual* (Operations Manual), was adopted by the Governing Body through Resolution 3/2019.[4] The Operations Manual brings together resource mobilization, allocation and disbursement in an integrated manner, and is incorporated into the overall Funding Strategy of the International Treaty. The Governing Body delegated the authority for the management of BSF operations to the Standing Committee on the Funding Strategy and Resource Mobilization (the Funding Committee).[5]

7. To date, BSF has invested more than 35 million USD in 5 project cycles in 78 developing countries to support small scale farmers improve their livelihoods, and to promote food security and sustainable agriculture through the conservation and sustainable use of plant genetic diversity. The Fund strengthens the implementation of some of the main provisions of the International Treaty, including its Articles 5 and 6.

8. In 2023, the Funding Committee approved a new portfolio of 28 projects to be funded as part of the Fifth Call for Proposals of the Benefit sharing Fund (BSF-5), which is currently in its implementation phase. The BSF-5 is the first funding cycle where the new approaches set out in the BSF Operations Manual, including funding second phase of previously funded projects, is used. It is also the first funding cycle where a newly developed Monitoring, Evaluation and Learning (MEL) framework will inform the programme design, implementation, monitoring and learning. All BSF-5 projects will contribute to the realization of the new Results Framework of BSF for the 2020-2025 period.[6]

9. The Governing Body and the Funding Committee receive regular updates on the implementation of the BSF project cycles, outlining the main results, lessons learnt and success stories at project and programme levels.[7]

10. The primary beneficiaries of the BSF are farmers who conserve and sustainably utilize PGRFA. BSF partners implement responsive and inclusive PGRFA strategies that cater to diverse needs of farmers, including women and youth. BSF supports participatory development of locally adapted PGRFA with traits that benefit farmers; enhanced capacities within the local seed value chains; dissemination of locally adapted PGRFA as well as policy changes and institutional transformation.

11. The projects funded by the BSF strengthen the connection between conservation efforts ranging from farming communities to national and international genebanks enabling the exchanges of seeds and the interactive flow of PGRFA material, hence strengthening the systems that maintain and create PGRFA diversity.

12. A major focus of the BSF programme is on capacity building for farmers' empowerment to enable them conserve and use PGRFA tailored to their highly diverse agroecology and socio-cultural needs. On the policy level, the Seed Fairs and Farmer Field Days empower farmers to dialogue with policymakers and stakeholders, thus increasing their negotiation skills. Similarly, capacities of local and national institutions are strengthened with the objectives to conserve, manage, improve and disseminate PGRFA and raise awareness on the International Treaty.

13. The Results Framework presented in Figure 1 is a summary visual representation of the BSF programme for the period 2020-2025. The Results Framework links the achievement of outputs with the programme level outcome and is fully aligned with the Theory of Change and other elements of the BSF Operations Manual.

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[4] Annex 2 of the Funding Strategy of the International Treaty on Plant Genetic Resources for Food and Agriculture 2020-2025, available at www.fao.org/3/nb780en/nb780en.pdf

[5] Ibid

[6] Monitoring, Evaluation and Learning (MEL) framework of the BSF, section 1.2. Results framework available at https://openknowledge.fao.org/server/api/core/bitstreams/835a935c-21ba-4c85-a50b-2de82836dc05/content

[7] See https://doi.org/10.4060/cc2245en and https://doi.org/10.4060/cc8123en.

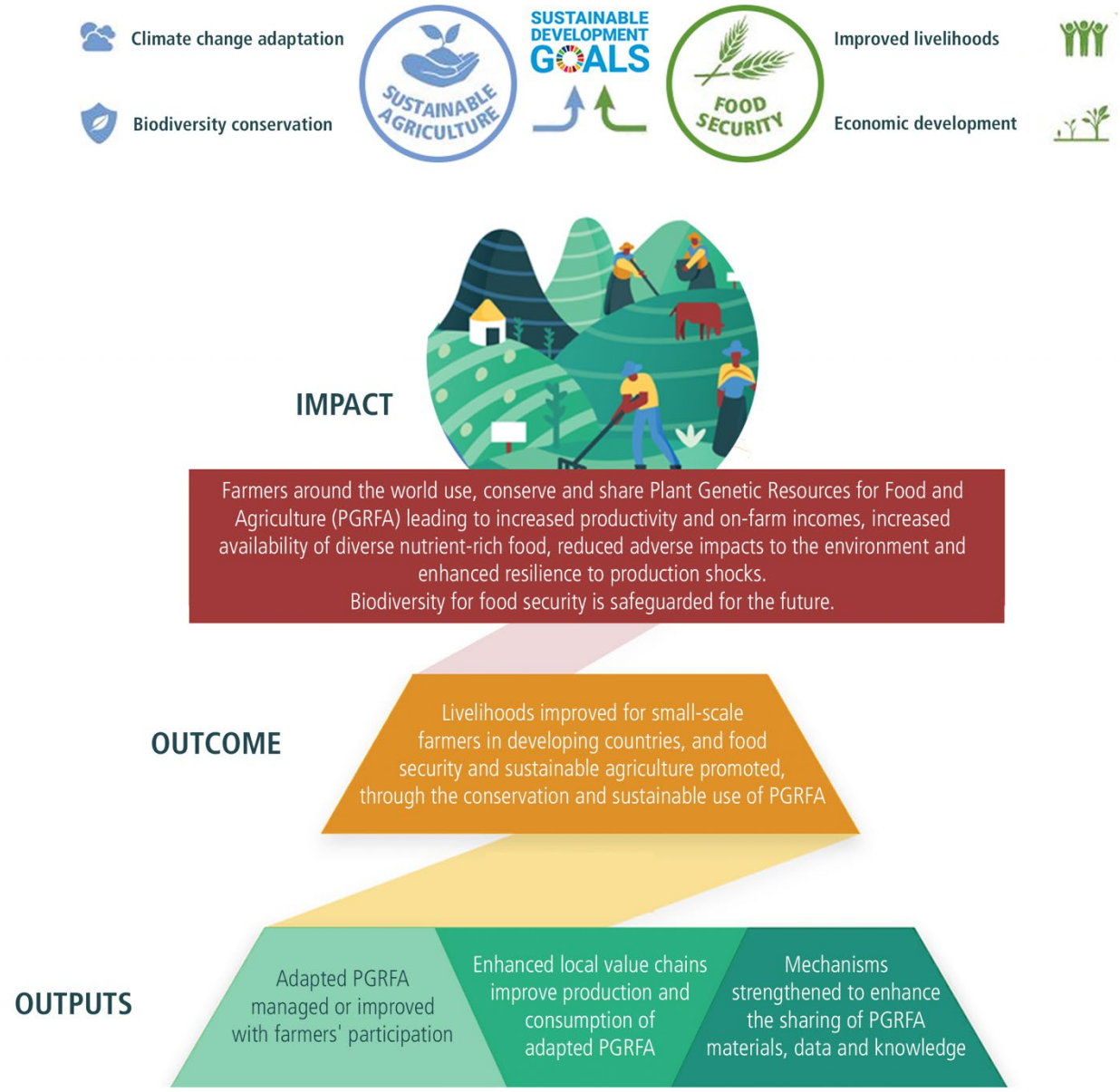

Figure 1: Benefit-sharing Fund Results Framework

14. The main outcome of the BSF Results Framework is: "Livelihoods improved for small-scale farmers in developing countries, and food security and sustainable agriculture promoted through the conservation and sustainable use of plant genetic resources for food and agriculture (PGRFA)".

15. Within the agreed priorities of the *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture* (Second GPA), the Benefit-sharing Fund program specifically focuses on:

- Priority area 2: Supporting on-farm management and improvement of plant genetic resources for food and agriculture;
- Priority area 11: Promoting development and commercialization of all varieties, primarily farmers' varieties/landraces and underutilized crops.

16. The contribution of BSF projects' portfolio to the achievement of the Results Framework addresses various bottlenecks and needs identified in the Background study.

17. As evidenced by the *Independent Evaluation of the third project cycle of the Benefit-sharing Fund*,[8] BSF is relevant in filling gaps and adding value in the management and conservation of PGRFA and is

[8] https://openknowledge.fao.org/items/07f851b9-8656-4b1d-a49e-3a052e340e1b

aligned to relevant international agreements and goals of the United Nations, primarily the Sustainable Development Goals (SDGs). The BSF also is aligned and strategically linked with the Second Global Plan of Action and the Convention on Biological Diversity (CBD) and the various articles of the International Treaty.

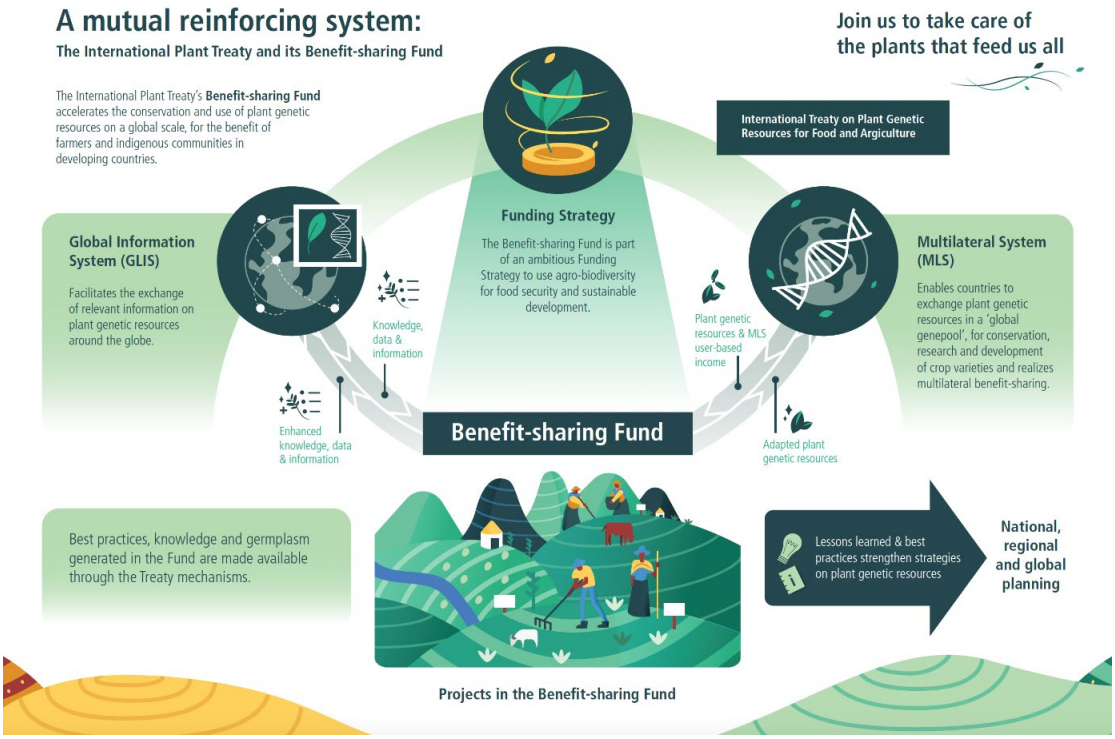

Figure 2: A mutual reinforcing system: the International Plant Treaty and its Benefit-sharing Fund

18. Through its links to the Multilateral System, the BSF also enables the access to and facilitates the use of PGRFA, which in turn generates new materials for farmers and the Multilateral System. By supporting *in situ* and on-farm management of PGRFA, the BSF creates linkages with broader ex-situ conservation efforts, facilitates farmer to farmer exchanges of seeds and enables the flow of PGRFA material from farmers to *ex-situ* collections and back. Notably, the multi-stakeholder and multi-country partnership arrangements in the BSF make it possible for the iterative flow of PGRFA materials; dynamic exchange of scientific and local knowledge; active engagement and ownership of national institutions of the Contracting Parties.

19. The BSF integrates research for development with vulnerable and often marginalised communities through participatory selection, development, innovative breeding and conservation of PGRFA as an integral part of climate resilience strategies. Knowledge, information and germplasm generated in the BSF are made available through the Treaty's mechanisms, such as the Multilateral System and GLIS.[9] Funded projects result in strong consortia and partnerships that are inclusive and dynamic among a wide range of institutions. Through established partnerships, the BSF benefits a wide range of PGRFA stakeholders involved in governance, R&D for conservation and breeding, seed delivery e.g. researchers, breeders, genebank curators, governmental officials, students, both MSc and PhD and lectures.

[9] Specific provisions on the inclusion of PGRFA material arising from the BSF projects in the Multilateral System of Access and benefit-sharing and making the information publicly available in GLIS are included in the contractual agreements (Letters of Agreement) signed with the BSF executing partners.

III. Benefit-sharing Fund in the context of Articles 5 and 6 of the International Treaty and broader global agenda on biodiversity

20. Articles 5 and 6 elaborate in more detail two of the main objectives of the International Treaty's, laying the groundwork for the conservation and sustainable use of PGRFA.

21. These articles articulate the practical actions and policy measures that Contracting Parties should implement regarding the conservation, sustainable use, and management of PGRFA. Together, Articles 5 and 6 create a comprehensive approach to the conservation and sustainable use of PGRFA, and acknowledge the interconnected nature of these two areas, recognizing that effective conservation is essential for sustainable use and vice versa. In essence, Articles 5 and 6 together are part of the cornerstones of the International Treaty, directing and fostering efforts towards a sustainable future where plant genetic diversity is both a means and outcome of sustainable agricultural practices.

22. The Background Study provides an analysis of the main bottlenecks that hinder the effective implementation of these Articles in the different geographic regions, and the critical challenges that must be addressed to ensure their effective implementation.

23. By stressing the need to focus on *in situ* and on farm conservation of landraces, NUS, CWR and minor crops; generate characterization and evaluation data; greater involvement of farmers, increase access to seeds and development of market opportunities, improve intersectoral coordination, raise awareness on the International Treaty and build human and institutional capacities, the Background study provides a roadmap for overcoming the identified bottlenecks and challenges for better implementation of articles 5 and 6 at the national level.

24. The Benefit-sharing Fund supports projects geared towards the implementation of diverse approaches to PGRFA conservation and use. Its contributions are particularly significant in promoting inclusive approaches to the field of PGRFA by supporting community-based conservation, linkages between *in situ* and *ex situ* conservation efforts, diversification of agricultural practices, inclusive and participatory research and development of PGRFA, integrated and inclusive training, multistakeholder partnerships and planning and policy engagement.

25. By the very nature of its approach to conservation and use, the BSF programme contributes to addressing several of bottlenecks identified in the Background study.

26. Since its inception in 2009, the Benefit-Sharing Fund has supported 106 projects that contributed, to various extents, to the conservation and sustainable use of plant genetic resources. Key good practices include *in situ* and on farm conservation, collection and inventory of PGRFA, participatory breeding, research and documentation of PGRFA, the integration of *in situ* and *ex situ* conservation, promotion of underutilized crops and human and institutional capacity building.

27. Projects supported by the BSF are aligned with and contribute to implementation of various elements of broader global efforts, actions and plans on agrobiodiversity, such as the Kunming-Montreal Global Biodiversity Framework (GBF), the Second Global Plan of Action (Second GPA), and the FAO Framework for Action on Biodiversity for Food and Agriculture (FAO-FAB). While these international instruments operate within distinct frameworks, there are significant linkages and synergies among them, especially when it comes to conservation and sustainable use of biodiversity, with emphasis on agricultural biodiversity.

28. The Global Biodiversity Framework has a broader focus on biodiversity across all ecosystems, while the International Treaty (which is a legally binding agreement) specifically targets agricultural biodiversity. Both frameworks emphasize the synchronous approach to sustainable use and conservation of PGRFA. The BSF supports implementation of different targets of the Global Biodiversity Framework, in particular targets 4, 10 and 13. On a similar note, within the agreed priorities of the Second Global Plan of Action, the programmatic approach of the BSF specifically focuses on Priority areas 2 and 11.[10] Both the FAO-FAB and the ITPGRFA aim to integrate biodiversity considerations into agricultural practices. While the FAO-FAB

[10] Resolution 3/2019: Annex 2: Benefit-sharing Fund: Operations Manual, paragraphs 6-8 available at https://openknowledge.fao.org/server/api/core/bitstreams/40256592-9663-45cc-892a-3cd451b93d28/content

provide policy oriented guidelines for countries, the BSF under the International Treaty acts as a financing mechanism, providing material support to operationalize some of these guidelines.

29. BSF therefore contributes to the realization of priorities contained in GBF, FAO-FAB and GPA and in their efforts to conserve biodiversity, promote sustainable use, and ensure equitable benefit-sharing. While the BSF provides a focused approach on agricultural biodiversity, its strategies and projects complement the broader biodiversity agenda. The BSF has a direct impact through targeted funding within the policy framework of the Treaty, which is a unique feature compared to broader policy frameworks that do not directly fund projects designed to meet context specific needs and challenges from a PGRFA perspective. In addition, BSF's focus on agricultural genetic resources provides a model for how specific types of biodiversity can be managed to maximize both conservation, sustainable use, access and benefit-sharing.

30. Hence, the Benefit-sharing Fund fills an important niche in the global effort to conserve biodiversity by focusing on on-farm management and local seed value chains, and being a fund for the fair and equitable distribution of benefits arising from the utilization of genetic resources. It funds projects that align with global strategies, thereby operationalizing broader biodiversity goals into actionable and practical actions on the ground.

IV. Distinctive features of the BSF funding modality and its linkages to specific bottlenecks and challenges identified in the Background study

31. This section focuses on some distinctive elements of the BSF funding mechanism and related operational approaches, vis-à-vis the main bottlenecks and challenges identified in the Background Study.

32. As evidenced in the Background Study, there is great diversity among and within regions in the main challenges and bottlenecks to be addressed for effective implementation of Articles 5 and 6, which require context specific approaches and analysis. However, the Background study identifies a common trend among regions on the most pressing needs to be addressed as follows:

a) Policy, legal and institutional challenges;

b) Scientific and technical issues;

c) Seed distribution and marketing of landraces and farmers' crop varieties;

d) Operational and resources constraints.

35. The analysis of the approaches and practices implemented as part of the BSF programme will revolve around these common identified challenges.

36. While the BSF operates in all FAO regions, with exception of the North America region, the breadth and incidence of funded activities, along with amount of funds invested, are different across the regions and the targeted developing countries. This trend reflects the proportion of developing countries that are eligible to apply for funding across the regions.[11] To date, the regional distribution of the BSF funded projects is as follows:

[11] Please note that according to the latest list of Contracting Parties that are eligible to apply for funding under the Benefit-sharing Fund, 41% are from Africa, 21% from GRULAC, 16 % from Asia, 9 % from SWP, 8 % from Europe and 7 % from Near East.

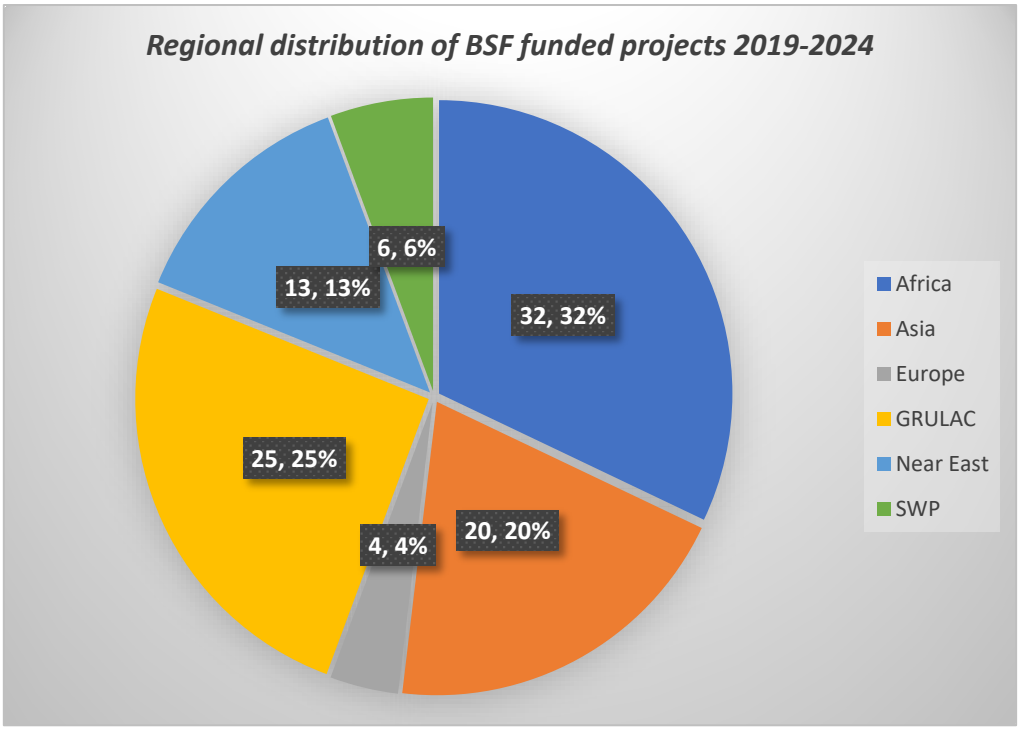

Figure 3: Regional distribution of the BSF funded projects 2019-2024

37. By nature of its funded activities, the BSF aims to implement integrated approaches in the field of PGRFA management, conservation and development. The examples below are tailored around a selected set of elements that directly illustrate specific challenges and are not exhaustive of the actual approaches implemented as part of the BSF funded projects.

Focus on Plant Genetic Resources for Food and Agriculture

38. The Benefit-sharing Fund possesses a distinctive characteristic that sets it apart from broader biodiversity or agricultural development funds: its exclusive focus on plant genetic resources for food and agriculture (PGRFA). This specialization allows the BSF to address specific challenges and opportunities within the realm of agricultural biodiversity, which are often overlooked by other funding mechanisms.

39. Being an integral part of the MLS, the BSF incentivizes multiple stakeholders in multiple countries to access, exchange, conserve and sustainably use PGRFA. This is done through innovation in the co-creation of a diversity of locally adapted and climate resilient varieties. In addition, knowledge management such as technologies and software sharing platforms facilitate international cooperation for more effective PGRFA management and sharing of information that are responsive to the interdependence of countries on PGRFA for their national food systems.

40. The BSF works with the entire array of PGRFA needed to address food security and climate change challenges. This includes working with crop wild relatives, landraces, farmer improved varieties, and improved varieties from research institutions.

41. By concentrating exclusively on PGRFA, the BSF factors the sustainable use and conservation of PGRFA as being instrumental in enhancing food security, reducing climate vulnerabilities and building capacities for resilient livelihoods. This targeted funding enables BSF stakeholders to develop expertise in specific areas of PGRFA management, potentially leading to more effective and innovative conservation strategies and use practices, addressing specific needs, challenges and opportunities related to conservation and use of PGRFA.

Promoting crop varieties for diversified farming systems and improved livelihoods

***Bottleneck**: Scientific and technical issues: lack of scientific interest in specific types of crops and varieties*

***Bottleneck**: Market issues: prevalence of commercial varieties, resulting in the disappearance of traditional varieties*

42. Throughout 4 project cycles, the BSF worked with traditional cultivars and landraces, local varieties, pre-breeding materials, and, in some cases, underutilized crops and crop wild relatives. This material was either collected during project implementation or accessed from national gene banks, breeding institutes and international research institutions through SMTAs. During the third and fourth projects cycles alone, over 3 700 varieties of potato, sorghum, wheat, millet, maize, rice, cassava and taro were collected by BSF partners. The material collected and that made available from national and international gene banks was characterized, evaluated and genotyped jointly by farmers and scientists to harness their traits potential in order to develop new, resistant crop varieties with superior agronomic and quality traits. To date, more than 31 000 plant genetic resources were evaluated in farmers' fields or at research stations. A total of 400 new varieties were developed to meet farmers' needs and preferences in terms of taste, nutrition, productivity and economic and cultural values.

43. The BSF funds activities targeted, *inter alia*, to critical yet often ignored crops such as small grains, landraces, farmers' varieties, crop wild relatives (CWR) and neglected and underutilized species (NUS).

44. Especially in Southeast Asia and South West Pacific, there is a strong focus on the conservation and promotion of neglected and underutilized species, such as taro, millet, yams, oilseeds and pulses, thus addressing some of the technical and scientific issues identified in the Background Study in that region. For instance, Taro has been neglected and underutilized as a food crop in Southeast Asia during the past few decades. It is an alternative crop that provides carbohydrates and protein and can be grown in fragile ecosystems, for example, marginal lands where salinization and desertification make cultivation to be challenging.

45. As part of the on-going BSF-4 cycle, partners from **Indonesia, Malaysia and the Philippines** are collaborating to bring taro back to the table. The exchange of local varieties of taro with high potential for small-scale farmers in areas vulnerable to climate change is ongoing between the three countries. The project is also strengthening the countries' capacities for taro in vitro mass propagation and established Farmer Field Schools for the evaluation of taro varieties by farmers and for training in good agricultural practices for taro cultivation. To date, partners in the Southeast Asia and South Pacific regions have collected and restored the cultivation of 125 varieties of millet, taro, oils and pulses. New plant genetic material has been included in the national gene banks, thereby enriching the national PGRFA collections. Projects partners presented the main results of this project during a dedicated BSF side event at GB-10, titled "Seeds and Innovative Solutions through the Benefit-sharing Fund".

46. On-farm conservation sites, field trials, Farmer Field Schools and seed fairs have been established for participatory selection and the promotion of selected varieties, as well as the diversification of cropping systems and strengthening of local seed value chains.

47. As part of crop diversification in Africa, partners in **Malawi, Zambia**, **Zimbabwe**, **Uganda** and **Burkina Faso** are rediscovering the value of drought resilient and nutritious minor crops such as millet, sorghum, cowpea and groundnut at a time of climate change and food insecurity. Minor crops have strong potential for high yields in increasingly challenging conditions, especially drought prone areas, and are sought after by farmers to diversify livelihoods and nutrition. However, several technical and policy obstacles associated with small crops hinder their wider adoption by farmers in the region, as evinced by the Background Study. BSF-4 partners in Africa are working towards the testing, development and introduction of resilient small crops. For example, in Malawi and Zimbabwe, more than 20 tons of Quality Declared Seeds and certified seed are being produced and almost 3 000 farmers have switched to cultivation of sorghum, bean and millet. Projects in the region are complementing the increased availability of seeds from adapted varieties with sustainable cropping practices: legume-legume and legume-cereal intercropping have proved effective in reducing risks of crop failure, while contributing to increased productivity per unit area, and hence income. For example, partners in Zambia, where the BSF also supports the strengthening of the National Strategy for Plant Genetic Resources for Food and Agriculture, reported a 10 percent increase in yields from improved bean cultivation, with an average income growth rate of 51 percent.

Promoting farmers innovation in plant breeding and exchange of scientific and local knowledge

Bottleneck: *Scientific and technical issues*: *lack of access to technologies for information management; lack of activities in certain areas of conservation and use of PGRFA, [e.g.] agro morphological characterization*

Bottleneck*: Market issues: disappearance of traditional varieties; lack of adequate marketing opportunities for landraces/farmers' varieties*

48. One of the most pressing bottlenecks identified across regions in the Background Study is the lack of farmer innovation in plant breeding.

49. By virtue of its mandate, BSF funds projects that directly involve and benefit smallholder farmers and local communities, including indigenous peoples. This focus ensures that the benefits of conservation and sustainable use initiatives flow to the local level and are integrated into local agricultural practices.

50. Managing plant genetic diversity with farmers' participation is integral to the BSF action and considered instrumental in building ownership over projects' activities and results, as well as increasing PGRFA diversity, providing material to researchers and breeders, and strengthening adaptive capacities and resilient livelihoods.

51. The BSF plays an important role in fostering synergies between traditional on-farm practices and technological innovations. As confirmed by the Independent Evaluation of the Third Project Cycle of the BSF, funded projects demonstrated the value of bridging scientific and traditional knowledge for demand-driven conservation, management and development of climate resilient crop varieties. The participatory approaches (e.g. participatory needs assessment, participatory variety selection, participatory varietal enhancement and participatory plant breeding) facilitate farmer-scientist analyses of climate change, define plant breeding objectives and trait preferences and jointly co-generate responses and adaptation strategies. These participatory and evidence-based decision-making processes enable a more inclusive PGRFA management, where farmers, and especially women, express their preferences, select and develop climate resilient PGRFA, conserve and use PGRFA tailored to their highly diverse agro-ecologies and socio-cultural needs.

52. In this way farmers act as evaluators and decision-makers, indicating which traits best suit their needs and which elements should be incorporated into research and breeding programmes. Farmers are also custodians of deep knowledge of local ecosystems and crop varieties, which is invaluable for conservation and sustainable use of genetic resources. Researchers and breeders, use this knowledge as a foundation for selection of farmers preferred traits that meet their context specific needs and challenges, while introducing modern technologies such as molecular breeding, or digital tools for crop monitoring, as demonstrated in the projects in Serbia and Uganda.

53. The inclusiveness of all stakeholders and farmers' participation are essential to build confidence and acceptance of projects' approaches, and ultimately, for the adoption and scaling out of projects results/strategies.

Enhancing market opportunities for farmers' varieties

Bottleneck*: Market issues: prevalence of commercial varieties, resulting in the disappearance of traditional varieties; lack of adequate marketing opportunities for landraces/farmers' varieties; disconnect between farers and the market*

54. The Benefit-sharing Fund supports efforts to improve and promote crop genetic diversity and marketing of diverse crops in local food value chains and to make the seeds of a wide range of adapted, improved and nutritious varieties available to small-scale farmers.

55. In Uganda and Zimbabwe, BSF-4 partners improved the productivity of sorghum, finger millet, pearl millet, cowpea, pigeon pea and groundnut by enhancing the capacity of farmers to access, produce and manage quality seeds and expand the skills and know-how in pre- and post-harvest production. A total of 30 demonstration gardens were established, where farmers have been trained in quality seed production, safe use of agrochemicals, post-harvest handling, seed quality assurance and seed inspection. The training involved 1 156 smallholder farmers, who organized themselves in community seed producer groups and 61 trainers of trainees, including youth and local leaders. A total of 3 367 kilograms of quality seeds have been produced by farmers. To disseminate lessons and know how, 4 500 brochures on production of the target

crops were translated into local languages and distributed to farmers at World Food Day and during agricultural and trade show events. A manual of target crops seed production has been produced, shared and used by seed producers.

56. Through this project, partners in Uganda characterized sorghum PGRFA using biochemical tools and identified 5 diverse clusters based on functional attributes of the grain and potential application to food processing industry. Furthermore, to assure a circular economy approach, regional efforts through collaboration with the Bioinnovate Africa Programmme made it possible to add value to PGRFA stover to develop livestock feed, compost and bioplastics. For this to be useful to stakeholders, the project linked existing biochemical, phenotypic and genotypic/sequencing data with publicly available germplasm and made this information available in the Global Information System (GLIS), institutional websites and the National Center for Biotechnology Information (NCBI) website.

57. The promotion of plant genetic diversity in local food value chains is a common thread within the projects funded by BSF-4 in Latin American. In order to promote the consumption of local varieties in Argentina, researchers have undertaken an evaluation of the nutritional value of a number of varieties of potatoes and beans. A gastronomy school in the province of Jujuy is supporting the production and consumption of local beans. Cookbooks and recipes using local varieties and other tools are being actively used in the region. Partners in Ecuador have organized three major gastronomic fairs to showcase the value of agricultural biodiversity for food processing, gastronomy and ecotourism. Fruit genetic materials evaluated in Uruguay are selected for their potential for agroecological production and to support the growth of organic markets in the country.

Multistakeholder collaboration: enhancing national policy and planning on PGRFA

***Bottleneck**: Policy, legal and institutional issue: lack of an enabling, efficient, integrated, and comprehensive national legal and policy framework to promote the conservation and sustainable use of PGRFA; limited inter-sectoral coordination; lack of legal and policy expertise; and lack of awareness of the importance of PGRFA and the International Treaty*

58. The BSF is a facilitating mechanism for increased cooperation among a wide range of PGRFA stakeholders and an instrument to generate and distribute collective benefits. The BSF programme enables multicountry, multistakeholder and multisectoral collaboration in the field on PGRFA management, conservation and use. This collaboration spans across the entire spectrum of *in situ* and *ex situ* conservation, with the aim of ensuring comprehensive and cohesive management of plant genetic resources.

59. As evidenced by the Independent Evaluation of the Third Project Cycle of the Benefit-sharing Fund, the multi-stakeholder and multi-country partnerships established within the BSF projects contribute to linking BSF activities to broader initiatives, establishing cross-border cooperation and enable sharing of the results and lessons learned broadly. The intergovernmental mechanism of the Treaty and the partnerships within the multi-stakeholder and multi-country arrangements are instrumental to the achievements of the projects.[12]

60. BSF programmatic approach encourages the formation of consortia of institutions that include a diverse range of stakeholders from different sectors which are essential for addressing the intricate challenges related to policy, legal, and institutional issues identified in the Background study, in particular the challenges of limited inter-sectoral coordination, lack of legal and policy frameworks to promote conservation and sustainable use, and lack of awareness on the importance of PGRFA and the International Treaty.

61. To date, more than 500 institutions joined forces and expertise in implementing the BSF projects, e.g., farmers and civil society organizations, universities, plant breeding and extension services, national governments, national and international gene banks, NGOs and seed companies. These multiple partnerships generate and/or reinforce PGRFA innovations and capacity building and foster coordination among different governmental and non-governmental sectors.

[12]Evaluation of the third project cycle of the Benefit-sharing Fund of the International Treaty on the Plant Genetic Resources for Food and Agriculture available at : https://openknowledge.fao.org/server/api/core/bitstreams/dc1712ec-6da2-4a4d-bba4-0e8792503317/content

62. Through the design of BSF Call for Proposals, funded projects make links with national and regional priorities/programmes on food security, climate change and agro-biodiversity.[13] All activities supported by the BSF are designed to be consistent with national strategies and plans related to biodiversity and poverty alleviation, hence establishing synergies with different policy frameworks. This is particularly important in regions where policy fragmentation was identified in the Background study as some of the main barriers to effective PGRFA conservation and use (e.g. Asia, Near East).

63. Within the framework of BSF partnerships, the constant engagement with and ownership by national institutions facilitates the translation of BSF projects' outcomes into actionable policy changes and developments, such as updating of seed laws, revival or creation of new fora for policy discussions on the importance of PGRFA, the International Treaty and related policy and programmes on agrobiodiversity.

64. As part of the implementation of the BSF-4 project in **Yemen**, the Genetic Resources Center conducted an impressive campaign to revive the interest of the national authorities on the importance of PGRFA for food security, adaptation and resilience, and the need to set in place a National Programme for Genetic Resources in Yemen.

65. Project partners organized workshops and consultations and met national representatives from different ministries and directorates as well as gene bank managers and agricultural officers, to raise awareness on the need to assess the state of genetic resources in Yemen and to develop a National Programme for Genetic Resources. As a result, a national mechanism for coordination and joint action at national level was established and started working on the national strategy for PGRFA. These efforts were complemented by an intensive awareness raising campaign, meetings with decision makers, radio and television events etc.

66. Networking and multi-sector approach along with pulling the expertise and experiences from a wide range of stakeholders was reported to be a success factor in the achievement of BSF-3 project objectives in Malawi, Zambia and Zimbabwe**.** Project partners guaranteed policy support for field work by involving all actors in field activities so as to inform advocacy and planning, with the aim of developing effective practices and mechanisms for the implementation of action plans for the conservation and sustainable use of PGRFA.

67. Partners in Malawi and Zimbabwe succeeded in concretely contributing to national level plans to help farmers adapt to climate change. This achievement is an important step in institutionalizing the contribution of the BSF projects in PGRFA conservation and sustainable use, as evidenced by the *Independent Evaluation of the Third Project Cycle of the BSF*.[14]

68. In Malawi, project partners contributed to the drafting of the Seed Bill which recognizes access and benefit sharing measures on materials accessed from smallholder farmers. The information generated from this project helped partner institutions' policy and advocacy work on seed policy and other legal frameworks.

69. In Zimbabwe, partners took the lead in the development of the National Strategy and Action Plan on Plant Genetic Resources for Food and Agriculture (NSAP on PGRFA). More specifically, the BSF project supported the gathering of information as a basis for the discussion to enhance national implementation of the Treaty; organized meetings at national level to review the existing strategies for PGRFA with a view of broadening the crops coverage and inclusion of provisions of the Treaty such Farmers Rights; supported discussions on germplasm exchange for research and/or crop improvement for food and nutrition security with the National Plant Genetic Resources Committees; explored the possibility of developing a framework for competent organizations in the two countries in support of the Treaty implementation.

70. The project empowered farmers to advocate for their rights during discussions with policy makers. This strong advocacy and engagement processes saw the revival and strengthening of the national committees to discuss how Farmers' Rights can be realized at national level.

[13] The design of the Call for Proposals, the full project proposals as well as the reporting formats include the requirement to explain the relevance of the funded projects to national or regional priorities, plans and programmes for PGRFA.

[14] Evaluation of the third project cycle of the Benefit-sharing Fund of the International Treaty on the Plant Genetic Resources for Food and Agriculture available at : https://openknowledge.fao.org/server/api/core/bitstreams/dc1712ec-6da2-4a4d-bba4-0e8792503317/content

71. A recently concluded project implemented in Zambia**,** contributed to the review of the National Strategy for Plant Genetic Resources for Food and Agriculture which was ratified for implementation.

Promoting cross sectoral collaboration and building institutional capacity

***Bottleneck**: **Policy, legal and institutional issue**: limited inter-sectoral coordination; lack of legal and policy expertise; and lack of awareness of the importance of PGRFA and the International Treaty, lack of legal and policy expertise*

***Bottleneck**: **Operational and resources constraints:** lack of technical capacities and human resources*

72. The complexity of managing plant genetic resources involves multiple sectors and actors that need to coordinate to achieve applicable outcomes.

73. Within the BSF programme, collaboration with and the involvement of key stakeholders such as local and traditional leaders, agricultural extension staff, different ministries and government units, academics, scientists and breeders from NARS and regional and international research institutions have proven key to project successes, as they provide motivational, technical, policy and academic backstopping to projects' implementation. In some cases, they prove to be instrumental in mobilizing additional financial and institutional resources for project implementation. Government ministries, international organizations, and private sector actors provide co-funding, in kind contributions, technical expertise, and infrastructure that support BSF projects' implementation.

74. Cross-sectoral collaboration allows for the pooling of technical expertise from various sectors, ensuring that projects benefit from a wide range of knowledge and expertise. Involving multiple sectors in the planning and implementation also fosters a sense of ownership and commitment among stakeholders. The inclusiveness of important stakeholders, especially farmers, from the inception phase are essential to build confidence and acceptance of projects' approaches, and ultimately, for the adoption and scaling out of projects results.

75. For example, collaboration among research institutions, farmers and farmers' organizations, private companies, and government agencies can result in the co-creation of innovative technologies (e.g., drought-resistant crops, high yielding crops, certified seeds) and practices (inter copping, agro-ecological practices, use of drones for crop monitoring, irrigation management etc.), that enhance productivity, including value addition and increase in the marketing value of cultivated crops, as is the case of projects funded in Uganda, Malaysia or Ecuador.

76. In **Argentina**, INTA coordinated a multidisciplinary team that joined forces to provide support to local and indigenous farming communities to promote the diversification of production systems, the use of local varieties in food, along with development of community strategies for the conservation and safeguarding of local seed varieties. The project worked with seed guardians, groups of families and producers who manage seed houses in the target project areas. Training activities were conducted for curators and managers of germplasm banks and for collections of PGRFA in the country. The Directorate of Sustainable Productions, under the Secretary of Agriculture, Livestock, and Fisheries, the Enforcement Authority of the Treaty took the lead for coordination and consultation to build institutional capacities for the implementation of the Treaty. Meetings were held with professionals from the National Scientific and Technical Research Council (CONICET) and the National Parks Administration to discuss national and international regulatory frameworks related to access to genetic resources and the distribution of benefits, as well as the scope of the International Treaty.

77. Additionally, officials and technicians from the National Seed Institute (INASE) collaborated in disseminating regulations related to seed trade and provided support for queries related to seeds within the project's scope. All these institutions were represented in the project management committee, which met weekly to monitor the project's activities and progress.

78. Especially important is the collaboration with breeding institutions, which facilitate the introduction of new planting materials to farmers, hence generating interest to continue working with similar projects. It is also empowering as the interaction between farmers and breeders ensures that farmers' knowledge and traits preferences are taken into account in the breeding programmes. The projects in the GRULAC region have, as an underlying aspect, the engagement of farmers and indigenous communities, local government, and research institutions. This inclusive approach ensures that traditional knowledge about cultivation of

indigenous and local varieties is preserved and documented while introducing modern conservation practices.

79. A common multisectoral approach in BSF projects often involves NGOs working with farmer and producer organizations and research institutes, including universities, to identify crop diversity of potential interest, jointly select material with useful traits, undertake multilocation tests of PGRFA and develop and conserve high-performing seeds. They act as channels for communication between farmers and researchers, ensuring that research is relevant to farmers' needs and meet their preferences. NGOs also act as facilitators between producer organizations and local government, in particular in terms of registering, certifying and marketing new varieties.

V. Analysis of main crops targeted in Benefit Sharing fund programme and links to the Global Crop Conservation Strategies

80. The data on the top 7 crops addressed throughout the different project cycles of the Benefit-sharing Fund[15] is as follows: Beans (28%), Sorghum (27%), Wheat (22%), Maize (20%), Rice (17%), Cow pea (16%), Finger millet (16%) and Cassava (15%).[16]

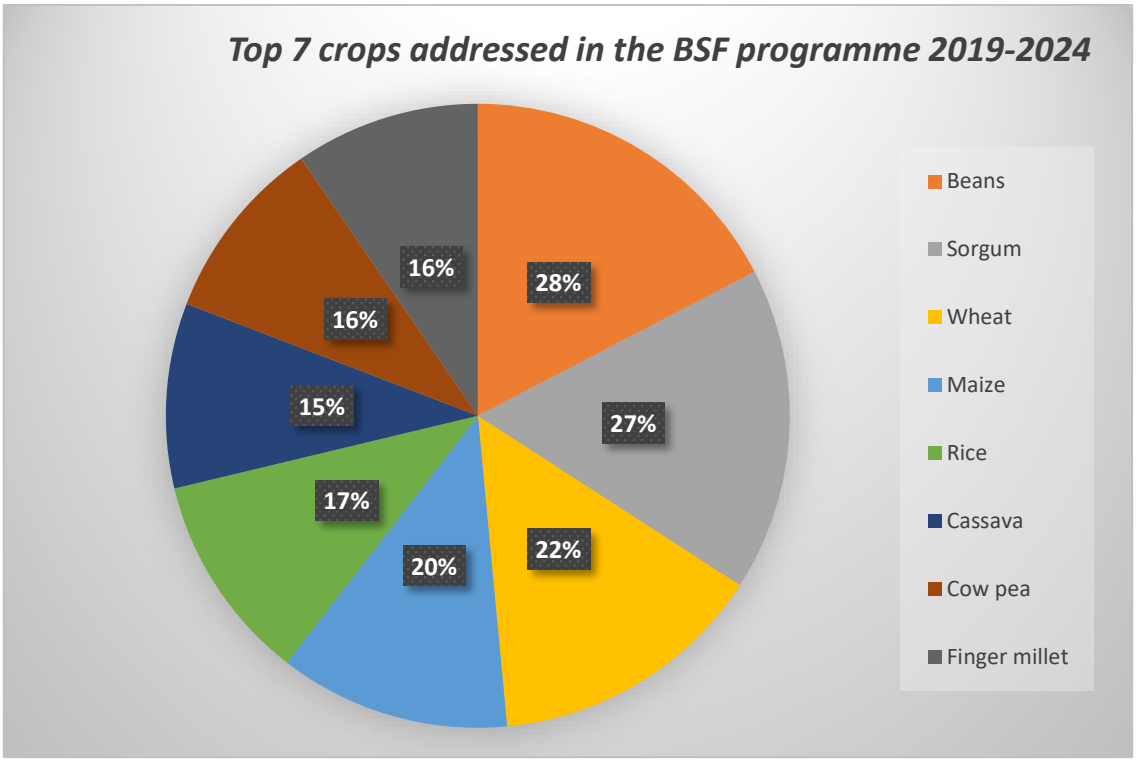

Figure 4: Top crops addressed in the BSF funded projects 2019-2024

81. The top crop addressed through BSF (28 %) is beans, followed by sorghum (27%). Beans are a crucial source of protein, fiber, and vitamins for millions worldwide, especially in regions where meat is scarce or expensive, for example, some areas in the GRULAC region. They are also significant for nitrogen fixation, which can improve soil fertility. Sorghum is extremely resilient to dry conditions and poor soils, making it an essential crop for arid and semi-arid regions, particularly in Africa and Asia.

82. A total of 22% of projects funded so far target wheat, followed by 20% targeting maize, and 17 % targeting rice. These are staple food crops critical for global food security, with rice alone being a staple crop for more than half of the world's population, particularly in Asia. These staple crops serve as a primary

[15] The percentages were calculated on a total of 106 projects funded so far as part of the Benefit-sharing Fund programme and represent the most frequently addressed crops throughout the funded projects.
[16] Please note that the % reflect the share of projects that address the top 7 crops. One project addresses more than 1 crop, therefore the sum is higher than 100%.

source of calories and sustenance for a large portion of the world's population and, in the case of maize, are versatile crop used for food, feed, and industrial products.

83. Finally, 16% of projects target cowpea and finger millet, and 15% cassava. While cassava thrives in poor soils and provides food security in challenging environments, cowpea is important for protein and, similarly to finger millet, adapts well to arid environments and improves soil fertility through nitrogen fixation. These crops are often grown in marginal environments and are critical for the livelihoods of smallholder farmers. Conservation and sustainable use of these crops can lead to greater food security and resilience against climate change. The conservation efforts of these crops also help maintain traditional knowledge and practices that are crucial for the sustainable management of local ecosystems.

84. The *Global Crop Conservation Strategies* (GCCS), led by the Crop Trust, and the *Background Study on Bottlenecks and Challenges to the Implementation of Articles 5 and 6 of the International Treaty on Plant Genetic Resources for Food and Agriculture* analyse key aspects of conservation of plant genetic resources from two different angles: global crop conservation needs for GCCS and structural regional conservation needs for the Background study. Both documents advocate for policy integration, capacity building, stakeholder engagement, and addressing financial and environmental challenges. By identifying and addressing these linkages and synergies, the two documents collectively provide a roadmap for strengthening the implementation of Articles 5 and 6 and outline the basis for mutually supportive activities between the Treaty and the Crop Trust. The spirit of collaboration and sharing embedded in the GCCS process also directly aligns with other Treaty mechanisms such as MLS and GLIS.

85. As highlighted in the White paper, *Mainstreaming Global Crop Conservation Strategies in Plant Treaty Processes*,[17] the GCCS could contribute to strengthening evidence-based decision making regarding the Benefit Sharing Fund (BSF) and certain aspects of the work the Funding Committee.

86. The analysis of the main crops addressed through the BSF provide useful information that the Treaty Secretariat and the Crop Trust could consider for deciding which crop strategies (for example sorghum and millets or cowpea) supported through the BSF are worth further analysis and the conceptualization of mutually supportive efforts undertaken by the Treaty and the Crop Trust for the conservation of genetic diversity. In addition, through the implementation of the Fifth Call for Proposals, and especially during the knowledge management webinars, the Secretariat will raise awareness on the Global Crop Conservation Strategies and their potential as scientific and peer reviewed source of information to guide conservation strategies funded by the Treaty through its Benefit-sharing Fund.

[17] IT/GB-10/23/16.2/Inf.1: *White paper on Mainstreaming Global Crop Conservation Strategies in Plant Treaty Processes*, section 3: Global Crop Conservation Strategies and the Plant Treaty, Benefit-sharing Fund available at https://openknowledge.fao.org/server/api/core/bitstreams/a7a95daa-b1f9-4514-b4aa-244ecc90787e/content