Breeding, Variety Release & Maintenance

Country: Kenya

	Profile Element	Response
1	**Focus crops for assessment**	Potato, Maize, Rice, Cowpea, Beans, Pigeon pea, Green Grams, Sorghum, Millet, Cassava, Sweet potato
2	**National public institutions (stations) in charge of breeding work for focus crops**	KALRO- (Katumani (Maize, Cowpea, Beans, Pigeon pea, Green Grams, Sorghum, Millet, Cassava, Sweet potato), Embu (Maize, beans), Kakamega (Maize, beans cassava), Kitale (Maize, beans), Kabete (Maize), Muguga (maize), Mwea/Mtwapa (Rice), Irish potato-Tigoni, Kandara-beans, ADC, Egerton, University of Nairobi, Masinde Muliro, JKUAT
3	**Number of qualified and active public breeders for each focus crop**	Maize: 18 Bean: 6 Cowpea: 4 Sorghum: 8 KALRO: Maize-5, Cowpea-1, Sorghum/Millet-2, Green grams/pigeon pea-1, Beans-4, Cassava (1) /Sweet potato-(1), Irish potato (2)
4	**Number and focus of scientists from support disciplines (such as agronomy, entomology, etc.) that support breeding for each focus crop**	Agronomy-5, Plant pathologist-5, entomology-1
5	**Private entities with breeding programs for focus crops in the country**	Potato (Kisima, Agrico), Maize (Seed Co, East Africa Seed Co, Kenya Seed Co, PANNAR, PIONEER
6	**Institutions/agencies in charge of variety testing and release**	KEPHIS
7	**Average time to release a variety (note TASAI or other source)**	30 months
8	**Availability of documented variety release data, including DUS and NPT/VCU**	Yes
9	**Extent of on-farm testing program (indicate #farms x #varieties x #reps)**	Depends on crop
10	**Focus crop varieties released in the last 10 years and commercialization status of each (none, emerging, expanding, stalled, full)**	Maize-40, Cowpea-5 Beans-14, Sorghum-2, Sweetpotato-18, Rice-1, Wheat-21, PP-2, IP-7
11	**List and year of release of varieties accounting for 80% of crop volume, by focus crop**	TBD
12	**Average life of a variety in the market**	Maize: 13 Bean: 17 Cowpea: 16 Sorghum: 22

13	**Status of Plant Variety Protection (PVP) Act**	SEEDS AND PLANT VARIETIES ACT CHAPTER 326; Revised Edition 2012, formation of GERRI-2015
14	**Functionality of variety licensing program(s)**	Steps followed: Seed company learns of a variety from breeder, or KEPHIS catalogue or in awareness creation forums. Submits application to owner including basic seed requirement. Owner assesses capacity of company to produce certified seed. Agreement is then signed detailing the payment details, royalties to be paid, licensing arrangements and conditions for termination. Where varieties are royalty free, the producers is supposed to pay for the cost of producing the basic seed. KALRO's approach has varied throughout the years and now focuses on a non-exclusive, non-IP based model that usually includes the following elements: o Parties to the agreement and relevant objectives and goals o Varieties to be licensed o Non-exclusive and non-transferable licensing clause o 15-year duration o Royalty payments set as percentage of gross sales for the varieties in the previous FY o Reporting duties as verification mechanism for royalty payments

15	**Functionality of royalty collection programs**	There have been delays or non-payment by some companies to pay KALRO for the royalties on the varieties commercialized. This has resulted in delays when the companies sought to obtain more basic seed. The main challenges for KALRO have been legal and human resources to administer its 30 active agreements (and conclude new agreements) and royalty collection. KALRO uses a standard 2.5 percent royalty on the value of the seed sold of KALRO varieties. All of KALRO's agreements mandate that the seed company keep accurate records of the seed sold and make these records available to KALRO upon request. After each financial year, the licensee is to communicate the gross annual level of sales for the licensed varieties and pay the royalties within six months after the end of the Fiscal Year. As a verification mechanism, KALRO requires that the licensee provide an annual report, done by a reputable audit firm, of all seed produced, sold, and paid for within the financial year. KALRO also reserves the right to request an independent audit to verify the information in the summary provided. Auditing is one verification for use with licensing agreements, though not the only one. While it has benefits, it can also be an expensive verification mechanism.
16	**Allocation of royalties collected back to breeding program(s)**	Could not be verified
17	**Infrastructure in place to support public breeding work --cold rooms, irrigation, land (resilience screening, green houses), modern labs, etc.**	The CGIAR Excellence in Breeding (EiB) platform provided KALRO with digitization equipment as part of ongoing efforts to modernize the public agency's crop breeding programs valued at $85,000 in March 2021. These included 23 units of equipment including seed counters, label printers, handheld data collectors, tablets and package printers. These will help KALRO speed up and enhance the accuracy of various breeding processes, including seed preparation, data collection, data analysis and inventory management at KALRO's maize, wheat, rice, sorghum, bean, soybean and potato breeding programs at six of its research centers in Kenya.
18	**Status/condition of national gene bank**	Genetic Resources Research Institute is an entity within KALRO that focuses on conserving plant, animal and microbial genetic resources. This is done through germplasm collection, characterization, evaluation and generation of genetic materials.

19	**Major innovations that have impacted the program in the last 5 years**	The CGIAR Excellence in Breeding (EiB) platform provided KALRO with digitization equipment as part of ongoing efforts to modernize the public agency's crop breeding programs valued at $85,000 in March 2021. These included 23 units of equipment including seed counters, label printers, handheld data collectors, tablets and package printers. These will help KALRO speed up and enhance the accuracy of various breeding processes, including seed preparation, data collection, data analysis and inventory management at KALRO's maize, wheat, rice, sorghum, bean, soybean and potato breeding programs at six of its research centers in Kenya. NARS including KALRO are starting to use a new costing tool to get the better financial data needed to optimize their programs. This will ultimately mean higher genetic gain per dollar invested. A new open access "Breeding Costing Tool," was developed by the University of Queensland (UQ), is currently being piloted by the CGIAR Excellence in Breeding (EiB) and the International Maize and Wheat Improvement Center (CIMMYT) in collaboration with various NARS.
20	**Key variety access and licensing information available on government website(s)**	KALRO website under Food Crop Research highlights released varieties but no clear process on access and licensing. On the KALRO website there is a tab on Products and Services which is generally uninformative. KEPHIS websites hosts the national crops variety list, which is mostly up to date.
21	**Learning events or joint activities between breeders and private sector in the last two years**	Junior breeders training by CIMMYT, Development and handling of GM crops-TELA, Joint NPT tours
22	**Program's total budget for each of the last 5 years**	Missing information
23	**Proportion of the budget spent on the following: salaries/breeding/testing/other (total should add up to 100%)**	In 2016, for example, maize research accounted for 9.5 per cent of the total research budget.