

The Rockefeller Foundation and the Conservation of Genetic Diversity in Agricultural Crops

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In 1943, the Rockefeller Foundation launched a program that aimed to increase agricultural production in Mexico through greater research and training in agricultural sciences. This program (the Mexican Agricultural Program) is often described as the starting point of what we today call the Green Revolution, the transition in agricultural production seen in parts of the Global South in the 1950s and 60s. It is less often noted that the Mexican program was also the starting point of more than five decades of Rockefeller Foundation involvement in the collection and conservation of genetic diversity in agricultural crops.

The research I conducted at the Rockefeller Archive Center consisted of surveying the various ways in which the Rockefeller Foundation contributed to the exploration, collection, and conservation of agro-biodiversity from 1943 onwards. Key moments in this history that I investigated through the available archival materials included: the collection of maize varieties as part of the Mexican Agricultural Program beginning in the 1940s, and continuing through the Inter-American Food Crop Program and still later the International Center for the Improvement of Maize and Wheat (CIMMYT); the establishment of a world collection of sorghum varieties at the Indian Agricultural Research Institute, New Delhi, in the late 1950s; the creation of an equivalent world collection of rice varieties at the International Rice Research Institute (IRRI) beginning in 1960; the launch of a "World Germplasm Project" by the Rockefeller Foundation's Agricultural Sciences Program in 1969 in response to growing international concern over the global diminishment of crop genetic resources; the involvement of the Rockefeller Foundation (along with the Ford Foundation) in the creation of the Consultative Group on International Agricultural Research (CGIAR) and its subsequent launch of an International Board for Plant Genetic Resources (IBPGR) in 1973; and, finally, the role of the Rockefeller Foundation in funding and planning the construction of a genebank facility in China in the early 1980s in cooperation with the Chinese Academy of Agricultural Sciences.

The Rockefeller Foundation's first forays into the exploration and collection of crop plant diversity in the 1940s aimed to gather materials that would advance their goal of breeding higher-yielding crop plants for Mexican farmers as part of their newly formed Mexican Agricultural Program. Those leading the corn-breeding program, for example, began almost immediately to gather Mexican corn varieties that might serve as the basis for improved breeds suited to diverse Mexican environments. The first collections were made mostly at random while driving across the Mexican countryside. As the corn-breeding program became more firmly established, however, these collection activities became more comprehensive and regularized. By 1947, those working in the program estimated that they had some 1500 samples in their maize collection.¹

Although the Rockefeller Foundation corn breeders relied on these diverse materials, they also realized that if they succeeded in creating high-yielding types, their new varieties would replace the genetically diverse “traditional” varieties then in cultivation. Without farmers to grow them each year, selecting and maintaining seeds from season to season, these landraces could well die out. And they would be lost not only to future Mexican farmers but also to breeders like themselves. They soon began to articulate a need to conserve collections of diverse varieties, not just assemble them for immediate use.² They were supported in this idea—and in the creation of still greater collections of maize diversity—by a National Academy of Sciences-National Research Council “Committee on the Preservation of Indigenous Strains of Maize.” Working together with the Rockefeller Foundation and drawing especially on funding provided by the US foreign aid agency, this Maize Committee claimed by 1955 to have amassed some 11,000 samples of maize from across the Americas. These accessions were stored at four sites, including new storage centers at the Rockefeller Foundation's established research stations (the one associated with the Mexican Agricultural Program at Chapingo, Mexico and a newer facility in Medellín, Colombia).³

The actions of Rockefeller Foundation administrators and staff of its various agricultural programs during the 1950s and early 1960s suggest their deepening sense of the importance of collections of crop plant diversity, and especially of the central role of the foundation in maintaining these collections. This was due in large part to the perceived importance of the collections of maize (as well as those made of wheat) to the successes of its breeding programs in Mexico.

As the Rockefeller Foundation looked to extend its agricultural research and breeding programs from Mexico and Colombia to all of Latin America and then to India, Pakistan, and the rest of Southeast Asia, it generated a need for access by a greater number of breeders and other scientists to collections of various key economic crop plants. For example, in 1956, the Rockefeller Foundation entered into an agreement with the Government of India to create a cooperative program at the Indian Agricultural Research Institute at New Delhi. As the program got off the ground in 1957 and 1958, a corn breeding initiative was the first to be established, followed shortly by an effort to improve sorghum and millets. The Rockefeller Foundation employee tasked with sorghum improvement (who had been transferred from the Mexican Agricultural Program) immediately proposed creating a "world collection" of sorghum varieties to support this effort. His inspiration came directly from his experience with the corn collection in Mexico. In short order, an India-wide collecting program was begun, in which Indian agronomists sought out locally adapted sorghum varieties, as well as corn and millets. These were later combined with materials sent from abroad to create the envisioned "world collection."⁴ A similar story can be told of a different Rockefeller-linked institution, the International Rice Research Institute (IRRI). Jointly funded by the Rockefeller and Ford Foundations, IRRI's mission was to raise rice production across Asia especially through the production of higher-yielding types. As with the maize and sorghum efforts described above, rice breeding began with an effort to assemble at IRRI as many rice varieties as possible. Because there were already a number of significant rice collections available elsewhere in Asia as well as in the United States and Europe, the

collection initially grew by means of donations rather than collecting. It nonetheless constituted a significant effort. By the end of 1972, the collection included nearly 7000 accessions.⁵

While these programs were accumulating significant numbers of varieties of select crop plants, a growing number of breeders and geneticists in many different countries had begun to articulate concerns about the loss of crop genetic diversity. The 1960s saw increasing agitation for the creation of an international institution that would gather and protect in perpetuity the genetic diversity in agricultural plants, which was thought to be in rapid decline as a result of agricultural modernization—that is, because of the still-unfolding Green Revolution—especially in those parts of the world where the genetic diversity of crop plants was richest. International organizations including a joint initiative of the UN Food and Agriculture Organization (FAO) and the International Biological Programme (IBP) formulated ambitious plans for a response to the escalating loss of plant genetic diversity—including global collecting activities across a wide range of crops and their wild relatives, new regional and international seed banks, a coordinating agency, and more—only to see these founder for lack of financial and institutional support.⁶

Mounting international concerns about the "genetic erosion" occurring in species of agricultural importance worldwide soon spurred the Rockefeller Foundation to take action as well. Officers of the Rockefeller Foundation's Agricultural Sciences program felt that the foundation had an important role to play in collecting and maintaining crop genetic diversity, not least because of its past involvement in launching and maintaining large varietal collections at its agricultural research centers. In 1969 it put forward an initial proposal for a "World Germplasm Project" that would address this issue. This would consist in assembling four expert groups—one each for maize, rice, wheat, and sorghum and the millets—each of which would establish the status of existing crop collections, the gaps in

these collections that most needed to be filled, and the future actions required to ensure the long-term survival of global crop diversity, or "germplasm resources."⁷

Meanwhile, the joint FAO/IBP group continued to press for their vision of securing what were increasingly referred to as "plant genetic resources" through the creation of a world network of genetic resources centers and an international genebank for crop plants and their wild relatives. In 1971 representatives of this group laid their plans, and a plea for funding, at the feet of a newly organized international body called the Consultative Group on International Agricultural Research (CGIAR). There they described the loss of crop diversity as a concern that threatened the entire future of agricultural development, and therefore a crucial issue for CGIAR. From 1971 until 1973, members of CGIAR, whose mandate was to coordinate international aid for agricultural research in developing countries, worked to address the conservation of global crop diversity in a way that satisfied its core members.⁸

Because the Rockefeller Foundation (along with the Ford Foundation) had been instrumental in creating CGIAR, and was extremely influential in CGIAR's decision making in its early years, it became involved in the conservation of agrobiodiversity through this route as well. In fact, administrators of the Rockefeller Foundation who served as representatives to CGIAR and sat on its Technical Advisory Committee directly influenced the eventual response of CGIAR to the issue of plant genetic resources. In 1973, CGIAR voted to establish a new agricultural research organization called the International Board for Plant Genetic Resources (IBPGR), the final form of which differed dramatically from the organization that the FAO/IBP group had had in mind and, by comparison, strongly reflected the concerns and priorities of the Rockefeller Foundation as these were articulated by its representatives.⁹

The interest of the Rockefeller Foundation's agricultural science administrators in the conservation of crop plant diversity in the 1970s, and their embrace of this

as an issue suited to the aims of the foundation, is also evident in its sponsorship of a new seed storage facility in China beginning in the late 1970s. In 1974, one of the Rockefeller Foundation's agricultural officers traveled to China as part of a delegation of American scientists, and recommended to the agricultural scientists he met that they invest greater resources in the conservation of China's crop diversity. A few years later, when a Rockefeller Foundation delegation was invited to China to explore the possibilities for a foundation-funded project, a gene bank to be associated with the Chinese Academy of Agricultural Sciences was quickly settled on as the preferred project. The planning and construction of this gene bank extended from 1980 to 1986; investigation of its execution unsurprisingly offers insights into US-China relations during this period as well as the Rockefeller Foundation's interest in germplasm collections.¹⁰

Together these activities constituted the core of the Rockefeller Foundation's involvement in the exploration, collection, and conservation of agro-biodiversity from the 1940s through the 1990s. As this overview suggests, these activities were varied in nature and purpose. Taken as a whole, however, they are indicative of the central role of crop plant diversity in agricultural modernization in the twentieth century as well as the increased urgency attached to the conservation of such diversity over this period.

¹ For more on these efforts, see the oral histories of Paul Mangelsdorf and Edwin Wellhausen (both in RAC, RF RG 13). Additional scattered materials that describe these initial corn-collecting activities are found in RAC, RF RG 6.13, Series 1.1, in miscellaneous folders relating to the corn-breeding program (see, e.g., folders 21-28, 137, 141, 507).

² See, e.g., foreword to E. J. Wellhausen, L. M. Roberts, and E. Hernandez X. in collaboration with Paul C. Mangelsdorf, *Races of Maize in Mexico: Their Origin, Characteristics and Distribution* (Bussey Institution of Harvard University, 1952).

³ Correspondence with and about the "Maize Committee" held in the RAC collections can be found in RAC, RF RG 1.2, Series 300, Box 1, Folders 2–6.

⁴ Detailed documentation of the sorghum collecting missions and the creation of the "world collection" are gathered in RAC, RF RG 6.7, Series IV.5, Box 74, Folders 485–487.

⁵ Documentation of the origins of the IRRI rice collection within the holdings of the RAC is limited, at least insofar as I could discover. Some relevant materials are available in RAC, RF 1.3, Series 103D, Box 18, Folders 116–120.

⁶ A useful overview of these proposals can be found in O. H. Frankel and E. Bennett, eds., *Genetic Resources in Plants—Their Exploration and Conservation*, IBP Handbook No. 11 (Oxford: Blackwell, 1970).

⁷ Files related to the World Germplasm Project are concentrated in RAC, RF RG 1.3, Series 103D, Boxes 16–17, Folders 101–115.

⁸ A useful overview of the FAO/IBP and CGIAR efforts on plant genetic resources is Robin Pistorius, *Scientists, Plants, and Politics: A History of the Plant Genetic Resources Movement* (Rome: IPGRI, 1997).
http://www.biodiversityinternational.org/uploads/tx_news/Scientists_plants_and_politics_240_01.pdf.

⁹ Materials related to the formation of the IBPGR at the RAC are scattered but sometimes very revealing. One series of documents can be found in RAC, RF RG 1.3, Series 103D, Box 20, Folders 127–130; other related materials are in RAC, RF RG, Series 103D, Box 16–17, Folders 101–109.

¹⁰ This project is richly documented in the RAC and well worth the attention of another historian. The files are in RAC, RF RG 1.23, Series 601D, Boxes R2967–R2969.