Designing Agricultural Programs in Mexico and India: Challenges, Successes, and Missed Opportunities

by Gabriela Soto Laveaga
Harvard University

Abstract

While several scholars have examined the foundation and agricultural innovation of the initial 1943 Office of Special Studies (OSS or OEE, the abbreviation in Spanish), this research focuses on, first, the impact of this knowledge on domestic science and rural Mexican development, and, second, the production of agricultural science techniques designed for domestic experimental stations yet implemented beyond Mexico. Consequently, this research examines how these Mexico-based ideas, distinct practices and scientific knowledge looked on the ground in the 1960s when knowledge practices —and seeds—developed in Mexico, arrived in India. In addition to research at the Rockefeller Archive Center (RAC), as well as in national and state archives in Mexico and India, oral histories of farmers and scientists were conducted. This research report briefly examines the sunsetting of the OEE and its fusion into a new, wholly Mexican institute (INIA) which would become vital for later international networks. Simultaneously, the Rockefeller Foundation was expanding its presence in rural India.

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Office of Special Studies

It is challenging to describe the vast reach and cultural impact of the Office of Special Studies (OEE). While billed as a partnership between the Mexican government and the Rockefeller Foundation for agricultural research and education, its influence spilled into areas that extended beyond agricultural education and practice. Investments in research, for example, created jobs and opportunities and professionalization of technicians and scientists. Experimental stations provided a broad gamut of jobs for untrained locals from drivers to field hands. Ministries hired personnel and schools opened programs led by former recipients of Rockefeller Foundation grants. In particular, the OEE brought the possibility of seed funding or continued funding for agricultural science training. For smaller campuses, this was especially appealing.

For example, on May 29, 1958, the director of the Escuela Superior Antonio Narro of the state of Coahuila wrote to the central offices asking if the OEE could provide funds toward the construction of a much-needed laboratory. The response, that OEE mainly funded postgraduate research, did not deter the director from writing a year later to inform the office that the school had expanded its reach and was now offering advanced courses, could the OEE now fund their laboratory? It is unclear from the archival documentation if this curricular change brought desired funding to the school, yet it illustrates how the OEE was perceived at all levels of agricultural research and training in Mexico as a potential motor for funded transformation.

Once the agreement between Mexico's Ministry of Agriculture and Livestock (Secretaria de Agricultura y Ganaderia, SAG) and the Rockefeller Foundation was signed, what was needed to make this program function? The answer depends on how one understands the objective of MAP, the Mexican Agricultural Program. If we think of it in terms of training of Mexican scientists, infrastructure (experimental stations, offices, laboratories), or cooperation with domestic agencies and offices, each of these necessitated new definitions of success.

Despite its ultimate impact, from its inception, the Office of Special Studies was conceived as a temporary office. It was meant as a provisional bridge to gap the number of trained Mexican personnel. Once the Mexican government assessed that it could wholly carry out research on its own, the OEE would transition to a wholly-Mexican administered office—or to something else. In the early 1960s, that "something else" came into existence as the Instituto Nacional de Investigaciones Agrícolas (INIA).

The sunsetting of the Office of Special Studies led to a reorganization and rethinking of the role of state-led agricultural programs and its reach in the country. The Ministry of Agriculture and Livestock (SAG) created the Instituto Nacional de Investigaciones Agrícolas (INIA), a fusion of the Office of Special Studies and the Instituto de Investigaciones Agrícolas (IIA). The merging of two distinct organizations —one national and one bi-national in nature—with distinct objectives posed new challenges. In this new panorama of agricultural projects, what would the mission be for national agricultural research? In an early 1960 document, the SAG pondered what this new agreement between its ministry, the Mexican government, and the Rockefeller Foundation might entail.[2]

In this early document, the SAG explained that INIA was rethought so it could address the nation's "most important and urgent problems" in agricultural development. To carry out its mission, it would need a domestic corps of highly trained personnel capable of "utmost effectiveness." Fortunately, it had them. In the previous two decades, the Office of Special Studies had first sent young Mexican agricultural students to obtain advanced degrees in the United States, mostly in the Midwest's land-grant universities. Importantly, young scientists and

technicians could continue their studies and training once back in Mexico because the research infrastructure was such that they could do this. Continuity of research was possible because of a second major point outlined in the report: major investment in the nation's scientific infrastructure (investment in the Chapingo campus, as well as in its experimental fields and laboratories, for example) had taken place since the 1940s. The Rockefeller Foundation's role in training dozens of Mexican scientists was pivotal to make this seamless transition to a fully-Mexican operation was recognized by the SAG.

Yet even with a clear mandate, how do you build a new organization when you merge two different ones? As the SAG acknowledged, there were some key challenges.

An immediate issue was how to organize the breadth of programs and diverse research interests covered by two institutions into one cohesive unit. This necessitated a careful replanning of the organization and, especially, deciding how —and who—would lead it. In addition to the director, charged with defining the research plan, and a subdirector, there was a need for a co-director focused on guiding the technical group of the RF and coordinating its efforts with existing groups. In other words, an individual who could bridge two institutional aims, practices, cultures, and personnel. In addition, this co-director would join the executive director in devising a general research plan. This latter point is vital to grasp. This indicates that though this would fully be a Mexican governmental agency, INIA would also rely on input and advice culled from programs already in existence. Essentially, this was a written pledge that programming and an existing research agenda would continue. Vital to the continuity of the research agenda were the *jefes de departamento*, department area chiefs, charged with carrying out different targeted research and regional center directors spread throughout Mexico. These centers were strategically located throughout the country: Mexico's northwest (CIANO – in Ciudad Obregon), northeast (CIANE in Torreón), Bajío (CIAB – Roque, Guanajuato), Southeast (CIASE – Cotaxtla and Rosario Izapa) and the Huasteca in the valleys of San Luis Potosí (CIAH). This geographic spread reflected Mexico's many microclimates and also reveals the expansive geographic network of on-the-ground expertise.

The newly founded INIA's headquarters would be based in Chapingo, neighboring Mexico's National School of Agriculture, where its main research center would be anchored.

Significantly, and this is important for the future history of the Green Revolution, all existing research stations and experimental camps were administered by regional centers. These experimental areas, charged with creating new hybrid seeds, would focus on "benefiting the regions in which they were based." In other words, hybrid seeds would be designed for specific locales. But what does it take to *build* an influential program? For some centers, they would have to begin from scratch. There were, fortunately, specific blueprints for how to do this.

Decades earlier, the Rockefeller Foundation, via the Office of Special Studies, grasped how more than goodwill and funds were needed to develop a successful program. Expertise came in different guises and often one had to go out and find it. For example, a mere five years earlier, in March 1956, E.J. Wellhausen wrote to Dr. Wendell Bragonier of the Department of Botany and Plant Pathology at Iowa State with a single question: what does one need to start a seed laboratory like the one Bragonier had at his university, perceived by many as being "the best seed laboratory in the United States"?[3] Funds would allow the establishment of a seed laboratory at Chapingo and more than a research-driven facility it would also be "both a service and a research laboratory" providing, for instance, seed certification in corn, wheat, beans, grasses, and sorghums, to list a few. Wellhausen added an interesting detail at the end of his letter. The Wheat Rust Conference was "in full swing" and he was racing to catch a train that would take them to the Office of Special Studies' experimental station in the Bajío. I highlight this last sentence for it underscores how crucial physical movement across Mexico's many stations was for directors of the program who needed to be engaged with local scientists and, one presumes, farmers.

A month later, impatiently awaiting a response from Professor Bragonier, Wellhausen was authorized to travel to Iowa and personally request a list of equipment needed to set up a top-tier seed laboratory in Mexico—there was an unmistakable urgency for crucial research to begin immediately in Chapingo.

Coincidentally, two days later, a thorough, thoughtful, and detailed description of what was needed arrived at the Mexico City office of the Rockefeller Foundation. The letter provided an account of the material, people, space, and reference material considered vital for top-tier seed research in 1956. The letter's exhaustive instructions helped explain its delay. For instance, citing the Association of Official Seed Analysts as the source for the majority of the recommendations, it explained the educational qualifications needed for a head of the laboratory (minimum master's degree in biology *or* a bachelor's degree with three-years' experience); the type of lighting — "daylight" fluorescent lights,— to "comfortable adjustable" chairs, to "at least one germinator with automatic heat and cold control." The lab floor space itself was also explained, insisting that the minimum required area "equal at least one square foot for each seven samples received" for testing. Furthermore, the letter writer took care to list the reference books essential for any good seed laboratory, as well as the recommendation that the Rockefeller Foundation write to the Iowa State College Book Store and "obtain a copy of the book 'Seed Analysis'…the price is $2.80." Finally, the letter ended with a list of the five leading seed germinator companies that could help outfit the needed instruments in the lab.

In short, if all instructions were followed, what was considered the best American laboratory would be replicated a few miles outside of Mexico City and on the campus of the nation's National School of Agriculture. The archival folders consulted do not reveal if an equivalent letter was sent to seed research laboratories in Mexico or other parts of Latin America. It is this latter point which is of particular interest for my research. Since its arrival and despite the push for cooperation with Mexico's National School of Agriculture at Chapingo and various government ministries, for the OEE, the model to follow was one of American science. This exchange of letters and the attempts to model a laboratory to the exact specifications of an American one also reveals where knowledge was perceived by Rockefeller Foundation scientists to be produced: outside of Mexico.

Five years after the seed laboratory was established, this practice of continually seeking experts and expertise outside of Mexico prompted the SAG to directly address the issue when the OEE transitioned into INIA. In particular, the SAG

called attention to how the OEE and IIA had accomplished their goals. Whereas the OEE had an "evolution which allowed it to have clearly defined goals and plans," by contrast, the IIA was required to establish experimental stations despite not having personnel or sustainable funds to follow through with the required research.[4] It is unclear in the document who compelled the IIA to continue to establish experimental camps it was unable to fully maintain, though the implication is that it seemed to be part of the arrangement between the Mexican government and the Rockefeller Foundation. This "difference" in pursuing research goals on the ground —a well-funded, foreign-led team as opposed to a domestically underfunded and hence struggling team—certainly influenced what type of research would be carried out.

The document fusing OEE and IIA also covered the continuing education of personnel and the tension between these two. Though the Rockefeller Foundation's scholarships "rewarded all professional deemed excellent, for some unknown reason the researchers of IIA never sought out these grants."[5] This perceived distinction between opportunities for "Rockefeller" scientists and Mexican ones also made its way into the transitional document. To avoid differential treatment the SAG decreed that "when this organizational change takes place Mexican personnel—from the directorships to the specialized assistant—will be the *only* ones responsible in the eyes of the Ministry and the country for the running of said institution."[6]

An additional problem, with larger ramifications, was the disparity in salaries between the OEE and IIA. To avoid problems associated with differing pay scales for the same work, as well as an increased deficit for spreading the research agenda too thinly, the SAG advised a needed increase in funding than what had been given in the previous years.

Anticipating pushback from federal authorities for its request for more funding, the SAG explained that though agricultural research seemed to have a high price, these funds were minimal "compared to the amount the government has had to spend in a single year importing wheat and other crops to make up for the country's deficit" - and so, SAG authorities seemed to reason that these were funds

well spent. Moreover, this request in increased funds would only be temporary as the SAG would seek that funding of agricultural research in Mexico be equally distributed between farmers, the government, and "semi-official or private interests" linked to agricultural production. As that would take a while to set in place, the SAG would rely on the Rockefeller Foundation for "a more substantial effort, not only financial, but also technical." The question SAG then raised was how interested was the Rockefeller Foundation in pursuing a research agenda that favored states beyond those already supported by the RF? In other words, with SAG officials setting a clear agenda that was centered on local needs, would the RF continue to fund Mexico-based projects with the same enthusiasm and actual dollars?

Redefining Agriculture in India

The question of projected funding and dollars also arises in other countries. This was especially the case when the Rockefeller Foundation set its sights in expanding its agricultural program in India beyond specific projects (such as the Allahabad Institute). Though India had long been a key interest of the Rockefeller Foundation with earlier projects in health stretching to the early twentieth century, its foray into agriculture would be influenced by what had occurred in Mexico.

While there was no equivalent to the reach of the Office of Special Studies in India, there were direct networks built with the nation's agricultural research institutes (in particular, IARI, the Indian Agricultural Research Institute) and new agricultural universities, especially those in wheat and rice-producing regions. As became apparent, however, relying on existing institutions and organizations posed a set of new issues. At a Rockefeller Foundation trustees' meeting, some raised concerns about what to do if "the government of a country would use the grants of the Foundation as a sort of budget support for their Plan projects or would tend to withdraw support from projects which were considered suitable for grants by the Foundation."[7] With these considerations, they determined instead to "build on strengths" and work with a variety of organizations on the ground.

This breadth, however, raised a different question: *who* is in charge of technical assistance in the country? Was it the RF with its finite but targeted resources or the relatively new Indian government which created the nation's Technical Assistance Selection Committee which would determine the country's agricultural future?

In Spring 1966, in addition to seed purchased by the Indian government, the Mexican government sent high-yielding hybrid wheat seeds to India, with financial help from the Rockefeller Foundation. It was the largest shipment of wheat seeds ever exported from Mexico. As dozens of scholars have already noted, these Mexican seeds launched the Green Revolution. If we follow the trajectory of hybrid seeds from Mexico to South Asia, we find echoes of what was happening on the ground in other parts of Mexico. Yet, it also introduces new elements of complexity to the story of the production of hybrid seeds and a universal solution to hunger. For example, my larger project examines what measures travel well and which must be calibrated to the specific locale. While one may assume that there are universal roles and factors (i.e., water, farmer, loan, etc.) that remain constant regardless of location, the RAC files reveal that when speaking of the transfer of seed technology, this was not always the case. While the parameters that define who is a "farmer" are unsurprisingly not applicable on a worldwide scale, it is how this information was used—or not—by RF field agents and politicians that merits a larger discussion. Put differently, who is a *farmer* is, not surprisingly, not universal. While this seems an obvious point, it nonetheless is vital for how organizations, such as the Rockefeller Foundation, came to understand their work and the people with whom they interacted.

The complexity on the (literal) ground was reflected in the "type" of farmers profiled. A critique of the Green Revolution was that the RF and other technocrats of the era did not fully understand the micro-level interactions involved with farming in both Mexico and India. Yet, information found in the RAC archival collections leads one to believe that the information was available, though it is uncertain if it was applied—or read—by field officers. Case in point is a fascinating report on "Changing Agriculture and Rural Life in a Region of Northern India," which determined that there were ten types of farmers in a sample consisting of

403 farmers from Uttar Pradesh.[8] The reported classification is quite interesting, especially from the first division: "progressive" and "less progressive." This seemingly arbitrary division was further divided into small, medium, and large landholders, and these designations further divided. The report took care, it seems, to anchor the idea that farmers in India could not be lumped as one. Such is the case of Doodh Nath of Bhatpura who owned "5 acres and sows 9," of which 66% "is irrigated by his own diesel tubewell which was just installed this year—after July 1967." Though the report explains that the only "improved implement" is a one iron plough for his "pair of bullocks," it also notes that one third of his land is sown with HYV (high-yield varieties), including Sonora 64 wheat and hybrid maize. Also, though he has no heavy machinery (his entire family, including two children, perform all the work), he does have a loan that covered his new tubewell and the motor. Curiously, neither the motorized tubewell nor the HYV are considered improved technologies in the report. Much is made about his lack of formal schooling and his attempt to compensate this "lack" by "making and learning from many useful contacts outside his family and village." This was especially interesting because it reveals that though a small plot famer, Nath is in constant conversation with outside "experts," who have clearly pushed for the aim of "complete irrigation" on his farm and increased use of fertilizer.

In contrast, there is Som Pal of Disauli who, like Nath, owns 5 acres of land, though he sows a total of 9 acres. Pal, however, does not own a tubewell and his inability to secure a reliable source of water tethers him to a state tubewell. Moreover, the report notes that Pal has not turned to high-yielding varieties of wheat and instead relies on "deshi" (or desi) wheat. This lack of shift to the new varieties seems to already label him problematic. [9] As opposed to Nath, Pal is described in less glowing terms. In fact, he is seen as:

> [s]olely dependent on outmoded implements and inadequate imported irrigation, with no cash or credit to buy high yielding seed or fertilizer, he seems held to a general condition of less progressiveness without personal, family or other non-economic assets to bring about improvement. His wish to install a tubewell will probably remain long unfulfilled because means are not in prospect within or without his capabilities.

This dire prediction about Pal's prospects dismisses a fact in the previous paragraph which explains how forty-year-old Pal tried unsuccessfully to obtain a loan for a tubewell. This fact illustrates that Pal was not only aware of the improvements that were needed, but he was willing to indebt himself in order to make his small plots yield more using new technologies. Yet, his inability to secure credit is portrayed as a personal flaw rather than systemic inequity in rural India. Furthermore, this inability to obtain credit continues as a resounding theme in following years. Invariably, it is often translated as an inability to embrace technology and independent of any rigid social, political, and financial constraints which exclude most rural farmers from credit at this time.

The example of Pal, whose various attempts to secure a bank loan are understood as failure and, worse, interpreted as an unwillingness to modernize, allows us to understand how the idea of a difficult farmer might become part of the narrative of development projects. Moreover, it would be nearly impossible for an individual farmer to move beyond that category once he had been labeled "difficult" or "not progressive."

It is these granular actions on the ground (credit, local networks, access to education, access to tubewell, etc.) which will determine the success of high-yielding varieties of wheat in India.

The most surprising aspect of this attention to detail, in particular of small farmers, is that this degree of consideration seems not to matter once high-yield hybrid seeds enter India and are distributed across the country. It is somewhat baffling that these anthropological and telling ethnographic details which played such a heavy role in the report seem to, nonetheless, mean little for the design of local programs.

This disinterest in finding locally-tailored programs or solutions—in spite of significant ethnographic work—was already observed in Mexico. As just one example, in the summer of 1957, for a bit more than three weeks (June 24 – July 14), a team of RF-sponsored researchers traveled to Mexico (and later Colombia) to review a program in agricultural economics. Not surprisingly, the evaluators

were looking to implement programs similar to farm management ones in the United States. To do so, researchers would have to have a "random sample of farm business records from privately operated farms," and crucially avoid the ejidos, the foundation of Mexican rural life. Though acknowledging the difficult in obtaining such records it was, the researchers believed, not impossible. In large part because a similar study of a cooperative had been conducted earlier under the auspices of credit banks. The hope was that the study would yield a "more complete understanding of the economic problems of Mexican agriculture" which would, in turn, influence the shaping of future studies and, crucially, new programs. [10] There was also a strong encouragement that some Mexicans travel to, in this case, Purdue for farm administration and operation courses. The author of the report warned that others would not see his plans as "agricultural economics" (the stated goal of the working group), but he was quite clear that, "this doesn't concern me. What I have in mind is training that lies in the twilight zone among the departments of Agricultural Economics, Agronomy, Animal Husbandry, and Agricultural Engineering."

So, what does the above reveal? In short, it was complicated to enter a country and it was equally difficult to leave. When the Rockefeller Foundation entered a new region, it conducted studies to understand the people, the environment, and the potential socio-economic impacts of future programming. However, carrying out these studies did not mean that they would influence projected planning, as was the case both in Mexico and India. Also, tensions between Rockefeller Foundation-funded offices (or initiatives) and (poorer-funded) domestic projects were common. In the case of Mexico, these tensions were significant enough to warrant explicit mention in the creation of a new institute when the Office of Special Studies ceased to be a Rockefeller Foundation-Mexico government initiative and became a wholly Mexican institution. The above reports also reveal that individual field officers had significant leeway to shape on-the-ground programming and research agendas, often disregarding former studies conducted by their own organization. Despite these tensions, the funding provided by the RF was desired and, as the letter from the agricultural school reveals, also sought after. The Rockefeller Foundation's funds had real power to transform the number of trained professionals, broaden the access for those who wanted

agricultural training, and expand the actual infrastructure of existing schools. These changes were significant, and they left a lasting legacy in each country researched.

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[1] I am deeply grateful to the RAC staff for their enthusiasm and research support during my brief stay. I am especially grateful to Lee Hiltzik whose expansive knowledge of the archive and incisive questions prompted me to search beyond my initial scope.

[2] Unless otherwise specified citations are from: Secretaria de Agricultura y Ganaderia, Instituto Nacional de Investigaciones Agricolas."INIA Rules and Regulations, "1960-1961, RG 6.13, Series 1.1, Box 28, Folder 315, Rockefeller Foundation records (RF), RAC.

[3] The citations that follow until specified are from "Letter to Bragonier from Wellhausen, March 23, 1956." Decorations Borlaug, RG 3, Series 900. Box 1A, Folder 7.14, RF, RAC.

[4] Unless otherwise specified citations are from: Secretaria de Agricultura y Ganaderia, Instituto Nacional de Investigaciones Agricolas."INIA Rules and Regulations, "1960-1961, RG 6.13, Series 1.1, Box 28, Folder 315, RF, RAC.

[5] The document does stress that the reasons for Mexican researchers at IIA not pursuing Rockefeller grants is officially unknown. However, from anecdotal evidence from a chemist at UNAM's Chemistry Institute there was a known rivalry among scientists from IIA and OEE for the already stated reasons (i.e., difference in pay, in work conditions, and educational opportunities).

[6] Emphasis mine.

[7] This was referencing India's multi-year plans for developing the nation. RG 1.2, Series 460, Box 1, Folder 3, RF, RAC.

[8] RF-Uttar Pradesh, RG 6.7, Series 1112, Box 149, Folder 1090 RF, RAC.

[9] In 2019 *desi wheat* from the Punjab, the "variety that existed before the Green Revolution," will be proposed as a possible solution to climate change- resistant varieties of seed. In part because this "old" variety does not respond well to fertilizers and must then be "cultivated in a natural way." The turn to traditional forms of farming emphasizes the possibility to find solutions beyond those developed in the mid-twentieth century. See Vibhor Mohan, "Punjab's 2,000-yr-old 'desi' wheat variety is solution to climate change," *Times of* India. December 7, 2019.

[10] RF- Mexico Field Office, RG 6.13, Series 1.1, Box 1, Folder 4, RF, RAC.