The Trouble with Mechanized Farming: The Politics of Technological Change in the Netherlands East Indies, ca. 1920

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In 1919, the colonial government of the Netherlands East Indies launched an experiment in mechanized rice farming not far from Palembang, Sumatra, an important colonial plantation district. The main supporter of this project, J. Sibinga-Mulder, director of the Indies Department of Agriculture, Industry and Trade (which for simplicity I will refer to henceforth as the Department of Agriculture), sought to show that large-scale rice farms using the most modern mechanical equipment and methods could provide the Indies with a reliable domestic source of rice (Handelingen van den Volksraad: Buitengewone Zitting 1919: 19). The experiment touched off a public debate about the social and technical appropriateness of mechanized rice farming for the Indies, a debate that contributed to the decision of the Department of Agriculture to cancel the project in 1923. At issue was not simply the techniques of farming, but conflicting ideologies of modernization, ideologies that defined a social, technical, and moral framework for the colony’s future. This article explores the ideologies of modernization used in this debate and shows how these ideologies informed the technological choices made by colonial officials.

Before going any further, it is important to be quite clear about what I mean by modernization. Rarely did those involved in this debate refer to the projects they discussed as attempts at "modernization" (modernisatie, or vernieuwing), preferring instead to talk about specific projects as "improving" or "development" (ontwikkeling). Nonetheless, I believe it is useful to speak of moderniza-

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tion in connection with the ideologies studied here because it captures the idea of a significant break from the past that involves, to quote Webster’s definition of modern, "recent techniques, methods, or ideas" (Webster's New Collegiate Dictionary 1980). I use this broad definition in contrast to the more restricted meanings adopted by some modernization theorists of the late 1960s who defined modernization as "the process of social change whereby less developed societies acquire characteristics of more developed societies" (Sills 1968: 386). This definition is an example of what Francesca Bray calls the "master narrative" of development, that sees all societies proceeding along a linear and progressive path defined by the history of Western Europe (Bray 1997). Such master narratives often view mechanization as a characteristic of the "more developed" societies and therefore as inherently "modernizing." Such a definition requires that one read what happened in the Netherlands East Indies as a history of modernizing, forward-looking supporters of the mechanization of rice production versus an inherently conservative anti-modern opposition. In rejecting the narrow definition of modernization, I also reject the simplistic view imposed by this master narrative. I instead ask how historical actors defined their own ideas about the proper direction of social and technical change for Indies society. A close examination reveals that both supporters and opponents of mechanization held forward-looking ideals that contained some elements radically new to colonial society and some that were deeply conservative, making a simplistic "moderns vs. anti-modern" characterization of the debate problematic. Adopting the broader definition of modernization allows us to see how historical actors configured recent techniques, methods, and ideas within their conflicting views of the proper direction for the colonial future, especially the role that the mechanization of rice production could or should play.

The Politics of the Food Supply

When Sibinga-Mulder proposed an experiment in mechanized rice agriculture in the colony, he did so as an answer to public concerns over the Indies’ increasing dependence on imported rice. By the early twentieth century, Dutch colonization of the East Indies had spread to most of the areas that make up the current state of Indonesia.2 The Dutch effectively controlled (that is, they collected taxes and enforced laws concerning trade and land use) Java, Madura, Bali and the lower Sunda islands, and much of Sumatra, Kalimantan, Sulawesi, and the Moluccan islands. Rice was the staple food across much of the archipelago, grown locally by peasant farmers, usually on very small holdings, using labor-intensive, but productive methods. Until about 1890 the Indies had exported more rice than it imported, and food policies generally centered on localized famine relief projects (Hugenholtz 1986). This changed by the early years of the twentieth century,

2 For a general political history of Indonesia during this era, see Rickelfs 1993.
when the Indies became a net importer of rice, relying on Siamese and Burmese suppliers to support a growing population, many of whom were landless laborers on European-owned plantations.

With the booming plantation industry bringing in substantial profits from export crops such as tea, coffee, tobacco, and sugar, few people in the colonial government or in the wider European community worried about this dependence on imports until the disruptions of World War I. During the war, rice-exporting countries, especially colonial Burma and Vietnam, instituted export restrictions and sometimes complete embargoes due to their own food shortages. The Indies colonial government compensated for the shortage of imported rice through stringent short-term measures: it rationed rice, mandated that some Natives\(^3\) plant their land to food rather than export crops, and encouraged wider cultivation and consumption of "alternative" foods, such as cassava and corn (see speeches by Sibinga-Mulder in *Handelingen van den Volksraad* 1919: 8–18). It also temporarily required plantation owners to grow a certain percentage of the food for their own laborers on plantation land.

The hardships of the war years had a galvanizing effect on many politicians and social critics, and led them to call for significant changes in policies to alleviate the insecurity of the food supply. Some critics argued that the war had only served to forcefully demonstrate a fundamental problem caused by important shifts in the character of the Indies population that had been slowly taking place since the late nineteenth century. In a statistical analysis that supported a popular, common-sense explanation of the problems in the Netherlands Indies, C. Lulofs analyzed the intersections of food, population, and production in the Indies, homing in on the troubled relationship between Native rice farming and European estate farming (Lulofs 1918). He argued that as Java became more densely populated and tillable land not used by European plantations more scarce, a growing number of Natives would find themselves unable to meet their own food needs through farming. Some would lose or give up their land and become coolies for the large estates, buying rather than growing their own food. Yet since the remaining Native farmers produced only a moderate amount of rice beyond their own needs, the supply of rice would increasingly fall short of the demand, rendering the Indies ever more dependent on imported food.

Lulofs’ analysis identified increasing population density as the main culprit, but other analysts saw the problem stemming not from a simple lack of land, but from the structure of work promoted by estate agriculture. H. J. Grijzen, a former governor of Sumatra, noted that during the war the East Coast of Sumatra, an

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\(^3\) Throughout this article I refer to the peoples of the colony according to the racialized legal categories in use at the time, including *Native* for indigenous Malays and *European* for those people either born in Europe or legally acknowledged by a European father. This distinction is important because "development" was aimed only at legal Natives, never at Europeans, regardless of their place of birth, or "Chinese," who may or many not have been born in the Indies.
administrative district containing some of the richest plantations in the Indies, had imported more rice than the rest of the Indies combined (Grijzen 1921). Yet Sumatra had a relatively small population in proportion to available land. Grijzen described how the plantation labor system on Sumatra had caused this significant imbalance between production and consumption of rice. Plantations relied almost exclusively on contract laborers from Java and Madura. These workers owned no land and were obligated to work full time for the plantation for the length of their contract, usually three years. They had neither the means nor the opportunity to grow rice themselves, and depended on the plantation owners for food, which they received as partial payment for their work. The indigenous peoples of Sumatra showed little inclination either to work on plantations or to produce significant surpluses of rice. Thus Sumatran plantation owners were forced to look elsewhere for their rice, usually to Burmese or Siamese imports coming through Singapore, to keep the plantation production system afloat.

The significance of rice in the operation of the plantation system went beyond its utility as food, because rice could not be easily replaced by alternative foods for any length of time without jeopardizing already tense relations between plantation owners and workers. For most Indonesians, especially the Javanese that made up the bulk of the contract laborers, eating rice was a symbol of well-being and prosperity. One’s social position could be measured by both the amount and quality of rice one consumed; going without rice signified a humiliating level of poverty. Adding humiliation to the already bad conditions on the Sumatran plantations, which Ann Laura Stoler described as “cramped and poor housing, widespread disease, high adult and infant mortality, along with verbally and physically abusive (and violent) labor relations,” would undoubtedly provoke disruption, and perhaps violence (Stoler 1995: 34). Stoler shows that intermittent violence on the plantations characterized labor relations throughout the colonial era. If plantation owners rationed rice too stringently or claimed rice shortages, even if they supplied ample quantities of “alternative food,” they risked destabilizing volatile labor relations, and thus jeopardizing the plantation system itself.

Labor relations became more precarious with the rise of vocal and well-organized Native activist groups, most notably Sarekat Islam, whose popularity peaked around 1919, when it claimed roughly 500,000 members (Shiraishi 1990). These groups had spoken out against injustices in the colonial system and in some cases had even called for Indonesian independence. Many Europeans felt threatened by the increasingly politicized Native population, and planters especially feared political organization among coolies. In this atmosphere of political tension, colonial officials and plantation owners saw just how dangerous a dissatisfied population could be. Maintaining an adequate supply of rice was necessary therefore not simply to feed the population, but to keep it, and colonial society, quiescent.
Creating a Rice Surplus

With the stability of the plantation system and to some extent the entire colonial system so intertwined with the rice supply, many Europeans argued that the colony should become self-sufficient in rice production, reducing or eliminating what they saw as the suicidal dependence on outside suppliers. This led to questions about the technology of rice production in the Indies, as peasant rice agriculture typically produced only small surpluses. Without some change in production methods, the colony could not hope to adequately supply the needs of both farmers and the growing numbers of landless laborers. The question became how to create a rice surplus. Some critics, especially members of the emerging Native activist movements known collectively as the pergerakan ("the movement"), called for the government to give some land currently occupied by sugar plantations back to landless farmers who would then provide the surplus.\(^4\) Supporters argued that the plantation system of export crops should make way for traditional Javanese wet-rice farming, achieving the desired surplus by dedicating more land and people to rice production. Sibing-Mulder, newly appointed as director of the Department of Agriculture and a former sugar planter himself, rejected any such scaling-back of sugar plantations. He proposed instead mechanized rice farming on the lightly populated outer islands, which would, he claimed, produce larger rice surpluses per worker than traditional methods. Sibinga-Mulder’s plan aimed to leave the plantation system intact, but to replace, or at least supplement, traditional methods of rice production.

Both proposals to address the food supply combined radically new and conservative elements. While those supporting plantation cutbacks saw little need for radical change to the technology of rice production (both in technique and in the social groups involved), it is important to recognize that they were advocating a radical shift in relations between plantation and Native production. If officials adopted this plan, they would give production of food primacy over production of export crops, threatening the stability of plantations and the appeal of these plantations to foreign investors. They would in effect be backing Natives as both producers and consumers to the detriment of European financial interests in the colony. Likewise, while Sibing-Mulder’s plan required the introduction of much modern machinery and the overturn of traditional social relations in rice production, it also buttressed the colony’s long-standing system of plantation production.

\(^4\) See, for instance, speeches by Tjokroaminoto, Tjipto Mangoenkoesomo, Abdoel Moeis, and Chr. Cramer in Handelingen van de Volksraad 1919. For more information on the complicated connection between rice and sugar on Java, see Geertz 1963.
Ideologies of Mechanization

In supporting mechanized farming, Sibinga-Mulder advocated a system of cutting edge technology that many agricultural experts, especially those who had managed large-scale operations in the United States and Russia, viewed as the most rational and therefore most productive method of farming. Yet productivity is a tricky term. Sibinga-Mulder could argue that modern mechanized farming methods were more productive than Native methods only because he defined productivity in terms of yield *per worker*, rather than yield per hectare. Experts knew that mechanized methods could not compare in yield per hectare to the wet-rice practices of Natives in Java or Bali. Where land was cheap and labor expensive, however, mechanized farming could be profitable, and thus Sibinga-Mulder pointed to the seemingly empty stretches of land on the lightly populated islands of Sumatra and Borneo. He argued that the Indies could follow the highly successful model of mechanized farming practiced in the United States, especially in California. The California rice industry had grown in the space of seven years from a U.S. Department of Agriculture experiment near the town of Biggs, to a commercially successful enterprise, one that was well-documented in professional journals (Chambliss 1920). Sibinga-Mulder hoped to duplicate not just the technologies of production, but the business structure of the American system, promoting rice farms not as government operations, but as profitable private businesses that had the potential to transform the Outer Islands into a storehouse for the Indies (Mail Rapport no. 426/A, 11 Jan. 1919, reprinted in Creutzberg 1974: 245–48). Sibinga-Mulder’s view of the modernization of rice production in the Indies was based on an ideology of mechanization that was similar to that in the United States: mechanization guaranteed bountiful harvests on large areas of land with a minimum of hand labor. This promised for Sibinga-Mulder a new area for European investment, mechanized rice plantations, a dependable source of rice for existing, labor-intensive plantations, and perhaps even the return of a rice exporting business for the Netherlands East Indies.

Sibinga-Mulder was so impressed with the California system that he sent M. B. Smits, a Dutch agricultural expert, on a year-long study trip to the United States. Smits was instructed to become familiar with the methods and machinery used by the Americans and to decide which techniques and equipment would be most promising for the Indies (Smits 1918, esp. "Drooge Rijstbouw als Grootcultuur" [Dry-rice cultivation as a large-scale culture]: 99). On California rice farms, Smits learned that workers used machinery at every stage in the life cycle of the crop: they used tractors to pull plows and disk harrows for land preparation, seed drills for sowing, and combines for harvesting and threshing. Pumps

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5 It is likely that Sibinga-Mulder heard of the mechanized farming practices in California through the contacts he made while a member of The Netherlands East Indian–San Francisco Committee, a group in the Indies Department of Agriculture, Industry and Trade that promoted foreign investment in the Indies.
gave easy and close control of the necessary flooding and draining of the fields during the growing season, essential for good harvests. The California system would often yield as much rice per hectare as a well-tended Javanese wet-rice farm in which most of these operations were done by hand, but Smits was more than pleased by the amount of rice such a farm could produce per worker. He returned to the Indies in 1920 confidently recommending the entire California system, and with a shopping list of machinery they would need to get started.

The Experiment at Selatdjaran

While Smits was in the United States, experts in the Indies Department of Agriculture had selected a site for the experiment, at the confluence of the Aer Moesi and the Selatdjaran rivers near Palembang in Sumatra. After final budget approval from the Ministry of the Colonies in the Netherlands, Dutch experts began work on the experiment, embracing the latest in agricultural machinery for every aspect of the farm’s operation. The object of the experiment was to work out any difficulties in mechanized methods and to demonstrate for potential investors the possibilities for production and profit in rice farming on the Outer Islands. With this in mind, project engineers minimized the labor force, both to demonstrate the power of the machinery and to maximize the yield per worker. Convincing results needed to show a rice surplus notably higher than what Native producers achieved, or could conceivably achieve. It was also important that the project show good results quickly, as Sibinga-Mulder’s plan from the start faced heavy criticism. As the project progressed, the staff faced a serious challenge to their mechanized methods, as these did not always achieve high yields and presented serious operational problems in the wet climate of Sumatra.

Project workers experienced trouble with the machinery almost immediately. Colonial engineers constructed irrigation works and agricultural engineers started land reclamation at Selatdjaran in 1920 using machinery including high-powered tractors, pulling disk harrows and stump-pullers. They had projected that using such machinery would accelerate the normal 2–3 year timetable for land-clearing that a heavily forested area like Selatdjaran might normally require. Despite their best efforts, they could not finish the clearing in time for planting in October: the uprooted vegetation would not burn and some tree stumps could not be pulled out even with machinery. As a result of this and problems completing the irrigation works, project workers planted only a small experimental crop in October of 1920. Looking back, authors of the project’s final report remarked that the mechanized approach to clearing had been misguided (Verbaal 26, 2 Sept. 1924). Land could have been more cheaply and effectively reclaimed if they had allowed the Natives of Sumatra to practice shifting agriculture on it for two or three years before starting the experiment. Hindsight aside, project leaders proceeded as they did because the project was supposed to make a complete break
with traditional methods and demonstrate the superior efficiency and speed of mechanized techniques.

The combination of Sumatran climate and the requirements of dry rice agriculture as practiced in California presented numerous complications as the project continued. Choosing a suitable tractor was difficult. Sumatra has a long rainy season, and heavy wheeled-tractors compressed wet soil, making it useless for cultivation. Tread-style tractors alleviated the compression problem, but they slipped on the wet fields. Inexpensive, low-powered models sometimes could not even propel themselves on the wet soil, much less pull a disk harrow. For mechanical rice agriculture, land preparation and planting at the beginning of the season and harvesting at the end had to be done in dry weather, on dry soil. Timing was crucial: the experiment needed a slow-ripening variety of rice, planted late in the dry season and harvested early in the next dry season. In 1920, the small crop was planted too late and it did not receive enough water at the end of its growing cycle. Rats and insects infested the insufficiently flooded crop and it was entirely lost. In 1921, the planting again started too late, but some of the crop did manage to survive. However, weeds choked fields that had not been thoroughly worked before planting, due in part to the fast reclamation process. The project staff reluctantly hired laborers to manually pull weeds, compromising the mechanized approach, so that there would be enough rice to harvest with the new combines that had yet to be tested.

Despite these problems, they continued to experiment with combinations of mechanized techniques, rice varieties, and water control, weighing the usefulness of techniques based on the extent to which they supported a comprehensively mechanical approach to farming. An example of a technical possibility they rejected is useful to demonstrate their priorities. In the final report, the authors discussed a technical solution they had considered to the problems of running tractors on wet ground. Using the so-called cable system, a plow attached to a cable could be run between two engines on the sides of the field. These engines were mounted on cars that ran on permanent roadways surrounding the fields. Using this system, tractors would never compress the soil and there were no problems with slippage. The system was not experimental, as it had been used successfully in the sugar beet industry in Louisiana during the 1910s and 1920s (Ellis and Rumely 1911). The Selatdjaran engineers reported that they rejected this option because they could not harvest rice mechanically with the cable system, and they were unwilling to consider a good option for one element of farm operations that would jeopardize the use of mechanical techniques for others.
Criticism and Response: 
Mechanization vs. "Native Development"

In early 1922, the Selatdjaran project harvested only 882 piculs (1 picul = approx. 137 lbs) of rice from 65 bouws of land, disappointing staff members and the interested public alike. Unsurprisingly, critics argued that the harvest proved Selatdjaran a failure. Others, including Sibinga-Mulder, claimed that the problems should not be read as a failure of the concept of mechanization, but only as the expected setbacks and necessary information gathering of early experimental work. Advocates for Selatdjaran interpreted the results of the experiment in a positive light. The project’s valuable experience could be made publicly available to private investors, who could benefit from the mistakes of the past without bearing the cost. The poor harvest should not be attributed to the mechanical approach but to the natural limitations of the site selected. The Sumatran climate was a little too wet, the soil in the Selatdjaran delta less fertile than originally believed, and insect plagues had been unusually intense throughout the region, seriously damaging Native rice holdings as well as those on Selatdjaran. Mechanization worked, they argued, but the location did not. By July of 1922 Sibinga-Mulder had already proposed that the Department of Agriculture set up a second project on a more favorable location in Borneo (Handelingen van den Volksraad 1922). While critics did not dispute the project’s technical feasibility, they cited its economic troubles as proof that mechanized farming was a failure in the Indies. Adding up the cost of machinery and reclamation and comparing it with the paltry harvest, they concluded that the project could indeed produce rice, but only insignificant quantities at a price five or six times higher than the highest wartime prices (see e.g., Chr. Cramer’s speech in Handelingen van den Volksraad 1922: 649–51). No right-thinking capitalist would invest in such a scheme.

Sibinga-Mulder addressed the economic claims of his critics in a speech to the Volksraad (an advisory body for the colonial government made up of appointed members from the European and Native communities), insisting that naysayers were unjustifiably separating technical means from economic predictions. Before critics could draw economic conclusions, he argued, they needed to have access to complete scientific information, information not yet available. Scientists needed to establish, for instance, if different varieties of rice would be more resistant to insects, if improved land preparation practices would decrease weed problems, or if other locations in the Indies were more favorable for mechanical rice production. He claimed economic judgments had to wait for technical mastery, which could not be attained after only two or three years of work. Some members of the Volksraad supported him in this view (Handelingen van den Volksraad 1922: 688). They cited the promises of modern mechanization for the

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6 For other optimistic readings of Selatdjaran see also, de Boer 1921; Broersma 1921; and for a somewhat less warm, but still positive reading, see "Selatdjaran," Algemeen Landbouw Weekblad (6 Oct. 1922).
specific conditions of the Indies, and for long-term colonial food security. They argued that since rational, mechanized production would certainly provide higher yields of rice per worker than Native agriculture did, it was the only logical path toward rice self-sufficiency. Sibinga-Mulder warned that without a significant increase in rice production, the colonial system might easily be pushed "out of balance," as plantations increasingly relied on external sources for food (Handelingen van den Volksraad 1922: 691). Mechanized farms could protect the labor-intensive systems of existing plantations by guaranteeing an ample domestic food supply for landless laborers, using land currently going to waste, and employing the fewest possible workers.

These arguments did not silence the experiment's critics, as the debate increasingly raised more fundamental, ideological differences between supporters and critics. Those who cited the economic failings of mechanized farming sought not merely to show that it was expensive but to underscore what they saw as its fundamentally wrong-headed approach to solving food problems in the colony. For these critics, a good solution to food supply should at the same time solve the social and economic problems of the bulk of the Indies traditional food producers, the Natives. They supported an ideology of modernization for the colony in which the government would improve "Native development" or the economic circumstances of Native life and Native agriculture, by helping Natives to become more productive on their own holdings, not by replacing them as rice producers. They objected to mechanization plans that left Natives out entirely, because such plans would never solve what they saw as the critical underlying colonial problem of Native poverty.

Their view that the colonial government should prioritize its custodial relationship with Natives emerged from the so-called Ethical movement, a colonial reform movement from the turn of the twentieth century. Supporters of Ethical policies argued that the Dutch owed a debt of honor to the Indies Natives, because colonial exploitation of the colony had seriously reduced Native welfare. Historians commonly characterized the goals of Ethical reformers as improved "agriculture, education and irrigation" for Native peoples, providing Natives with the means they needed to improve their lives.7 Critics of Selatdjaran spoke in the idiom of colonial Ethicists, arguing that the government should solve the problems of the food supply by improving the well-being of Natives, directing their efforts (and budget) toward the long-term benefit of the Native peoples. Rather than expending so much effort on a problematic experiment that would at best provide yet one more outlet for a small number of European investors, the government should look to the needs and promise of Native peoples. Chr. Cramer, a member of the Volksraad, an ardent socialist, and a highly vocal critic of Selatdjaran, voiced this view when he declared: "It goes without saying that Native agriculture is more important for this country than ten Selatdjarans" (Handelingen van den Volksraad 1922: 651).

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7 For a general discussion of the Ethical reforms, see Ricklefs 1993: chaps. 13, 14.
Cramer argued for an alternate solution: Javanese colonization. In this plan, one advocated by some Ethicists since the early years of the century, landless Javanese would be transported from the densely populated island of Java to Sumatra or other islands and given irrigated land, tools, livestock, and seed to establish villages and practice rice agriculture. Such farmers could produce a moderate rice surplus, and not incidentally provide some laborers for nearby plantations. Work by agricultural extension agents to improve the productivity of Native rice agriculture would support the transmigration projects and in the long run might even lead to self-sufficiency in rice production. Transmigration’s greatest strength in the eyes of its advocates was not, however, any projected self-sufficiency, but the possibility of economic uplift it promised for Natives. Landless Natives, considered by many Europeans as the main cause of growing unrest on Java, had the opportunity to farm land, an agrarian ideal for many Javanese, and develop prosperous farm communities that would benefit European plantation owners by providing food and labor. Cramer advocated this alternative to mechanization saying, "Not with a technical revolution, but with socio-economic evolution will the Indies benefit the most" (Handelingen van de Volksraad 1922: 651).

Advocates of mechanization disputed Cramer’s interpretation, defending the experiment in terms of its relationship to Native development. They argued that, contrary to the claims of Cramer, Native development would eventually benefit far more from mechanization than from existing projects aimed directly at Native agriculture. The Indies Natives were at a low stage of development, they explained, because they had been tied to rice agriculture for so long, depleting their energies on highly labor-intensive practices, resulting in economic stagnation (de Boer 1921). Dr. R. Broersma, an agricultural expert and frequent contributor to the Algemeen Landbouw Weekblad, an agricultural weekly, said "The backwardness of native society is rooted in the fact that rice agriculture is practiced almost everywhere, in various ways that will never lead to a major industry and in which many hands are kept busy all too easily" (Broersma 1921). Bringing in more Javanese to practice rice agriculture would not only be ineffective in increasing food supplies, it would be pernicious to the development of the Native farmer. Mechanizing rice farms on the other hand would free Natives to raise more profitable crops such as fruit, rubber, and tea. Sibinga-Mulder pointed out that the indigenous Natives of Sumatra (not the Javanese contract workers) turned away from rice agriculture when imports were secure and grew rubber instead. Why force Natives to grow rice when they could more readily benefit from other kinds of crops?

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8 For more on agricultural colonization, see Pelzer 1948; Perk 1963; Hardjono 1982; Sri-Edi Swasono and Masri Singarimbun 1985. For analyses from the time, see, for example, Schalkwijk 1917–18: 415.
The End of Selatdjaran

While critics did not accept this interpretation of Native development, the colonial government backed Sibinga-Mulder and maintained Selatdjaran’s budget for another year. The growing season of late 1922 started off positively, with the staff fully completing planting before the onset of the rainy season. By early 1923 the crop was doing well. In February, however, the workers noted an infestation of kepi, a difficult-to-eradicate rice-damaging insect. Kepi destroyed most of the harvest. A second blow to the project was Sibinga-Mulder’s retirement (because of ill health) as the director of the Department of Agriculture in late 1922. With the loss of the harvest and the project’s most aggressive champion, the new director, A. A. Rutgers, terminated the experiment at Selatdjaran. Rutgers did not support further mechanization experiments and redirected the energies of the department to improving native rice agriculture and planning for Javanese colonization. With the project canceled, both critics and advocates of mechanized rice farming agreed that the project had failed. With the precipitous drop in rice prices in 1923, public calls for rice self-sufficiency became muted. The authors of the official government report on Selatdjaran concluded that while the experiment had not had the chance to pursue several technical areas that might have shown better results, they doubted that mechanized farming would ever prove profitable in the Indies (Verbaal 26, 2 Sept. 1924). Such economic judgments, however, are not an adequate historical explanation for the rejection of the plan. Some of the same officials who described Selatdjaran as a failure based on cost supported Javanese colonization, a very risky project that no one saw as likely to provide any significant financial return on the considerable investment it required.

For officials in the Department of Agriculture and the long-term critics of the experiment, Selatdjaran’s social failure was far more significant than its economic problems. Selatdjaran failed, they contended, because the ideology of modernization through mechanization excluded Natives and could therefore never contribute to Native development. They argued that Selatdjaran was too expensive, not merely because of falling rice prices, but because the government should not spend money experimenting on rice farming practices that required large capital investments and extensive holdings of land, both of which were simply unavailable to the average rice farmer. These critics continued to campaign for an alternative ideology of modernization, one that promoted projects to improve the technical practices of ordinary farmers without significantly changing the structure of peasant farming. F. Laoh, a member of the Volksraad, said at a meeting of that body in 1923 that for the amount of money spent on Selatdjaran and a failed mechanical rice mill in Korintji, North Sumatra, the government could have built three Native agricultural schools. He concluded: "Then we would have indeed gotten food, Mr. Chairman, not rice but intellectual nourishment, and for this country, I consider that much more beneficial than both the Korintji and Selatdjaran projects, even if these projects had fully answered their
expectations” (*Handelingen van de Volksraad* 1923: 315). For Laoh, Selatdjaran could not have succeeded even had it produced the promised abundant harvests, because it abdicated the colonial government’s responsibility to promote Native development. While Rutgers said little about Selatdjaran after its termination, under his leadership the Department of Agriculture pursued projects conducive to an ideology of modernization through Native development, promoting improvements in Native farming designed to be accessible to peasant farmers, and aiming to bring about the "socioeconomic" evolution for which Cramer had argued.

**Conclusion**

The conflict over Selatdjaran highlights a deep social concern with the process of modernization in the Indies. Sibinga-Mulder initially framed the importance of Selatdjaran in its contribution to the colony’s food supply, and the promise it held for rice self-sufficiency and the stabilization of plantation production. The ideology of modernization supporting the project held that mechanization would provide rice surpluses per worker impossible to achieve through Native agricultural practices. Not long into the project however, opponents had subtly changed the terms on which Selatdjaran should be judged, criticizing it because it did not contribute to Native development. Their ideology of modernization supported projects that achieved larger rice harvests by improving existing technical practices and increasing wet-rice production on islands outside of Java and Bali. By 1922, the question of Native development had become important enough that supporters of Selatdjaran tried to argue that the experiment in fact contributed to Native development. The conflict over Selatdjaran was very much a story of competing ideologies, one that conceived of mechanization as an integral part of modernization, and another that viewed mechanization as inherently damaging to modernization. From the perspective of Selatdjaran’s detractors, refusing to mechanize rice production in the Indies was not a refusal to modernize. It was rather an affirmation that the colony’s modernization efforts should directly target Native life without changing the structure and scale of rice agriculture, a focus that the Department of Agriculture maintained throughout the final years of Dutch colonial authority in the colony.
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