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Madagascar: Bridging Vangaindrano's Lean Season with Rice Resilience Circles

Introduction

After the main rice harvest, a family in southeastern Madagascar may sit down to rice grown in its own field. By April, however, that same family may have run out of grain and be buying rice, or relying on cassava, unripe jackfruit, and the local tuber tavolo to fill the gap. In nearby Farafangana District, moderate or severe food insecurity rose from 39 percent after harvest to 78 percent before the next harvest (Rousseau et al., 2023). That shift is more than a seasonal statistic: it captures how quickly a household can move from relative security toward hunger. It also shows why food security is not only about producing more. Families must be able to protect what they harvest, earn income without selling food they still need, eat a varied diet, and make it through the next cyclone. I recommend a 36-month Rice Resilience Circles pilot in Vangaindrano District. Groups of 25 farm households would use one connected Produce-Protect-Purchase system: improve rice cultivation through locally selected, low-input methods, protect grain from floods and post-harvest loss, and sell only true surplus through Madagascar's existing home-grown school feeding program.

Country and Family Background

Madagascar is an island nation off southeastern Africa with about 32.7 million people, 67 percent of whom live in rural areas (World Bank, 2026a, 2026b). Agriculture is central to daily life, yet poverty, weak roads, and repeated climate shocks leave many families vulnerable. Rice holds particular importance. The average Malagasy person consumes about 153.5 kilograms each year, and rice provides more than half of daily calories (Ashtakala et al., 2025). It is also woven into hospitality, identity, and family life. For that reason, a culturally appropriate strategy should make rice farming more dependable rather than ask households to give it up.

This paper focuses on Vangaindrano in the humid Atsimo-Atsinanana region because place matters. The Food and Agriculture Organization of the United Nations (FAO, 2026) describes Madagascar's drought-prone south as a relatively minor rice-producing area, so a rice-centered pilot there would be a poor fit. Vangaindrano faces a different set of pressures. Across the cyclone-exposed southeast, many households grow rice amid heavy seasonal rainfall, weak drainage, damaged roads, and long periods of isolation. A survey in nearby Farafangana found that households averaged about eight people; roughly three-quarters owned a rice field, nearly nine in ten had a non-rice plot, and about one in five was headed by a woman (Rousseau et al., 2023). Their food and livelihoods also draw on cassava, sweet potatoes, fruit, fish, greens, legumes, cloves, and coffee.

Women often carry several responsibilities at once: managing meals and child feeding, farming, gathering fuel and water, and working for wages. In the Farafangana study, 76 percent of surveyed women had performed agricultural wage labor during the previous year (Rousseau et al., 2023). When rice stocks begin to shrink, the choices become painfully narrow. Families may buy rice at higher prices, substitute cheaper staples, cut back on side dishes, sell assets, or search for day labor. Children bear the greatest nutritional cost. The Integrated Food Security Phase Classification (IPC, 2026) projects that Vangaindrano will enter Acute Malnutrition Phase 3, "Serious," during the October 2026-January 2027

lean season, when isolation, disease, poor diets, and weak access to health and water services converge. Any viable recommendation must therefore protect household food first, avoid adding unpaid labor to women, and improve both income and children's diets.

Challenge and Food Security Impact

Madagascar's food crisis is both severe and unstable. The July 2026 IPC analysis estimated that 2.12 million people faced Crisis-level acute food insecurity or worse from June through September 2026. It projected that the number would reach 3.72 million from October 2026 through February 2027 as household stocks fall, prices rise, and climate risks intensify (IPC, 2026). Nearly 502,000 children ages 6-59 months are expected to suffer acute malnutrition between May 2026 and April 2027, including about 78,000 severe cases. Behind those figures are four connected failures in food availability, access, utilization, and stability.

Food availability is constrained by low and unreliable production. Madagascar's national paddy yield has hovered near 2.75 metric tons per hectare since the late 2000s. Farmers are trying to produce under difficult conditions, often without adequate tools, extension services, credit, or dependable irrigation and drainage. Only about half of cultivated areas equipped with irrigation infrastructure actually benefit because many systems have deteriorated. Rehabilitating existing works can cost less and produce more than building new ones (Ashtakala et al., 2025). In the wet southeast, however, the problem is not simply too little water. Heavy rain, poor drainage, and cyclones can submerge paddies and cut communities off from markets and services. Water practices must therefore be chosen field by field, not imposed as a single solution everywhere.

Access can fail even after a successful harvest. Households may sell rice immediately, when prices are low, because they need cash and have nowhere safe to store grain. Months later, they may have to buy that same rice back at higher lean-season prices. Research in rural Madagascar links higher rice yields with better calorie and micronutrient intake through both home consumption and cash income, but the benefit depends on market access (Nikiema et al., 2023). Damaged roads, storage losses, delayed payments, and weak bargaining power can erase part of a yield gain. The consequences reach cities as well, where falling local supply and higher transport costs raise food prices for consumers.

Utilization is about what food does for the body, not simply whether it is present. Rice provides energy, but it cannot by itself supply enough protein, iron, vitamin A, and other nutrients. IPC identifies poor diet quality, diarrheal disease, malaria, unsafe water, and limited access to health care as drivers of malnutrition in the southeast (IPC, 2026). Stability is the final weakness. A household can recover after harvest and still slide back into hunger before the next one. Children may carry lasting developmental harm, women take on more food and care work, land-poor and tenant farmers have the least room to risk a failed experiment, and schools struggle to serve meals when supply or access breaks down. Sustainable agriculture must therefore connect production with post-harvest protection, income, nutrition, and cyclone preparedness.

Exploring Solutions

Emergency food, cash, nutrition treatment, and water, sanitation, and hygiene support are the first line of response. They are indispensable when a child is already acutely malnourished or a family is already skipping meals. The World Food Programme (WFP, 2026) assisted more than 900,000 people in June 2026, while also warning that repeated shocks expose the limits of short-term emergency response. Relief must continue. Still, it cannot stop the same household from returning to crisis if its paddy floods, its storage leaks, or its harvest has to be sold immediately.

Another approach would be a national productivity campaign built around new irrigation schemes, high-input hybrid seed, or universal adoption of the System of Rice Intensification. Raising yields matters, and the appeal of a large campaign is understandable. In Vangaindrano, however, this version would ask the poorest farmers to carry too much risk. Full SRI can demand more labor, tools, organic fertilizer, technical knowledge, and water control than they possess. Hybrid seed costs far more than local seed, must be purchased again, may require more fertilizer and water, and could displace locally adapted varieties (Ashtakala et al., 2025). A safer option is the less input-demanding Système du Riz Amélioré, or SRA, which uses selected practices such as younger seedlings and wider spacing. Even SRA should be tested beside current methods so farmers can see the results and choose what works without gambling an entire harvest.

A third approach begins with a connection Madagascar already has: local farms supplying school meals. In 2024, WFP supported 1,245 schools, including 653 using the home-grown model, while farmer organizations supplied more than 5,400 metric tons of rice and pulses to canteens through government-financed programs (WFP, 2025). The World Bank-supported Food Systems Resilience Program also finances school meals, producer training, irrigation, storage, and market infrastructure (World Bank, 2024). The foundation is promising, but important gaps remain. An earlier evaluation found weak local monitoring, limited community capacity, and no secure long-term financing framework (WFP, 2020). The strongest recommendation is therefore neither a stand-alone farm technology nor a new national bureaucracy. It is a local improvement to an existing system - one that connects the whole path from the field to storage and then to a reliable school buyer.

Recommendation: Rice Resilience Circles

The pilot would operate in eight rice-growing fokontany, or local communities, in Vangaindrano. It would form 24 Rice Resilience Circles of 25 households each, reaching 600 farm households and linking them with 12 public primary schools that already participate in, or are eligible for, home-grown school feeding. A site would need active rice production, an operating school management committee, workable drainage and flood-safe storage, and documented community consent. Priority enrollment would go to women-headed households, low-asset and tenant farmers, and families with young children. Participant lists would be public, and a grievance process would give residents a way to challenge favoritism.

Each circle would elect three paid leads: one for production and water, one for storage and finance, and one for the school market and nutrition. At least half of all leadership positions would be held by women, and every circle would include a youth representative. This structure draws carefully on fihavanana, the Malagasy norm of solidarity and reciprocal responsibility. That tradition can strengthen shared labor and risk management, but poverty can also make communities understandably cautious about innovations that might create shared losses (Sandron, 2008). Trust cannot be assumed. The pilot would earn it by starting with small demonstration plots, voluntary practice selection, public accounts, and household food reserves before any sales.

During Months 0-6, district agriculture staff, school committees, women farmers, youth, and local researchers would design the pilot together. Women and men would meet in separate workshops so labor constraints and preferred practices can be discussed openly. Research in Atsimo-Atsinanana shows that preferences vary by gender and location and that extra labor is a major concern (Tojo-Mandaharisoa et al., 2022). Local positive-deviance research also points toward building on practices already associated with stronger storage, diversification, nutrition, and market integration instead of importing a uniform package (Rafanomezantsoa et al., 2023). Teams would map paddies,

channels, flood zones, school routes, and safe storage sites. Baseline surveys would take place both after harvest and during the lean season, because a single snapshot would miss the seasonal change the pilot is meant to address.

During Months 7-18, the circles would focus on Produce and Protect. Side-by-side plots would compare current methods with a farmer-chosen SRA package, potentially including younger seedlings, wider spacing, line or mechanical weeding, compost where available, and locally tested seed. No household would be asked to convert its entire field. Paid crews would clear or repair small existing drainage and irrigation channels before the rainy season, with environmental screening to make sure flood risk is not simply pushed downstream. Each circle would also establish an elevated, lockable storage point outside mapped flood zones. It would include drying tarps or raised racks, a moisture meter, pallets, hermetic bags, and a grain ledger. Training would cover safe drying, quality grading, seed reserves, and a pre-cyclone plan for moving grain and tools.

During Months 19-30, the circles would add Purchase through forward agreements with school canteens. Before signing any contract, each household would set aside seed and a food reserve based on family size and expected lean-season needs. Household security would come first. Schools could then contract for up to 20 percent of the circle's expected marketable surplus - not 20 percent of total production. A revolving procurement account would pay farmers within 14 days of verified delivery and would later be replenished with the Ministry of Education, Food Systems Resilience Program, or WFP school-meal funds. Canteen committees would publicly post prices, quantities, delivery dates, and payments. Rice would be paired with locally available pulses, vegetables, or fortified foods so school meals strengthen dietary diversity rather than reinforce a rice-only diet.

Farm households would gain lower losses and a more dependable buyer, although they would need to attend meetings and follow shared storage rules. Women and youth would receive paid leadership roles and training instead of being expected to contribute more invisible labor; time-use monitoring would test whether the program keeps that promise. Students would gain more reliable meals, while school committees would take on transparent procurement duties. Local millers, transporters, and artisans would be hired for services rather than bypassed. District extension staff would gain a cluster-based delivery model, and national partners would gain evidence for a possible scale-up. Households outside the first round would remain eligible for expansion and would take part in the comparison study.

Months 31-36 would be reserved for an independent evaluation and a decision about scale. After the baseline confirms the starting point, targets would include: at least 80 percent of farmers using two or more chosen SRA practices by the second crop cycle; a 15 percent increase in median paddy yield relative to baseline and comparison plots; a 30 percent reduction in measured post-harvest loss; household rice stocks lasting at least four weeks longer into the lean season; at least 90 percent of school deliveries completed and paid within 14 days; and at least 50 percent female leadership. Evaluators would also track dietary diversity, school-meal continuity, household income, women's paid and unpaid work time, grievances, and storage damage. Scale-up would happen only if food reserves improve without increasing women's unpaid labor or pushing poorer farmers aside.

A preliminary three-year budget is $1.1 million, subject to local engineering and procurement review. It includes $275,000 for drainage rehabilitation and paid labor; $240,000 for flood-safe drying and storage; $220,000 for training, extension, seed, and tools; $155,000 for the revolving school-procurement account and food-safety support; $110,000 for seasonal monitoring, evaluation,

and audits; and $100,000 for administration and cyclone contingency. The cost is about $1,833 per participating farm household, before counting benefits to students. The most feasible financing path is a dedicated pilot window within Madagascar's existing $228 million Food Systems Resilience Program, implemented with the Ministries of Agriculture and Education and WFP rather than through a new institution (World Bank, 2024). After the first contracted sale, 3 percent of circle revenue would go into a transparent maintenance fund. The poorest members could contribute approved labor instead of cash. School-meal appropriations would replenish procurement funds, while trained district staff and local repair providers would remain after pilot financing ends.

The risks are serious, and the pilot should name them plainly. Cyclones could damage fields or stores, so structures would need to be elevated, mapped, inspected, and backed by a pre-positioned repair reserve. Schools could pay late, so the revolving account must separate farmer payment from government reimbursement. No purchase contract should be signed unless funds are already available. Leaders could capture benefits, which is why the program would require eligibility lists, dual signatures, public ledgers, female leadership, a grievance system, and third-party audits. New practices could add to women's workload, so adoption would remain voluntary and time-use data would trigger redesign when needed. Farmers could sell food they later need, so household and seed reserves would come before school contracts. These safeguards make the model slower than a nationwide campaign, but they also make it more feasible, ethical, and testable.

Conclusion

In the first year, Rice Resilience Circles would create paid repair work, protect more of each harvest, and make school demand more predictable. By the second harvest, farmers could gain both food and income from modest yield improvements without risking every field they own or cultivate. Across three years, longer-lasting household rice stocks, timely payments, more reliable school meals, and stronger women-led institutions would improve availability, access, utilization, and stability. Over time, a successful Vangaindrano pilot could be adapted for other cyclone-prone rice districts through institutions Madagascar already operates.

Madagascar does not need another paper promise to solve every national problem at once. Families in Vangaindrano need a credible link between the field, the store, and the school. Rice Resilience Circles would build that link by helping farmers produce carefully, protect what they grow, and sell only the surplus their households can truly spare. The goal is simple but urgent: to turn the months after harvest into a bridge across the lean season, rather than a countdown to hunger.

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