From Prize Incentives to Public Systems: How Government Collaboration Can Sustain Aquaculture Innovation

The pilots in Indonesia explored whether aquaculture technologies introduced through prize incentives could keep delivering for smallholder farmers long after the competition ended.

Early in 2026, as the AgResults Indonesia Aquaculture Challenge Project approached the end of its five-year competition, the project faced a question that matters for any results-based program: What happens after the incentive ends?

Over the life of the project, Pay-for-Results prizes (PfR) helped motivate private aquaculture technology and technical assistance providers in Indonesia to expand into smallholder markets. During that time, 13 technology competitors and 9 technical assistance (TA) providers sold and rented aerators and auto-feeders, tested new outreach strategies, and delivered TA packages focused on water quality, disease prevention, and farm management, reaching nearly 4,000 farmers with more than 14,000 technology units. These incentives helped demonstrate that private sector actors could reach smallholder farmers with practical tools and services.

But simply selling a product during a project does not translate to long-term adoption after that project ends. Farmers need to see technologies work under conditions that resemble their own ponds, understand the management routines behind them, and know who can help when equipment fails,

disease risks rise, or production conditions change — long after the prizes or incentive payments have ended.

That broader behavior shift was exactly what motivated Project Manager WWF-Indonesia to design and coordinate two pilots in Pati Regency and Mojokerto on the island of Java. The two pilots were designed as a joint effort with local government agencies, extension actors, and farmer groups as a practical test of whether market-tested innovations could be sustained after the competition closed. By bringing these actors together around a shared production cycle, the pilots created a platform for observing results, diagnosing constraints, and identifying what would be needed for continued use and replication. The sections below explore what worked in practice and where these efforts fell short.

Adoption Requires More Than Awareness

For the Indonesian smallholder aquaculture farmers that AgResults worked with, adoption was rarely just a matter of awareness. Technologies such as aerators, auto-feeders, and biofloc systems could improve productivity and efficiency, but they also required investment, behavior change, and consistent management. Across the project's pilots, the value of a particular technology depended on surrounding practices: feed management, oxygen levels, water quality, disease monitoring, seed quality, electricity access, and timely maintenance. Without those enabling conditions, even the most promising tools underperformed.

For the prize competition, this created a sustainability challenge. During implementation, project teams could convene roadshows, connect competitors with farmer groups, and create incentives for private providers to reach new customers. At closeout, those forms of facilitation became less available in theory. If farmers and competitors did not have trusted channels for continued learning and support, adoption of the technologies could ostensibly stall.

Local fisheries agencies and extension systems helped address that gap. They brought legitimacy, convening power, and knowledge of local production priorities. They could help identify appropriate farmer groups, host or validate demonstration sites, reinforce good practices, and socialize lessons across villages and districts. In doing so, they helped move innovation from initial uptake toward continuation, and unlike a project team, they had a real reason to still be there next season.

Pati: Turning a Pilot into a Local Replication Platform

For the Indonesia project, Pati Regency was the first place where the collaborative approach with government extension got tested on the ground. Since 2014, Pati Regency had been promoting saline tilapia as an alternative to traditional shrimp-milkfish systems affected by water quality challenges and disease. By 2023, the district was producing 7.5 thousand tons a year across roughly 1,800 hectares of ponds.

The pilot took place in Jepat Lor Village, chosen for its active farmer organization, existing infrastructure, and institutional readiness. These conditions made it a fitting place to test a model under real farming conditions. Competitors contributed aerators, auto-feeders, and technical support, while public partners and farmer groups helped create the conditions for implementation, testing whether improved seed, aeration, auto-feeding, and management support could strengthen the saline tilapia model that the local government was already trying to advance.

In the Pati pilot, farmers, government officials, and project partners tested whether improved seed, aeration, and feeding practices could strengthen a saline tilapia model that local government was already working to scale.

Because saline tilapia aligned with an existing local priority, the pilot did not introduce an isolated intervention. Rather, it built on a model that Pati Regency was already committed to scaling. That distinction shaped how the demonstration was received. The result was a pilot that farmers, government officials, and private providers could all observe together: a test of an approach the district had already staked resources on, rather than an outside experiment dropped into the village.

The pilot also produced evidence of increased production. Despite flooding during the production cycle, farmers at the pilot site brought fish to market noticeably larger and faster than their neighbors did.

> *"Despite the flooding, saline tilapia growth in this cycle was more optimal due to the support of technology, high-quality seed, and assistance from the Pati Regency Marine and Fisheries Agency. With the same stocking density and culture period, fish at the pilot site reached 4–6 fish per kilogram, compared to 10–12 fish per kilogram in surrounding ponds."*
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> *— Nugroho, Head of Mina Barokah Fish Farmer Group*

Just as important, the pilot helped local actors see what had driven those results: better seed, aeration, feed management, technical guidance, and coordinated support. That shared understanding is what makes a pilot valuable for sustainability: it gives government and extension actors a concrete example they can discuss with other villages, adapt to local conditions, and use as a basis for future outreach.

The sustainability lesson from Pati was that government collaboration could turn a pilot from a one-time activity into a replication platform. The harvest result mattered, but the more durable value was the shared learning process around it: Public officials, farmers, and competitors began looking at the same

production cycle and asking what would need to be repeated, adjusted, or supported for the model to continue delivering for farmers.

Mojokerto: Testing Whether the Model Can Travel Through Extension Networks

In Pati, the question had been if market-tested technologies could be absorbed into a model that the local government was already committed to scaling. The Mojokerto pilot asked something different: Could that same kind of model spread through government and extension networks into an entirely new setting?

Mojokerto had a clear production gap. Fish consumption there was the highest in East Java, at roughly 50 kilograms per person per year (~58,000 tons of annual demand), while local production met only about 3 percent of that need. Recognizing this gap, the project team designed the pilot to test scalable production approaches that could improve local supply while strengthening farmer capacity. The pilot used a village cooperative site connected to government aquaculture and extension efforts, with eleven extension officers already in place, giving the demonstration a pathway into systems that already support farmers.

The biofloc tilapia production tanks at the Mojokerto pilot site were part of an effort to test whether the model could scale through existing village cooperative and extension networks.

Rather than introducing elements one at a time, the pilot combined three elements at a single village cooperative site — a biofloc tilapia production system, hands-on technical assistance in managing it, and aeration equipment supplied by AgResults competitors. In doing so, it reflected one of the project's broader lessons: Technologies work best when paired with practical guidance and the right enabling conditions. The pilot showed potential (a partial harvest after 76 days produced 140 kilograms of tilapia),

but it also revealed constraints that matter for scalability, including non-uniform seed size, intermittent aerator failure, and insufficient electricity supply.

> *"The support of the biofloc system from KKP, combined with assistance and technology from AgResults, has accelerated fish growth. We want this activity to become an extension model, where the people of Mojokerto can directly see the impact of technology on aquaculture productivity. If proven successful, this model can be replicated to meet larger fish consumption demands in other regions."*
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> *— Yayan Hikmayani, Head of the Center for Marine and Fisheries Extension*

Those constraints were not signs that the model had failed. They were exactly the information the pilot was designed to uncover. Government and extension actors who will support future adoption need to know not just what works, but what has to be in place for it to keep working. That is the shift Mojokerto delivered, from demonstration to adaptation — proof that replicating the model takes more than moving equipment from one site to another. Effective replication also requires attention to seed quality, electricity, maintenance, farmer training, troubleshooting, and continued technical guidance.

What Government Collaboration Adds — and What It Doesn't

Together, the Pati and Mojokerto pilots point to several lessons for future Pay-for-Results and market systems programs. To start, it is worthwhile recognizing what this government collaboration did *not* accomplish: Neither pilot resolved how farmers or technology providers would pay for aerator maintenance after the project ended, and neither enabled the reliable electricity or consistent seed supply that Mojokerto showed were still missing. Naming those gaps matters as much as documenting what worked, since future programs will need to address them directly.

Because they were run in a single year of a project, these two pilots are better considered as a proof of concept, not necessarily a demonstrated pathway to scale. That being said, they still provide some useful lessons for similar Pay-for-Results programs in the future.

First, government collaboration helps move programs from uptake to continuation, narrowing in on who stayed involved and had reason to keep using the model once the project's own facilitation ended. Prize incentives can catalyze adoption by rewarding private providers for verified results. Government partners can help keep learning and outreach active after those incentives end by connecting pilots to extension systems, local development priorities, and farmer networks.

Second, demonstration sites build trust because they are local and observable. Farmers are more likely to consider unfamiliar technologies when they can see them operating in a nearby pond, hear from peers, and understand the management routines behind the results. Government involvement can make these demonstrations feel less like a sales pitch and more like a shared learning opportunity.

Third, government agencies can translate private innovation into public learning. Competitors focus on their economic motivations, prioritizing technology and service delivery as well as cementing customer relationships. Government actors, on the other hand, prioritize local needs, interpreting what is relevant for communities, identifying where support is still needed, and sharing lessons through channels that reach more farmers than one company or project team could reach alone.

Fourth, sustainability depends on enabling conditions, not technology alone. Both pilots reinforced that adoption requires reliable inputs, infrastructure, maintenance, farmer organization, technical guidance, and clear roles for follow-up support. In practice, that means naming, before a project closes out, who will maintain the equipment, who will keep offering advice, and how farmers will get answers once project facilitation ends.

Finally, the strongest handoff is a shared model, not a finished product. Government collaboration does not guarantee scale. What it creates is a functioning platform where public agencies, farmer groups, extension officers, and private providers can continue adapting a model together. That matters because smallholder adoption is rarely linear. It requires repeated learning, local adjustment, and trusted support over time.

Lessons Beyond One Harvest

Although the Pati and Mojokerto pilots did not answer every outstanding question about scale, they still showed what durable adoption could look like in Indonesia. In the project's fifth year, a government-linked pond became a place where farmers could observe technologies, extension actors could discuss practices, and private providers could demonstrate integrated solutions. Not only did the pilots make this innovation more visible, but they also showed how these solutions could last over time.

Through the pilots, government, competitors, extension officers, and farmers worked together in ways meant to outlast the pilot itself — the kind of partnership at the heart of the project's lessons learned.

In Indonesia, the lasting lesson for AgResults was that market incentives and public systems can play complementary roles. Prize competitions can help private providers test and expand solutions for smallholder farmers. Government collaboration can help those solutions remain visible, trusted, and usable after the prize period ends. As the project closes, the most important question is not only what the pilots produced, but whether the partnerships around them can keep the next cycle of learning moving.

Finally, the issue of timing deserves one more look. Both pilots occurred only in the project's final year, not because the conditions for them arrived late, but because the sustainability question they aimed to answer only became a public priority as the competition was ending. The readiness that made Pati work (an aligned government priority, an organized farmer group, existing infrastructure) was there well before the pilot began. The constraints that Mojokerto surfaced (seed quality, aerator reliability, electricity access) were knowable earlier too, through smaller test-scale versions of the same exercise, run alongside the competition rather than after it. For future Pay-for-Results programs, that is perhaps the simplest lesson of all: Rather than waiting until the end, government partnership is worth building into program design from year one.

If you are interested in learning more about AgResults' Pay-for-Results model, its prize competitions, and its results to date, visit https://agresults.org/.