

Pay-N-Pump (PNP) Business Model Canvas

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Key Partners

- A Swiss manufacturing company, ennos, produces the solar irrigation pumps used by PNP.
- A range of organizations, including GIZ, Innovate UK, and UNICEF, have provided grant funding to PNP.
- The Uganda Solar Energy Association actively pursues tax exemptions and additional business-friendly policies.
- Cellphone service providers ensure reliable network access for pump monitoring.
- Innovex, a local software developer, developed the remote pumping monitoring system.
- Local metalworking shops produce the pushcart frames used to make the PNP system mobile.



Key Activities

- Conducting community outreach
- Selecting and training agents
- Installing irrigation equipment
- Providing ongoing equipment maintenance and troubleshooting
- Collecting rental revenues
- Managing cloud data for equipment performance
- Negotiating offtaker contracts for customers
- Business management and administrative functions

Key Resources

- Aptech Africa, PNP's parent company, is an equipment distributor and provides start-up financing, corporate leadership, technicians, and warehouse/repair facilities.
- Custom remote monitoring hardware and software with cloud controls enables pumps to be turned on and off to enforce payment.
- Cellular connectivity in rural areas is necessary to operate pump cloud controls.

Value Propositions

PNP provides a core set of value propositions (#1-3) to all of its customers. PNP agents (Customer Segment 2) benefit from an additional value proposition (#4).

1. Access to irrigation:

For smallholder farmers with limited capital, PNP offers temporary, mobile irrigation services (solar pump + 100 meter hose) without the need to purchase irrigation equipment or fuel.

2. Marketing support and connection to offtakers:

Small-scale farmers have difficulty finding buyers for their produce (small amounts of crops grown on small plots), often leading to spoilage and lost income. PNP aggregates high-value produce from multiple farmers, creating larger volumes that are easier to sell. This collective marketing approach expands farmers' market access.

3. Renting out irrigation equipment:

Farmers may not need irrigation year-round, leading to idle equipment and an inability to pay the monthly subscription fee to PNP. Customers are allowed to sublease PNP's equipment when not in use, creating a potential additional revenue stream for customers. This increases the utilization rate of the equipment and benefits both the owner and the renter.

4. Agent commissions for customer referrals:

PNP incentivizes its agents to refer others through providing commissions for signing up new customers.

Customer Relationships

- Customer relationships are based on long-term, personal interactions between PNP personnel and customers. PNP's product is sold as a subscription with multi-year contracts.
- PNP creates communities of customers linked to its operations. In particular, it uses some farmers (agents) as embedded representatives who can provide support and advisory services to other customers.
- PNP strengthens the sense of community among its customers through providing group crop marketing support. Encouraging customers to sublease equipment further builds brand loyalty.

Channels

- PNP uses its farmer-agents as a primary channel for customer acquisition, leveraging word-of-mouth and social-proof strategies to attract customers within identified service areas.
- PNP technicians communicate regularly with agents and customers about any concerns they may have.
- Encouraging subleasing of equipment provides another marketing channel. Non-customers can try out the PNP product without committing to a contract.

Customer Segments

PNP has two customer segments:

1. Individual smallholder farmers in low-rainfall regions who:

- Farm one to two acres
- Grow high-value horticultural crops
- Are located less than 7 meters above (vertical distance) and within 100 meters (horizontal distance) of a water source
- Are members of a Savings and Credit Cooperative Organization (SACCO) and demonstrate creditworthiness
- Do not own a pump or have access to irrigation equipment

2. Farmer-agents within the first customer segment:

- One in five customers are selected to serve as agents
- Agents are typically well respected farmers in an area
- Agents must demonstrate the ability to be trained on equipment operation




Cost Structure

- Hardware costs, including irrigation pumps and steel frames (ennos Sunlight pumps are likely available at wholesale prices because PNP's parent company, Aptech, is the ennos distributor in Uganda)
- Service and maintenance costs for irrigation systems
- Software and connectivity costs (including remote monitoring software and cell service)
- Staff salaries and agent commissions
- Transportation costs, including those for equipment installation and maintenance

Revenue Streams

- Customers enter into four-year contracts, and then pay a monthly subscription fee of 180,000 Ugandan shillings (~50 USD) via mobile money. However, during the rainy season, customers receive a 50% discount, reducing their monthly payment to 90,000 Ugandan shillings (~25 USD).



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Pay-N-Pump (PNP), based in Kampala, Uganda, is an irrigation service provider that rents mobile irrigation kits to smallholder farmers on a monthly basis. The company is a wholly owned subsidiary of a Ugandan irrigation equipment dealer, Aptech Africa. Aptech has a distribution agreement with ennos, a solar irrigation pump manufacturer.

By renting equipment to its customers, PNP makes irrigation accessible to farmers who may not have the capital to purchase, or who prefer not to maintain, their own equipment. PNP's business model includes three important elements that should increase its profitability.

1. As a subsidiary of an irrigation equipment dealer, PNP benefits from significantly reduced equipment and maintenance costs. PNP can leverage Aptech's existing inventory and technician staff, potentially using unsold inventory for rentals and utilizing technicians' downtime for equipment servicing, thus reducing operating costs.
2. The company reduces its customer acquisition costs by turning some of its customers, who are leading farmers in their communities, into sales agents. The agents earn a commission for referring new customers to PNP. Additionally, agents install, maintain, and train customers on PNP's equipment.
3. PNP increases its customers' profitability by providing them with crop marketing services. The company aggregates multiple smallholder farmers in an area and connects them with offtakers who are willing to purchase high-value crops in larger quantities than any single farmer can provide. In addition to increased customer retention, this potentially allows PNP to charge higher fees for its services.

Our research team visited the Aptech retail stores in Kampala, Uganda in March 2023. Conversations with the PNP Manager, Paul Kamoga, provided valuable insights into their operations. Several aspects of PNP's business model stand out.

Customer Segments

PNP is an irrigation service provider for smallholder farmers who do not have access to their own irrigation equipment. The company's main customer segment is farmers who cultivate high-value horticultural crops on small plots of land (1-2 acres). PNP's equipment is designed to access water sources within 100 meters horizontally and less than 7 meters vertically.

PNP prioritizes partnerships with smallholders who are members of a Savings and Credit Cooperative Society (SACCO). PNP uses this criterion as a proxy for financial stability and creditworthiness. SACCO members typically maintain regular savings and have established financial and credit histories. By preferentially working with SACCO members, PNP reduces the risks of customer non-payment.

PNP also has a second customer segment. One in five of its customers is given an 'agent' status. These agents are typically recognized as leading farmers in a region. They are equipped with in-depth product knowledge through rigorous training on equipment operation and maintenance. Agents can increase their income through commissions earned from successful referrals of other customers, amplifying their engagement with PNP and incentivizing network expansion.

Value Propositions

PNP offers an affordable and reliable irrigation service for smallholder farmers who require irrigation during the dry season but lack the resources or desire to invest in their own irrigation equipment.



The PNP mobile irrigation kit includes one solar panel, one surface water pump, seven meters of intake pipe, 100 meters of hose pipe, six sprinklers, one remote monitoring device, and a pushcart. The system can pump up to 10,000 liters of water per day, allowing irrigation of 1-2 acres. Equipment maintenance is included in the monthly charge. Cloud monitoring and controls can switch the pump on and off to enforce payment.

PNP also assists smallholder farmers by aggregating multiple customers and connecting them with offtakers who are interested in purchasing their produce. This activity addresses the challenge of smallholders trying to market small quantities of crops individually. As a result, farmers can sell their crops at a higher price than they could without PNP's service, even if they were irrigating.

PNP allows its customers to generate additional income by subleasing their equipment to neighbors when not in use. This opportunity is also beneficial for 'agent' farmers who earn commissions by facilitating subleases. Agents play a key role in referring new customers, onboarding them, and overseeing subleases. This includes managing, monitoring, and maintaining equipment for new customers. Farmers typically charge 30,000-50,000 Ugandan Shillings per day for subleasing equipment. From each sublease, a portion of the rental income (15,000 Ugandan Shillings per day) goes to the agents as a commission.

Customer Relationships

The relationships between PNP and its customers are primarily long-term personal service relationships maintained by PNP's agents. As they are members of the farming community themselves, there is straightforward communication between customers and agents (the agents are themselves customers). Agents meet regularly with PNP technicians on behalf of customers to address any concerns or technical

issues arising. This collaborative partnership fosters efficient problem-solving and enhances the overall customer experience, ensuring that farmers receive timely support and assistance whenever it is needed.

Channels

PNP'S most reliable form of marketing is through established agents, especially in smallholder farming communities where technology adoption is often driven by word of mouth, peer influence, and social proof. Initial identification of regions for customer acquisition (i.e. groups of farmers who are SACCO members, need to irrigate, and are an appropriate distance from water) requires PNP involvement.

Key Activities

PNP's focus is on regions experiencing low rainfall. Their customer acquisition process starts with community outreach, followed by the selection of suitable agents. PNP selects agents that possess an understanding of local farming practices, have strong relationships with other farmers, and are viewed as leaders in their communities. These agents communicate with farmers, understand their needs, and relay these needs back to PNP.

Agents receive comprehensive training. This covers how to operate the irrigation system, perform maintenance, and troubleshoot issues. Once a customer signs a lease, agents handle the installation in their field. They set up the equipment and input the necessary data. Post-installation, agents provide ongoing support. They diagnose problems, liaise with PNP technicians, and carry out repairs. Regular maintenance checks are also conducted to prevent issues.

Revenue Streams

PNP enters into four-year equipment leasing contracts with its customers. The customers then pay a monthly





subscription fee of 180,000 Ugandan Shillings (approximately 50 USD) via mobile money. However, during the rainy season customers receive a 50% discount, reducing their monthly payment to 90,000 Ugandan Shillings. Farmers are not required to make an initial payment at the time of installation.

Cost Structure

PNP's business model requires skilled technicians and managers and appears to be asset heavy. However, PNP's actual inventory and labor costs may be modest as many of these costs are already being incurred by Aptech, PNP's parent company. In particular, PNP should be able to take advantage of Aptech's existing unsold inventory of solar pumps. Similarly, PNP can leverage Aptech's existing personnel, such as managers and technicians who have available capacity. Finally, Aptech provides corporate governance and oversight to PNP.

To operate its business model, PNP developed a steel pushcart that holds irrigation equipment and allows mobility. Each PNP solar pump uses one pushcart. The pushcarts are manufactured locally. Additionally, the company paid a local software company to develop proprietary remote-monitoring software.

PNP incurs additional expenses for transportation of equipment to customers' fields, equipment servicing, and equipment repossession in cases of non-payment. Finally, PNP is responsible for paying out commission fees earned by agents.

Key Resources

A key technology developed by PNP is the hardware and software around its cellular-connected remote pump monitoring and control device. The monitoring software used for this purpose was developed by

Innovex, a Ugandan software developer. To enable remote monitoring and control, PNP relies on cellular connectivity. Poor connectivity or network downtime can cause significant challenges for PNP's operations.

Key partners

PNP has established strategic partnerships with companies like Innovex, which developed the remote pump monitoring system. PNP has also received grants from organizations such as GIZ, UNICEF, and UK Innovate, including for software development. PNP also collaborates with the Uganda Solar Energy Association to advocate for policies that promote the use of solar technology.

Conclusion

Pay-N-Pump's business model fully leverages ownership by an irrigation equipment dealer, allowing effective management of operational costs, human resources, and capital. At the same time, the company uses a farmer-agent model to lower its customer acquisition costs and maintain long-lasting customer relationships. It builds connections with offtakers to increase its customers' revenue from using irrigation equipment, in turn increasing PNP's potential revenues. PNP encourages subleasing of its equipment, creating additional revenue opportunities for leasing farmers, which have the potential to offset PNP's irrigation rental fee.

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