THE/NUDGE Prize

DCM SHRIRAM FOUNDATION

Unlocking Investments to shape India's AgWater future

Volume 2

Pathways to Scale AgWater Innovation

Challenges, Startups, and Investment Gaps

Volume 2 builds on the landscape outlined in Volume 1 – shifting the focus from what exists to what's possible. While the first volume mapped the scale of India's AgWater crisis and the innovations emerging in response, this volume turns to the question of scale: What will it take to bring these solutions to farmers across the country?

It outlines where capital needs to flow, which ecosystem enablers matter most, and the decisive moves – or big bets – that capital providers can take today to unlock market and impact opportunity.

Foreword

We have developed a two-volume AgWater Investment Point of View focused on the water challenges facing Indian agriculture. Volume 1 maps the current landscape – the scale of the water crisis, emerging innovations, and critical investment gaps. Volume 2 builds on this foundation, outlining what it will take to scale promising solutions, unlock capital, and deliver impact at the ground level.

This PoV examines the urgent need to address water stress in farming, explores how strategic investment can respond to these complex challenges, and demonstrates how innovation can deliver tangible benefits to farmers.

Rather than presenting definitive conclusions, this document serves as a foundation for broader discussion. We believe that collective wisdom from across the ecosystem will strengthen and enrich this thesis.

It outlines the necessary ecosystem to support AgWater innovation, including the roles of incubators, accelerators, investors, policymakers, entrepreneurs, and industry experts. In this document we have incorporated diverse viewpoints and takeaways from meaningful conversations about developing scalable, sustainable solutions in agricultural water management.

We view this two part AgWater investment PoV as a catalyst for substantive dialogue and a compelling case for directing capital toward AgWater innovations.

Hemendra Mathur
Investor & Venture Partner,
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Acknowledgement

This report has been shaped by the knowledge, experience, and generous contributions of many across the AgWater ecosystem.

Our sincere thanks to ecosystem experts **Hemendra Mathur, Romiel Samuel, Arindom Datta,** and **Ankit Chandra,** whose thought partnership and sectoral perspectives enriched this work meaningfully.

We are especially grateful to the startup founders, operators, and experts who took the time to share their on-ground experiences and strategic perspectives, including **Naveen Singh (PhyFarm), Tarang Patel (Intech Harness), Shrilesh Mande (IndusTill), Jasveer Singh, Sri Malladi (AgriRain Agro Industries Private Limited), and Rajesh Pandey (AgAutomate Private Limited).** Your insights brought depth and clarity to our understanding of this evolving space.

We also thank the teams atorganisations such as **Avanijal Agri Automation, BharatRohan Airborne Innovations, EF Polymer, CultYvate, JeethTechnical Inventions and Products, Oorja Development Solutions, Oscillo Machines, and Virentiatech (Virenxia)** for engaging with us and generously sharing your learnings.

We also acknowledge **Tracxn** for their curated data support, which provided a strong foundation for several trends highlighted in this report.

To the broader AgWater community - thank you for your relentless commitment to solving one of agriculture's most pressing challenges. This report is a small step forward in what we hope will be a bold and enduring AgWater investment journey.

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About the
DCM Shriram AgWater Challenge

Smallholder farmers across India face increasing water stress due to unpredictable weather, groundwater depletion, outdated farming practices, and fragmented technological solutions. These problems threaten farm productivity and income generation, making water efficiency critical for sustainable agriculture. The DCM Shriram AgWater Challenge was launched in June 2023 with a bold mission: to secure water and livelihoods for 1 million farmers in India by transforming water use in agriculture.

The DCM Shriram Foundation, along with The/Nudge Institute, designed and launched this challenge to identify and scale innovative and affordable AgWater technologies that improve water use efficiency, boost crop productivity, and strengthen the economic resilience of farmers. From 134 applications across the nation, 16 AgWater innovators were selected to develop solutions for India's most water-intensive crops - wheat, paddy, sugarcane, and cotton, backed by a ₹2.6 Cr prize purse to support their efforts.

Beyond the innovators, a diverse ecosystem of investors, academia, policymakers, and implementation partners played a crucial role in building awareness, generating evidence, and strengthening the sector's investability.

As the challenge evolved, it became a platform for testing, learning, and scaling solutions that address water sustainability, ensuring that smallholder farmers can thrive in a rapidly changing agricultural landscape.

This report and its contents are based on learnings and field evidence gathered over the last 18-20 months of the challenge.

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Executive Summary

While the AgWaterTech ecosystem in India holds great promise, it is at risk of stalling. Almost 20–25% of active startups are currently deadpooled – at immediate risk of shutting down. Startup activity has declined significantly over the past five years, and those that do receive funding are underperforming compared to global peers in markets such as the USA and Israel, both in deal size and maturity.

This dearth of funding activity can be attributed to several structural challenges impacting startup investability, including:

- *The disproportionately high share of small and marginal farmers in India's agricultural base*
- *Long gestation periods and delayed returns on AgWaterTech investments*
- *Lack of reliable and standardized data on agricultural water consumption*

Historically, irrigation technologies in India, such as micro-irrigation - scaled primarily after widespread adoption and government support through central and state subsidies. AgWaterTech may follow a similar trajectory. However, it will require a capital infusion of INR 500–600 crores across bio-input and smart irrigation categories to achieve that scale and impact.

Field-level evidence from the DCM Shriram AgWater Challenge has demonstrated the potential of these solutions — including cost reductions for smallholder farmers, improved distribution models through direct sales and partnerships, and measurable water savings for individual crops.

Estimated Capital Requirements by Innovation Category

₹50-60 CR* IN THE NEXT 2 YEARS CAN UNLOCK
₹3000 CR MARKET BY 2035

Category	*Investment needed by 2035*	*Scalability*
Bio-inputs and stimulants	₹ 150 - 200 cr	High
Soil moisture and climate sensors	₹ 100 - 150 cr	Medium
Satellite and aerial remote sensing	₹ 100 - 150 cr	Medium
Automated irrigation systems	₹ 25 - 50 cr	Low

High Medium Low

How do we make the above a reality?

To catalyze adoption and unlock private investment, our point of view is that investors and capital providers need to allocate INR 50–60 crores over the next two years, linked to well-defined thresholds for results-based financing.

Simultaneously, startup founders and ecosystem actors must activate the following pathways to de-risk and accelerate AgWaterTech scale:

- *Generate digitally verifiable evidence through large-scale demonstrations*
- *Collaborate with government actors to define clear value propositions and innovative financing models for specific farmer segments*
- *Build partnerships with scaled distribution players to improve accessibility of AgWaterTech solutions*
- *Standardize water use data methodologies and integrate with emerging digital public infrastructure for agriculture*

1.

Unlocking AgWaterTech Investments

How much funding do AgWaterTech startups need and why can they obtain it?

In the previous sections, we highlighted the need for AgWaterTech solutions, introduced the categories of startups addressing the need, and highlighted the funding landscape and factors impeding investability for these categories.

In this section, we will focus on the investment needs of AgWaterTech startups. We start by exploring the timeline of events that led to the scale up of micro-irrigation solutions, focusing on how market activity was catalysed through private sector investment first and scaled with the introduction of state and eventually, federal level subsidies. It is highly likely that AgWaterTech startups will need to have a similar trajectory to scale, but these startups still need significant capital to reach the level of adoption where subsidies start to get introduced. The bulk of this section is devoted to outlining the funding need for each category and why they are reaching an inflection point where scale up is increasingly becoming a possibility.

1.1 Lessons from the scale up of micro-irrigation

Experiments with micro-irrigation technology were first conducted in Germany in the 1860s where water was pumped through clay pipes for irrigation. Research done by E.B. House at Colorado State University in 1913 concluded that the technology was too expensive to be used commercially and no further studies were done till the 1920s (CICR Report, 2011). Use of perforated pipes (Germany, 1920s) was one of the major breakthroughs in the industry. However, current micro–irrigation technology relates to the work of Symcha Blass of Israel in the 1930s. He accidentally discovered the concept when a farmer drew his attention to a large tree that showed a much more rigorous growth than other trees in the area because it received water from a leaking faucet nearby. Based on this observation, he developed the first patented drip irrigation system and subsequently took major steps in the development of his idea with the advent of cheap plastics in the 1950s after World War II.

The availability of low cost plastic pipe for water delivery lines helped popularise the use of drip irrigation systems. From Israel, the drip irrigation concept spread to Australia, North America and South Africa by the late 1960s and eventually throughout the world. The development of LDPE (Low density polyethylene), HDPE (High density polyethylene), and LLDPE (Low linear density polyethylene) in 1977, suitable and economical material, resulted in the sudden growth of the micro-irrigation industry.

In India, the use of drip irrigation started in 1970 with experiments in Tamil Nadu University in Coimbatore. Drip irrigation system was first installed at Patidar Farms in village Jodpur Madhya Pradesh) in 1971 and inaugurated by the then Deputy Chief Minister. The area under drip irrigation has increased from 1500 ha in 1985 to 70,859 ha in 1991-92 and further to 0.5 million ha in 2003 (INCID 1994; GOI 2004 as mentioned in Narayanamoorthy 2005). The most recent data collected by ICID shows that an area of 1.32 million ha (6.5% of total irrigated area) was under micro-irrigation in 2008 which increased to 1.89 million ha (8.1% of total) in 2010.

Timeline of events

1980s-2000s
Early market development led by private sector innovation

Jain Irrigation's early lead

- *Jain Irrigation started promoting drip irrigation in India in the 1980s, recognising its potential for water conservation and yield improvement. Initially the technology was expensive and largely inaccessible to small farmers due to high upfront costs.*
- *Jain focused on developing a full ecosystem - manufacturing, farmer training, and financing - to make adoption viable*
- *By the early 2000s, Jain had expanded significantly, working with tens of thousands of farmers, especially in Maharashtra*

Netafim and international influence

- *Netafim, an Israeli company, entered India in the 1990s, bringing global expertise in drip and precision irrigation. It focused on demonstrating how micro-irrigation could increase yields, reduce water usage, and boost farmer incomes.*
- *Initial adoption was slow due to high costs and limited awareness among Indian farmers*

Government recognition and initial state-level subsidies

- *Some state governments, notably Maharashtra, Gujarat, and Tamil Nadu, started introducing state-level subsidies in the late 1990s and early 2000s*
- *Jain, Netafim, and other players worked closely with state governments to push for adoption*

2006 onwards
Scaling with government subsidies

Central government steps in

- *By the mid-2000s, micro-irrigation had proven its benefits, but adoption was still limited due to costs*
- *The Indian government launched the National Mission on Micro Irrigation (NMMI) in 2006, offering subsidies of 40-50% for drip and sprinkler system*
- *Companies like Jain Irrigation and Netafim scaled rapidly, working directly with farmers while leveraging the subsidies*

PMKSY

- *In 2015, the government merged earlier schemes into the Pradhan Mantri Krishi Sinchayee Yojana, significantly boosting micro-irrigation funding*
- *The Micro Irrigation Fund (MIF) under NABARD provided ₹ 5000 crore in support, encouraging states to adopt and scale programs*
- *Companies expanded to millions of farmers, with Maharashtra, Gujarat, Karnataka, and Andhra Pradesh leading in adoption*
- *Today micro-irrigation covers ~15 million hectares in India, but that is still only about 15% of the total irrigated area*

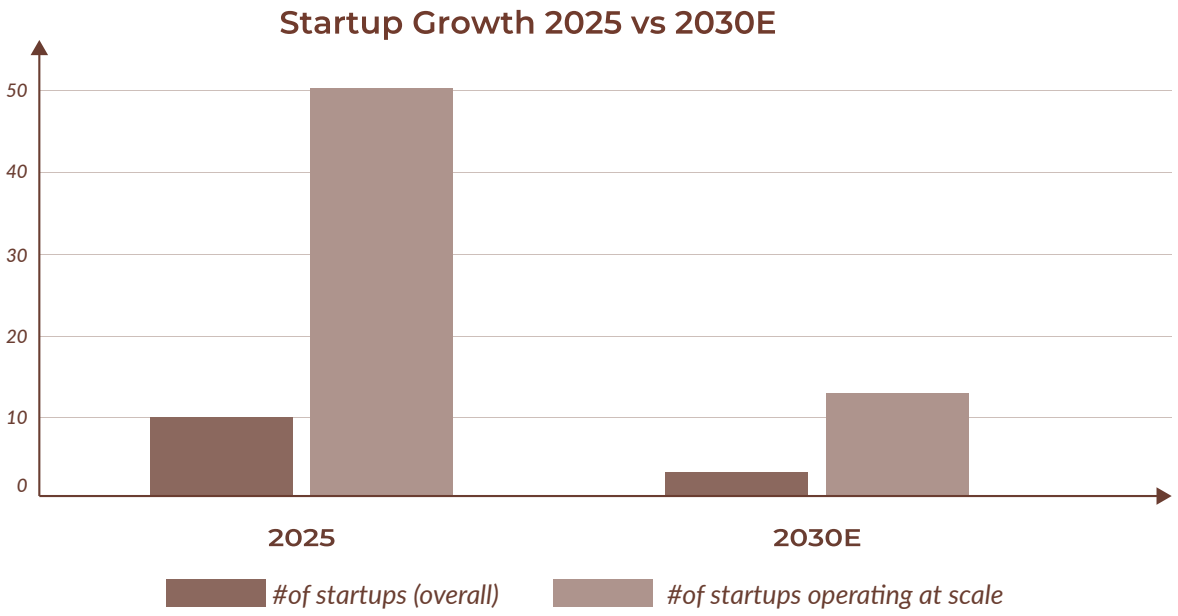
In summary

- *Jain Irrigation and Netafim pioneered the market before subsidies made large-scale adoption viable*
- *State-level programs saw the potential of micro-irrigation and laid the groundwork for national subsidies, helping companies scale*
- *Once the government stepped in with large subsidies (post 2006), micro-irrigation adoption surged*
- *Companies like Jain and Netafim transitioned from being product sellers to holistic irrigation solution providers*
- *Despite significant progress, micro-irrigation adoption still has potential for growth*

1.2 Investment needed

AgWaterTech startups require funding of ₹500-600 crores to achieve the farmer density where government funds like subsidies may start to kick in. As we go through each category, we will explain the type of funding needed and use field evidence gathered from the DCM Shriram AgWater Challenge to highlight how they are tackling the challenges that are currently impeding their investability.

A. Bio-inputs and stimulants



Startups producing biologicals require around ₹150-200 crore in funding over the next five years. Currently, the number of startups operating in the domain is fairly low and hence, there is a need for new startups to be seeded and scaled. Biologicals require a significant amount of R&D in the pre-seed stage, due to which 20-30% of the total funding is required at that point. Given the dearth of existing startups working on optimising water use, the focus over the next five years would largely be on this stage, but unlocking seed sector funding will also be a priority.

Funding stage	Funding / startup	Total funding	Potential funder types
Pre-seed	*₹90 lakhs*	*₹35-40 crores*	*Grants, innovation awards*
Seed	*₹1.5 crores*	*₹60-70 crores*	*VC, public sector funds, impact investments*
Series A	*₹5 crores*	*₹50-60 crores*	*VC, public sector funds, corporate investments*

Case study: EF Polymer

EF Polymer is an agro-biologicals startup that is trying to improve water availability for agriculture. Their product - Fasal Amrit - is an organic superabsorbent polymer whose granules absorb water up to 50 times their weight, which increases soil moisture retention. The soil conditioner is applied to the soil at the time of sowing the crop, and its function is to absorb and retain the water that the field receives from irrigation or rainfall

Factor impeding investability

A.1. Potential for enabling farmer adoption

Crop yield increased by 18-19% and cost of cultivation reduced by 2-3% for wheat farmers after adopting EF Polymer's technology.

Their solution is affordable. While the cost of the solution has not reduced during the challenge duration, it would cost a farmer INR 1556 per acre per season, which itself makes it attractive for purchase.

The application of the solution is similar to traditional farming practices, including rainfed farming, which makes it easier for a farmer to adopt and use. It also enables farmers to cultivate crops with less water in water-scarce regions and has also mitigated the risk of crop failure due to climate change.

Currently, the startup is working with 70000 farmers and the average landholding size is 1.92 acres. According to their estimates, approximately 40% of their customers are repeat users and many have applied their product across multiple seasons and crops.

A.2. Ease of distribution and scale up

While EF Polymer has its own sales team and a team of 70+ distributors across selected districts in key states, B2C only makes up ~35-40% of their total sales figures

What has largely aided the organisation's ability to penetrate the farmer base is B2B sales where they provide bulk supply to organisations like DCM, Bio-seeds, NGOs, governments and international markets that make up 40% of their sales. They have also partnered with DeHaat for the bulk supply of their products, which are sold under DeHaat's brand name. This white labelling channel makes up ~20% of EF Polymer's total sales.

Additionally, EF has partnered with Ayekart for marketing their brand in some of the non-served states through Ayekart's distribution channel. They are also planning on deepening their presence in key states by appointing more dealers and distributors to enhance farmer coverage.

While EF has not increased its sales through FPO channels significantly yet, they have signed an MoU with Basix to sell through their network of FPOs. Similar partnerships with Access Development and Sammunati are also in progress, which will significantly improve their adoption rates among small farmers and further ease distribution.

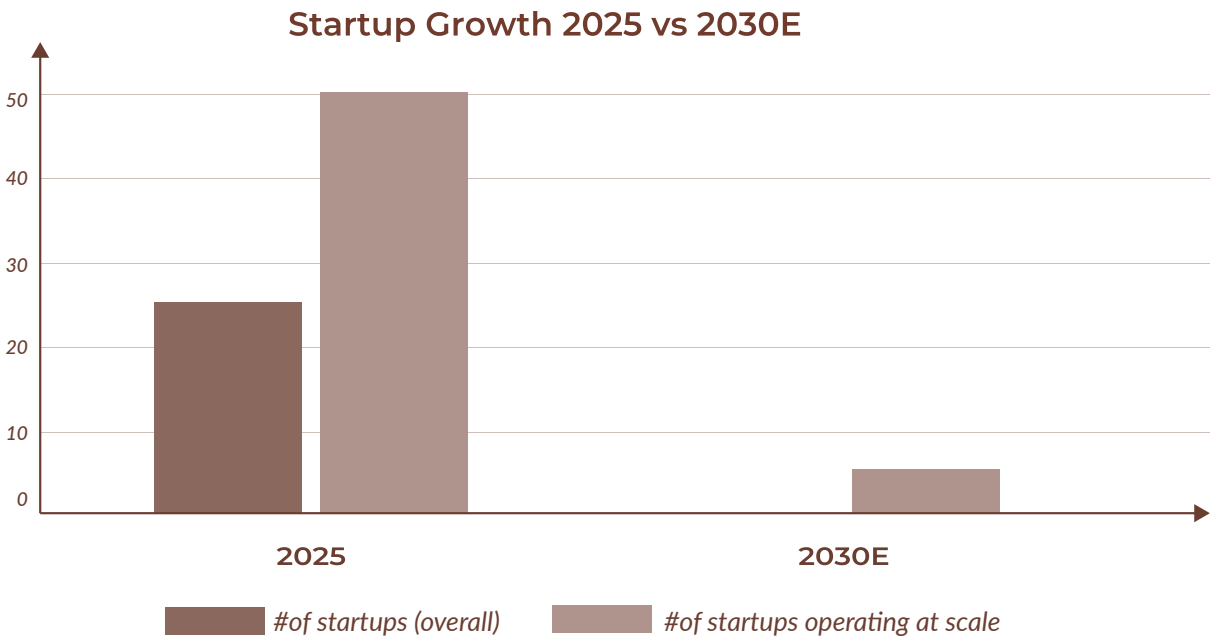
Lastly, the product is also certified organic, which creates a market opportunity for exports. In fact, ~10% of EF Polymer's sales came from outside India between June to November 2024

A.3. Potential for enabling water savings

The solution reduced water consumption by 18.8%

The solution reduced water consumption by 18.8% after being adopted, bringing the quantum of water use to 3387 m3 / ha, which is only 6% above the recommended requirement for wheat.

B. Soil moisture and climate sensors



Startups providing sensors require around ₹100-150 crore in funding over the next five years.

Funding stage	Funding / startup	Total funding	Potential funder types
Pre-seed	*₹60 lakhs*	*₹15-20 crores*	*Grants, angel, friends & family*
Seed	*₹4 crores*	*₹80-90 crores*	*Debt, public sector funds, impact investments, blended finance*
Series A	*₹7 crores*	*₹35-40 crores*	*Debt, public sector funds, impact investments, blended finance*

More than half the funding required in this category is at the seed stage and will be used to enable pilots and demonstrations. Startups that are able to successfully demonstrate impact and growth will require ₹6-7 crores of funding to start their scale journey.

Case study: CultYvate

CultYvate is an agri-tech platform by Farm2Fork Technologies, which develops smart irrigation systems that automate and simplify irrigation for farmers. The startup has developed an IoT-enabled AWD (alternate wetting and drying) system for irrigation management of paddy farmers. They provide subscription-based advisory services that can work in a basic analog phone.

Lastly, the product is also certified organic, which creates a market opportunity for exports. In fact, ~10% of EF Polymer's sales came from outside India between June to November 2024

Factor impeding investability

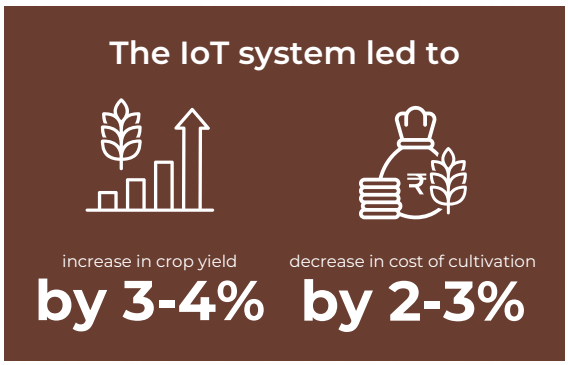
A.1. Potential for enabling farmer adoption

CultYvate developed a new solution during the challenge, which drastically reduced the price of measuring irrigation requirements to INR 199 / acre for companies / organisations implementing AWD projects. While this solution is more targeted towards B2B clients and institutional buyers, the impact will trickle down to farmers as well.

The IoT system led to a 3-4% increase in yield with a 2-3% decrease in cost of cultivation.

The technology is user friendly and provides full support to farmers to make decisions on irrigation. Communication is sent to farmers through a mobile app, as well as messages that serve as action triggers to start or stop irrigation. The technology is simplified to the point where it can work on a basic analog phone.

Farmers have received the technology as part of a project supported by a development partner who paid the subscription fee.. So far farmers have not paid for the usage of technology, but since the results experienced by them were significant, their willingness to pay is increasing especially for the new and more affordable solution.



A.2. Ease of distribution and scale up

CultYvate is targeting large B2B buyers like Bayer that have significant acreage under them. The market fit of their new solution is also strong among this segment as it is affordable, portable and fits the requirement of large institutional buyers that are undertaking AWD projects. Going forward, they envision 80% of their business coming from the new solution.

Additionally, the organisation is focusing heavily on working with FPOs and other farmer cooperatives in Punjab and AP / Telangana, which will enable greater expansion.

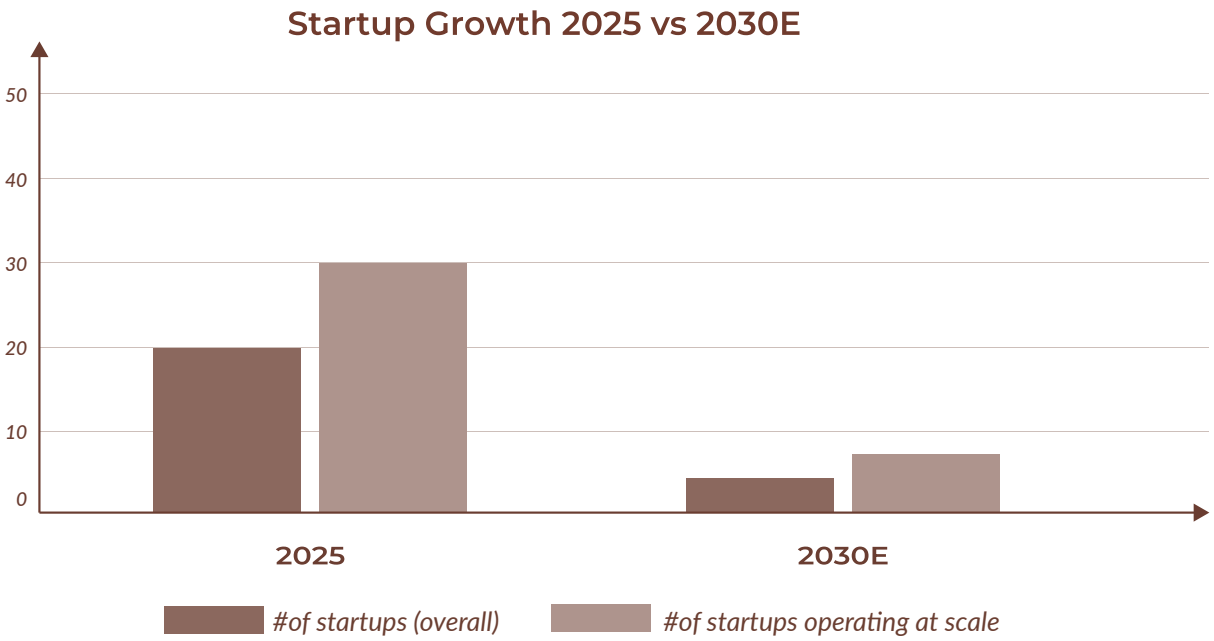
They have also retained and acquired partners to aid marketing, customer acquisition and provide implementation support over the past year, which will strengthen their ability to grow. However, they currently don't have any strong distribution partnerships, which may become a need in the future.

A.3. Potential for enabling water savings

The solution reduced water consumption by 33.8% after being adopted, bringing the quantum of water use to 14786 m3 / ha, which is 18% above the recommended requirement for paddy. The total number of irrigation cycles have also reduced.

The solution reduced water consumption by 33.8%

C. Satellite and aerial remote sensing



Startups in remote sensing require around ₹100-150 crore in funding over the next five years.

Funding stage	Funding / startup	Total funding	Potential funder types
Pre-seed	*₹1 crore*	*₹10-15 crores*	*Grants*
Seed	*₹4 crores*	*₹40-50 crores*	*VC, corporate investments*
Series A	*₹12 crores*	*₹60-80 crores*	*VC, corporate investments*

The bulk of the funding required in this category is at the Series A stage and will be used for technology development, product enhancement, and to launch and deploy infrastructure. This may range from the development of more advanced analytics solutions for both institutional and individual buyers, or to design and launch satellites that can better help triangulate and monitor data. Some of the funding will also go towards customer acquisition and team development, but the bulk of it is expected to go towards capability enhancement.

Case study: Manna

Manna is a digital application developed by Rivulis Irrigation which provides satellite based data and information to farmers for scheduling irrigation based on crop needs with drip irrigation. Until 2022, Manna's software was provided free for farmers using Rivulis' drip system and it started collecting payments from 2022 onwards.

Factor impeding investability

A.1. Potential for enabling farmer adoption

Manna uses a constellation of five satellites to obtain open-source satellite imagery data at higher accuracy, which powers a tool that enables daily advisory even during days when there is cloud cover.

Since the solution does not have any hardware or sensor requirement, it is highly cost efficient - it costs a farmer ₹ 1500 per acre per season.

While the solution currently provides advisory to drip farmers, there is a scope of expanding advisory beyond this segment.

A.2. Ease of distribution and scale up

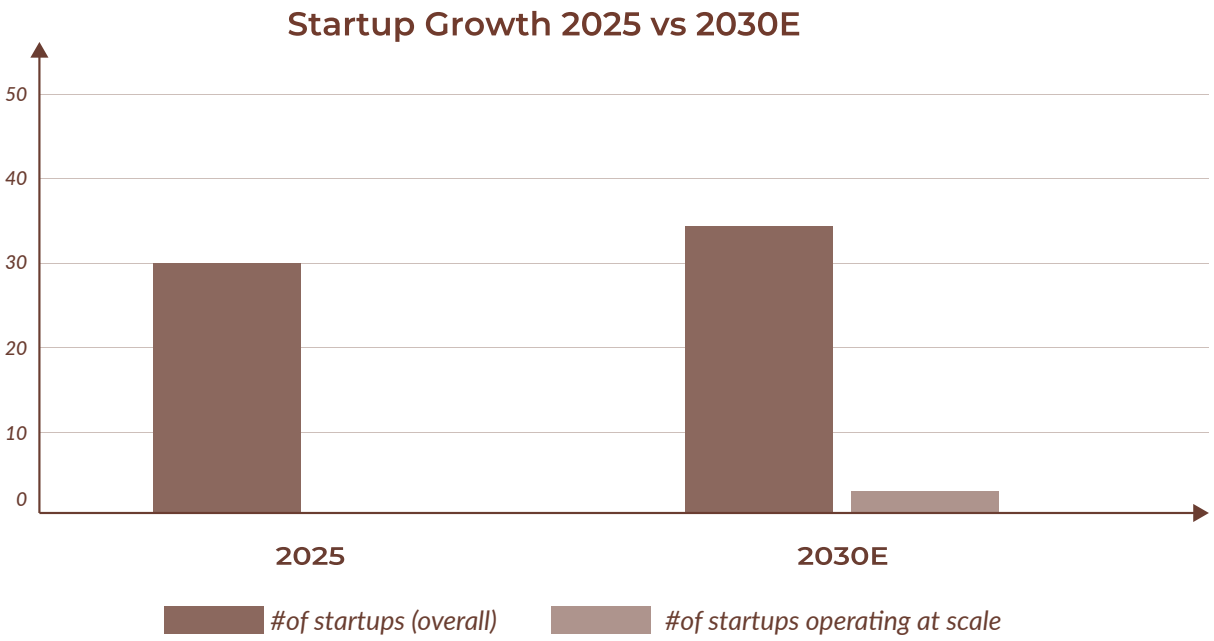
Manna leverages Rivulis Irrigation's network of distributors and field operations staff to reach farmers. Additionally, they also operate via B2B and B2G business models.

A.3. Potential for enabling water savings

Informed decision making for irrigation leads to significant reduction (up to 30-40%) of water use, enabling high savings.

The solution reduced water consumption by 30-40%

D. Automated irrigation systems



Startups providing irrigation automation solutions require around ₹25-50 crore in funding over the next five years.

Funding stage	Funding / startup	Total funding	Potential funder types
Pre-seed	*₹40 lakhs*	*₹2-4 crores*	*Grants, angel, friends & family*
Seed	*₹2 crores*	*₹10-20 crores*	*Debt, impact investments, blended finance*
Series A	*₹6 crores*	*₹10-20 crores*	*Private equity, debt*

The majority of funding in this category is expected to go towards organisations whose products are interoperable with on-field or remote sensing products for taking irrigation decisions. While part of the funding will be used for R&D, the bulk is expected to go towards creating distribution and implementation support capabilities.

Case study: PhyFarm

PhyFarm provides sensing, automation and traceability solutions for smart farming. Their solution is a data driven platform with integrated sensing and automation hardware such as smart sensors, irrigation and fertigation units that gather data on the farm, and automate irrigation operations.

Factor impeding investability

A.1. Potential for enabling farmer adoption

The erratic supply of electricity at odd hours in the night has been a recurrent problem for farmers. However, PhyFarm's technology provides a solution that can measure water use on a real time basis. Farmers earlier were unable to operate multiple valves in the field located at different and remote locations in odd hours. The IoT based technology has facilitated the farmers for automating irrigation with pre-defined scheduling.

The system also provides for managing electricity cut-offs and restarting of irrigation based on system memory recall of water supply made up to electricity cut-off. Further, app-based control by the farmers has helped to implement irrigation scheduling more efficiently.
The technology helps farmers in mitigating risk of wildlife at night, electrical shocks and elimination of labour engagement for valve management.

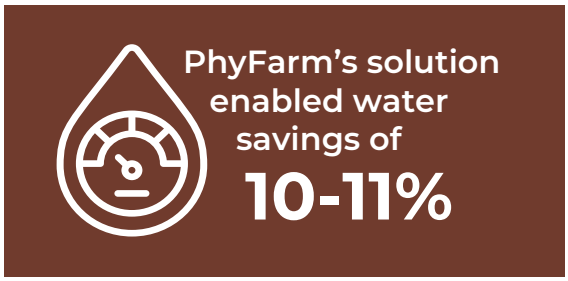
PhyFarm's solution is also plug-and-play and crop agnostic, which may make it attractive to a broad array of farmers, but the cost of technology per acre is still fairly high

A.2. Ease of distribution and scale up

PhyFarm is building a network of local and regional distributors / dealers, but has also entered into partnerships with organisations like DeHaat, Fasal and DIW to enable distribution. They have also forged partnerships with local service providers to enable implementation support.

A.3. Potential for enabling water savings

PhyFarm's solution enabled water savings of 10-11% post adoption and also provided real-time data on water use.



2.

Action Pathways

How do we reduce barriers for scale journeys to happen?

Addressing the ₹ 500-600 crore investment need for AgWaterTech startups can unlock a market of ₹ 2500-3000 crore by 2035 and also move India significantly forward in meeting global benchmarks for agricultural water use efficiency.

As the first step, investors and capital providers need to allocate ₹ 50-60 crores and outline key thresholds for results based financing over the next two years.

Catalysing this initial investment will require multiple actors across governments, venture capital, debt, and impact to come together, but startup founders and support actors from the ecosystem need to action these additional pathways to see the expected returns. Systems integrators who seamlessly combine elements like water, soil, climate, and pest management into a unified solution for farmers are equally important value-chain players. By enhancing farmer participation in AgWater initiatives, they can drive the adoption of new technologies, ultimately making the sector more investable.

Addressing the ₹ 500-600 crore investment need for AgWaterTech startups can unlock a market of INR 2500-3000 crore by 2035

A. Generate digitally verifiable evidence through large scale demonstrations

AgWaterTech startups need access to testing grounds where they can conduct large scale pilots and demonstrate tangible and digitally verifiable evidence of the benefits of their technologies, for e.g. increased crop yield, improved water use efficiency, etc. These demonstrations can help build confidence among skeptical farmers, investors and policymakers while generating valuable data and insights that can refine technologies and support broader policy initiatives.

Funding stage	Potential funder types
Government agencies	*Allocate dedicated funding and create supportive policy frameworks for demonstration projects, and establish public-private partnerships to scale pilots.*
Startups	*Collaborate with research institutions and local bodies to implement pilots, and share performance data and best practices to help refine solutions.*
Academic / research institutions	*Develop robust methodologies to evaluate the impact of technologies, and publish findings to build credibility and inform policy.*
Local governments, large corporates and farmer cooperatives	*Identify target regions and willing participant farmers, while providing on-ground support and facilitating feedback loops.*
Impact investors / philanthropic institutions	*Allocate funding on a pilot by pilot basis and for research to build strong evidence around technology use and impact.*

B. Define unique value propositions and financing models across sharply defined farmer

Water use / savings are not a top of mind concern for most farmers today. Additionally, many farmers - especially smallholders - face financial barriers that prevent the adoption of advanced AgWater technologies. Incentives such as subsidies or tax breaks and access to affordable finance can reduce the financial burden and drive large scale adoption of technologies that promise improved productivity and sustainability. Financial measures like Kisan Credit Cards are currently enabling adoption, but more interventions may be needed.

Another potential approach is the creation of a carbon credit-like structure or a climate resilience index that encourages farmers and villages to improve their environmental practices through financial rewards. Additionally, new mechanisms such as sustainability certifications, where food produced with lower water use is marketed at a premium, could create financial incentives.

For this to become a reality, startup founders need to sharply define farmer segments and develop a balanced framework of unique value propositions and incentives that motivate them to adopt water-efficient practices and technology.

Key actor	Role in intervention
Government agencies	*Sharply define farmer segments across parameters like geography, income, landholding size, crop type, etc. and identify unique value propositions.* *Collaborate with financial institutions to create innovative financing models (for e.g. pay-per-use, revenue or product sharing arrangements) that minimise upfront costs for farmers.*
Financial institutions	*Develop tailored financial products (low-interest loans, credit schemes, insurance policies) for technology adoption, and leverage digital platforms to streamline loan processing.*
Government bodies, policy makers and regulators	*Enable extension of existing measures like KCC, or set up grant programs, subsidies or risk mitigation funds that specifically target water-saving technology investments.* *Develop clear guidelines that include subsidies and tax incentives aligned with water use, while ensuring transparency and consistency in policy enforcement.* *Building carbon credit-like structures or a climate resilience index encourages farmers and villages to improve their environmental practices through financial rewards.* *Establishing mechanisms such as sustainability certifications.*
Agricultural extension services	*Educate and train farmers on the benefits of adopting efficient AgWater technologies and the long-term cost savings, while serving as a bridge between technology providers and end users to ensure smooth implementation.*
Farmer cooperatives and associations	*Advocate for practical and locally relevant incentives, and organise collective action to negotiate better terms and ensure compliance within their networks.*

C. Develop partnerships with scaled distribution players to streamline distribution networks for AgWaterTech solutions - building better accessibility

Distribution is one of the biggest challenges faced by AgWaterTech startups that are trying to scale up and often leads to a difficulty in reducing customer acquisition costs. A well organised distribution network ensures that technologies reach farmers quickly and cost-effectively. Creating a large and impactful distribution network in a country such as India is financially strenuous for a startup which is why partnerships and existing networks become a key.

Existing networks such as drip irrigation companies, fertiliser distribution networks, online agri marketplaces, and government agricultural departments hold the key to unlocking distribution for new AgWaterTech startups, offering a cost-effective alternative to building networks from scratch.

Key actor	Role in intervention
Startups	*Develop integrated supply chain strategies that include robust after-sales support and service networks, and partner with local distributors to tailor solutions to regional needs.*
Scaled distribution players	*Establish dedicated channels for AgWaterTech products, ensuring efficient inventory and service management.*
Agricultural extension services	*Train distributors and farmers on technology usage and maintenance, and act as the communication link between technology providers and end users for prompt issue resolution.*

D. Standardise data collection methodologies for water use / source utilisation and build integrations with emerging digital infrastructure for agriculture

A key challenge in driving water-use efficiency at the farmer level is the difficulty of measuring applied water. The absence of common standards for, adequate and accurate farm-level data collection, particularly for tracking water-use efficiency, makes it challenging for farmers to recognise its importance and articulate water savings at the granular level of an acre.

Common standards and methodologies can help ensure that water use data is collected in a reliable, comparable and transparent manner, fostering trust among farmers and other stakeholders - particularly for those who have water savings as an important

part of their charter, for e.g. impact investors focused on water savings.

Better data systems also have the potential to address the barrier to farmer participation in water conservation and help link water usage to income, providing a clearer incentive for farmers to optimize their resource use.

India is taking massive strides in building digital infrastructure for agriculture and developing integrations with these technology stacks will enable multiple institutional players to participate in this endeavour. AgWaterTech solutions that adhere to standardized water-use protocols would feed real-time data directly into Agristack via APIs, creating a centralized, trusted database of water usage metrics across regions, accessible to all stakeholders. Integrating with Agristack enables seamless linkage between water-use data and other agricultural data (crop health, weather, soil data), driving holistic agricultural advisory services, while policymakers and regulators can monitor water usage trends, enforce compliance, and design better-targeted incentives or penalties.

Key actor	Role in intervention
Regulatory bodies	*Lead the development of standardised protocols for measuring water use and certify compliant technologies.* *Utilize integrated data to refine policies, monitor compliance, and support water conservation initiatives*
Research institutions	*Develop, test, and refine methodologies and tools for accurate water measurement, and publish guidelines and best practices to support widespread adoption.*
Agristack administrators / digital infrastructure bodies	*Serve as the backbone for data integration, ensuring that all digital systems (like irrigation tech platforms) align with standardized data protocols. Develop and maintain robust APIs for water-use data, ensure data security, privacy, and interoperability with existing agricultural datasets, and facilitate regular stakeholder consultations to evolve the digital framework as technologies advance.*
Startups	*Integrate common standards into their products to ensure compatibility and reliability of data.* *Adapt solutions to feed standardized water usage data into Agristack.*
Large corporates	*Invest in pilot programs and provide feedback on the effectiveness and usability of the standards.*
Financial institutions	*Leverage integrated water data to refine risk assessments and design better financing products.*

2.1 Highlights from Union Budget 2025

The recently released Union Budget has certain measures that have been introduced or enhanced, which will also have a positive impact on the state of AgWaterTech startups.

Measure	Description
Enhanced credit through KCC	*The loan limit under the Modified Interest Subvention Scheme to be enhanced from ₹ 3 lakhs to ₹ 5 lakhs for loans taken through the Kisan Credit Card.*
Research, development and innovation	*Allocated significant resources to strengthen India's research and development (R&D) ecosystem, with an ₹ 20000 crore fund for the Department of Science and Technology to promote private-sector innovation and foster AI, geospatial initiatives, and Atal Tinkering Labs.*
Prime Minister Dhan-Dhaanya Krishi Yojana	*Motivated by the success of the Aspirational Districts Programme, the government will undertake PMDDKY in partnership with states. Through the convergence of existing schemes and specialised measures, the programme will cover 100 districts with low productivity, moderate crop intensity and below-average credit parameters.* *The scheme aims to increase agricultural productivity, adopt crop diversification and sustainable agriculture practices, improve post-harvest storage at the panchayat and block levels, improve irrigation facilities,and provide short-term and long-term credit.*

3.

AgWater: The Way Forward

The core purpose of this exercise is to agitate the issue of AgWater financing and the lack of it in India. Agitating an issue leads to debate which leads to consensus and finally action. The problem is there for everyone to see. There is no incentive to the Indian farmers to save water. The HYDROPOLITICS of water is in favour of the farmer and changing that around is a long and distant dream, not that dreams do not get fulfilled, but an effort needs to be directed towards achieving that dream. This document is the beginning of that effort.

We are all aware that 90% of groundwater is used for agriculture and 70 % of portable water comes from groundwater sources. Add to the increasing incidence of groundwater contamination, estimated at 60% of all ground water in India and we have a recipe for disaster. The best way to avoid the disaster is the reduction of consumption of groundwater in agriculture. Projections suggest that by 2030, India could face a 50% shortfall in freshwater, underscoring the need for immediate, decisive action.

This challenge has opened a debate, much overdue, on how to make the AgWater story fundable and create an investment thesis in favour of AgWater. We have no doubts that the volume of funding required is available, not only from the government, but even private sources like VC's, Institutional, Impact Funds, Blended Finance instruments etc.

The report addresses several issues, the fulcrum of it being the financial backing that Startups in the sector, not only need but which is critical for their very existence. This input can breathe life into a much neglected sector that can have a multiplier effect on 55% of the population of India and have a spin off effect on the national economy.

Strategy for a rapid distribution and outreach, an activity that a Startup cannot afford and therefore cannot reach is critical to its financial viability, which is currently 10 years thereby failing most of the benchmarks that a normal financier is looking for .

So starting from benchmarking water consumption patterns to impact assessment criteria , the narrative to engage the millions of farmers in India has to be easily understood and the simplest way to make people understand is to ensure their income goes up due to implementation.

Today, we stand at a decisive moment. The challenges are immense, yet the opportunity to redefine India's AgWater future has never been more within reach. The path forward lies in taking small, collaborative steps that gradually build a comprehensive ecosystem—where investment and innovation converge to secure a prosperous future for both our farmers and our nation's precious water resources.

The sector needs an innovation capital of INR 500-600 crore dedicated to AgWater. Let's join forces as a united community of stakeholders, from grassroots innovators to global investors, to reshape the AgWater landscape. Together, we can turn challenges into opportunities and lay the foundation for a resilient, water-secure agricultural future in India. The Startups in India today are the frontline soldiers of a change that is not only essential but critical.

Let's change the narrative. The journey has started with this foundational document, it needs to be built upon and structured so the coming years will see a change in the way we approach AgWater.

Romiel Samuel
Founder, Indus Water Institute

Annexure I

Glossary of Terms

Term	Definition
AgWaterTech	*AgWaterTech at Prize encompasses emerging technologies at the intersection of agriculture and water, aimed at optimising water use as a limited public resource, increasing crop yield, and supporting farmers in adopting sustainable practices across crops to improve farming efficiency and resilience. This includes innovations in the space of bio-inputs and stimulants, sensor-based technology, irrigation automation, and more, helping fulfil the ever-growing needs of the farmer population while tackling some of the impacts of climate change.*
Irrigation water use efficiency	*In irrigation, Water Use Efficiency (WUE) represents the ratio between effective water use and actual water withdrawal.*
Smallholder farmers	*Crop farmers with land sizes of two hectares or less.*
Irrigation-fed farmers	*Irrigation-fed farmers are those who rely on a controlled water supply through irrigation systems to cultivate their crops.*
Rain-fed farmers	*Rain fed farmers depend solely on rainfall for their crops, with no additional irrigation provided.*

Annexure II

Methodology

1. We followed a step-by-step approach to build the case for investability in AgWater in India and estimate the average funding required for startups to scale and maximise impact.

Landscape of Agriculture and Water (AgWater)

As a first step, we analysed the AgWater space, examining technology innovations and funding trends over recent years through reports and existing literature. We then categorised these innovations by solution type - bio-inputs & stimulants, soil moisture and climate sensors, satellite and aerial remote sensing, and automated irrigation systems.

Average Funding Amount

Next, we estimated the funding requirements at various stages for different categories of tech startups in the AgWater sector in India using a guesstimate approach. The approach is based on the following assumptions:

1. Focus on Smallholder Farmers:
The primary target beneficiaries are smallholder farmers.

2. Diverse Solution Needs:
Each farmland plot may eventually require multiple solution categories.

3. Varying Scale Potential:
Different startup categories have distinct scaling potentials.

4. Cost Differentiation:
Cost structures will vary across startup categories and funding stages, with some shared components.

The guesstimate involved the following steps:

Step 1: Identifying startup categories:

We identified four categories for AgWaterTech startups: bio-inputs & stimulants, soil moisture and climate sensors, satellite and aerial remote sensing, and automated irrigation systems. We used an extensive database from Tracxn and certain Agri reports to refine the categories.

Step 2: Target validation:

Determined a target farmer base to further define the customer market for startups and form the foundation for all future calculations. The farmer base was critical to analyse market investment dynamics and identify a critical mass at which stakeholders like the government (through subsidies) and corporate investors contribute to expand the farmer base and support the adoption of startup technologies. We examined multiple government policies and schemes to understand farmer density and its implications for AgWater solutions. Additionally, we engaged with various startups in the sector to gather insights from this step onwards.

Current estimate for critical mass of smallholder farmers : 200k (2,00,000)

Step 3: Stage mapping to target farmer base:

Analysed the category-wise market share (farmer share) and the stage at which each startup category would achieve it.

Step 4: Identifying scale potential:

We assessed the scalability potential of startups across different AgWater categories and calculated the farmer reach per startup. Our analysis emphasised startups that have successfully deployed their technologies to a majority of farmers. We focused on those nearing or closing Series A funding and assumed a 25% success rate for startups

Step 5: Mapping number of startups in different categories:

The category-wise market share (farmer share) and the farmer reach per startup in each category helped map the number of startups in different categories.

Number of startups in each category = Category-wise farmer share / Farmer per startup progressing from the pre-seed stage to Series A.

Step 6: Determining average funding amount:

We estimated the startup costs for different categories at various stages (pre-seed, seed, etc.) to calculate the investments needed for their sustainability and scaling. Eg, the cost categories for a startup in the bioi-inputs and stimulants category may include -

- Product development cost (R&D for formulations, lab tests, regulatory compliance, and initial production)
- Field trials and testing cost
- Team building cost
- Regulatory approvals cost
- Go-to-Market (GTM) cost (Customer acquisition through farmer networks, cooperatives, or agribusiness partnerships, outreach campaigns, digital tools, and initial distribution)
- Operational cost

We examined secondary funding data from relevant startups across our categories to assess cost structures and investment needs. Additionally, we engaged with startups from the Seed to Pre-Series A stages to gain insights into their investment requirements and key cost components. The average funding amount across startup categories helped estimate the total funding required for each category and the sector as a whole. This analysis also enabled an evaluation of available funding types and their alignment with startup needs across categories and stages. While identifying first-movers and risk-takers for each category at different stages remains challenging, the guesstimate exercise provided valuable insights to chart a clearer path forward.

2. To estimate the current market size of irrigation technologies in India, focusing on biologicals and smart irrigation systems (excluding micro and drip irrigation), we began by reviewing some existing literature to gather data on the adoption rates of these technologies among Indian farmers. We then applied a compound annual growth rate (CAGR) of 15% to project the market size for the year 2035. This growth rate was chosen based on factors such as increasing water scarcity, government initiatives promoting precision agriculture, and the declining costs of relevant technologies. This methodology allowed us to arrive at a projection of the market's potential expansion over the next decade.

Annexure III

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This two-volume AgWater investment Pov is a bold call to action to infuse catalytic capital into the AgWater space. It brings together breakthrough technologies, investment insights, and partnerships within the ecosystem.

The goal: To enable a water smart, resilient future for Indian agriculture