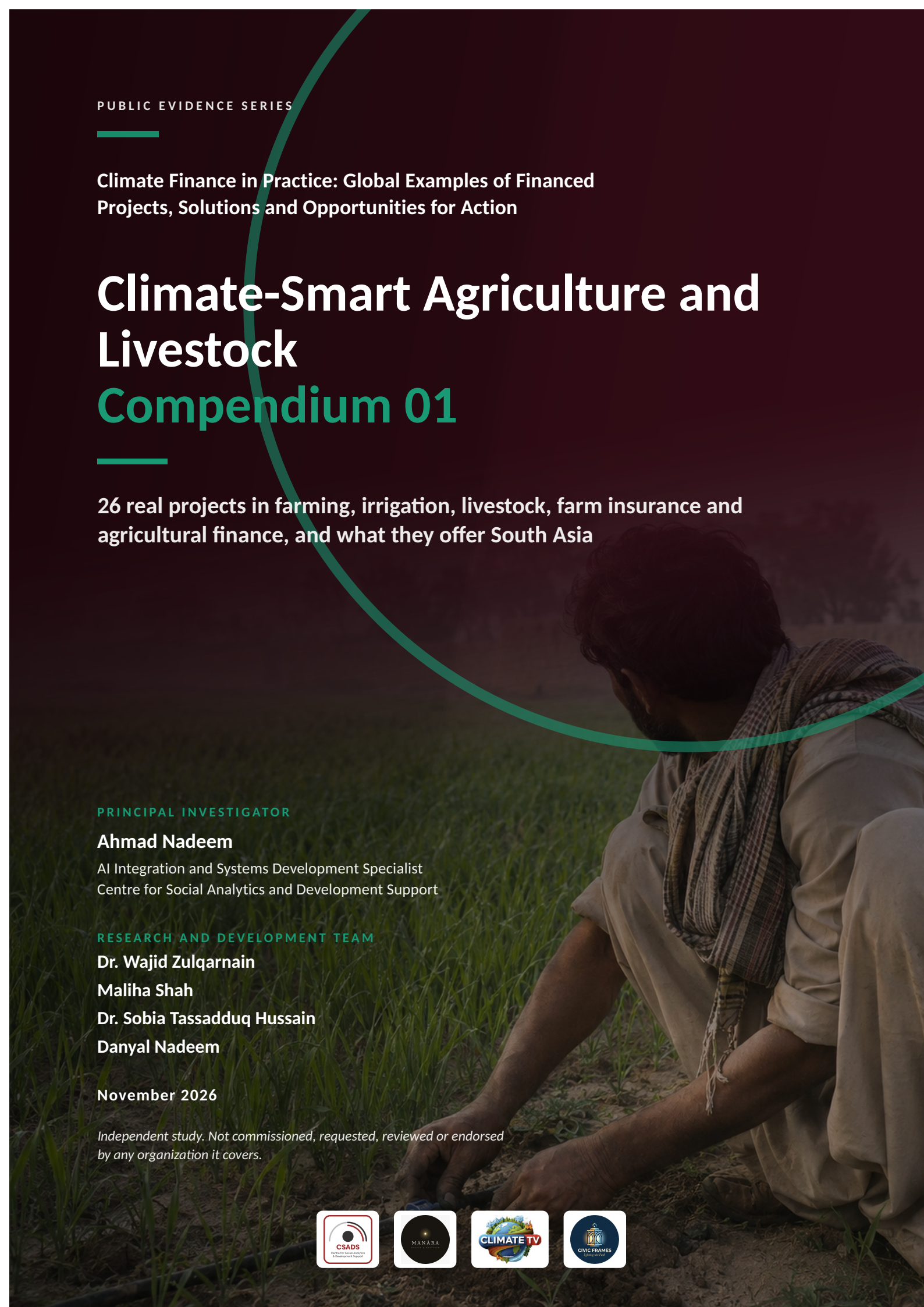
PUBLIC EVIDENCE SERIES

Climate Finance in Practice: Global Examples of Financed Projects, Solutions and Opportunities for Action

Climate-Smart Agriculture and Livestock

Compendium 01

26 real projects in farming, irrigation, livestock, farm insurance and agricultural finance, and what they offer South Asia



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November 2026

Independent study. Not commissioned, requested, reviewed or endorsed by any organization it covers.

About Climate Finance in Practice

The Public Evidence Series brings together independent, openly sourced knowledge products that make documented evidence usable in public and private decision making. *Climate Finance in Practice* is a series of 18 thematic compendiums of real, internationally documented climate finance projects, written for non technical readers in government, business, civil society and development organisations.

Suggested citation

Public Evidence Series. 2026. *Climate Finance in Practice, Compendium 01: Climate-Smart Agriculture and Livestock*.

Edition

November 2026. Project information verified between October and November 2026; retrieval dates are given in the References.

Independence

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CHAPTER 1

Purpose, audience and how to use this compendium

This compendium is the first in *Climate Finance in Practice*, a series of 18 thematic compendiums issued in the Public Evidence Series. It brings together 26 real climate finance projects in agriculture and livestock, each financed by a development bank, climate fund, development finance institution, United Nations agency, government programme or private investor, and each recorded in official or investor documents.

It is written for people who need practical ideas rather than theory: managers in agribusinesses, banks, insurers and investment funds; officials in agriculture, livestock, irrigation and finance departments; staff of farmer organisations, nongovernmental organisations and development agencies; and researchers who advise them. No background in finance is assumed.

Readers can use it in three ways. To browse, start with Table 2.1, which lists every project by the kind of climate action it supports, and turn to any profile that matches a problem you recognise. To compare, read profiles of the same type side by side: each follows the same layout, from key facts to the challenge, the solution, how it was paid for, what happened and what it would take to do something similar in South Asia. To act, use the guidance on developing a preliminary project idea, which turns the lessons of the profiles into first steps.

Every figure is cited to its source, and each result is labelled by the strength of its evidence: expected (a target), reported (by the implementer), verified (through a financier's supervision) or independently evaluated. A weblink in each profile leads to the official record. Project status and figures change over time, so readers should confirm current details with the institutions concerned before making decisions. Nothing in this compendium is investment or financial advice.

CHAPTER 2

Climate-smart agriculture and livestock: an introduction

Farming is where climate change touches South Asia most directly. More than 800 million people in the region live in places where rising temperatures and changing rainfall are projected to lower living standards by 2050 under a carbon intensive pathway (Mani et al. 2018), and most of them depend on crops or livestock. Pakistan's 2022 floods alone caused USD 3.7 billion of damage to agriculture and livestock (UNDP 2022).

Climate smart agriculture means farming that copes better with heat, drought and floods, produces more from the same land and water, and where possible releases less greenhouse gas. In practice it covers a wide range of investments: drought tolerant seed, efficient irrigation and solar pumps, cold storage that stops harvests from rotting, advice sent to farmers' phones, insurance that pays out when rains fail, and credit that lets farmers pay for all of these.

Money for this work is scarce. Developing countries will need more than USD 310 billion a year for adaptation by 2035, against international public adaptation finance of USD 26 billion in 2023 (UNEP 2025), and tracked adaptation finance from all sources reached only USD 46 billion (CPI 2025). Yet the projects in this compendium show that finance does reach farms when it is designed well: when a solar pump is sold as a service, when insurance is bundled with a loan or a bag of seed, when a public subsidy draws in farmers' own savings, or when a climate fund takes the first risk so private investors can follow.

The 26 profiles are grouped under four dimensions of climate finance. Adaptation projects help farmers and herders cope with climate risks. Mitigation projects cut emissions from farming. Cross cutting projects do both, such as solar irrigation that replaces diesel while keeping crops watered. Enabling and financing projects build the funds, credit and insurance that make farm investment possible. Projects whose payouts help people recover from climate losses are also tagged Loss and Damage. Ten of the projects are in South Asia and one more operates partly in the region. Every profile closes with first steps for readers there.

2.1 Projects by climate finance dimension

Every project in this compendium is listed below, grouped by its main dimension: adaptation (A), mitigation (M), cross cutting action (C), and enabling and financing (E). Projects whose payouts help people recover from climate losses are marked Loss and Damage.

Table 2.1 Projects by climate finance dimension

ID	Project	Where	What it is	Status
CF01-A01	Maharashtra Project on Climate Resilient Agriculture (PoCRA)	India	State programme for climate resilient farming	Completed
CF01-A02	Kenya Climate Smart Agriculture Project	Kenya	National programme with value chain partnerships	Completed
CF01-A03	Adaptation for Smallholder Agriculture Programme (ASAP)	Global, including Bangladesh, Bhutan and Nepal	Climate grants blended into rural development loans	Completed; successor under way
CF01-A04	Drought tolerant maize for Africa	Sub-Saharan Africa	Drought tolerant seed bred publicly and sold by private seed companies	Varieties in commercial use
CF01-A05	Punjab Agriculture Department digital advisory service	Pakistan	Weather, crop and input advice sent to farmers' phones	Operating under government management
CF01-A06	Modernized Climate Information and Early Warning Systems (M-CLIMES)	Malawi	Seasonal forecasts and farm advice with community preparedness	Implemented
CF01-A07	Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP)	Pakistan	Subsidised drip and sprinkler irrigation with farmer cofinancing	Completed
CF01-A08	Punjab Resilient and Inclusive Agriculture Transformation (PRIAT)	Pakistan	Successor programme for efficient irrigation and watercourses	Under implementation
CF01-M01	Vietnam Sustainable Agriculture Transformation Project (VnSAT)	Viet Nam	Lower emission rice farming linked to agribusiness	Completed
CF01-M02	ABC low carbon agriculture credit (Programa ABC)	Brazil	Subsidised bank credit for low emission farming	Operating since the 2010 and 2011 crop year
CF01-M03	PM-KUSUM solar pumps for farmers (Component B)	India	Subsidised standalone solar pumps replacing diesel	Operating since 2019
CF01-C01	IDCOL Solar Irrigation Programme	Bangladesh	Solar irrigation sold to farmers as a service	Under implementation
CF01-C02	SunCulture	Kenya and other African countries	Solar irrigation sold to farmers on instalments	Operating
CF01-C03	Ecozen	India	Solar powered cold rooms and pump controllers for farmers	Operating
CF01-C04	ColdHubs	Nigeria	Solar cold rooms paid for by the crate	Operating
CF01-C05	Sahyadri Farms	India	Farmer owned company that stores, processes and exports produce	Operating
CF01-E01	Acumen Resilient Agriculture Fund (ARAF)	East and West Africa	Equity fund for agribusinesses serving small farmers	Under implementation
CF01-E02	Apollo Agriculture	Kenya	Seed, fertiliser and insurance sold to farmers on credit	Operating

ID	Project	Where	What it is	Status
CF01-E03	AGRI3 Fund	Global, including Latin America, Africa and Asia	Guarantees that let banks lend longer for sustainable farming	Under implementation
CF01-E04	Global Index Insurance Facility (GIIF)	Africa, Asia, Latin America and the Caribbean	Building markets for index insurance with private insurers	Operating since 2009
CF01-E05	Crop Loan Insurance Scheme (CLIS) (Loss and Damage)	Pakistan	Crop insurance attached to farm loans	Operating since 2008
CF01-E06	Kilimo Salama, now ACRE Africa (Loss and Damage)	Kenya and East Africa	Micro insurance linked to seed and paid by phone	Operating
CF01-E07	Pradhan Mantri Fasal Bima Yojana (PMFBY) (Loss and Damage)	India	National crop insurance through private and public insurers	Operating since 2016
CF01-E08	R4 Rural Resilience Initiative (Loss and Damage)	Africa, Asia, Latin America and the Caribbean	Insurance that very poor farmers pay for with work	Operating since 2011
CF01-E09	Kenya Livestock Insurance Program (KLIP) (Loss and Damage)	Kenya	Drought insurance for herders bought by government	Operating since 2015
CF01-E10	De-risking, Inclusion and Value Enhancement of Pastoral Economies (DRIVE) (Loss and Damage)	Djibouti, Ethiopia, Kenya and Somalia	Insurance, savings and markets for herders	Under implementation

Source: Authors' compilation from the official and investor records cited in each profile.

PART ONE

Adaptation



1 Maharashtra Project on Climate Resilient Agriculture (PoCRA)

2 Kenya Climate Smart Agriculture Project

3 Adaptation for Smallholder Agriculture Programme (ASAP)

4 Drought tolerant maize for Africa

5 Punjab Agriculture Department digital advisory service

6 Modernized Climate Information and Early Warning Systems (M-CLIMES)

7 Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP)

8 Punjab Resilient and Inclusive Agriculture Transformation (PRIAT)

CHAPTER 3

Adaptation

The eight adaptation profiles show how farmers have been helped to keep producing as heat, drought and erratic rain intensify. Two are large state programmes: Maharashtra's village level water and soil investments in drought prone districts of India, and Kenya's county led climate smart agriculture project. IFAD's ASAP shows how climate grants were blended into rural loans in more than 40 countries, and drought tolerant maize for Africa shows seed bred with public money and sold by private seed companies. Two profiles deal with information: Punjab's phone based advisory service in Pakistan and Malawi's GCF financed forecasts and early warnings. The section ends with two Punjab irrigation projects, PIPIP and its successor PRIAT, in which farmers paid part of the cost of drip and sprinkler systems.

3.1 Maharashtra Project on Climate Resilient Agriculture (PoCRA)

CF01-A01 | India | State programme for climate resilient farming | Completed

Key facts	
Where	Drought prone districts of Maharashtra, India
Who	Government of Maharashtra, where the programme is known as Nanaji Deshmukh Krishi Sanjivani Prakalp, with the World Bank
How Much, From Whom	World Bank (IBRD) loan of USD 420 million, of which USD 419.94 million was disbursed (World Bank 2025)
When and Status	Approved in fiscal year 2018; closed; completion report reviewed by the Independent Evaluation Group (World Bank 2025; IEG 2025)
Where It Is Recorded	World Bank P160408. Open the official record
Evidence Strength	Verified through World Bank results reporting and independently reviewed
The project story	
The Challenge	Smallholder farming in Maharashtra's dry interior suffers from erratic rainfall, falling soil fertility and scarce water. Repeated crop failures have left many families unable to pay for the ponds, sprinklers and better seed that would help them cope with the next dry season on their own.
What Was Done	The programme set out to make smallholder farming in selected districts more climate resilient and more profitable (World Bank n.d.b). Villages drew up their own climate resilient farm plans. Farmers received support for demonstrations of climate smart practices, sprinklers, pumps, pipes and farm ponds, soil improvement, better seed supply and stronger value chains, alongside a digital platform and a Climate Innovation Center for local firms (IEG 2025).
How It Was Paid For	The World Bank lent to India, and the state government ran the programme. Support reached farmers and farmer groups through the state's extension system and through payments made directly into beneficiaries' bank accounts, which reduced the scope for leakage between the state treasury and the farm.
What Government Did	The state government designed the programme, chose the districts and ran it through its agriculture department. Its subsidies created a large and predictable market for private suppliers of irrigation equipment, seed, soil testing and advisory services.
What Happened	Good practices for managing saline and sodic soils covered 67,057 hectares by January 2024, against a target of 127,600 hectares (World Bank n.d.b). Almost the whole loan was disbursed, and the Independent Evaluation Group reviewed the completion report (World Bank 2025; IEG 2025).
Who Could Use This Model	State and provincial agriculture departments; suppliers of micro irrigation, seed and soil testing; banks and microfinance institutions financing the farmer's share; agricultural universities providing monitoring.
Risks to Watch	Slow adoption of unfamiliar practices; benefits captured by better off farmers; and equipment that falls out of use once programme support ends.
Conditions That Made It Work	Strong state ownership, village level planning, direct payments to farmers and a results framework tracked over several years.
How to Get Started in South Asia	Suppliers and banks in Pakistan and Bangladesh can identify provincial programmes that subsidise climate smart practices and offer equipment packages, after sales service and loans for the farmer's share, matched to programme eligibility rules.
Lessons for South Asian Businesses and Institutions	A large public programme can build demand for private agricultural services across a whole state. Firms that sell irrigation equipment, seed, soil testing or digital advice can treat such programmes as market openings, while banks can finance the farmer's share. The shortfall on soil management is a reminder that new practices spread slowly, which any business plan built on farmer uptake must allow for.

3.2 Kenya Climate Smart Agriculture Project

CF01-A02 | Kenya | National programme with value chain partnerships | Completed

Key facts	
Where	Selected counties across Kenya, covering smallholder farming and pastoral communities
Who	Government of Kenya, Ministry of Agriculture, with county governments and the World Bank
How Much, From Whom	IDA credit of USD 250 million approved on 9 February 2017, with a 38 year maturity and six year grace period (World Bank 2017b)
When and Status	Implemented from 2017; completion report issued in 2024 (World Bank 2024)
Where It Is Recorded	World Bank P154784. Open the official record
Evidence Strength	Verified through World Bank implementation reports
The project story	
The Challenge	Kenyan smallholders and herders depend on rain that has become less reliable, and droughts regularly destroy crops and livestock. Low productivity and weak links to buyers leave many farmers with little income to invest in better practices, and few private firms see them as customers worth serving.
What Was Done	The project set out to raise agricultural productivity and build resilience to climate risks among smallholder farming and pastoral communities (World Bank 2017b). Its largest component, worth USD 163.8 million, scaled up climate smart practices on farms and rangelands, while other components strengthened research, seed systems and investments chosen by communities themselves (World Bank 2021).
How It Was Paid For	The World Bank lent on concessional IDA terms to the Government of Kenya, which channelled funds through national and county institutions. Communities and farmer groups received grants for investments they selected, and value chain partnerships brought private buyers and processors into the arrangement alongside public money.
What Government Did	The national ministry and county governments led implementation, decided where investments went and brokered partnerships between farmer groups and companies.
What Happened	By March 2021, the project had set up 34 public private partnerships in farm value chains against a target of 40 (verified; World Bank 2021). The World Bank's implementation completion report was finalised in 2024 (World Bank 2024).
Who Could Use This Model	Agribusinesses and processors seeking reliable supply; farmer groups and cooperatives; county or district governments; development banks financing national programmes.
Risks to Watch	Partnerships that depend on public facilitation and fade without it; uneven county capacity; and slow disbursement, which reached about 59 percent by early 2021 (World Bank 2021).
Conditions That Made It Work	Concessional long term finance, devolved implementation through counties, and a deliberate effort to give private buyers a defined role.
How to Get Started in South Asia	Agribusinesses in South Asia can approach provincial agriculture departments preparing climate smart programmes and propose structured offtake or input partnerships with farmer groups.
Lessons for South Asian Businesses and Institutions	National programmes can do more than pay for practices: they can build lasting commercial relationships in farm value chains. For South Asian firms, the opening lies in becoming the buyer, processor or input supplier that a public programme needs, with the programme absorbing part of the early cost of organising farmers into reliable suppliers.

3.3 Adaptation for Smallholder Agriculture Programme (ASAP)

CF01-A03 | Global, including Bangladesh, Bhutan and Nepal | Climate grants blended into rural development loans | Completed; successor under way

Key facts	
Where	Over 40 developing countries, including Bangladesh, Bhutan and Nepal in South Asia
Who	International Fund for Agricultural Development (IFAD), with governments that borrow from it
How Much, From Whom	USD 366 million contributed by 11 donor governments by 2016 (IFAD 2016); 42 grants totalling USD 298 million (IFAD 2020)
When and Status	Launched in September 2012; successor programme ASAP+ launched with a USD 500 million target (IFAD 2016; IFAD 2020)
Where It Is Recorded	IFAD Executive Board document EB 2016/118/R.15. Open the official record
Evidence Strength	Reported by IFAD
The project story	
The Challenge	Smallholder farmers produce much of the food in developing countries but receive a small share of climate finance. Rural development loans rarely included the extra cost of making investments resilient, such as drought tolerant varieties, water harvesting or climate information, because governments were reluctant to borrow for benefits that were hard to measure.
What Was Done	IFAD created a dedicated window that receives climate finance from donor governments and blends it with its regular rural development loans, so that roads, irrigation, markets and farmer training are designed for a changing climate (IFAD 2016). The goal was to strengthen the resilience of 8 million smallholder farmers.
How It Was Paid For	Donor governments contributed grants to a trust fund managed by IFAD. Each ASAP grant was attached to a larger IFAD loan or grant to a government, so a modest climate grant shaped the design of a much bigger investment. By 2016, 36 supported projects had committed USD 285 million (IFAD 2016).
What Government Did	Borrowing governments agreed to include adaptation measures in their rural programmes and implemented them through national agencies, often with farmer organisations.
What Happened	IFAD reports 42 grants totalling USD 298 million and improved adaptation capacity for five million small scale farmers (reported; IFAD 2020). A successor programme, ASAP+, seeks USD 500 million to reach 10 million people (IFAD 2020).
Who Could Use This Model	Development banks and funds designing rural programmes; agriculture ministries; farmer organisations and nongovernmental organisations implementing projects.
Risks to Watch	Adaptation benefits that are hard to separate from general development results; and donor contributions that may not be renewed.
Conditions That Made It Work	A trusted lender with a large rural portfolio, donors willing to pool grants, and a simple rule linking each grant to a bigger investment.
How to Get Started in South Asia	Agriculture departments can ask development partners preparing rural loans to include climate grant windows, and specify the extra resilient features those grants would pay for.
Lessons for South Asian Businesses and Institutions	Small grants can steer large loans. For South Asian governments and institutions preparing rural investments, attaching climate grants to existing programmes is often quicker than designing standalone climate projects, and it makes ordinary infrastructure fit for a harsher climate.

3.4 Drought tolerant maize for Africa

CF01-A04 | Sub-Saharan Africa | Drought tolerant seed bred publicly and sold by private seed companies | Varieties in commercial use

Key facts	
Where	20 countries in sub-Saharan Africa where drought tolerant varieties have been released (Prasanna, Simtowe and Erenstein 2019)
Who	International Maize and Wheat Improvement Center (CIMMYT) and International Institute of Tropical Agriculture (IITA), with national research systems and more than 100 seed companies
How Much, From Whom	Grant funding from the Bill and Melinda Gates Foundation, USAID, the UK Department for International Development, the Syngenta Foundation and the CGIAR maize research programme (Prasanna, Simtowe and Erenstein 2019)
When and Status	Varieties grown commercially on nearly 3.5 million hectares by 2019
Where It Is Recorded	CIMMYT programme presentation, 2019. Open the official record
Evidence Strength	Independently studied through adoption surveys
The project story	
The Challenge	Maize is a staple food crop for millions of African farm families, and much of it is rain fed. A drought at the wrong moment can wipe out a harvest. Farmers needed seed that yields reasonably well in dry years without losing out in good ones.
What Was Done	Public research centres bred maize varieties that tolerate drought, tested them with national research institutes and passed them to seed companies to multiply and sell. Varieties have been released in 20 countries, and more than 100 small and medium seed companies produce about 85,000 tonnes of certified drought tolerant seed a year (Prasanna, Simtowe and Erenstein 2019).
How It Was Paid For	Philanthropic and donor grants paid for breeding, testing and support to seed companies. Seed companies financed production and marketing from their own revenue, and farmers paid for the seed, so the costly research was public while delivery became a private business.
What Government Did	National research systems tested and released varieties, and seed regulators certified them, which allowed private companies to sell them legally.
What Happened	Drought tolerant varieties were grown on nearly 3.5 million hectares. Adopters had about 15 percent higher average yields in Zambia and 16 percent in Uganda, and in the 2015 and 2016 El Niño drought the new hybrids yielded roughly double the most popular commercial variety in southern Africa (independently studied; Prasanna, Simtowe and Erenstein 2019).
Who Could Use This Model	Seed companies; agricultural research councils and universities; agribusinesses supplying farmers; development partners funding crop research.
Risks to Watch	Seed that is too costly for poor farmers; weak certification systems; and new pests or climate extremes that outpace breeding.
Conditions That Made It Work	Long term grant funding for breeding, open sharing with national institutes, and many local seed companies ready to commercialise varieties.
How to Get Started in South Asia	South Asian seed companies can partner with national research institutes and international centres to license and multiply heat and drought tolerant varieties of wheat, rice and pulses.
Lessons for South Asian Businesses and Institutions	Public money spent on breeding can create a private seed market that reaches millions of farmers. In South Asia, where heat stress threatens wheat and rice, partnerships between research centres and seed companies offer a proven route to climate resilient varieties.

3.5 Punjab Agriculture Department digital advisory service

CF01-A05 | Pakistan | Weather, crop and input advice sent to farmers' phones | Operating under government management

Key facts	
Where	Punjab, Pakistan
Who	Agriculture Department, Government of Punjab, with the nonprofit Precision Development and telecom partner Telenor
How Much, From Whom	Grant funding from the International Fund for Agricultural Development from November 2020, alongside government resources (Precision Development n.d.)
When and Status	Started in 2018; transferred fully to government management in 2023 (Precision Development 2024)
Where It Is Recorded	Precision Development 2023 Annual Report. Open the official record
Evidence Strength	Reported by Precision Development and IFAD
The project story	
The Challenge	Punjab's millions of small farmers face heatwaves, erratic rain and pest outbreaks, yet the provincial extension service has far too few staff to visit them. Advice on what to plant, when to irrigate and how to respond to a weather warning often reaches farmers late or not at all.
What Was Done	Since 2018, the Agriculture Department has sent farmers recorded voice calls and text messages with advice on crops, livestock, inputs and weather. Precision Development designed and built the service, and a partnership with Telenor carried advice beyond the government platform (Precision Development n.d.).
How It Was Paid For	IFAD provided grant funding from November 2020, and the provincial government paid for the service and took it over completely in 2023 (Precision Development n.d.; Precision Development 2024). Mobile messaging keeps the cost per farmer very low compared with field visits.
What Government Did	The provincial government owns the service, supplies the expert content and now runs it from its own budget.
What Happened	The service reached about 1.5 million farmers in 2023, and a further 200,000 received customised soil health cards (reported; Precision Development 2024). IFAD reports that more than 1.35 million Punjab farmers were reached during its 19 month collaboration (reported; IFAD n.d.).
Who Could Use This Model	Provincial agriculture departments; telecom companies; seed, fertiliser and pesticide companies; insurers and microfinance institutions wanting to reach farmers.
Risks to Watch	Advice that is too general for local conditions; message fatigue; and farmers without phones, many of them women, left out.
Conditions That Made It Work	A government willing to own the service, a technical partner to build it, grant funding for the early years and a telecom operator for distribution.
How to Get Started in South Asia	Agribusinesses and banks can partner with provincial advisory services to add input offers, insurance reminders or loan information, and help fund content in local languages.
Lessons for South Asian Businesses and Institutions	Digital advice can reach more farmers in a year than an extension service reaches in a decade, at a small fraction of the cost. Built with grant money and then absorbed into the public budget, it creates a channel that private firms can use to reach farmers with climate smart products.

3.6 Modernized Climate Information and Early Warning Systems (M-CLIMES)

CF01-A06 | Malawi | Seasonal forecasts and farm advice with community preparedness | Implemented

Key facts	
Where	Malawi
Who	United Nations Development Programme as accredited entity; Department of Disaster Management Affairs and partner agencies
How Much, From Whom	Total cost USD 16.3 million: Green Climate Fund grant of USD 12.3 million, UNDP USD 1.8 million and Government of Malawi USD 2.2 million (IEU 2022)
When and Status	Approved in November 2015 as one of the Green Climate Fund's first projects (Green Climate Fund n.d.a)
Where It Is Recorded	Green Climate Fund FP002. Open the official record
Evidence Strength	Independently evaluated through the Fund's first impact evaluation
The project story	
The Challenge	Most Malawians depend on rain fed farming, and floods and droughts have become more frequent. Farmers had little access to forecasts, and those who heard them often did not know how to turn a seasonal outlook into decisions about which crop to plant, when to sow or how to protect their harvest.
What Was Done	The project expanded weather and river monitoring networks, produced climate and farming advice delivered by mobile phone, radio and print, strengthened community preparedness for floods, and trained farmers in participatory climate services for agriculture, known as PICSA, which helps them plan using forecasts and local knowledge (IEU 2022).
How It Was Paid For	The Green Climate Fund provided most of the money as a grant, with cofinancing from UNDP and the Government of Malawi. Public agencies delivered the services free to farmers.
What Government Did	Government agencies own and run the weather and advisory services, and the disaster management department led implementation.
What Happened	The Fund's evaluation unit found that farmer training had a statistically significant positive effect on lead farmers' ability to adapt, including greater use of seasonal forecasts, changes in crops, and higher yields and incomes (independently evaluated; IEU 2022).
Who Could Use This Model	Extension services; input companies and insurers that need farmers to plan around forecasts; telecom companies; nongovernmental organisations; universities that evaluate results.
Risks to Watch	Services that fade when project funding ends; advice that reaches lead farmers but not their neighbours; and forecasts that are not trusted.
Conditions That Made It Work	Pairing better observations with practical, participatory training, and building in a rigorous evaluation from the start.
How to Get Started in South Asia	Agribusinesses and extension agencies can pilot seasonal forecast based planning with farmer groups in one district, measure the results and use them to secure funding to scale.
Lessons for South Asian Businesses and Institutions	Forecasts change farming only when farmers trust them and know how to act on them. The training approach used in Malawi is simple, low cost and supported by strong evidence, and it could be built into South Asian extension, insurance and input supply programmes.

3.7 Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP)

CF01-A07 | Pakistan | Subsidised drip and sprinkler irrigation with farmer cofinancing | Completed

Key facts	
Where	Punjab, Pakistan
Who	Agriculture Department of the Government of Punjab (On Farm Water Management), with the World Bank
How Much, From Whom	World Bank financing of USD 250 million plus USD 130 million of additional IBRD financing approved in November 2017 (World Bank 2017a); provincial outlay of Rs. 67,459 million, including Rs. 25,721 million from farmers (Government of Punjab n.d.)
When and Status	Implemented from 2012 to 2021; reported complete in 2024 (Government of Punjab n.d.; Dawn 2024)
Where It Is Recorded	World Bank P157736. Open the official record
Evidence Strength	Verified at mid term; reported by the provincial government at completion
The project story	
The Challenge	Punjab's farms depend on canal and groundwater irrigation, yet much water is lost through unlined watercourses, uneven fields and flooding of whole plots. As water becomes scarcer and groundwater falls, the province needs to grow more crop with each drop.
What Was Done	The project aimed to improve the productivity of water use in irrigated agriculture (World Bank n.d.a). It supported drip and sprinkler systems, laser land levelling, watercourse improvements and rainwater harvesting ponds; the revised provincial plan covered 85,000 acres of drip and sprinkler systems, 5,000 laser levelling units and 500 ponds (Government of Punjab n.d.).
How It Was Paid For	The World Bank lent to Pakistan, and the province ran the programme. Farmers installing drip or sprinkler systems received a subsidy, reported at 60 percent, and paid the rest themselves (Dawn 2024). Their contributions make up more than a third of the total outlay (Government of Punjab n.d.).
What Government Did	The provincial government designed and subsidised the programme, registered suppliers and checked installations before paying subsidies.
What Happened	By early 2017, drip irrigation covered about 26,000 acres and 5,000 laser levelling units had been provided (verified; World Bank 2017a). A successor project continues the work with a higher subsidy (CF01-A08).
Who Could Use This Model	Irrigation equipment manufacturers, dealers and installers; banks financing the farmer's share; provincial agriculture departments elsewhere in South Asia.
Risks to Watch	Subsidy budgets that are not sustained; poor installation and after sales service; uptake concentrated among larger farmers; and saved water used to expand irrigated area.
Conditions That Made It Work	A subsidy large enough to overcome farmers' caution, a network of private suppliers, verification of installations, and development bank support across two phases.
How to Get Started in South Asia	Equipment suppliers can register with provincial subsidy programmes and partner with banks so that farmers can borrow their share, while offering maintenance contracts that keep systems working.
Lessons for South Asian Businesses and Institutions	A well designed subsidy can draw large private contributions from farmers and create a lasting market for irrigation equipment. For Pakistani firms and banks, it points to steady demand for efficient irrigation and to an opening for finance that helps farmers meet their share of the cost.

3.8 Punjab Resilient and Inclusive Agriculture Transformation (PRIAT)

CF01-A08 | Pakistan | Successor programme for efficient irrigation and watercourses | Under implementation

Key facts	
Where	Punjab, Pakistan
Who	Government of Punjab with the World Bank
How Much, From Whom	IDA financing of USD 204.44 million (Business Recorder 2026)
When and Status	Approved on 15 July 2022; due to close on 30 June 2027 (Business Recorder 2026)
Where It Is Recorded	World Bank financed project, reported by Business Recorder. Open the official record
Evidence Strength	Reported from World Bank supervision; preliminary survey results
The project story	
The Challenge	Punjab's earlier irrigation programme (CF01-A07) proved that farmers would invest in drip and sprinkler systems, but uptake remained small relative to the province's farmland, and smaller farmers struggled to meet their share of the cost while water scarcity worsened.
What Was Done	PRIAT continues and extends the earlier work, improving watercourses and supporting high efficiency irrigation such as drip and sprinkler systems, alongside wider measures to make Punjab's agriculture more resilient and inclusive (Business Recorder 2026).
How It Was Paid For	The World Bank provides IDA financing to Pakistan for implementation by the province. The subsidy for modern irrigation systems was raised, reported at 75 percent, to make the systems affordable to more farmers (Dawn 2024).
What Government Did	The provincial agriculture department runs the programme, sets subsidy levels and verifies installations through its On Farm Water Management wing.
What Happened	High efficiency irrigation had been installed on more than 8,048 hectares, about half the target, and field surveys showed preliminary water productivity gains of 41 percent for wheat and 71 percent for rice (reported; Business Recorder 2026). The World Bank rated progress satisfactory.
Who Could Use This Model	Irrigation equipment firms and installers; banks and microfinance institutions; farmer organisations; research institutions measuring water productivity.
Risks to Watch	Rising subsidy costs for the province; dependence on continued development finance; and the need to confirm that water savings reduce groundwater pumping.
Conditions That Made It Work	A proven predecessor, a higher subsidy for smaller farmers, and survey based measurement of water productivity.
How to Get Started in South Asia	Suppliers can align products with programme specifications, and banks can design short loans that let farmers pay their share while waiting for subsidy release.
Lessons for South Asian Businesses and Institutions	Second phase programmes can build on proven delivery systems to reach more farmers, but higher subsidies raise questions about long term affordability. Measuring water productivity, as PRIAT does, gives governments and financiers the evidence they need to decide whether to continue.

PART TWO

Mitigation



1 Vietnam Sustainable Agriculture Transformation Project (VnSAT)

2 ABC low carbon agriculture credit (Programa ABC)

3 PM-KUSUM solar pumps for farmers (Component B)

CHAPTER 4

Mitigation

The three mitigation profiles cut emissions from farming in different ways. Viet Nam's VnSAT linked lower emission rice practices to agribusiness buyers in the Mekong Delta. Brazil's ABC programme used subsidised bank credit to finance pasture recovery, no till farming and crop livestock integration, and its record shows why monitoring matters. India's PM-KUSUM replaces diesel pumps with subsidised standalone solar pumps, with costs shared between central government, states and farmers.

4.1 Vietnam Sustainable Agriculture Transformation Project (VnSAT)

CF01-M01 | Viet Nam | Lower emission rice farming linked to agribusiness | Completed

Key facts	
Where	Eight rice provinces of the Mekong Delta and five coffee provinces of the Central Highlands, Viet Nam (World Bank 2015)
Who	Ministry of Agriculture and Rural Development of Viet Nam, provincial authorities and the World Bank
How Much, From Whom	IDA credit of USD 238 million approved on 30 June 2015 (World Bank 2015)
When and Status	Implemented from 2015; rice pilots reported in 2022 (World Bank 2022a)
Where It Is Recorded	World Bank P145055. Open the official record
Evidence Strength	Expected beneficiaries set at approval; results reported by the World Bank as estimates
The project story	
The Challenge	Viet Nam is one of the world's largest rice exporters, but much of its rice was grown with heavy use of seed, fertiliser, pesticide and water. Flooded paddies release methane, a powerful greenhouse gas, and high input costs squeezed farm incomes. Government reviews found that a focus on volume had led to unsustainable practices and low value exports (World Bank 2015).
What Was Done	The project supported rice farmers in the Mekong Delta and coffee farmers in the Central Highlands to adopt better farm practices, improved infrastructure for producing and processing quality rice, and linked farmers to agribusinesses (World Bank 2015). Rice pilots promoted better water management and lower use of seed, fertiliser and pesticide (World Bank 2022a).
How It Was Paid For	The World Bank lent on concessional IDA terms to Viet Nam, and provincial governments implemented the project with farmer cooperatives and agribusiness partners. Farmers adopted practices that lowered their own costs, so the change paid for itself on the farm.
What Government Did	The national ministry and provincial authorities led implementation and used the project to support a wider reform of the rice and coffee sectors.
What Happened	Up to 200,000 rice households and 50,000 coffee households were expected to benefit (expected; World Bank 2015). Pilots covered more than 184,000 hectares of rice, with estimated input cost reductions of 20 to 30 percent, greenhouse gas cuts of up to 30 percent and net profit gains of around 25 percent (reported; World Bank 2022a).
Who Could Use This Model	Rice millers and exporters seeking low carbon supply; farmer cooperatives; fertiliser and seed companies; agricultural lenders; buyers of agricultural carbon credits.
Risks to Watch	Estimated rather than measured emission cuts; practices abandoned when support ends; and water management that depends on canal control beyond a single farm.
Conditions That Made It Work	Practices that cut costs as well as emissions, cooperatives to organise farmers, and agribusinesses willing to buy quality rice at a better price.
How to Get Started in South Asia	Rice millers and exporters in Pakistan, India and Bangladesh can pilot low input, water saving rice with contract farmers, measure costs and emissions, and test whether buyers will pay for low carbon rice.
Lessons for South Asian Businesses and Institutions	Lower emission rice can be a business proposition when it cuts farmers' costs. For South Asia's rice belts, the project suggests that improved water and input management, organised through cooperatives and buyers, can reduce methane while raising profits.

4.2 ABC low carbon agriculture credit (Programa ABC)

CF01-M02 | Brazil | Subsidised bank credit for low emission farming | Operating since the 2010 and 2011 crop year

Key facts	
Where	Brazil
Who	Government of Brazil, with Banco do Brasil as the main lending channel and the national development bank BNDES as the second (GVces n.d.)
How Much, From Whom	BRL 4.5 billion made available and BRL 3.027 billion contracted in the 2013 and 2014 crop year through 12,103 contracts; BRL 8.12 billion contracted from the programme's start to 2014 (GVces n.d.)
When and Status	First credit offered in the 2010 and 2011 crop year; continues under the ABC+ plan (GVces n.d.; Oliveira, Souza and Assunção 2024)
Where It Is Recorded	Brazilian rural credit system; Observatório ABC reports. Open the official record
Evidence Strength	Independently evaluated for pasture recovery (Oliveira, Souza and Assunção 2024)
The project story	
The Challenge	Low carbon agriculture is one of nine sectoral plans under Brazil's emissions commitment, and more than 50 million hectares of degraded pasture needed recovery (GVces n.d.). Farmers needed long term, affordable credit to restore pastures, adopt no till farming and combine crops, livestock and trees, but such investments take years to pay back.
What Was Done	The ABC programme offers rural credit for low carbon farming practices, including restoring degraded pasture, as one of Brazil's sectoral plans to reduce emissions (GVces n.d.). The pasture recovery line became the main instrument of the updated ABC+ plan (Oliveira, Souza and Assunção 2024).
How It Was Paid For	Public banks lend to farmers at below market rates over long periods. In 2013 and 2014, rates were 4.5 to 5 percent a year with up to 15 years to repay, depending on farm income (GVces n.d.). The government covers the cost of the interest subsidy.
What Government Did	Government designs the plan, funds the interest subsidy and sets eligibility rules, while public banks assess borrowers and disburse loans.
What Happened	Lending grew from BRL 418.5 million in the first year to BRL 3.027 billion in 2013 and 2014 (GVces n.d.). An independent study of pasture recovery loans in the Cerrado found very small effects: nearly three quarters of financed areas were unchanged four years later, and the credit contributed at most 2.5 percent of the 2020 recovery target (independently evaluated; Oliveira, Souza and Assunção 2024).
Who Could Use This Model	Central banks and agricultural development banks; commercial banks with farm portfolios; ministries designing green credit schemes.
Risks to Watch	Credit used for ordinary farm expansion rather than its climate purpose; weak monitoring of results on the ground; and costly subsidies.
Conditions That Made It Work	A large public rural credit system, a national emissions plan and long repayment periods matched to slow paying investments.
How to Get Started in South Asia	Central banks and agricultural lenders in South Asia designing green refinance windows can build in satellite monitoring of financed land and tie disbursement to verified practices from the start.
Lessons for South Asian Businesses and Institutions	Cheap credit alone does not guarantee climate results. Brazil's experience shows the value of independent evaluation, and the need to monitor what financed farms actually do. South Asian green credit schemes can learn from both its scale and its weaknesses.

4.3 PM-KUSUM solar pumps for farmers (Component B)

CF01-M03 | India | Subsidised standalone solar pumps replacing diesel | Operating since 2019

Key facts	
Where	States across India
Who	Ministry of New and Renewable Energy, state agencies, farmers and private pump suppliers
How Much, From Whom	Central government pays 30 percent of the benchmark cost and states at least 30 percent, with farmers paying the balance (Lok Sabha 2024)
When and Status	Launched in 2019; operating (PIB 2020)
Where It Is Recorded	Government of India, Lok Sabha Unstarred Question No. 346, 2024. Open the official record
Evidence Strength	Reported by government
The project story	
The Challenge	Millions of Indian farmers irrigate with diesel pumps that are costly to run and emit carbon, or with grid power that is unreliable in rural areas. Farmers without a grid connection depend on diesel prices, and their irrigation costs rise whenever fuel prices climb.
What Was Done	Component B of the scheme helps individual farmers replace diesel pumps with standalone solar pumps of up to 7.5 horsepower, with priority for small and marginal farmers (PIB 2020; Lok Sabha 2024). The national target for standalone pumps was 1.4 million (Renewable Watch 2024).
How It Was Paid For	The scheme splits the cost: the central government pays 30 percent of the benchmark price, states pay at least 30 percent, and farmers pay the rest, often with bank loans (Lok Sabha 2024). Private suppliers win tenders to supply and install pumps.
What Government Did	Central and state governments set prices through tenders, pay subsidies and select beneficiaries. Uptake depends heavily on how actively each state promotes the scheme.
What Happened	About 840,000 standalone pumps had been installed by June 2025 out of more than 1.33 million sanctioned; Maharashtra alone accounted for 419,000 (reported; Energetica India 2025).
Who Could Use This Model	Solar pump manufacturers and installers; banks and microfinance institutions lending for the farmer's share; state energy and agriculture departments.
Risks to Watch	Uneven progress between states; free daytime power encouraging over pumping of groundwater; and maintenance of pumps in remote areas.
Conditions That Made It Work	A clear cost sharing formula, competitive tendering to lower prices and strong promotion in leading states.
How to Get Started in South Asia	Pump suppliers and banks in Pakistan and Bangladesh can offer packaged solar pumps with loans for the farmer's share, and engage provincial governments on cost sharing schemes.
Lessons for South Asian Businesses and Institutions	Shared subsidies can move hundreds of thousands of farmers from diesel to solar within a few years, cutting emissions and running costs at the same time. Pairing such schemes with groundwater rules matters, so that cheaper pumping does not drain aquifers.

PART THREE

Cross Cutting Action



1 IDCOL Solar Irrigation Programme

2 SunCulture

3 Ecozen

4 ColdHubs

5 Sahyadri Farms

CHAPTER 5

Cross Cutting Action

The five cross cutting profiles both cut emissions and protect farm incomes, and four of them are private businesses. IDCOL in Bangladesh finances solar irrigation pumps whose owners sell water to neighbouring farmers. SunCulture in Kenya sells solar irrigation on instalments, Ecozen in India sells solar cold rooms and pump controllers, and ColdHubs in Nigeria rents solar cold storage by the crate. Sahyadri Farms in Maharashtra shows how a farmer owned company can attract investors to pay for storage, processing and export capacity.

5.1 IDCOL Solar Irrigation Programme

CF01-C01 | Bangladesh | Solar irrigation sold to farmers as a service | Under implementation

Key facts	
Where	Bangladesh, with large numbers of pumps in Rangpur and Rajshahi divisions
Who	Infrastructure Development Company Limited (IDCOL), a state owned financial institution; private companies and nongovernmental organisations as sponsors
How Much, From Whom	For each project: 50 percent grant from development partners, 35 percent concessional loan from IDCOL and 15 percent sponsor equity (CDKN 2019)
When and Status	1,523 pumps with 42.1 megawatts installed by mid 2022; continuing (IWMI 2022a)
Where It Is Recorded	IDCOL Solar Irrigation Program. Open the official record
Evidence Strength	Reported by IDCOL; independent survey by the International Water Management Institute
The project story	
The Challenge	Bangladesh had about 1.24 million diesel irrigation pumps in 2019 (IWMI 2022a). Diesel irrigation is costly, labour intensive and polluting, and fuel price spikes hit farmers exactly when dry season rice needs water most.
What Was Done	Under a fee for service model, a private company or nongovernmental organisation installs, runs and maintains a solar pump, and farmers buy water from the operator for a fee based on the area irrigated (IDCOL n.d.; IWMI 2022a). IDCOL is also exploring a model in which farmers own pumps (IDCOL n.d.).
How It Was Paid For	Each project combines a development partner grant, a concessional IDCOL loan and the sponsor's own equity (CDKN 2019). The grant keeps fees below diesel costs, the loan rewards good operation, and the sponsor's equity puts its own money at risk. Fees cover operation, maintenance and repayment.
What Government Did	IDCOL is state owned, and government support for renewable energy made the programme possible.
What Happened	By mid 2022, IDCOL pumps made up about 56 percent of Bangladesh's solar irrigation pumps and 84 percent of capacity (reported; IWMI 2022a). Farmers buying water from IDCOL pumps spent about 1.3 hours a day irrigating, against 2.6 hours with their own diesel pumps (independently surveyed; IWMI 2022b).
Who Could Use This Model	Energy companies and nongovernmental organisations with rural networks; banks and refinance schemes; national development lenders able to pool grants and concessional loans.
Risks to Watch	Grant dependence; low pump use outside the main season; competition from subsidised grid power; and the need to manage groundwater.
Conditions That Made It Work	A national lender pooling grants and loans, sponsors with rural networks, fees below diesel costs and inspection before grants are paid.
How to Get Started in South Asia	Survey diesel pump use in a district, set a fee per hectare below diesel costs, and seek grant and concessional layers from a national lender or refinance scheme.
Lessons for South Asian Businesses and Institutions	The model turns an expensive asset into an affordable service while cutting diesel use, so it serves both adaptation and mitigation. Connecting pumps to the grid to sell surplus power could improve returns (IWMI 2022a), making it a template wherever diesel pumping is widespread.

5.2 SunCulture

CF01-C02 | Kenya and other African countries | Solar irrigation sold to farmers on instalments | Operating

Key facts	
Where	Kenya, with sales in Ethiopia, Uganda, Zambia, Senegal, Togo and Côte d'Ivoire as of 2020 (SUN-CONNECT 2020)
Who	SunCulture, a Kenyan solar irrigation company
How Much, From Whom	USD 14 million in shares in 2020 from Energy Access Ventures, EDF, Acumen Capital Partners and Dream Project Incubators (SUN-CONNECT 2020); USD 12 million from InfraCo Africa in 2024 (Afrik21 2024); a USD 10 million securitisation with the Mirova Gigaton Fund in 2026 (Africa Sustainability Matters 2026)
When and Status	Operating; latest financing in 2026
Where It Is Recorded	Investor announcements. Open the official record
Evidence Strength	Reported by the company and investors
The project story	
The Challenge	Most African smallholders farm without irrigation and depend on unreliable rain. Solar pumps could let them grow in dry months, but few can pay the full price upfront, and banks rarely lend for farm equipment to small farmers.
What Was Done	SunCulture sells solar powered pumps and irrigation kits to smallholders under a pay as you grow plan, letting farmers pay in instalments from the extra income they earn (SUN-CONNECT 2020).
How It Was Paid For	Equity investors funded the company's growth. In 2026, a special purpose company financed by the Mirova Gigaton Fund bought the repayments owed by SunCulture's Kenyan customers, turning thousands of small instalment contracts into an investable asset and freeing cash for new sales (Africa Sustainability Matters 2026).
What Government Did	Government's role is indirect, through rules on consumer lending, mobile money and import duties on solar equipment.
What Happened	The company reports more than 85,000 systems and pumps sold (reported; Africa Sustainability Matters 2026).
Who Could Use This Model	Solar equipment companies; microfinance institutions and banks; asset finance and leasing firms; investors seeking pools of small loans.
Risks to Watch	Customer defaults after droughts or price falls; currency risk on foreign funding; and repossession of equipment that harms trust.
Conditions That Made It Work	Mobile payments that make small instalments easy, equipment that raises incomes quickly, and investors willing to buy pools of receivables.
How to Get Started in South Asia	Solar pump distributors in South Asia can partner with microfinance banks to offer instalment plans, collect repayment data, and later approach investors to refinance their loan books.
Lessons for South Asian Businesses and Institutions	Paying in instalments puts solar irrigation within reach of small farmers, and securitisation can recycle the money at scale. The model combines adaptation, through dry season farming, with mitigation where solar replaces diesel.

5.3 Ecozen

CF01-C03 | India | Solar powered cold rooms and pump controllers for farmers | Operating

Key facts	
Where	India, headquartered in Pune
Who	Ecozen, a company founded in 2010 (Triodos Investment Management 2019)
How Much, From Whom	USD 6 million in shares in 2019 from Caspian, the Hivos-Triodos Fund, the Innovation in Food and Agriculture Fund and Omnivore (AgFunderNews 2019); a USD 25 million round of shares and debt led by Nuveen and Dare Ventures, with the Export-Import Bank of India (pv magazine India n.d.); more than USD 23 million of debt in 2025 (Entrepreneur India 2025)
When and Status	Operating
Where It Is Recorded	Investor announcements. Open the official record
Evidence Strength	Reported by the company
The project story	
The Challenge	Indian farmers lose part of their fruit and vegetables after harvest because they have no cold storage near the farm. Heat makes losses worse, and grid power is unreliable in many villages, so conventional cold rooms are hard to run.
What Was Done	Ecozen makes Ecofrost, a solar powered cold room with thermal storage that lets farmers cool produce on the farm right after harvest, and Ecotron, a controller for solar irrigation pumps. Farmers can buy or lease cold rooms, and a digital marketplace links them to buyers (Triodos Investment Management 2019; AgFunderNews 2019).
How It Was Paid For	Impact and venture investors bought shares in the company, and later rounds added debt from investors and India's export credit bank (pv magazine India n.d.). In 2025 the company raised more than USD 23 million in debt to scale up (Entrepreneur India 2025).
What Government Did	Government support for solar pumps and farm infrastructure creates demand for Ecozen's products, and an export credit bank invested.
What Happened	The company reports that its products benefit over a million farmers in India (reported; Entrepreneur India 2025).
Who Could Use This Model	Farmer producer companies and cooperatives; fruit and vegetable traders and exporters; banks financing farm equipment; solar companies.
Risks to Watch	Utilisation of cold rooms outside harvest seasons; lease repayment risk; and competition from cheaper but less efficient storage.
Conditions That Made It Work	Technology designed for off grid conditions, leasing that removes the upfront cost and a marketplace that helps farmers sell stored produce at better prices.
How to Get Started in South Asia	Farmer groups in Pakistan and Bangladesh can pilot shared solar cold rooms on lease, track losses avoided and prices received, and use the results to seek bank or development finance.
Lessons for South Asian Businesses and Institutions	Cold storage cuts food loss, raises farm income and reduces the diesel or grid power used for cooling, so it serves both adaptation and mitigation. Leasing makes it practical for small farmers.

5.4 ColdHubs

CF01-C04 | Nigeria | Solar cold rooms paid for by the crate | Operating

Key facts	
Where	Nigeria, at farm clusters, collection centres and markets
Who	ColdHubs, a company founded in 2015 from a partnership between the Smallholders Foundation, the refrigeration institute ILK Dresden and GIZ (Belfer Center n.d.)
How Much, From Whom	Design and prototype funded with catalytic support from GIZ (Belfer Center n.d.); expansion supported by Feed the Future Partnering for Innovation, funded by USAID (Agrilinks n.d.)
When and Status	Operating since 2015
Where It Is Recorded	Water and Energy for Food partner factsheet. Open the official record
Evidence Strength	Reported by the company
The project story	
The Challenge	In Nigeria's heat, fresh produce can spoil within a couple of days of harvest. Small farmers and market traders lose income and food, and the absence of reliable electricity rules out conventional cold storage in most markets.
What Was Done	ColdHubs installs and runs fully solar powered walk in cold rooms. Users pay a flat daily fee for each crate they store, which extends the freshness of produce from about two days to about 21 days (WE4F 2023; Belfer Center n.d.). A partnership with Feed the Future added 20 rooms at 10 sites and trained more than 3,000 farmers and vendors in post harvest handling (Agrilinks n.d.).
How It Was Paid For	Grant funding from GIZ paid for research and the prototype, and a United States government programme supported expansion. Users' daily fees cover operating costs, so no upfront payment is needed.
What Government Did	No direct government financing is reported; market authorities control the sites where cold rooms can be placed.
What Happened	In 2021 the company reported serving 6,317 farmers, retailers and wholesalers through 54 cold rooms at 38 locations, saving about 52,700 tonnes of produce from spoilage (reported; WE4F 2023).
Who Could Use This Model	Market committees; traders' associations; agribusinesses; solar and refrigeration firms; donors supporting food loss reduction.
Risks to Watch	Low occupancy outside peak seasons; theft or damage in open markets; and dependence on grants for expansion.
Conditions That Made It Work	A simple pay per crate fee, location at markets where losses are high, and early grant funding for design.
How to Get Started in South Asia	Market committees and agribusinesses in South Asia can pilot a solar cold room at a busy wholesale market, charge per crate, and track occupancy and losses avoided.
Lessons for South Asian Businesses and Institutions	Charging per crate makes cold storage available to the smallest traders. The model reduces food loss in a hotter climate without burning fuel, and it suits South Asia's crowded fruit and vegetable markets.

5.5 Sahyadri Farms

CF01-C05 | India | Farmer owned company that stores, processes and exports produce | Operating

Key facts	
Where	Nashik, Maharashtra, India
Who	Sahyadri Farmers Producer Company, founded in 2011, and its majority owned subsidiary Sahyadri Farms Post Harvest Care Limited (FMO n.d.a; FMO n.d.b)
How Much, From Whom	Rs. 310 crore (almost EUR 35 million) in 2022 from Proparco, Incofin, FMO and Korys; Rs. 390 crore (about EUR 40 million) in 2024 (Proparco n.d.b), led by responsAbility and GEF Capital (responsAbility 2025)
When and Status	Investments made in 2022 and 2024
Where It Is Recorded	Proparco project PIN1115; FMO projects 56347 and 61128. Open the official record
Evidence Strength	Reported by the company and its investors
The project story	
The Challenge	Grape, fruit and vegetable growers around Nashik face rising temperatures and erratic rain, and small farmers on their own lack the cold storage, processing and export links needed to earn more from their crops.
What Was Done	Sahyadri buys, processes and markets fruit and vegetables for export and domestic markets. Its post harvest company sources from more than 15,000 mostly small and medium farmers (FMO n.d.b), who can use a digital platform with information on varieties, inputs, real time climate conditions and markets (Proparco n.d.c).
How It Was Paid For	Development finance institutions and impact investors bought shares in the company. Proparco states that its investment supports adaptation and mitigation measures, including raising renewable energy above half of production energy and a zero waste policy (Proparco n.d.c). A grant from the Luxembourg agency ADA supports a climate resilience plan for up to 22,000 farmers (expected; ADA n.d.).
What Government Did	India's farmer producer company law allows farmers to own the business; export and food safety rules shape its operations.
What Happened	The company reports that it works with more than 25,000 smallholder farmers (reported; responsAbility 2025). Results of the climate resilience plan are not yet available.
Who Could Use This Model	Farmer producer companies and cooperatives; agribusiness exporters; development finance institutions and impact investors.
Risks to Watch	Export market and price swings; dependence on a few crops; governance strains when farmer owned companies take outside investors; and climate shocks across a concentrated sourcing area.
Conditions That Made It Work	Farmer ownership that built trust, control of cold storage, processing and export, and professional management that met investor standards.
How to Get Started in South Asia	Farmer groups can consolidate supply, invest in shared storage and grading, and prepare audited accounts and an environmental and social plan before approaching impact investors.
Lessons for South Asian Businesses and Institutions	A farmer owned business can attract large private investment when it controls the stages where value is added, and then finance climate measures for thousands of small farmers through its own balance sheet.

PART FOUR

Enabling and Financing



1. Acumen Resilient Agriculture Fund (ARAF)
2. Apollo Agriculture
3. AGRI3 Fund
4. Global Index Insurance Facility (GIIF)
5. Crop Loan Insurance Scheme (CLIS)
6. Kilimo Salama, now ACRE Africa
7. Pradhan Mantri Fasal Bima Yojana (PMFBY)
8. R4 Rural Resilience Initiative
9. Kenya Livestock Insurance Program (KLIP)
10. De-risking, Inclusion and Value Enhancement of Pastoral Economies (DRIVE)

CHAPTER 6

Enabling and Financing

The ten enabling and financing profiles build the money and insurance that farm investment depends on. Three are investment vehicles: Acumen's resilient agriculture fund, Apollo Agriculture's bundle of inputs, credit and insurance in Kenya, and the AGRI3 Fund, which guarantees bank loans for sustainable farming. The other seven are insurance schemes, from the World Bank Group's Global Index Insurance Facility to Pakistan's Crop Loan Insurance Scheme, Kenya's Kilimo Salama, India's PMFBY, WFP's R4 initiative, the Kenya Livestock Insurance Program and the DRIVE project for herders in the Horn of Africa. Six of them carry the Loss and Damage tag because their payouts help people recover after climate shocks.

6.1 Acumen Resilient Agriculture Fund (ARAF)

CF01-E01 | East and West Africa | Equity fund for agribusinesses serving small farmers | Under implementation

Key facts	
Where	East and West Africa, including Ghana, Kenya, Nigeria and Uganda (Green Climate Fund n.d.b)
Who	Acumen Fund, Inc., which manages the fund
How Much, From Whom	Green Climate Fund: USD 23 million equity and USD 3 million grant; other investors USD 25 million equity; Acumen USD 2 million; further grants USD 3 million; total USD 56 million (Green Climate Fund n.d.b)
When and Status	Approved 1 March 2018; estimated completion September 2030; 93 percent of Fund financing disbursed (Green Climate Fund n.d.b)
Where It Is Recorded	Green Climate Fund FP078. Open the official record
Evidence Strength	Reported; independent interim evaluation commissioned in 2025 (Acumen 2025)
The project story	
The Challenge	Smallholders in East and West Africa depend on rain fed farming and are highly exposed to drought and shifting rainfall. The businesses that could help them adapt, by buying their crops, supplying better inputs, offering digital services or extending credit, are often too young and risky for conventional investors.
What Was Done	ARAF buys shares in early growth agribusinesses whose products and services make smallholders more resilient. Proparco describes it as a USD 58 million fund making investments of USD 1 million to 5 million (Proparco n.d.a). By 2025 it had invested USD 38.4 million in 14 companies in five countries (Acumen 2025).
How It Was Paid For	The Green Climate Fund was the anchor investor, buying shares alongside private and development finance investors and funding technical support for the companies. Acumen invested its own money too. Public climate money took part of the early risk and drew private capital into an underserved market.
What Government Did	No government borrowing is involved; governments shape the fund's prospects through rules on digital finance, input markets and land.
What Happened	An independent interim evaluation was commissioned in 2025 (Acumen 2025). A successor fund of USD 120 million, ARAF II, has been approved with USD 34 million from the Green Climate Fund (Green Climate Fund n.d.c), a sign the model was judged worth scaling.
Who Could Use This Model	Impact investors and fund managers; development finance institutions able to anchor funds; agribusinesses offering storage, aggregation, advice or input finance.
Risks to Watch	A thin pipeline of investable companies; long holding periods; currency risk; and difficulty measuring resilience benefits for farmers.
Conditions That Made It Work	A patient anchor investor willing to take early losses, a manager with strong networks among founders, and grant funded support for companies.
How to Get Started in South Asia	South Asian impact investors can map agribusinesses already serving small farmers, then approach climate funds and development finance institutions about anchoring a dedicated fund with a technical assistance window.
Lessons for South Asian Businesses and Institutions	Adaptation becomes investable when it is framed around businesses that sell useful products to farmers. A dedicated fund, a public anchor investor and technical support together can bring private equity into farm resilience.

6.2 Apollo Agriculture

CF01-E02 | Kenya | Seed, fertiliser and insurance sold to farmers on credit | Operating

Key facts	
Where	Kenya
Who	Apollo Agriculture, a company founded in 2016
How Much, From Whom	USD 6 million in shares in 2020, led by Anthemis Exponential Ventures (TechCrunch 2020); USD 40 million in shares in 2022, led by SoftBank Vision Fund 2 with CDC Group (TechCrunch 2022); a USD 9.5 million, ten year loan from the US International Development Finance Corporation for lending to farmers (Business Daily 2022)
When and Status	Operating since 2017
Where It Is Recorded	Investor announcements and US International Development Finance Corporation approval. Open the official record
Evidence Strength	Reported by the company
The project story	
The Challenge	Kenya's smallholders often cannot afford good seed and fertiliser at planting time, have no insurance against a failed season and are rarely served by banks. Without inputs, yields stay low; without insurance, one drought can wipe out a family's savings.
What Was Done	Apollo sells farmers a package of inputs, credit tied to the crop cycle, crop insurance and advice by phone, and farmers repay after harvest. It uses mobile money, machine learning and satellite data to decide whom to lend to and how much (Business Daily 2022). Insurance is bundled with every credit it sells (TechCrunch 2022).
How It Was Paid For	Equity from venture and impact investors pays for growth and technology, while long term development finance funds the credit extended to farmers. Partner insurers protect both farmers and Apollo's loan book against climate shocks.
What Government Did	A United States government agency provided long term debt; Kenya's mobile money and digital lending rules shape the business.
What Happened	The company reported serving more than 100,000 farmers since it began, with 70,000 paying relationships in 2021 (reported; Business Daily 2022).
Who Could Use This Model	Input companies; microfinance institutions and digital lenders; insurers; mobile money providers; agricultural technology investors.
Risks to Watch	Defaults after droughts or poor harvests; reliance on investor funding for growth; and consumer protection concerns in digital lending.
Conditions That Made It Work	Cheap mobile repayments, data that improved lending decisions, insurers willing to cover crop loss, and investors funding technology while lenders funded loans.
How to Get Started in South Asia	Input companies and microfinance institutions can pilot a bundle of seed, fertiliser, insurance and advice for one crop in one district, measure repayment over two seasons, then seek a development lender's credit line.
Lessons for South Asian Businesses and Institutions	Bundling credit, inputs and insurance turns a risky small farmer into a bankable customer. In South Asia, partnerships in which each firm supplies one part of the bundle could reach millions of farmers.

6.3 AGRI3 Fund

CF01-E03 | Global, including Latin America, Africa and Asia | Guarantees that let banks lend longer for sustainable farming | Under implementation

Key facts	
Where	Developing countries in Latin America, Africa and Asia
Who	UNEP and Rabobank as founders, with FMO and the Sustainable Trade Initiative (IDH) as partners (UNEP 2020)
How Much, From Whom	Initial capital of USD 80 million: USD 40 million each from the Government of the Netherlands and Rabobank (UNEP 2020)
When and Status	Partnership formed in 2017; fund launched in January 2020 (UNEP 2020)
Where It Is Recorded	UNEP case study, 2020. Open the official record
Evidence Strength	Reported by fund partners
The project story	
The Challenge	Farmers and agribusinesses that switch to sustainable, deforestation free and climate resilient production need loans with long terms and grace periods, because the benefits take years to arrive. Banks usually see such loans as too risky and offer short terms instead.
What Was Done	AGRI3 gives partner banks partial loan guarantees and tenor extensions so they can make long term loans they would otherwise refuse, while IDH manages a technical assistance facility that helps borrowers prepare and adopt better practices (Green Finance Institute n.d.).
How It Was Paid For	The Dutch government and Rabobank each put in USD 40 million as anchor investors (UNEP 2020). The fund earns fees on its guarantees and uses its capital to absorb part of the risk, so that commercial bank lending, many times larger, can follow.
What Government Did	A donor government co invested as anchor. Borrowing governments' land and forest rules define what counts as deforestation free production.
What Happened	In one transaction, an AGRI3 tenor extension guarantee allowed Rabobank Brazil to provide a USD 13 million, ten year loan facility to a soybean, maize and vegetable farmer in Goiás (reported; Green Finance Institute n.d.).
Who Could Use This Model	Commercial and agricultural banks; agribusinesses; development finance institutions; donor governments wanting to leverage private lending.
Risks to Watch	Guarantees that subsidise loans banks would make anyway; weak verification of deforestation free claims; and slow deal flow.
Conditions That Made It Work	A large commercial bank as partner, public anchor capital, and technical assistance to prepare borrowers.
How to Get Started in South Asia	South Asian banks with agribusiness portfolios can identify sustainable farming loans held back by short tenors and approach guarantee funds or development finance institutions for risk sharing.
Lessons for South Asian Businesses and Institutions	A modest guarantee can unlock long term private lending for sustainable agriculture. For South Asian banks, risk sharing may matter more than cheaper money.

6.4 Global Index Insurance Facility (GIIF)

CF01-E04 | Africa, Asia, Latin America and the Caribbean | Building markets for index insurance with private insurers | Operating since 2009

Key facts	
Where	Developing countries in Africa, Asia, Latin America and the Caribbean
Who	World Bank Group (IFC and World Bank); now the Global Inclusive Insurance Facility
How Much, From Whom	Multi donor trust fund financed by the European Union, Germany, Japan and the Netherlands (Government of the Netherlands 2024)
When and Status	Operating since 2009
Where It Is Recorded	World Bank Group programme assessment 2016 to 2022. Open the official record
Evidence Strength	Reported in a programme assessment
The project story	
The Challenge	Smallholders and small firms rarely have insurance against drought, flood or storm. One bad season can force them to sell assets or default, so lenders avoid them. Traditional insurance, which sends assessors to each farm, is too costly for small policies.
What Was Done	GIIF develops markets for index insurance, which pays out when a measured indicator such as rainfall or area yield crosses a threshold, without assessing each farm. It funds product design, training for insurers and regulators, and partnerships with banks, input suppliers and farmer groups that sell cover.
How It Was Paid For	Donor grants pay for technical assistance and, in some cases, part of the cost of launching products. Private insurers underwrite the risk and reinsurers carry the largest exposures, so the insurance is commercial while market building is publicly funded.
What Government Did	Regulators are central partners, because index insurance needs rules that recognise payouts based on an index rather than individual loss.
What Happened	Between 2016 and 2022, regional partners facilitated more than 4 million contracts with about USD 2.5 billion insured, reaching about 70 million people; 120 new index or hybrid products were developed against a target of 55 (reported; Government of the Netherlands 2024). In East Africa, GIIF support helped One Acre Fund issue 4.3 million policies in 2023 to 2025 (reported; Global Inclusive Insurance Forum n.d.).
Who Could Use This Model	Insurers and reinsurers; banks, input suppliers and farmer organisations that can distribute cover; regulators; research institutions designing indices.
Risks to Watch	Basis risk, when the index misses a farmer's real loss; lost trust after a missed payout; and dependence on subsidies.
Conditions That Made It Work	Donor funded product design and data, low cost distribution partners and willing regulators.
How to Get Started in South Asia	South Asian insurers can partner with banks or seed companies to bundle index cover with loans or seed, using public weather data, and seek development finance support for product design.
Lessons for South Asian Businesses and Institutions	Public money spent on market building can bring private insurers into farm markets they would not otherwise serve, especially when cover is bundled with something farmers already buy.

6.5 Crop Loan Insurance Scheme (CLIS)

CF01-E05 | Pakistan | Crop insurance attached to farm loans | Operating since 2008

Key facts	
Where	Pakistan
Who	State Bank of Pakistan; commercial and microfinance banks; insurance companies; Government of Pakistan
How Much, From Whom	Premium of up to 2 percent per crop per season, paid by the federal government for farmers with up to 25 acres (State Bank of Pakistan n.d.a)
When and Status	Introduced in 2008; extended to all crops in 2014; revised in 2026 (State Bank of Pakistan 2008; State Bank of Pakistan n.d.a; State Bank of Pakistan 2026)
Where It Is Recorded	State Bank of Pakistan scheme documents. Open the official record
Evidence Strength	Scheme terms published; outcomes not independently evaluated
The project story	
The Challenge	Floods, droughts and other calamities can wipe out crops financed with bank loans, leaving farmers unable to repay and banks reluctant to lend again. Small farmers are least able to absorb such losses.
What Was Done	The scheme insures agricultural production loans against calamities. It was first made compulsory for loans for wheat, cotton, rice, sugarcane and maize (State Bank of Pakistan n.d.b) and later extended to all crops. Claims are paid to the lending bank and credited to the borrower's loan account (State Bank of Pakistan n.d.a).
How It Was Paid For	Banks collect premiums on behalf of insurers when they lend, and the federal government reimburses premiums for small and medium farmers. Claims are triggered when an area is declared calamity affected and damage results from an insured peril (State Bank of Pakistan n.d.a). The 2026 terms add technology based loss assessment, funded by a fee of 0.40 percent of the sum insured, and require claims to reach borrowers within five working days (State Bank of Pakistan 2026).
What Government Did	The central bank sets rules, the federal government pays premiums for smaller farmers, and provincial authorities declare calamities.
What Happened	The scheme has run for more than 15 years and was revised in 2026 to link triggers to measured yield losses at tehsil level and speed up claims (State Bank of Pakistan 2026). No independent evaluation of outcomes has been published.
Who Could Use This Model	Commercial and microfinance banks; insurers; technology firms offering satellite loss assessment; provincial governments.
Risks to Watch	Slow calamity declarations; premiums dependent on public budgets; and borrowers unaware their loans are insured.
Conditions That Made It Work	A compulsory link between loans and insurance, public premium support and central bank rules that all lenders follow.
How to Get Started in South Asia	Banks and insurers can invest in technology based loss assessment allowed under the 2026 terms and develop voluntary cover for farmers outside the scheme.
Lessons for South Asian Businesses and Institutions	Insurance reaches farmers automatically when it is built into lending. Pakistan's reforms show how such schemes can be modernised with satellite data and faster claims.

6.6 Kilimo Salama, now ACRE Africa

CF01-E06 | Kenya and East Africa | Micro insurance linked to seed and paid by phone | Operating

Key facts	
Where	Kenya, later East Africa
Who	Syngenta Foundation for Sustainable Agriculture, insurers and mobile network partners; now continued by ACRE Africa (UN Women n.d.)
How Much, From Whom	Developed with support from the Global Index Insurance Facility (IFC 2013)
When and Status	Began in 2009 (IFC 2013)
Where It Is Recorded	IFC press release, 22 April 2013. Open the official record
Evidence Strength	Reported by IFC
The project story	
The Challenge	Kenyan smallholders who buy certified seed risk losing their whole investment if the rains fail. Conventional crop insurance was unavailable to them, because policies were too small and too costly to administer through farm visits.
What Was Done	Kilimo Salama let farmers insure as little as a bag of seed. Cover was linked to seed purchases and handled by mobile phone, and payouts were based on weather data rather than farm inspections. IFC describes it as the first agricultural insurance programme to reach smallholders using mobile technology (IFC 2013).
How It Was Paid For	The Syngenta Foundation developed the scheme with support from the Global Index Insurance Facility, and private insurers underwrote the risk. Farmers paid small premiums, kept low by using weather data instead of farm visits and by mobile payments.
What Government Did	Insurance regulators had to accept weather based payouts and mobile distribution; no public premium support is reported.
What Happened	The programme grew from 185 farmers in 2009 to 100,000 by April 2013 (reported; IFC 2013), and continues under the name ACRE Africa (UN Women n.d.).
Who Could Use This Model	Seed and fertiliser companies; insurers; mobile network operators and mobile money providers; agricultural lenders.
Risks to Watch	Basis risk when local rain differs from the weather station; low renewal if farmers see no payouts; and reliance on dense weather station networks.
Conditions That Made It Work	A trusted seed brand as distribution channel, mobile payments, and donor support for product design.
How to Get Started in South Asia	Seed companies and insurers in South Asia can pilot cover attached to seed packets, using public weather station data and mobile registration, in one district before scaling.
Lessons for South Asian Businesses and Institutions	Insurance becomes affordable when it travels with something farmers already buy. Linking cover to seed and mobile phones cut costs enough to reach very small farmers.

6.7 Pradhan Mantri Fasal Bima Yojana (PMFBY)

CF01-E07 | India | National crop insurance through private and public insurers | Operating since 2016

Key facts	
Where	India
Who	Ministry of Agriculture and Farmers Welfare; state governments; empanelled insurance companies
How Much, From Whom	Farmers pay at most 2 percent of the sum insured for kharif crops, 1.5 percent for rabi crops and 5 percent for commercial and horticultural crops; central and state governments pay the rest (Rajya Sabha 2021)
When and Status	Launched 18 February 2016; continuation approved in January 2025 (PIB 2025)
Where It Is Recorded	Government of India. Open the official record
Evidence Strength	Reported by government
The project story	
The Challenge	Indian farmers face droughts, floods, hail and pests every season,, and a single failed season can wipe out a year's income.
What Was Done	PMFBY is India's national crop insurance scheme. Insurance companies selected for each state cover farmers at actuarial or bid premium rates, and farmers pay only a small, capped share (Rajya Sabha 2021). A weather based scheme runs alongside it (PIB 2025).
How It Was Paid For	Central and state governments pay most of the premium, and private and public insurers carry the risk and settle claims. Farmers' contributions are capped at a few percent of the sum insured (Rajya Sabha 2021).
What Government Did	The central government sets the rules and shares premium costs with states; states select insurers and organise yield assessment.
What Happened	The government reports 784.1 million farmer applications insured and Rs. 1.83 lakh crore paid in claims since 2016 (reported; PIB 2025). Enrolment exceeded 61 million applications a year in 2019 to 2020 and 2020 to 2021 (reported; Rajya Sabha 2021).
Who Could Use This Model	Insurers and reinsurers; banks lending to farmers; technology firms assessing crop yields; state agriculture departments.
Risks to Watch	High public cost; delays in yield data and claims; and disputes over how losses are measured.
Conditions That Made It Work	Strong central government commitment, premium sharing with states, and competitive bidding among insurers.
How to Get Started in South Asia	Insurers in South Asia can study PMFBY's bidding and technology based yield assessment when designing or bidding for national or provincial schemes.
Lessons for South Asian Businesses and Institutions	Large public subsidies can create a vast market for private insurers and protect millions of farmers. The cost is high, so accurate and timely loss assessment is essential to keep schemes fair and affordable.

ENABLING AND FINANCING | LOSS AND DAMAGE

6.8 R4 Rural Resilience Initiative

CF01-E08 | Africa, Asia, Latin America and the Caribbean | Insurance that very poor farmers pay for with work | Operating since 2011

Key facts	
Where	18 countries in Africa, Asia, Latin America and the Caribbean (WFP n.d.)
Who	World Food Programme and Oxfam America, with insurers and local partners
How Much, From Whom	Donor funding; USD 12.9 million of premiums paid under WFP supported risk transfer (WFP n.d.)
When and Status	Launched in 2011, building on a project in Ethiopia (WFP 2019)
Where It Is Recorded	World Food Programme. Open the official record
Evidence Strength	Reported by WFP
The project story	
The Challenge	The poorest farmers cannot afford insurance premiums, have no savings and little access to credit. When drought strikes, they may have to sell livestock or other assets they need to recover.
What Was Done	R4 combines four ways of managing risk: building community assets such as water harvesting, weather index insurance, small loans and group savings. Farmers can pay premiums by working on community assets and move to paying cash over time (WFP 2019; WFP n.d.).
How It Was Paid For	Donors fund the programme through WFP. Work on community projects earns insurance cover, and insurers carry the risk. As incomes rise, farmers pay part or all of the premium in cash.
What Government Did	Governments host the programme and link it to national safety nets and disaster risk plans.
What Happened	In 2019 R4 reached more than 93,000 farmers, 60 percent of them women (reported; WFP 2019). WFP reports 550,000 households reached in 18 countries and USD 2.1 million in payouts after shocks in 10 countries (reported; WFP n.d.).
Who Could Use This Model	Social protection agencies; humanitarian organisations; insurers; microfinance institutions; community organisations.
Risks to Watch	Dependence on donor funding; small payouts relative to losses; and slow transition to cash premiums.
Conditions That Made It Work	Linking insurance to work and assets that farmers value, women's participation, and partners able to run savings groups.
How to Get Started in South Asia	Social protection programmes in Pakistan and Bangladesh can test paying premiums through public works, linking cover to cash transfer recipients.
Lessons for South Asian Businesses and Institutions	Insurance can reach the very poor when premiums are paid in labour and combined with savings and assets. It turns safety net spending into protection before disaster strikes.

6.9 Kenya Livestock Insurance Program (KLIP)

CF01-E09 | Kenya | Drought insurance for herders bought by government | Operating since 2015

Key facts	
Where	Arid and semi arid counties of northern Kenya
Who	State Department of Livestock, with the International Livestock Research Institute (ILRI) and the World Bank; private insurers led by APA, with reinsurance from Swiss Re (Artemis 2017)
How Much, From Whom	Government pays 100 percent of premiums for five tropical livestock units per vulnerable household; KES 1.2 billion of premiums paid and KES 1.3 billion in payouts (Kyuma n.d.)
When and Status	Launched in October 2015 (Financial Protection Forum n.d.)
Where It Is Recorded	Government of Kenya and World Bank. Open the official record
Evidence Strength	Reported by government and partners
The project story	
The Challenge	Herders in northern Kenya depend entirely on livestock, and severe droughts kill animals in large numbers. By the time relief arrives, herds and livelihoods are often already lost, and private insurers had little presence in these remote areas.
What Was Done	The government buys drought insurance from private insurers on behalf of vulnerable herders. Payouts are triggered by a satellite index of forage availability, developed by ILRI, so money arrives early in a drought, while herders can still buy fodder and water to keep animals alive (World Bank 2018).
How It Was Paid For	The government pays the full premium for five tropical livestock units per household; premium per unit was KES 2,600 for a sum insured of KES 14,000 (Kyuma n.d.). A consortium of insurers covers the risk, backed by reinsurance (Artemis 2017). Payouts go straight to mobile money or bank accounts (Financial Protection Forum n.d.).
What Government Did	Government designs the scheme, selects beneficiaries and pays premiums, while insurers develop the product and pay claims.
What Happened	The first payout, about USD 2 million, was made in early 2017 (reported; Artemis 2017). Cumulative payouts of KES 1.3 billion exceeded the KES 1.2 billion paid in premiums (reported; Kyuma n.d.). The model is being scaled regionally (CF01-E10).
Who Could Use This Model	Livestock departments; insurers and reinsurers; mobile money providers; pastoral development programmes.
Risks to Watch	Index readings that miss local conditions; dependence on public budgets; and low awareness among herders.
Conditions That Made It Work	A tested satellite index, full premium support for the poorest and fast mobile payouts.
How to Get Started in South Asia	Livestock departments in Balochistan, Sindh and Rajasthan could study satellite forage indices with insurers and pilot government purchased cover in one drought prone district.
Lessons for South Asian Businesses and Institutions	Paying early in a drought keeps animals alive and costs less than emergency relief. Government purchase of private insurance for the poorest can build an insurance market where none existed.

ENABLING AND FINANCING | LOSS AND DAMAGE

6.10 De-risking, Inclusion and Value Enhancement of Pastoral Economies (DRIVE)

CF01-E10 | Djibouti, Ethiopia, Kenya and Somalia | Insurance, savings and markets for herders | Under implementation

Key facts	
Where	Djibouti, Ethiopia, Kenya and Somalia (World Bank 2022b)
Who	World Bank, national governments and ZEP-RE, the regional reinsurer of the Common Market for Eastern and Southern Africa, as regional implementer (World Bank 2022b)
How Much, From Whom	USD 327.5 million from the World Bank (World Bank 2022b)
When and Status	Approved on 23 June 2022; under implementation
Where It Is Recorded	World Bank press release, 23 June 2022. Open the official record
Evidence Strength	Expected results set at approval
The project story	
The Challenge	Pastoralists across the Horn of Africa face repeated droughts that destroy herds, while weak access to finance and markets leaves them with few ways to save, protect their animals or sell at fair prices.
What Was Done	DRIVE combines drought insurance that pays out early so herders can keep breeding stock alive, incentives to save cash and open digital accounts, direct market contracts with livestock processors, and stronger trade standards across borders (World Bank 2022b).
How It Was Paid For	The World Bank provides USD 327.5 million to the four countries. ZEP-RE implements the regional insurance work and helps countries pool drought risk, and the project aims to mobilise USD 572 million of private capital for pastoral areas (World Bank 2022b).
What Government Did	National governments host the project and build on drought insurance programmes already running in Ethiopia and Kenya, including Kenya's livestock insurance scheme (CF01-E09).
What Happened	The project expects to reach 250,000 households and 1.6 million pastoralists and dependants, and to connect about 2,500 pastoralist groups to markets (expected; World Bank 2022b).
Who Could Use This Model	Regional reinsurers and insurers; livestock processors and exporters; microfinance and digital finance providers; pastoral associations.
Risks to Watch	Security and access problems in remote areas; basis risk in drought indices; and slow private investment.
Conditions That Made It Work	A regional reinsurer to pool risk, existing national insurance schemes to build on, and links between insurance, savings and markets.
How to Get Started in South Asia	Livestock exporters and insurers in South Asia can study DRIVE's combination of insurance, savings and processor contracts for herding communities in arid regions.
Lessons for South Asian Businesses and Institutions	Insurance works best as part of a package. Combining drought cover with savings and market access helps herders recover faster and invest, and regional pooling makes cover cheaper.

CHAPTER 7

Developing a preliminary project idea

The profiles show what others have financed. The steps below help turn one of those models into a preliminary idea that a financier would be willing to discuss. They are a starting point, not a full feasibility process.

Table 7.1 Six steps from a profile to a preliminary project idea

Step	What to do	Profiles that help
1. Name the climate problem	Describe the specific hazard and who it affects: for example, dry season water shortages for 2,000 vegetable growers in one district. Gather local data on losses and trends from meteorological, agriculture or research institutions.	CF01-A06 and CF01-A05 show how climate information supports this step.
2. Find a model that fits	Use Table 2.1 to find two or three profiles that address a similar problem, and note how each was paid for and what made it work.	Compare, for example, CF01-C01 (irrigation as a service) with CF01-M03 (subsidised solar pumps).
3. Decide who will pay, and why	Separate what users can pay for (a service, a product, a premium) from what needs public or concessional money (preparation, first losses, premium support for the poorest).	CF01-E01, CF01-E03 and CF01-E05 show different splits between public and private money.
4. Identify partners	List who would deliver, finance, insure, regulate and measure results. Most profiled projects involve at least one government agency, one financier and one private or community delivery partner.	CF01-E02 shows a bundle built from several partners.
5. Check risks and conditions	Use the 'Risks to watch' and 'Conditions that made it work' rows of the chosen profiles as a checklist for your own idea.	CF01-M02 shows why independent monitoring matters.
6. Prepare a two page concept	Summarise the problem, the model, the estimated cost and the proposed financing split, the partners and the expected results, with their evidence. Take it to a development bank, climate fund focal point, commercial bank or impact investor for a first conversation.	The weblinks in each profile lead to the financiers' own project records.

Source: Authors' compilation.

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Further resources

The official project records linked from each profile are the best starting point for further research. The following sources publish records of financed climate projects:

Table 3 Where to find further records of financed climate projects

Source	What it publishes
Green Climate Fund	Project pages with approved funding proposals, disbursement status and annual performance reports
World Bank	Project pages with appraisal documents, implementation status reports and completion reports
Asian Development Bank	Project data sheets, reports and recommendations of the President
International Fund for Agricultural Development	Project pages and the Adaptation for Smallholder Agriculture Programme reports

Source	What it publishes
Independent Evaluation Group and the Green Climate Fund Independent Evaluation Unit	Independent reviews and impact evaluations of financed projects

Source: Authors' compilation.

About the Team and Collaborators

Ahmad Nadeem, The Principal Investigator

Ahmad Nadeem is a development professional with 25 years' experience in programme implementation, communication, resource mobilization, research and AI integration. He has led donor funded projects, helped organizations secure funding and advised on implementation. His work has involved the World Bank, European Commission, ILO, UNICEF, UNDP, UN Women, OHCHR, USIP, GCF, KfW, Government of Italy and the Canadian High Commission. At the Pakistan Poverty Alleviation Fund and the Pakistan Centre for Philanthropy, he engaged, advised and supervised a wide range of development sector organizations, including charities, microfinance institutions, private universities, NGOs and INGOs, and worked with government bodies such as the Federal Board of Revenue, NACTA and social welfare departments. He has also worked on projects involving parliamentarians, law enforcement agencies, the National Police Bureau, police training colleges and churches. He is visiting faculty at Quaid-e-Azam University and SZABIST, holds an MPhil (Gold Medal, Iqra University) and a certificate (LUMS, McGill), and leads CSADS and Manāra.

Centre for Social Analytics and Development Support (CSADS)

The Centre for Social Analytics and Development Support (CSADS), established in 2023, is a research and advisory centre that uses artificial intelligence to generate evidence for informed policy, programme and strategic decisions. It serves public institutions, private sector organizations, UN agencies, INGOs and other development stakeholders, and makes research accessible to the media, students, parents and communities. It also helps organizations adopt AI responsibly, combining credible sources, transparent methods, human expertise and ethical safeguards. Within the Series, CSADS leads research design, source verification and final quality assurance. www.csads.org

Manāra Policy and Practice

Manāra is a strategic design and advisory practice that bridges evidence and action across critical development and institutional challenges. It works globally at the intersection of government, development organizations and the private sector, where efforts converge to generate social impact, mobilize capital and advance equity. Through policy analysis, systems thinking, strategic design, development finance advisory and public communication, it delivers solutions grounded in rigorous research, contextual realities and international best practices. www.manarapolicy.com

Climate TV

Climate TV is a digital media initiative led by Dr. Wajid Zulqarnain, Head of Media Sciences at SZABIST Islamabad. Dedicated to advancing environmental literacy across Pakistan, the platform utilizes edutainment, cultural narratives, and accessible digital storytelling to translate complex climate science into actionable public awareness. By bridging academic insight with mass media, Climate TV empowers communities to adopt sustainable practices and drive long term environmental resilience.

CivicFrames

CivicFrames is a creative knowledge communication initiative founded by Danyal Nadeem, a student of media sciences and an aspiring storyteller. It translates credible research into accessible creative forms, bridging the gap between data and public understanding. It explores how evidence can reach people through music, poetry and stories. Danyal intends to learn how creative formats can help evidence travel. Within the Series, it helps make findings easier to understand and share. www.civicframes.org