CASE STUDY

Digital Green

Film screenings teach resilient farming practices in Bihar.

DESIGN RESEARCHER
Shalin Shah

In the fertile plains below the eastern flow of the Ganges, a farmer is experimenting with new techniques to support her family and send her children to college. She's one of many across northern India making a living in the face of inflation, competition, increasing demand, and changing weather patterns.

RESEARCH PARTICIPANT

Kanchan

Kanchan has lived in the village of Sardarbhiga, Bihar all her life. A farmer in her 40s, she lives with her father-in-law, husband, a son (18) and a daughter (19).

Kanchan's family has been farming for as long as she can remember. She has never known anything else.

Kanchan was one of the first farmers in Bihar to adopt behaviours recommended by Digital Green. "At first, it was sheer curiousity of seeing the videos so often that made me want to plant potatoes in this new way. So I planted a small part of my farm that way. Once I noticed a difference, I started trusting the knowledge from Digital Green videos."

Kanchan has always been a bit of risk-taker. Ten years ago she made the decision to move from rice and wheat farming to vegetable farming. This was driven by economics and cash flow. Though it takes more effort overall, vegetables can give immediate payoff, which the family needed.

Over the past twenty years she's seen her village get better water systems and electricity. But she's also seen changing weather, especially in the last 5-8 years. The summers are longer and warmer and the monsoon is unpredictable. Many in the village are struggling to make ends meet in the face of unfavourable market policies. Ultimately, short-term survival is more important than long-term adoption for Kanchan.

Agriculture behaviours in Bihar are shifting to match the new weather patterns. Wheat used to be harvested in April, but now the summer heat comes earlier and kills the crop. The wheat must be harvested one month earlier, resulting in cascading effects throughout the timing of seasons. Wheat has to be sown a month earlier in November, which means the rice crop needs to be harvested earlier, and so on.

Kanchan attends a weekly peer support group and learns good farming techniques that will help her amidst the changing climate. Her group is a part of Digital Green, an education service that provides facilitated film screenings. The videos are relatable, and are shown regularly, followed by feedback sessions with a trained facilitator who can explain any complex material. This helps create a familiar and socially engaged environment where people are not afraid to ask till they learn.

Last winter, Kanchan learned how to protect her potatoes from blight — a disease which is becoming more common with longer combinations of high humidity and cold temperatures. Kanchan was one of the first to implement this new technique. She strategically planted a part of her farm according to new techniques, wanting to compare productivity levels and input costs. When she got a better than expected result, she decided to attend the video screenings much more regularly.

"At first, adoption of new techniques was low, even after seeing the videos. They required more initial effort. But when other saw good results, the others also started following these new techniques."

As the urban-rural gap has narrowed, Kanchan's aspirations have changed. Even though the situation with water and electricity in their village is much better than it was 20 years ago, and the productivity is much higher with the help of Digital Green, Kanchan and her husband think there is too much effort in farming for too little proportional gain.

Her priorities revolve around making sure her children are well-educated and have a better chance at life. "We never had any other option but to farm. I want a different life for my children. My son is planning to sit for the IIT entrance exam". Like most parents in villages, Kanchan wishes for her children to go to a college and find work in a company in the city.

Today, better infrastructure in the village is also helping the farmers cope with the changing weather patterns. Kanchan says, "it's become much hotter over the years. But now we have regular electricity and a tubewell, so we can grow crops year around. We can meet our ends this way."

ABOUT DIGITAL GREEN

Videos are produced, acted, and facilitated by locals in a community.

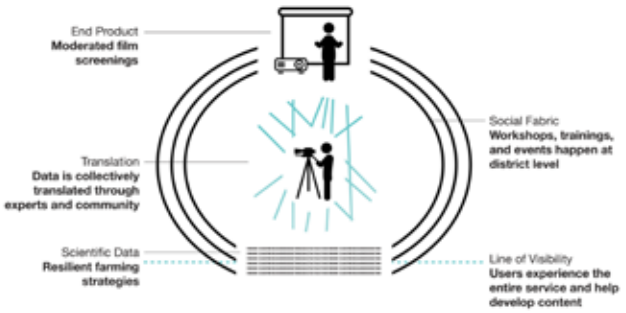
Digital Green is a service in Bihar which trains communities to use videos to increase resilient farming. The service is specifically designed to raise farmers' awareness and give them actions to improve the health and yield of their crops.

From a technology perspective, the service relies on low-cost videos that are shot on hand-held devices, edited in free software, and then projected via pico projectors. The video production teams are trained to script and produce around 10 videos a year.

The heart of the service, however, is people. Front-line workers—video producers and mediators—work in the communities, experts advise on content, and partners help financially support and guide content. A team of facilitators at Digital Green train the front-line workers, facilitate conversations between the experts and front-line workers, and monitor and improve the service. Mediators work full-time in the villages, hosting film screenings and facilitating discussions with self-help groups in the communities.

The service builds on previously existing extension programs. The video replaces the use of flip charts and oral presentations—making the content more engaging and consistent across the region.

Digital Green is designed to help people in manage the climate impacts that are already here: longer dry spells, stronger storms, shifting seasons, etc. The knowledge that is transmitted through the Digital Green platform directly helps raise community's adaptive capacity, helping them develop practices to meet the new reality.



> We came here, trained the front-line workers how to produce the video...the video captures the essence and the practical approach of any agricultural technology that's available in the village...showing the farmer who has the good practice.

KEY DETAIL

Learning rituals at the community level

Learning is a discipline that takes time, repetition, and social activities. More than simply giving access to information, Digital Green creates a social ritual, giving space for continuing, life-long learning. Communities come together once a week for the film screenings, and are organised into 'self-help' groups of around 15 people. Each community is exposed to videos at least twice, and attendees are even sent the videos via WhatsApp after a film screening. This repetitive, social structure supports deeper learning and behaviour change.

Once a week each village screens a video. Pawan, the State Lead for Bihar explains, "the same people will come, some videos will be of paddy, corn, vegetables...they even insert some health, nutrition [videos] to make it more interesting and maintain the continuity."

KEY STRENGTH

Upholding and amplifying people

While built around the technology of videos, the element of the Digital Green service that really stands out is the high amount of human-to-human interaction. Communities watch the videos together, with a facilitator to emphasise information and answer questions. The video production teams work with local farmers as actors in the films, and sit in meetings with experts to review storyboards. This investment of time amplifies trust, working with real people that are known in the community, and effectiveness, ensuring that scientific information is molded into language and communication familiar to the viewers. Critically, this investment in people also builds capacity within these villages, teaching new skills like video production, editing, how to use pico projectors, and facilitation.

Digital Green participants learn new skills like using pico projetcors and facilitating meetings. For Pawan, this is a source of pride. "We see after 6 months the very shy mediators have become the experts."

Digital Green is a mature service. Since its inception in Bihar, it has worked with 700,00 people, scaling from two blocks in a district to all 38 districts of Bihar. Key partners include JEEViKA, a program funded by the World Bank, and the government of Bihar. Digital Green also works in the Indian state of Andra Pradesh, as well as 10 other countries across the globe.

As Digital Green strengthens its network in rural Bihar, other agencies are also beginning to use the organisation's unique service model to deliver content (e.g.child nutrition).

RESEARCHER'S REFLECTION

Digital Green: A unique service intervention

The trip to Bihar was extremely inspiring. One of the most interesting aspects of it was Digital Green's multifaceted service model. By interfacing with committed knowledge partners at a higher level, and local farmers at the village level, and involving them in a single eco-system, Digital Green has created more than a tool. They have created a platform for the delivery of content at the level of its intended audience. This gives them a chance to address several issues through the same platform. The video content currently consists of better agricultural methods to increase productivity, dealing with weather changes, and even nutrition and health for the children of the farmers.

For this to be as successful as it is, it is critical to invest in relationships with people from the villages. In Bihar, they have made use of women's Self Help Groups (SHG) to help deliver content, provide feedback and monitor implementation. This helps create a great deal of trust at the local level and promotes higher adoption. So, while low-cost technology like video projection and pico projectors are the foundation of the service, it is really their aggressive stakeholder engagement that holds this platform together and produces results.

Given the landscape of rural India, systems such as this can only be effective if there is continuous engagement with the stakeholders at all levels. A

Finally, a lot of work done by Digital Green is around urban centres. To some extent, power and water are more reliable around these areas. However, India's rural landscape is wide and diverse and resources such as water, electricity, human capital can vary greatly as we move away from urban centres . This can only aggravate any issues related to climate change adoption. A different model will need to be imagined for these places.

Digital Green has successfully created a platform that enjoys a lot of trust from its users about the various action tools and knowledge they impart. However, beyond the cursory understanding of lived climate change (longer summers, and less rainfall), there isn't a long-term set of actions and responses to this growing challenge. Given the economic insecurity of Indian farmers, it is hard for them to formulate a blueprint of how to prepare for life 30 years from now. I was left with the sense that large scale climate adoption will require more help than content delivery both from the state and partners like digital green. This could be either in the form of more complex technology (big data, machine intelligence, new equipment), new employment opportunities or something yet not imaged. However, they have managed to create a platform that everybody trusts. This can be leveraged for all future endeavours and this is an amazing start.

cursory level of government support seems mandatory because of the size, scale as well as resource crunch at a local level. For example, Digital Green was not able to sufficiently establish themselves in Madhya Pradesh because of limited government support. Moreover an agency that is committed to knowledge transfer to its rural and hard to reach residents is important.

ACKNOWLEDGEMENTS

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Adaptation Services: A Design Guide

Turning climate science into valuable products, tools, and programs for people

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Francesca Desmarais
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Foreword

Climate change is here. As I write this, Europe is experiencing its second, record-breaking heatwave of the summer. My writing has been punctuated by swims in the harbor across from our Copenhagen offices, a desperate attempt to cool down enough to compose my thoughts.

Across the globe in India, Kanchan Kumari—one of the incredible people we interviewed for this project—is facing climate impacts that are far more disruptful to her job. Early heat in the spring has shifted agricultural seasons, and more frequent combinations of humid, cold periods in the winter propagate disease in her crops. As a farmer, she's forced to change her habits, planting spring crops a month earlier and experimenting with new techniques to protect her potatoes. Luckily Kanchan doesn't have to cope with the changing climate on her own. She participates in weekly video screenings with her community, watching educational videos carefully produced by her community and facilitated by a trusted 'sister'. This strong learning ritual, powered by technology, has raised her awareness and given her the confidence to take new actions.

Kanchan is one of the seven users we spoke with whose livelihoods and jobs are already shifting because of climate change. They are at the forefront of how we will adapt to the new reality and prepare for even bigger changes ahead.

Adaptation services support their small shifts, raising their ability to cope with the environmental change. As an interaction designer, I see this as a critical space for our design practice. How do we transform climate science into valuable, adaptive actions? How do we support scientists and policy makers in translating data into value for real people?

The growing wealth of digital climate data, the expanding computational power of models, the maturity of our understanding of climate science, and the spread of technology from mobile phones to remote sensing have provided an opportunity. As interaction designers, we are well positioned to apply our skills of designing data-driven services and digital experiences to create powerful adaptation services. We can add our skills to the multi-disciplinary toolbox that must address climate change.

What's an adaptation service?
Traditionally, 'services' supply a public need such as transportation, health care, or electricity. They are often composed of 'users' who consume and benefit from an end 'product', and 'actors' who make everything work. Services unfold over time, and different people take different pathways through a service, resulting in a myriad of experiences. For example, if you need to transfer money from your bank you could call a service representative, visit an office, or maybe use an app. Service designers focus on how to orchestrate these experiences—how technology and actors can work together to deliver value. Today, especially with the advent of digitalisation, many services are private consumer products such as Netflix or WeChat.

Adaptation services are particularly tailored to climate action. They cover a wide range, including Climate Information Services (which package and disseminate climate knowledge for decision makers), early-warning systems (which warn communities about natural disasters), weather information, educational services, and many others. All together, adaptation services are the products, tools, and programs we will use to navigate and thrive in our new climate reality.

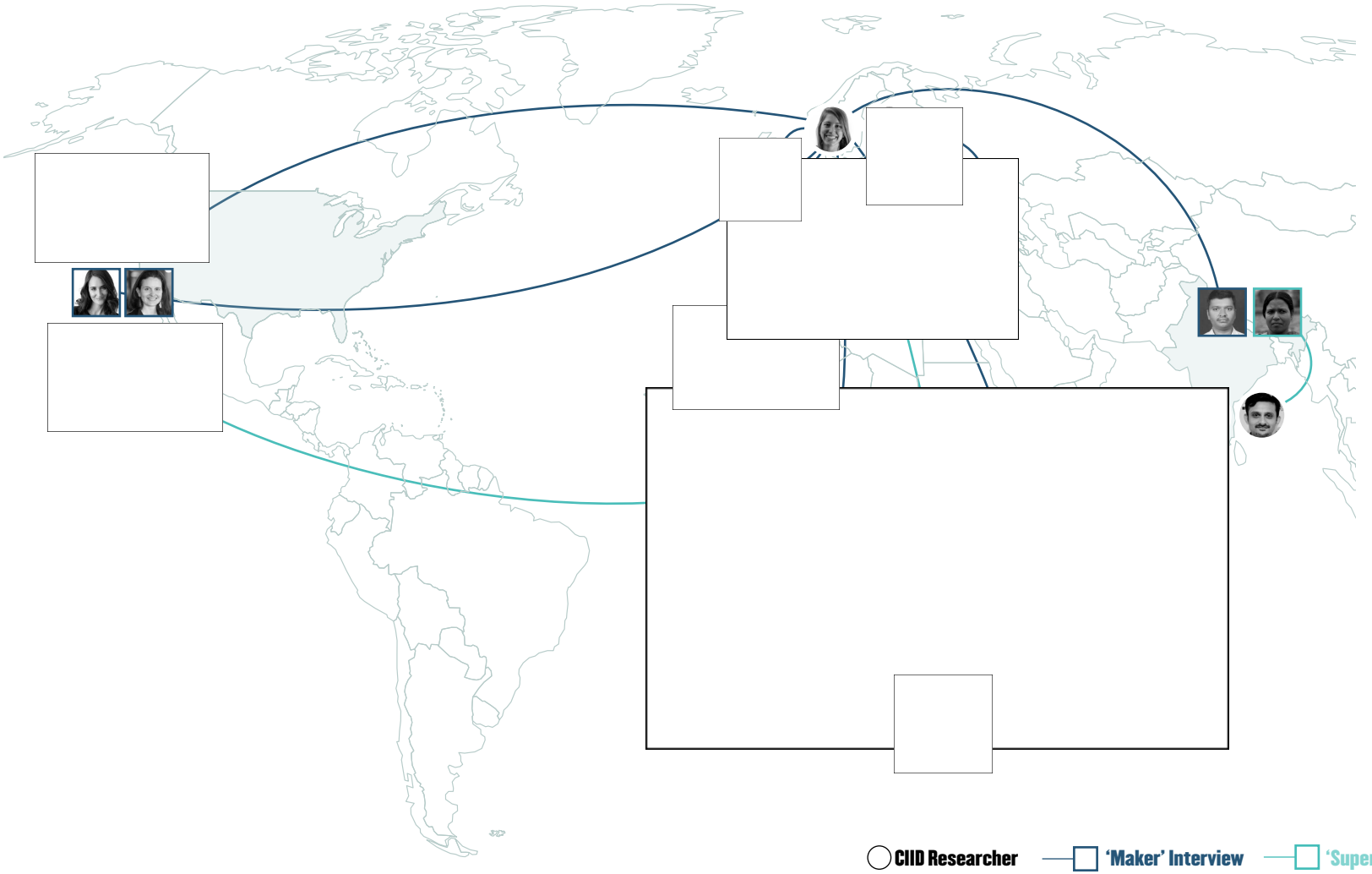
This booklet is a starting point
This booklet is written for anyone designing an adaptation service, particularly interaction and service designers. It provides inspiration and a way to think about frameworks and components. It's not an exhaustive study, more a spark of insight. It provides synthesised inspiration from seven quite different adaptation services. There are many more that we must continue learning from in this emergent field. The booklet is also not exhaustive in its design recommendations—of course people-centred processes, co-design, systems thinking, and excellent visual design remain highly relevant to creating great adaptation services.

It's also important not to lose sight of the bigger climate complexity. Adaptation is one of many actions we must collectively take. It's equally critical to accelerate toward low-carbon futures to avoid triggering tipping points and causing even more damage. Here, though, adaptation is a powerful motivator. Raising awareness of the sheer scale of actions we will have to take can motivate mitigation actions. Realistic but hopeful explorations about climate-adapted futures can be a strong tonic against the apocalyptic doom and help drive conversations about how we shape our climate-changed future.

For all the uncertainty, we know a lot. It will get hotter. The water will come. We will see more intense storms. We live in a moment of quickening environmental change.
Let's design for it.

Global research approach

The research for this project was conducted by a team of international design researchers. Trained by CIID, the seven researchers now work professionally across a variety of sectors. For this project, they conducted 15 qualitative interviews with people who have made adaptation services (Makers) and people who are frequent users of the services (Superusers).



Digital Green

Bihar, India

Agriculture

A service that trains communities to use video screenings to increase resilient farming.

Today	2100
Light	Data Heavy
Solo	Communal

'Makers' Interviewed:
Pawan Ojha, State Lead, Digital Green
Karin Lion, Vice President, Strategy
Suprita Makh, Senior Program Manager

'Superusers' Interviewed:
Kanchan Kumari, Farmer

Define the translation process

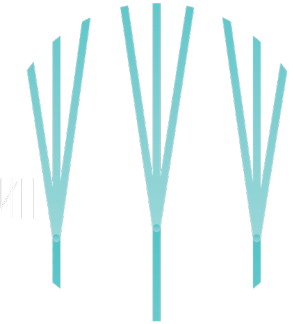
The complexity of climate science and projections can be a significant hurdle. Helping people make sense of this complexity is the critical value of an adaptation service.

The seven cases illustrate three mechanisms—uniform, mediated, and collective—for translating the data into valuable and informative products for people.

Key questions to ask: What's the end users' role in the translation process? How tailored is information to a given user?

Uniform

Users all see the same information. Translation of the data happens below the 'line of visibility', in the service backend (by data analysts, scientific experts, etc.). Users must navigate the information and decide what's relevant for them.



Mediated

Users get slightly different information, particular to their circumstances. The translation is mediated by technology (such as a cell tower that filters by location), or by humans (such as a call-service representative). The 'line of visibility' varies depending on the mediation.

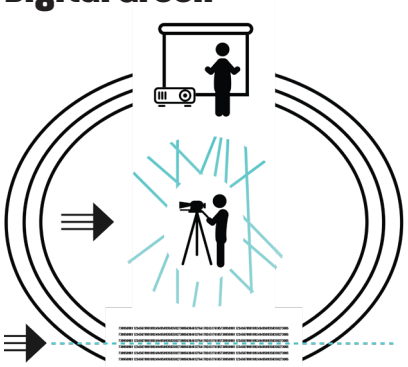
Collective

Users are part of the translation process, involved in shaping and communicating the information. Translation happens above the 'line of visibility' with users, experts, facilitators, and other service actors collectively involved in the process.

Example: Digital Green employs trained end users to make videos with experts (starring end users as actors) and hosts local screenings with facilitators.

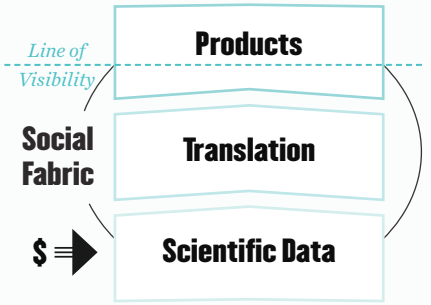
Structure of Each Case

Digital Green



Collective training and translation of data into community film screenings.

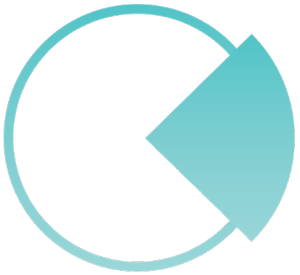
How to read diagrams:



Design for multiple stages

Cyclical Phases

Climate impacts are directly tied to natural cycles in biology and ecology. Adaptation services tailor information products to these cycles, with different information relevant per phase (such as dry season vs. wet season).



Priority Periods

Certain periods, or cycles, in a year are more critical, causing higher levels of risk to communities and economies (such as hurricane season). Services can be designed for these extreme periods and may be less relevant during the rest of the year.

Escalating States

As systems get close to tipping points—both social and ecological—there are periods of intensifying change (rising market prices, for example). These periods may require more frequent use of services or might render the service less helpful.

Ex: Even as Digital Green helps farmers increase their yields, the return on effort is tougher and tougher. Many farmers want their children to choose a different profession.

Inflection Points

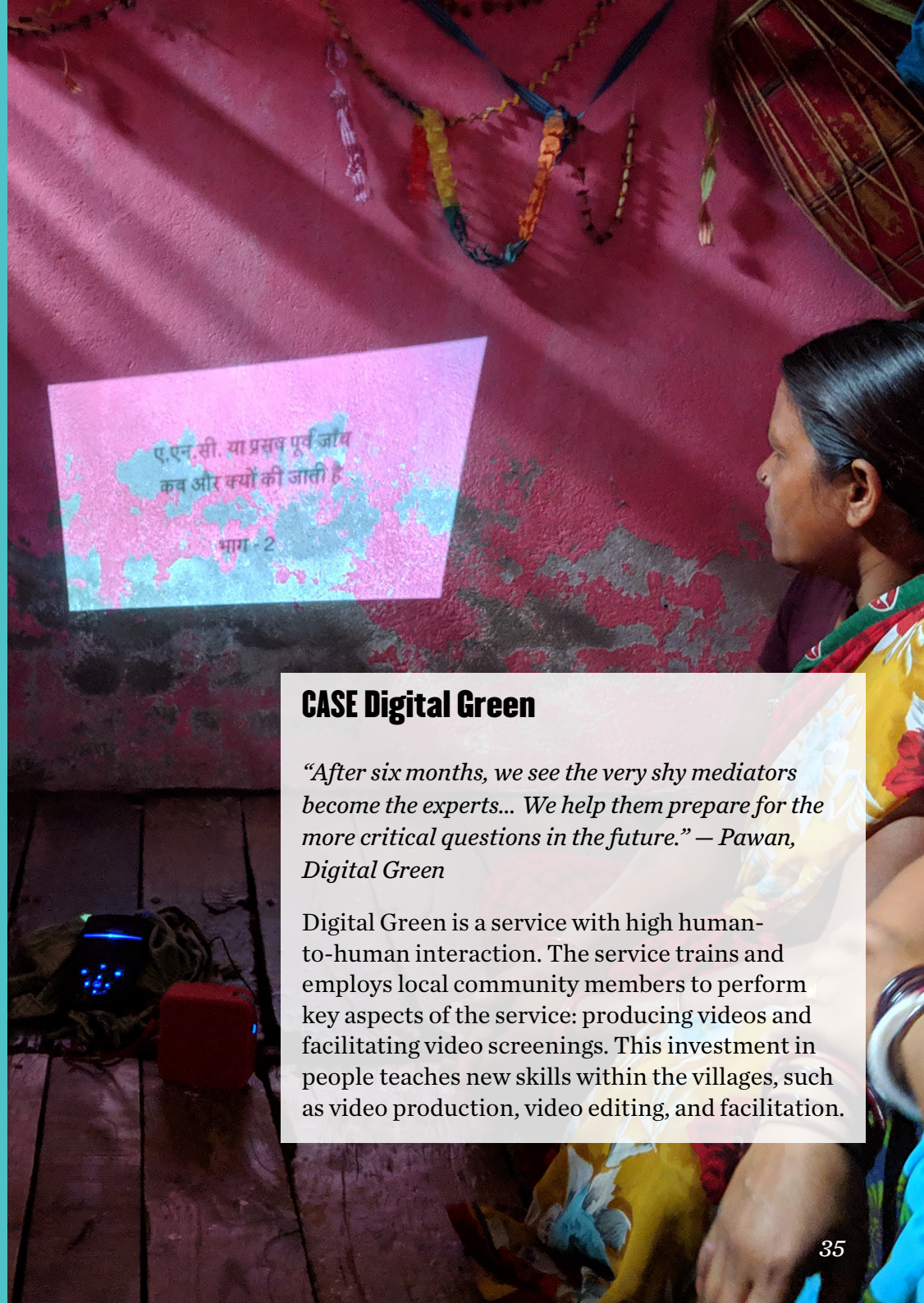
Once a tipping point is reached, the system switches into a new reality (think of a catastrophic storm that destroys a city's infrastructure). This creates an opportunity for new services to emerge or for existing services to pivot to fit the emerging conditions.

Actors

Who are the people in the service?

Despite a foundation in climate science, adaptation services are all about people. People translate the data into information; people interpret the information; and people benefit from using the information. Successful adaptation services amplify and empower individuals, building their capacity to navigate periods of change. This is especially critical for more vulnerable actors.

The seven cases illustrate four profiles—users and other actors involved in making the service work. This is an initial analysis; more research is necessary.



CASE Digital Green

"After six months, we see the very shy mediators become the experts... We help them prepare for the more critical questions in the future." — Pawan, Digital Green

Digital Green is a service with high human-to-human interaction. The service trains and employs local community members to perform key aspects of the service: producing videos and facilitating video screenings. This investment in people teaches new skills within the villages, such as video production, video editing, and facilitation.

Actor Profiles

Advocate

An Advocate is a champion for their community. They help raise awareness about the need for an adaptation service and go the extra mile to make the service work—training new facilitators, for example, or volunteering in a civil protection committee.

Risk Taker

A Risk Taker is an early adopter. They trust the service enough to change their behaviours before they know it works. These first movers are critical for a service, signaling to other potential users. It's important that small steps build their trust.

"At first, it was sheer curiosity... Once I noticed a difference, I started trusting the knowledge from the videos."
—Kanchan, Digital Green

Perseverer

A Perseverer is a general user of a service, following other users once they see value. They use the service to navigate climate changes and make better decisions. They are often faced with additional worries and difficulties that are top of mind.

Data Wrangler

A Data Wrangler is involved in data translation. They are often technical experts who are deeply familiar with the science. They can work directly with users (advising video production teams, for example), or more in the backstage (such as running analysis and modeling).

Engage people with narratives

Stories are the basis of human communication. In almost all aspects of our lives, we rely on stories to convey complex information. We find them compelling and persuasive.

Narratives can be a powerful mechanism of translating complex and sometimes dry scientific data into adaptation information. These stories can be even more powerful when combined with engaging mediums, such as video or podcasts.

Questions for designers:

What is the storytelling culture of your end users?

What technological changes are enabling new storytelling mediums?

CASE Digital Green

"We are now shifting from community videos to more professional videos... In training for production, we keep introducing aspects to make the video more interesting for the community to watch." - Pawan, Digital Green

Digital Green uses engaging 10-minute videos to showcase adaptive skills to farmers. Significantly more effective than traditional extension methods like flip charts, the videos have led to farmers adopting the procedures much more readily in their fields.

Build in repetition

Adaptation services are designed to provide new knowledge and skills, raising people's capacity to react to and thrive in a changing climate. This is not an immediate process. Repetition helps build skills, memory, and confidence over time. It can also sustain behaviour change.

The seven cases do not share a standard rhythm. Some services might repeat at the beginning of each season, or once a week, or daily. Designers should think about how to design this repetition in a way that adds to the service, helping people learn rather than merely being a nuance (or worse, dull!).

Questions for designers:

What's the key information that should be repeated?

What's the appropriate frequency for repetition?

How can the repetition be a learning experience?

CASE Digital Green

"Once a week, each village screens a video. The same people will come, some videos will be of paddy, corn, vegetable... They insert some health and nutrition to make it more interesting and maintain the continuity." —Pawan, Digital Green

Digital Green hosts video screenings once a week, creating a repetitive social event. Each video is shown at least twice, ensuring that everyone has multiple opportunities to learn a new technique.

Create an environment conducive to learning

Climate adaptation is an intricate field, and the complex landscape means that there's a need for ongoing learning. As systems change and new information emerges, people may have to adjust their adaptive behaviours. Adaptation services should be designed for this learning, helping refresh knowledge and teach new information as necessary.

The seven cases integrate a variety of learning techniques, including glossaries, workshops, support groups, and trainings. The most effective use strong social rituals to ensure people attend and participate. Some of the service actors, such as facilitators and coaches, are directly tasked with education; a key part of the service is training these trainers.

Questions for designers:

What are the educational goals of your service?

What is the split between training and more self-directed learning?

Who are the key educational actors in your service?

CASE Digital Green

"Sometimes the videos are very complex. Some of us cannot even read. But we can always keep on asking sister (the facilitator) to explain things till we understand them."
—Kanchan, Digital Green

By training a village local to be a facilitator, Digital Green has been able to foster an environment of trust, familiarity, and access. The videos are relatable and are shown regularly, followed by feedback sessions. This creates a familiar and socially engaged environment where people are not afraid to ask until they learn.

Design the service to change and evolve

In an emerging and complex situation, nothing stays static. Not only are natural systems themselves rapidly changing, but society and technology are also evolving. An adaptation service must be prepared to evolve and adapt as the situation changes.

Strong adaption services are structured to emerge, shifting to meet new conditions and needs. There are mechanisms designed to collect and analyse feedback, and practices in place for reviews and pivots. Most importantly, adaptation services should maintain a general attitude of change and support people emotionally through the shifts.

Questions for designers:

How will internal and external signals of change be collected and analysed?

How will decisions be made about strategy and direction?

How will a safe culture of change be fostered?

CASE Digital Green

"We observe 100–200 mediations in a month, and after observing we classify the issues—which components, which skills they lack... Based on the particular component we give this to the partners." - Pawan, Digital Green

Digital Green conducts extensive monitoring and evaluation, and the high human-to-human interaction allows them to easily add new videos, update existing videos, and improve the training and technical delivery of the content. The service is also innovating to include entirely new touchpoints, including a mobile alert system to inform farmers when it's a good time to apply certain practices they have learned.