GSMA

Nepal Market Report
GeoKrishi case study



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Contents

3 **Background**
How are digital inclusion and poverty alleviation related?

6 **Case: GeoKrishi**

Lumkani Market Analysis

11 **Is GeoKrishi use related to poverty alleviation? If so, in what ways?**
Job creation
Poverty reduction
Livelihood improvement
Increased resilience

14 **What role are market conditions playing?**
Microinsurance market
Regulatory environment
Local government fire response
Housing inequality and climate risks
Financial viability and variability

24 **Conclusions**
Acknowledgements
Endnotes

Background

The GSMA Innovation Fund (GSMAIF) sources solutions leveraging digital and emerging mobile technologies and supports them to scale. The aim of stimulating digital innovation is to deliver sustainable businesses that can create large-scale socio-economic impact through digital technology and mobile internet.

Together with the UK's Foreign, Commonwealth and Development Office (FCDO) and Swedish International Development Cooperation Agency (SIDA), the GSMAIF commissioned a series of research and evaluation projects to examine and understand the connection of its work de-risking digital innovation, specifically supporting businesses to scale who have a potential for follow-on positive outcomes. These potential outcomes include job creation, poverty reduction, livelihood improvement and increased resilience to negative shocks (for example, climate events).

This case study is part of this series of research, exploring the following questions:

- How are businesses and their ability to scale affected by market conditions?
- How are businesses, in turn, changing their market environment?
- Who are the users of the business product?
- What is the impact of the business product on these individuals' livelihoods and socio-economic status? And what role did market conditions play in this impact?

Look for other cases in this series:
Lumkani (South Africa), TaskMoby (Ethiopia), and Ensibuuko (Uganda).

How are digital inclusion and poverty alleviation related?

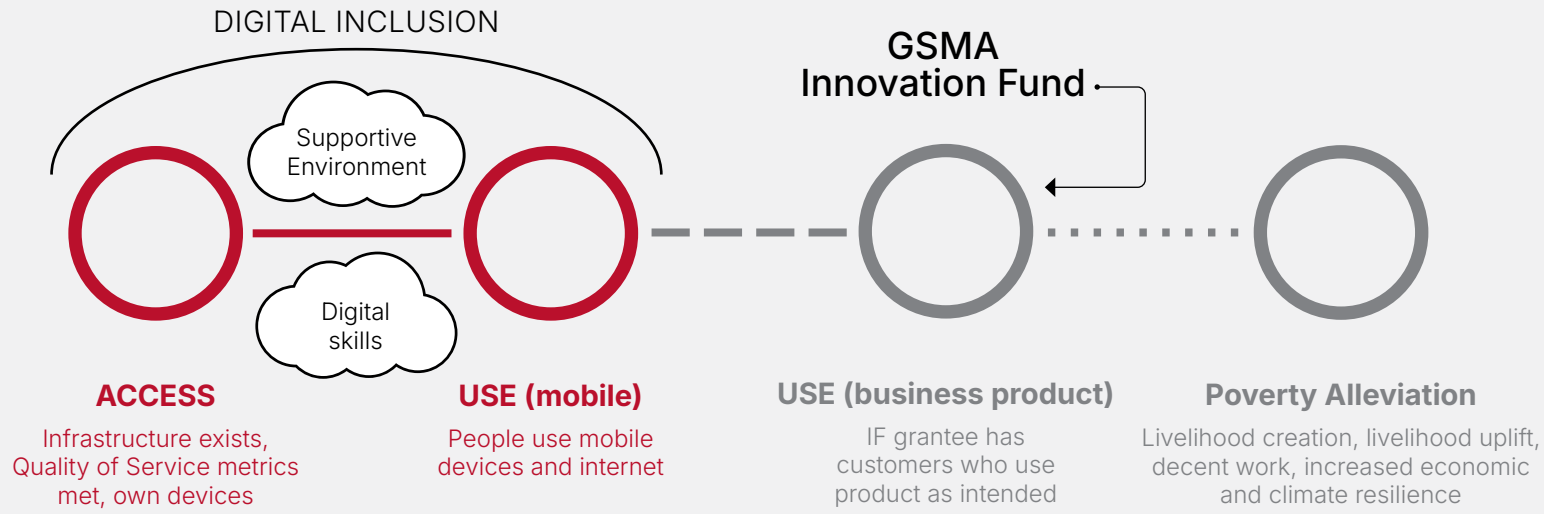
The GSMAIF looks to de-risk innovation in the digital space for businesses likely to have a positive social impact. Figure 1 shows the theory of change for the GSMAIF, drawing a pathway from digital inclusion, to the use of a business product, to poverty alleviation benefits.

The temptation is to read this chain of events from left to right, albeit with less and less of a direct link (i.e. increasing assumption) as you move from left to right, such that:

- **IF** GSMA member Mobile Network Operators and national governments, regulatory partners, etc. ensure access to mobile and use of mobile through digital inclusion,
  THEN people can use mobile products.
- **IF** the GSMAIF can de-risk the innovation of mobile products,
  THEN more products will reach people in poverty.
- **IF** products reach people in poverty,
  THEN there will be poverty alleviation.

While this is a nice story, these are aspects of a complex environment where causality, and even contribution, cannot be assumed to be linear.

Figure 1

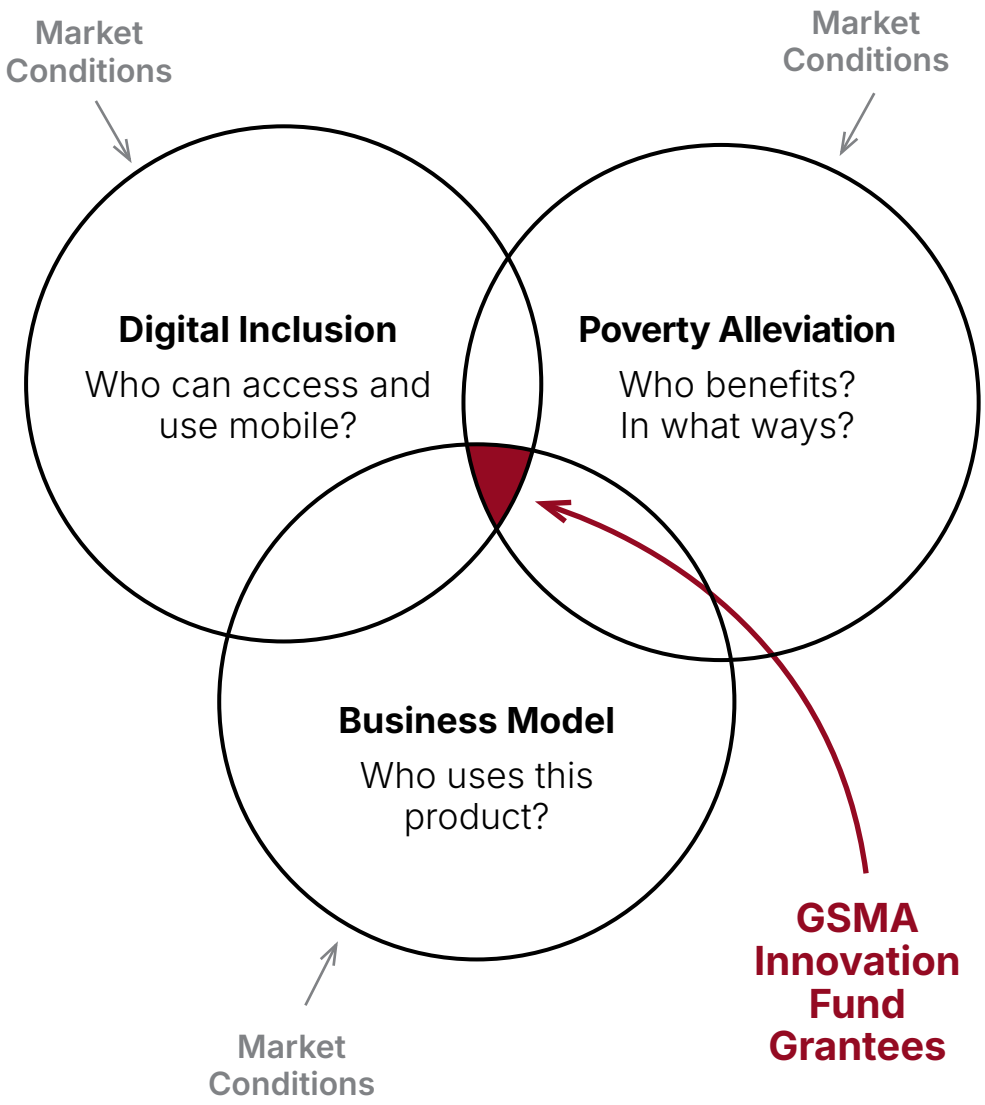


IMPACT STATEMENT:

Improved wellbeing, livelihoods and climate resilience, mitigation, and adaptation for low-income women and underserved groups through **improved access** to and **use of** mobile phones and digital service.

How are digital inclusion and poverty alleviation related?

Figure 2



Reality looks more like overlapping domains such as in Figure 2. A business product might rely on mobile without ever touching people in poverty, many businesses might support poverty alleviation, without really relying on digital inclusion, and services might increase access to mobile (services and information) that supports poverty alleviation without revolving around a specific product or business. Finding the "sweet spot" of using a specific business model that includes digital inclusion as part of its main value proposition AND leads to poverty alleviation is not a given.

Yet, the GSMAIF theory of change assumes that the funded innovations reside in this coveted middle spot. While it's true that **sometimes** mobile access provides access to business services which then **sometimes** creates jobs, reduces poverty and improves livelihoods, but the case studies demonstrate this is not **necessarily** the case. Digital inclusion, product use, and poverty alleviation are not dependent on one another, nor are they mutually exclusive. Additionally, all three domains are subject to influence from context-specific market conditions.

Starting with the specific product/business model of a given case helps to locate within these overlapping circles—identifying where/what the relationship is to mobile, potential benefit to those living in poverty, and how market conditions are impacting it all.

Case: GeoKrishi

Founded in 2017, GeoKrishi is one of the top agritech companies in Nepal. To date **they've reached more than 50,000 farmers and employ around 50 full-time staff agents.**

GeoKrishi's mission: To foster sustainable agricultural development, create green jobs and nurture the next generation of local agricultural entrepreneurs.

GeoKrishi has a suite of apps and services that provide localised data and climate-smart farming information to smallholder farmers, municipalities, cooperatives, agribusinesses and agricultural extension agents. They aim to provide real-time advisories and suggest best farming practices based on the unique needs and location of registered farmers.

GeoKrishi was funded by the GSMAIF in the 2022 Climate Resilience and Adaptation round to upgrade their digital learning content with climate-smart practices and to expand overall reach.





GeoKrishi products

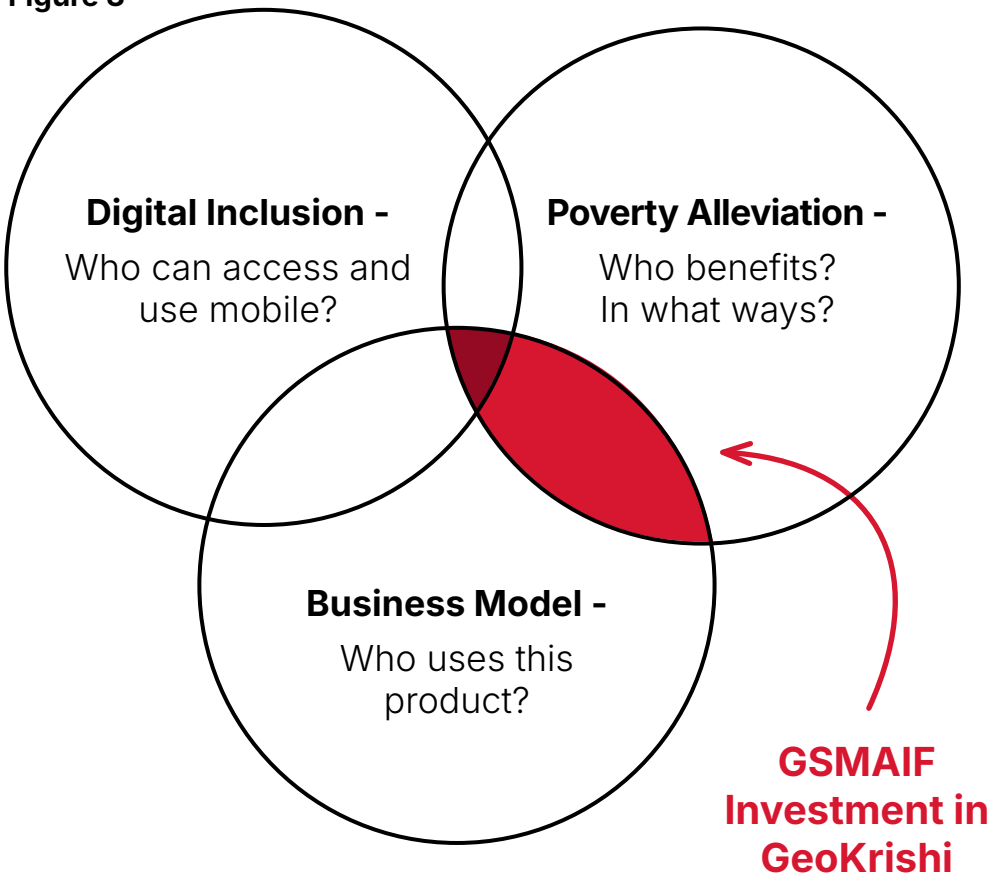
- **GeoKrishi Farm App:**
  - A free subscription with personalised updates on weather and market prices
  - Information and pre-recorded training on climate-smart choices for fertiliser, pest and disease management, and crop choice
  - "Ask the expert" agricultural advisory services
  - Webinars based on feedback gathered from field agents or farmers conducted nationally by subject matter experts.
- **Samuhik Bazar (e-marketplace) App:** A digital trading platform that connects farmers with buyers, suppliers and other agricultural stakeholders, making transactions transparent and providing up-to-date pricing information.
- **Community Agro-Ecosystem Service Centres (e-chautari):** In-person knowledge hubs for digital training, advisory services, capacity building and access to expert consultations.

How is GeoKrishi related to digital inclusion and poverty alleviation?

GeoKrishi is balancing its identity as an agritech company with the practicalities of reaching small-holder farmers across geography, language and digital literacy barriers. It is committed to maintaining connection with customers via digital pathways while eliminating barriers to agricultural information and ensuring inclusive access to their services through a suite of online, mobile and in-person options.

Much of the benefit GeoKrishi offers is in the contextualised, timely and convenient information through digital solutions. However, there are users and aspects of use that are still driven primarily through in-person relationships and non-digital pathways. As such, GSMA's investment in GeoKrishi resides both in the sweet spot (the intersection of mobile access, product use and poverty alleviation) as well as still somewhat in the overlap between poverty alleviation and a non-mobile dependent business model, as shown in Figure 3.

Figure 3



GeoKrishi Market Analysis

This market analysis, as a companion to an impact study, helps us understand how GSMAIF efforts to de-risk digital innovation for businesses have connected to broader social and economic outcomes. These impacts do not occur in isolation. Grantees are both shaped by and have an influence on the markets they operate in.

By analyzing these market dynamics, we can better understand how they influence the depth, sustainability and scalability of grantees' impact in local communities, such as job creation, poverty reduction, improved livelihoods and increased resilience to challenges like climate events. This analysis also considers factors that may affect the replication of solutions in different contexts.

Who is using GeoKrishi?

GeoKrishi users are majority farmers in the fertile Terai region who tend to be more educated, banked, older and own slightly more land than fellow Nepalis.

Many focus group members had at least one family member working abroad. Remittances make up a significant portion of household incomes.

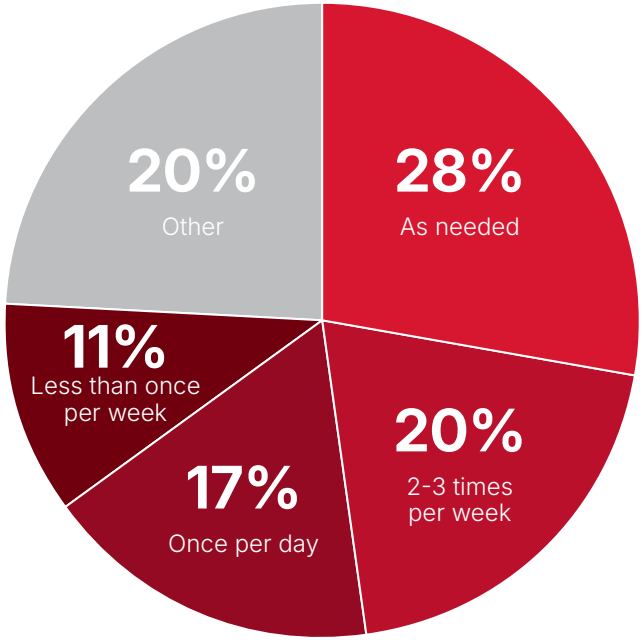
GeoKrishi users are new to accessing information via digital pathways. Of 600 users surveyed:

- 84% did not previously have access to similar agritech services.
- 70% reported no prior knowledge of climate-smart agricultural practices.

Still, in most cases, GeoKrishi is part of a mix of information sources farmers use for decision-making. Focus group respondents mentioned getting information from YouTube videos, training from local groups and cooperatives, and occasionally other agritech applications.

Most users stick with GeoKrishi for about 24 months, but there is **a significant portion of users (43% of those surveyed) who stop using the app after only 7-12 months due to technical issues** like damaged phones, lack of smartphones and insufficient support for app usage. Users who continue to use the app longer-term, use it on a weekly or even daily basis.

Users' frequency of GeoKrishi use, n=660



	Nepal national averages	GeoKrishi user survey respondents (1,002 total)	GeoKrishi users compared to Nepal averages
Average age of farmers	25 years	37 years	↑ Older
Farm location	54% Terai 40% Hills 6% Himalayas[1]	78% Terai 22% Hills 0% Himalayas	↑ More Terai farmers
Gender of farmers	49.1% male 50.9% female	49.3% male 50.7% female	= Equal
Below the national poverty line	20.3%[2]	3%[3]	↓ Less poverty
Below 200% of the poverty line	NA	26%	
Average land use	1.36 acres[4]	2.8 acres men 1.3 acres women	↑ Larger land size
Median land use	.63 acres[5]	1.1 acres	↑ Larger land size
Type of farming operation	78% subsistence[6]	55% Subsistence 45% Commercial 51% of male farmers participating in commercial agriculture, compared to only 38% of female farmers	↑ More commercial farming
Percent reaching secondary education	27%[7]	45%	↑ More educated
Formal bank account	53%[8]	91%	↑ More banked
Internet use	49.6%[9]	94%	↑ More digital
Mobile phones usage	92.4%[10]	100%	↑ More digital

Why are they using GeoKrishi?

Users' reasons for using GeoKrishi, primarily the GeoKrishi Farming App:



Weather updates for crop protection and decision-making on timing key actions (planting, harvesting, irrigation, etc.)



Information on pest management; insect identification and pesticide application



Information on disease care of crops



Crop-specific information on **timing of planting**



Low-cost and time-saving diagnostic (agrovet) services and specialist advice through photo sharing



Marketplace pricing information for making selling decisions

"Before the app was introduced, users had to visit the Directorate of Agriculture located in Birendranagar to consult with an agrovet and obtain medication. Travel time (one hour on autorickshaw) and cost was saved as a result of usage of the app."

- GeoKrishi focus group facilitator

"Now equipped with forecasted weather information in advance, we can take precautionary and proactive measures to safeguard our property and crops."

- GeoKrishi user

Is GeoKrishi use related to poverty alleviation? If so, in what ways?



Job creation

GeoKrishi directly employs 50 field agents, and a small percentage of its users are able to provide employment in farms due to income growth associated with use of the app.

GeoKrishi's users are already farmers and the business services are aimed at optimizing and growing existing farm income, not attracting new farmers. Their product offerings are not driving job creation.

Still, 72 users (12%) reported that GeoKrishi has helped them hire workers on their farms. In total, respondents reported hiring 75 full-time workers and 312 part-time workers to help with and because of increased yield.

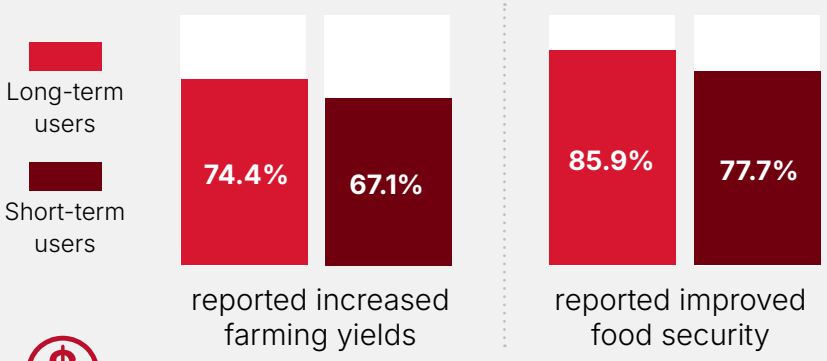
12% of users reported that GeoKrishi has helped them hire workers on their farms.

Poverty reduction

Pros

GeoKrishi use contributed to increased crop yields and improved food security. Those who use the app longer tend to see better outcomes.

Increased yields correlated with length of usage of GeoKrishi's services.





76% **of survey respondents said the app enabled them to save money**

Focus group discussions demonstrated that increased savings came in part from reducing market dependencies on daily consumption items. For example, working the land to meet food needs increased household savings due to not buying vegetables. This was common for users who have started doing their own animal husbandry since they were introduced to the app. In focus groups, some women reported being able to save their migrant husbands' earnings, sustaining themselves on farming income.

Cons

GeoKrishi does not help connect users to markets or change the price they can attract for their crops. The app was reportedly not reliable in providing localised market prices to be relevant for decision-making. It also doesn't adjust dynamics of having a single buyer who can set a price regardless of what a "market" says.

Just 20% of GeoKrishi users credit the app as being significant to their income uplift. For the remaining 80%, focus group participants made it clear they felt benefits were not always due to GeoKrishi use, but a variety of combined factors and practices—learning from others, income from other sectors, etc.

In terms of business expansion, none of the focus group respondents stated that they had expanded their business.

"Having said that income had increased, they noted that this growth in their livelihood could not be solely attributed to the app, as several other factors contributed to improving their quality of life. This was possible due to their own effort and willingness to be independent."

- GeoKrishi focus group facilitator

Livelihood improvement

For Farmers

The app is making work more efficient and saving farmers labor and expenses by providing services like the agrovet (eliminating need to travel) and timely weather reports (allowing preventative action).

"Another benefit of the app that respondents highlighted was that they did not need to attend actual training sessions, as the app provided all the necessary information. This feature of the app saved their time and offered convenience…They acknowledged that the app did help them manage their agricultural and animal husbandry businesses more effectively."

- User focus group facilitator (FGF)

For Agents

GeoKrishi directly employs 50 field agents, many of whom are young adults who gain meaningful skills through this employment opportunity. Of 22 GeoKrishi agents surveyed, half said that the job met all of six decent work factors. The two factors with some disagreement were access to benefits such as healthcare and sufficient income to meet household needs.

Increased resilience

Climate resilience

A little less than half of surveyed farmers (46%) report having adapted their farming practices to better respond to changing climatic conditions, though a majority (88%) reported that GeoKrishi services had enhanced their decision-making capabilities. Respondents consistently noted that the weather forecast feature of the app has made for improved and easier decision-making, specifically during planting and harvesting.

"I was checking the forecast for the week and discovered that heavy rain was expected in the coming days. As a result, I decided to harvest my crops a day earlier than planned. True to the app's prediction, it rained on the day indicated! I was so happy, I was able to save my crops."

- GeoKrishi user

Financial resilience

Of GeoKrishi users surveyed:

- **62% reported improved resilience to economic shocks**
- **77% feel more financially secure**

Focus group participants mentioned factors other than GeoKrishi contributing to greater financial security, including community cooperatives offering loans.

Given income earned from remittances, farming is often not the sole or primary income source, especially for women. Using GeoKrishi services provides resilience with a greater buffer between income from remittances and the ability to meet food and financial needs of a household. It also has potential to provide greater financial independence for women reliant on remittances.

72% **of farmers surveyed agreed they are gaining new skills through interacting with GeoKrishi, both online and offline**



What role are market conditions playing?

Nepal's economy is dominated by agriculture. Two-thirds of the population participates in subsistence farming. Agriculture (both crop and livestock) accounts for 34% of Nepal's GDP.[11] The number of families engaging in agriculture continues to rise, however there has been a decrease in arable land, leading to smaller average size of agricultural holdings.[12]

The government of Nepal is acutely aware of its agriculture-dependent economy's susceptibility to climate change and has a number of forward-thinking plans and strategies in place:

- **Agricultural Development Strategy**: pushing commercialization and cash crops[13]
- **Climate-Smart Agriculture Investment Plan (CSAIP)**: promoting climate-smart agriculture and aligning investments and policies to increase resilience and reduce greenhouse gas emissions
- **National Adaptation Plan**: coordinating climate adaptation actions at all levels and integrating into policies[14]
- **National Digital Agriculture Strategy**: integrating digital technologies into agriculture by focusing on resilient infrastructure, capacity-building in digital skills and enhanced public-private collaboration[15]

Overall, Nepal's economy is growing, with a significant jump in growth between 2023 and 2024. This is due, in part, to a significant portion of individuals working abroad and sending remittances home, accounting for 24% of the country's GDP.[16] Hydropower production, improved performance in agriculture and tourism also contribute to economic growth.[17]

Basic and digital literacy



Literacy rates in 2023 were 65% in rural areas, 73% in urban areas and 88% in Kathmandu.[18]

Also in 2023, a survey indicated that national digital literacy was at 31%[19]. Recognizing this, the government of Nepal launched a "Digital Nepal for All" campaign and programme. It has developed a national network of digital learning centres in both large and small cities, where citizens can receive free computer literacy and internet training.[20] Business owners are noticing a shift in the acceptability of digital services as a result of this campaign.[21]

Despite increasing adoption of digital apps in Nepal, GeoKrishi focus group data suggest issues like updates or new features can more easily lead to disorientation and user drop off.

Ownership of smartphones and use of mobile is on the rise. For the more than 50% of Nepali households that have someone working abroad, mobile is their means of communication. However, this does not always indicate additional use or comfort with mobile technology.

"When asked about their knowledge of mobile applications, they revealed that their husbands had taught them to use two applications—WhatsApp and Messenger. They primarily used these apps to communicate with their spouses, neglecting other features of their phones."

- GeoKrishi focus group facilitator

Influence

GeoKrishi growth and product use

For many users, adopting **GeoKrishi initially requires specific in-person promotion and training on how to use the app**.

"The orientation on app usage took place a few years ago but [participants] noted that due to their illiteracy, other participants could not continue using it."

- GeoKrishi focus group participant

"The lack of a person to orient them about the app, its advantages, and its methodology to use had hindered them from using the app."

- GeoKrishi focus group facilitator

The GeoKrishi Farm app has a 32% attrition rate, which focus group data suggests is largely due to inability to follow app updates.

"The app's interface had been updated, and during a previous attempt to reinstall it, he found the new features confusing."

- GeoKrishi focus group facilitator

Potential impact for GeoKrishi users

Users are often dependent on trainers from GeoKrishi or a younger generation to help them access useful information within the app. It makes the benefit precarious.

"One respondent noted that she used the app longer than the others, with the support from her children, who helped her understand it. However, after her children went to Kathmandu for further studies, she too stopped using the app."

- GeoKrishi focus group facilitator

Climate change and farming



Approximately 80% of Nepal is vulnerable to multiple natural hazards. It is one of the top 20 most multi-hazard prone countries in the world and the number of extreme rainfall events is projected to rise 30-50% by 2050.[22]

It is estimated that the agricultural sector suffers 10-30% production losses due to climate change—drought being the most common cause.[23] This threatens the national economy and food security and the government has identified priority sectors in a National Adaptation Plan to proactively respond.[24]

Despite the rapidly changing climate, implementing adaptive practices can be difficult in practice. GSMA research has found that, "although 88% of farmers said they had noticed changes in weather patterns and extreme weather events over the past five years, 70% had not made any specific changes to adapt to the impacts of climate change. Just 18% stated they had changed the crops they farmed to adapt to new weather patterns."[25]

Influence

GeoKrishi growth and product use

GeoKrishi's product is **in alignment with Nepal's national priorities and needs driven by climate change risk**. As climate change intensifies risks such as erratic rainfall, the need for timely, tailored information for farmers becomes more urgent.

While disseminating climate-smart agricultural information is important, **GeoKrishi should also consider broader behaviour change dynamics**. For example, focus group participants highlighted that even when farmers receive advice through the app, they may lack access to necessary resources, such as irrigation or improved seed varieties to implement changes.

Potential impact for GeoKrishi users

By receiving useful and impactful advice, GeoKrishi users could experience greater climate resilience and food security for their families. However, **if supply or other hurdles are not addressed the ability to take action and reap benefits will remain limited**. When farmers effectively apply the recommendations provided by agri-tech platforms, there are notable improvements in decision-making and crop yields.

Agritech in Nepal



There is a robust agritech industry in Nepal, rising to meet the challenges of climate change and a dominant agriculture sector. On average, one new agritech company launches each year in Nepal; GeoKrishi is rated as one of the top five agritech companies in Nepal.

In 2019 the UN Capital Development Fund hosted an innovation challenge in tech. In just three weeks it received a total of 123 registrations and 69 final submissions. Of eight finalists, two companies work in the same space as GeoKrishi, working to address timing and information gaps for farmers.[26]

GeoKrishi was early to market, winning a 2017 prize funded by USAID's Feed the Future for data-driven farming solutions. GeoKrishi was named the most viable solution.[27] Today, GeoKrishi has a few direct competitors offering similar services and of similar size, including SmartKrishi and IFA Krishi.[28]

Not only is the list of government plans and strategies supporting their development impressive, but continued growth of the agritech sector overall is encouraged through events like Driving Innovation through Digital Agriculture, 2024, a two-day event that gathered all the major players in this space to work together to address the digital divide in Nepal's agricultural sector.[29]

Influence

GeoKrishi growth and product use

More press, more competitors and more networking all work **to make space and acceptance for digital solutions in agriculture which works to grow the market for GeoKrishi. It simultaneously puts pressure on GeoKrishi to maintain high quality and its competitive edge**.

Existing research on agri-tech adoption shows that high-adoption tools are those that prioritise climate-smart agriculture, farmer empowerment, and collaborative platforms.[30]

GeoKrishi growth and product use

This environment provides users many options, though outreach is an important part of user adoption. **Just 1 in 6 GeoKrishi survey respondents said they were aware of other similar services before using GeoKrishi**. In addition to other mobile applications users are also using other information channels, such as YouTube. Farmers' trust and discernment is needed to sort good from bad messengers.

Internet and phone affordability



Nepal is within the affordability threshold set by the UN Broadband Commission, which aims for entry-level data plans to cost less than 2% of monthly GNI per capita.[31] Still, digital is more expensive in Nepal than for neighbors in the region due to heavy taxation on internet service providers and inefficient use of telecom infrastructure.[32]

In July 2021, the Nepal Telecommunication Authority (NTA) enacted an infrastructure sharing law to ease the financial burden for service providers and bring costs down.[33] Since then, the price of data has gone down nearly 60% for 1GB over the last four years.[34]

The majority (about 73%) of the population in Nepal have smartphones, and the market for these devices is projected to grow rapidly.[35] However, the cost of a smartphone remains relatively high due to an 18% taxation rate and no in-country manufacturers or company retail stores.[36] Phones are sold through national distributors, regional distributors, retail stores and mobile stores.[37]

Influence

GeoKrishi growth and product use

GeoKrishi's partnerships with mobile network operators offer subsidised data packages, which are important for expanding access—especially as government investment improves internet infrastructure nationwide. With smartphone use growing, these partnerships are increasingly important for reaching rural users.

Still, **lack of smartphone access remains a key barrier**. Many users stop using GeoKrishi due to broken feature phones or inability to afford smartphones.

GeoKrishi growth and product use

Budgeting for internet access and new phones amidst economic uncertainty and migrant labor may prove to be a challenge for potential and active GeoKrishi users.

Internet access and quality of service



GSMA Intelligence's data suggests that 80.5% of mobile connections in Nepal can now be considered "broadband", which means that they connect via 3G, 4G or 5G mobile networks.[38] Nepal has 4G coverage in all 77 districts, but it remains relatively slow compared to other countries. The government of Nepal is attempting to address some of these speed and service challenges via the Rural Telecommunications Development Fund (RTDF) which requires ISPs to contribute 2% of their annual income to this fund.[39] Additionally, mountainous terrain makes both telecom and electric infrastructure difficult to install and maintain.

The high rate of mobile connections also hides the fact that internet penetration is still only 49.6%—suggesting that 50.4% of the population remained "offline" at the start of last year. Using the internet is still not culturally normative for many segments of the population.[40]

Influence

GeoKrishi growth and product use

Recognizing access issues, GeoKrishi plans to establish 250 brick-and-mortar e-Chautaris to provide in-person agricultural extension services, financial services and market access. This is a substantial investment to accommodate for difficulties in pricing and mobile service in the country.

GeoKrishi growth and product use

The quality and/or consistency of the connection for many of GeoKrishi's users may be tenuous. Parts of GeoKrishi's offerings may be impractical to many users, such as their training content via video. **'Technical issues' was the most common reason among survey respondents for stopping use of GeoKrishi**. Traveling to in-person e-Chautaris increases access, but also decreases the value proposition of easing workload and time poverty.

Labor migration and remittances



Female-headed households are on the rise over the past decade, from 19% to 32.4%, due to increased migration of rural men for work in other countries.[41] More than half of all Nepali households now have a family member working abroad.[42] Families are choosing migration for reasons of financial and food insecurity as well as climate change.[43]

This has led to an increase in women actively participating in farm activities. On a practical basis it means that previously men were the ones to do land preparation, repairs to terraces, make animal shelters, cut bamboo and transport millet or maize to the mill. More and more, these tasks fall to women.[44]

Although remittances contribute to financial stability of a household, it is generally found to be a precarious and unstable source of income, necessitating a combination of subsistence and commercial farming to build financial and food resilience for families.[45]

Influence

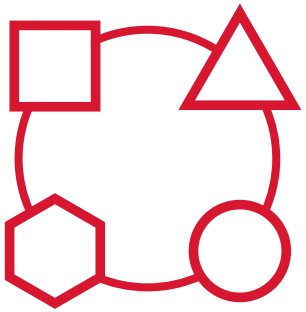
GeoKrishi growth and product use

There is economic pressure on families to maintain and maximise both subsistence and commercial farming efforts, driving demand for information and resources that will help them accomplish this.

GeoKrishi growth and product use

Many women, although familiar with farming, may find themselves new to both the labor and decision-making required of farming. **GeoKrishi can be an important part of providing key information** to help them in these roles and they may have a greater willingness to accept advice and resources.

Regional diversity



Nepal has three distinct ecological zones that require quite different farming advice and have different access to different markets.

Additionally, only 45% of the population are native Nepali speakers; there are an estimated 122 languages spoken across the country and, on average, nine major languages are spoken per district.[46]

Influence

GeoKrishi growth and product use

The product offering is in Nepali and some local languages, but not all, which causes drop off because users can't access the GeoKrishi in their language.

"This creates a challenge in ensuring farmers consistently use the app and often leads to user dropouts."

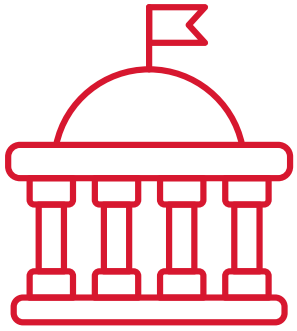
- GeoKrishi trainer

Users also do not use some of the features due to lack of localization—for instance, the market prices feature is often inaccurate and there is often no availability of recommended climate smart inputs.

GeoKrishi growth and product use

The market price services are often inaccurate for users so do not provide value for making better selling choices. Recommended inputs may not be available so they cannot take action to improve their farms. Limited translations limit use and impact of the product.

Governmental agricultural extension



At the local level, District Agriculture Development Offices (DADOs) operate to support agricultural initiatives and provide extension services to farmers.

The government offers training and inputs, but its notification system is poor, leading to missed opportunities.

"The notifications/information regarding agriculture (distribution of manure/seeds/ training to the farmers) were very delayed and reached them very late. Sometimes, they found that the training or distribution program had already ended when they received the notification."

- GeoKrishi focus group facilitator

Both fertiliser and irrigation issues loom large for farmers, and the government has a mixed track record in meeting these needs.

Influence

GeoKrishi growth and product use

Local government services mirror some of what is available in the GeoKrishi app, creating a potential for amplified effect when coordinated.

The farmers looked forward to coordination between the local government and GeoKrishi. As a result of this coordination, the farmers expect to receive government-related information on time and receive timely support from the government as well.

- GeoKrishi focus group facilitator

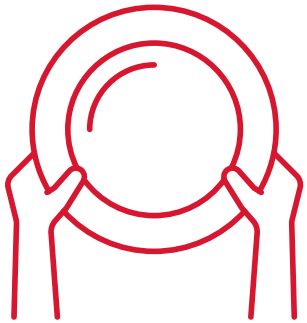
GeoKrishi growth and product use

If GeoKrishi can promote, through timely notification, government support and services relevant to their users, then the government can help fill some of the supply and training gaps that GeoKrishi is not currently able to fill.

Respondents suggested better coordination between the app and local government to tackle the fertiliser-related problems in their communities.

- GeoKrishi focus group facilitator

Food insecurity



As of October 2024, 16.5% of Nepal's population was food insecure—4.81 million people had inadequate food consumption, with worsening access to food in mountainous regions.[47] On average, food spending accounts for at least 57% of people's total spending.[48] Land use and food insecurity are intertwined; most farmers are both subsistence and commercial in nature—needing food grown to meet immediate nutritional needs. Producing food also contributes to overall resilience helping households cope with diverse shocks and stressors.[49]

Nepal has recently significantly reduced hunger; the reason may be increased buying capacity of people through remittances. In one study farmers were asked to estimate the proportion of remittances spent on different items. Food was by far farmers' biggest expenditure.[50]

Influence

GeoKrishi growth and product use

Farming is necessary to meet food needs for a majority of households so it is not likely to decline amidst climate changes, migration or urbanization.

GeoKrishi growth and product use

Being able to reliably meet nutritional needs for a family is important and motivating. If they are able to exceed this and increase income through partial commercialization, then optimization in farming practices offers tangible benefits.

Conclusions

GeoKrishi is not the only one to notice that **Nepal's population overwhelmingly participates in agriculture and is particularly vulnerable to climate change—action is needed**. The government of Nepal has been proactive in planning for and addressing these same issues, as have other agritech businesses. All have taken note of the opportunity that mobile and digital innovation offers to provide added value to climate-smart agriculture.

The government of Nepal, along with GeoKrishi and their competitors, are working to shift farming behaviours toward climate-smart solutions and farmer behaviours toward digital information-seeking and use. Some of the practical infrastructure, both for telecom and for farming inputs, still lags in support of this transition. It requires a multi-pronged approach.

As farmers make use of all the tools available to them, GeoKrishi included, they are having success in increasing yields, adding or growing commercial farming options for themselves, and ultimately increasing their family's food and financial security.





What were the main benefits and for whom?

Who

Farmers in the fertile Terai region, who tend to be more educated, banked, and own slightly more land than fellow Nepalis. Not many users fall within the poverty line, but about a quarter of users are quite vulnerable at 200% of poverty.

Users are not native digital or mobile users and not overly familiar with climate-smart agricultural practices.

Main benefits

Helping farmers increase yields and incomes, leading to stronger savings and food security.

Not

Working in a silo. Only 20% of users surveyed attribute income uplift to GeoKrishi. While GeoKrishi is a contributor, users attribute their position to a number of factors, including their own diligence.

What market conditions influenced these results?

There is a robust market in Nepal for both telecom and agritech companies. The national government of Nepal is notably involved in both through national planning (of which there is much) and policies such as taxation, infrastructure sharing bylaws and rural development funds to address inequity.

GeoKrishi has been strategic in recognizing and responding to key market conditions:

- Increasing impacts of climate change
- Growing digital literacy and inclusion
- The need for localization across varied terrain
- A strong agricultural industry.

GeoKrishi has a part to play in shaping these factors across this ecosystem. It will need to remain responsive and deliver quality services in order to stay relevant

What does digital have to do with it?

Digital contributes an important part of the value proposition for GeoKrishi. Services delivered via mobile allow for:

- Providing timely advice where being prompt matters
- Easing work by making travel less necessary
- Providing localised and customised information for users' needs.

Still, adopting new farming practices and digital tools can be a big shift, and farmers often need ongoing support to make that change. Agents and in-person training centres play a key role by offering hands-on help and encouraging continued use of the app—similar to how mobile phone stores help people get comfortable with their devices.

Since GeoKrishi's value depends on mobile access, any issues with connectivity can weaken both the app's use and its impact. To keep users engaged and ensure lasting benefits, digital tools like GeoKrishi need to be backed by strong infrastructure.

Importance of digital to Lumkani's impact



Endnotes

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The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing MNOs and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

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Radicle DEVELOPMENT

Radicle Development

Radicle Development is a consultancy committed to supporting transformation within and for organizations seeking social change. Using evaluation, strategy, and design, we get to a root understanding of how systems work and what new learning, strategy, or action can help positive change grow.

Authors

Anna Martin, Co-founder, Radicle Development
Jennifer Compton, Co-founder, Radicle Development

Visual Design

Julie Visco

Contributors

We would like to thank the following experts and innovators for their valuable contributions to this research:

Ruth Orbach, Director of Monitoring, Evaluation, and Learning (MEL), M4D: Central Insights Unit

Caitlin Blaser Mapitsa, consultant to GSMA Innovation Fund

Jamie Robertson, consultant GSMA Innovation Fund

TripleLine Consulting

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