

EVENT REPORT



Digital Technology for Women Farmers and Entrepreneurs in Nepal: A Stakeholder Dialogue

28th February, 2024

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Organized By:



Event Details

Name of the event:	Digital Technology for Women Farmers and Entrepreneurs in Nepal: A Stakeholder Dialogue
Date:	28 th February, 2024
Venue:	Dhokaima Cafe, Patan Dhoka
Time:	8:30 to 13:00
Organizers:	Southasia Institute of Advanced Studies (SIAS) and Aria Solutions
Speakers:	Keynote Presenter: Hon. Dr. Bimala Rai Poudyal, Member of the Parliament, Upper House
Panelists:	Dr. Smrittee Panta, Mr. Rajan Man Bajracharya and Mr. Arvind Shah
Presenters:	Dr. Mani Ram Banjade and Bibhor Kayastha
Number of Participants:	32

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I. Context

The agricultural landscape in Nepal is integral to the country's economy, with a significant proportion of women actively engaged in the sector. However, women farmers face challenges posed by climate change, increasing trends of male labor migration, and the country's unstable economy. The challenges are exacerbated by traditional gender norms that limit women's ability to navigate these issues effectively, while experiencing an increase in their work burden.

In this light, the project titled "Co-producing a shock-resilient business ecosystem for women-engaged enterprises in Nepal (CREW)" is being implemented to investigate and create an environment that supports women entrepreneurs, with a specific focus on developing a gender-responsive and shock-resilient entrepreneurial ecosystem in Nepal. The overarching objective is to co-produce solutions that promote financially sustainable and shock-resilient agriculture enterprises, empowering women economically. The project is led by Southasia Institute of Advanced Studies (SIAS) in partnership with Aria Solutions, Himalayan Bio Trade Pvt. Ltd., and NIMS College.

One of the major components of the project is action research on the role of digital technology in strengthening the ecosystem of support for women farmers in Nepal. In recent years, the agricultural sector in Nepal has witnessed significant transformations, with digital technology playing a pivotal role in enhancing productivity, sustainability, and inclusivity.

Women farmers, however, have faced multiple challenges in adopting and benefiting from digital technologies. In such a context, the Southasia Institute of Advanced Studies (SIAS), together with Aria Solutions, organized a national-level stakeholder dialogue on February 28, 2024. The dialogue aimed to share the learnings of the CREW project and facilitate discussions among different stakeholders regarding the prospects and challenges of digital advancements for women farmers and entrepreneurs in the Nepalese context. Additionally, the dialogue intended to drive policy change by engaging participants in constructive discussions contributing to formulating gender-responsive

policies that promote innovative solutions and resilient entrepreneurship among women farmers.

The dialogue brought together diverse stakeholders, including representatives from policy makers, banking institutions, digital service providers, researchers, academicians, development practitioners, and bilateral institutions. Hon. Dr. Bimala Rai Poudyal, a Member of Parliament Upper presented the key note address. The dialogue started with brief welcome remarks from Ms. Gyanu Maskey, Researcher at SIAS followed by the participant's introduction.

2. Presentations

2.1 Presentation by Dr. Maniram Banjade, Principal Investigator of the CREW project and Senior Research Fellow at SIAS

Dr. Banjade provided an overview of the background and objectives of the CREW project. His presentation focused on the major research questions and methodologies adopted during the period, while also highlighting the interventions made in three research sites (Ramechhap, Arghakhanchi, and Dolakha) to meet the project's specific research goals.

Some key points of the presentation:

- The research is focused on creating a supportive environment for building a gender-responsive and shock-resilient entrepreneurial ecosystem for women in Nepal.
- The major considerations during the research design were – understanding both subjective and objective dimensions of Women's Economic Empowerment (WEE) measures, integrating an intersectional approach, co-production of a resilient business ecosystem, use of mixed methods (both qualitative and quantitative), and ensuring the sustainability of the interventions.
- Worked with women farmers and entrepreneurs involved in legume farming, NTFPs, and vegetable cultivation to explore the gender-based constraints in different nodes of the value chain and find ways to overcome them.

- Facilitated technological and institutional interventions by strengthening the 'ecosystem of support' (through interventions on improving the production environment, value addition and branding, technological support, linkage with financing and market).
- Strengthened the capacity of women farmers and entrepreneurs to increase political space, agency, and voice in collective action arenas.
- Worked in three different commodities in three districts: Ramechhap-legumes, Dolakha-wintergreen, and Arghakhanchi-vegetables to strengthen WEE.
- The project adopted participatory research approaches and strategies to achieve the expected outcomes that included improved women's voice in the decision-making process, improved access to resources, uptake of gender, and climate-sensitive policies, improved digital and financial literacy, improved access to market, capacitated women champions, and enhanced resilience of women engaged agriculture and forest-based enterprises.
- The conceptual framework that guides the 'Ecosystem for support' Approach comprises five major domains that should be equally addressed to achieve WEE. These five domains are the socio-cultural domain, environmental domain, policy domain, technological domain, and economic domain.
- Methods adopted: 612 household surveys including both the baseline and endline survey. Likewise, sixty key informant interviews, three visioning workshops, six deliberative forums, four GESI and local planning process orientations, thirty-one focus group discussions, twenty-three stakeholder meetings, and nine case studies were conducted during the period.
- Key interventions in Arghakhanchi: Technical and extension support in vegetable production, engagement with the marketing group to revive the *haat-bazaar* - post-Covid, facilitation on Gender Responsive Budgeting in one Palika, financial support to women co-operatives, women's groups, and the marketing group, to implement their plans
- Key interventions in Dolakha: Wintergreen regeneration experiments, Strengthening CFUGs governance, and pilot testing of energy-efficient technology for wintergreen oil distillation

- Key interventions in Ramechhap: skills for production and post-production handling of legumes, soft skills in financial literacy, digital marketing (*Khalti wallet app, Prabhu Bank*), capacity enhancement of cooperative executives, and institutional development, market mapping, partnerships with women-led businesses, value-chain analysis, brand guidelines and materials developed and used

2.2 Keynote Speech: Hon. Dr. Bimala Rai Poudyal, Member of the Parliament, Upper House

Hon. Dr. Bimala Rai Poudyal commenced her speech by sharing the story of a woman farmer whose daily workload was reduced by the innovation of simple technology (in her case, it was a tool that helped to collect the dung of the cattle). This tool was enthusiastically embraced by her husband and children, relieving her of the sole responsibility of the task. Hence, Dr. Poudyal stressed the innovation of such technologies not only reduces the workload of the women but also contributes to reshaping the gender roles. Similarly, during her visit to a village in Madhesh province for monitoring, all the farmers, including women farmers present in the meeting, were using mobile phone applications to access weather information for planning their field calendar, which she found was very impressive. She remarked that even though digital technology is not accessible to all women in all places, its use is expanding.

'The global agricultural system, including Nepal's, is in critical condition in the face of changing climate, global economic crisis, food price inflation, and decline in population engaging in agriculture sector' highlighted Dr. Poudyal. She added that compared to 2019, the number of people suffering from hunger increased by 12.2 crores globally in 2022. Likewise, she noted that 29.6 percent of the world's population faced food insecurity in 2022, and without the increase in sustainable agriculture production, the situation will worsen. Dr. Poudyal stressed that the most effective solution to address the challenges of the existing agriculture system lies in investing in science and adopting new technologies and systems.

Dr. Poudyal remarked that there has been a notable feminization trend in the agriculture sector, emphasizing that women increasingly bear all the farm responsibilities as more men migrate out of the rural areas. 'Women are the 'de

facto' managers of their farms' highlighted Dr. Poudyal. She pointed out that despite women's significant engagement in farm activities, the extension services do not reach the women farmers as extension workers often typically prefer reaching out to the head of the family, who is male in the majority of households. She further noted that despite significant contributions to the agricultural economy, their efforts are often overlooked and undervalued. Highlighting the substantial time and workload contribution of women in agriculture, Dr. Poudyal stressed the need for innovative solutions to reduce their burden and resolve the issue of time poverty.

She asserted COVID has acted as the catalyst for rapid digital technology development, notably the expansion of the digital and financial market in Nepal. 'Increased access to internet services has widened the development and utilization of digital technology, consequently improving access to finance and the market,' added Dr. Poudyal. She also noted there are ample examples that demonstrate the integration of technologies and digital tools in the agriculture sector has resulted in knowledge transfer, increased production, expanded market, and enhanced resilience and sustainability of the agricultural system. She emphasized that such innovations not only increase crop production but also reduce post-harvest loss. Furthermore, she remarked that adopting digital technologies increases women's access to information on various activities of agriculture from sowing to selling their products, enables farmers to engage in several nodes of the value chain, reduces transaction costs, and supports employment generation.

However, Dr. Poudyal cautioned that despite the agricultural products being marketed digitally, the access and control of the farmer over such markets is still limited. 'Access to digital technology for all regardless of their social structures and geographical location is a significant milestone to achieve' remarked Dr. Poudyal. In addition, she noted the efficacy of digital tool usage is linked to the reliability of the existing database, which in our context is not dependable, despite improvements in its status. She further explained even though women are less likely to own smartphones in our societal context, they are smart and enthusiastic about adopting new technologies. However, factors such as the low literacy rate of women, accessibility and affordability of the internet, workload, and the existing gender norms like negative attitudes

towards women spending more time on their phones also hinder the uptake of digital technology by women.

Dr. Poudyal reiterated that digital innovations can enhance women's efficiency, reduce their workload, and contribute to women's economic empowerment. She suggested two pathways to support women's economic empowerment through digital technology. Firstly, by promoting digital tools as a platform to facilitate networking between women farmers and experts for knowledge exchange of good agricultural practices, market trends, and financial management. Secondly, she stressed the importance of developing technologies that address the challenges farmers face, especially women farmers at all nodes of the value chain. Dr. Poudyal highlighted, 'development of digital tools should be demand-driven and human-centered design to cater to the needs of the users.' Besides, she also pointed out that promoting and investing in digital innovations can serve as the motivation to increase youth engagement in the agriculture sector.

Dr. Poudyal also shed light on several other factors besides developing digital tools for enhancing effectiveness. She pointed out the significance of investing in infrastructures like electricity and internet access to support the usage of digital technology. Likewise, Dr. Poudyal stressed the importance of providing information about the available technologies to the farmers, especially women farmers as well as the necessity of skill and knowledge transfer to effectively utilize the technology. She asserted that investing in all the aforementioned components, in addition to the development of technology is crucial to achieving the intended outcomes. Concluding her speech, Dr. Poudyal stressed the need for designing women-friendly and women-responsive applications tailored to address their challenges, and policy instrument formulation - to promote innovations, monitor their both positive and negative impacts, and ensure user privacy and data security.

2.3 Presentation by Mr. Bibhor Kayastha, Founder Director of Aria Solutions

Mr. Bibhor Kayastha, in his presentation, highlighted Aria's role in the CREW project focusing on major technological interventions in Ramechhap, a key research site of the project, aimed at the economic upliftment of women farmers and their cooperative. He also discussed the significant challenges

encountered during the project and shared key learnings from the engagements.

Some key points of the presentation:

- Worked with legume producers and their cooperative for branding and marketing the legumes, strengthening the management of the cooperative that was still in the primitive stage and promoting the use of digital technologies for the economic upliftment of women farmers and their cooperative
- Digital technologies piloted were: the use of CoSys- a core banking software to digitalize their transactions, in-house development of farm to fork software for business intelligence and to support the decision-making of the cooperative, and development of a website, and social media for branding and marketing.
- To promote the economic resilience of women farmers training on personal finance management and information about the available applications like Sampatti, MunshiG, and different mobile banking applications were provided. Likewise, the farm-to-fork software is targeted to help farmers estimate their production but this could not be applicable.
- The Farm to Fork software was designed to serve purposes such as cooperative member profiling, production planning, customer relationship management, record keeping of purchases, sales and stock data, and accounting.
- The Char Gharey brand has been established and the use of social media helped with the digital marketing of the brand. Due to the high operational cost of selling in small packages, selling legumes in bulk was preferred.
- The efficient operation of the cooperative and handling the technologies intervened through the project seem challenging to the cooperative due to several reasons such as low scale of production, low digital literacy, limited accessibility of devices and connectivity, time constraints, lack of faith in technology, limited resources for follow-up and continuous training, and low engagement and enthusiasm among the cooperative members.

- Some of the few learnings during the two-year engagement are: Cost-benefit analysis from a user perspective is crucial in application development, concrete workflow procedure is essential for developing a digital platform, and fostering digital literacy and awareness is pivotal for ensuring the uptake and sustainability of digital technology.

2.4 Feedback and question answers on presentations:

In response to a participant's inquiry about **Imo's popularity** in the research area, Mr. Bibhor Kayastha replied that with the increased number of migrant workers from rural areas, the use of social media platforms is notable, and among these Imo is more popular because of its better video quality even in the low data connection. So, he recommended that Imo could be a better platform for effective branding and promotion.

Likewise, when a participant inquired about **the major factor that hindered the uptake of business modality by a cooperative**, Mr. Kayastha pointed out that staff retention was the major issue, particularly in an agri-cooperative that recently adopted the business model. He shared that two women from the village were trained to operate the software and handle all the technical responsibilities of the cooperative but both of them did not continue the work and moved to Kathmandu in pursuit of better opportunities. Moreover, he mentioned that the project has trained board members to capacitate them with the technical skills and Aria Solutions has committed to pay for the CoSys software and server for the next three years.

One of the participants, representing the banking sector was curious to know if **the farmers were willing to readily share their details easily** considering that banking customers often hesitate to share their information. Mr. Bibhor Kayastha noted that they faced a similar challenge as farmers were hesitant to share the details of their assets. Likewise, the farmers were also reluctant to share their photographs.

3. Panel Discussion

There were three panelists: Mr. Rajan Man Bajracharya – Founder MD of the GeoKrishi app, Mr. Arvind Shah – Co-founder of Khalti and Sparrow SMS, and Dr.

Smrittee Panta – Associate Academic Director and program head of BHM/BHTM Little Angles' College of Management. They shared their insights, experiences and research findings about technological advancements in Nepal's agriculture sector. The panel discussion was jointly moderated by Dr. Maniram Banjade and Mr. Bibhor Kayastha. The insights shared by the panelists has been described in the following section.

Panelist 1: Mr. Rajan Man Bajracharya, Founder MD of GeoKrishi App

Mr. Bajracharya highlighted that the GeoKrishi app aims to develop a digitalized agricultural system to provide timely contextualised actionable information to increase farm productivity and maximize profitability. He further informed that they provide five products namely, GeoKrishi Farm (for farmers), GeoKrishi EXT (for extension workers), GeoKrishi Enterprise (for operational and strategic decision making), Geo Krishi Agrovet (for agrovet input suppliers) and *Samuhik Bazar* (for efficient supply chain operation) to facilitate the agricultural system. He further elaborated that the app records the land location and the priority crops of each farmer to provide tailored information to help farmers throughout the farming process from sowing to harvest and post-harvest. 'Likewise, we also provide advisory services to increase the farm productivity by providing the information on scientifically proven farming techniques', said Mr. Bajracharya. Notably, they recently worked with CIMMYT to communicate the efficacy of split fertilization in maize to farmers through ICT, radio programs, and pamphlets. 'However, there exist adoption challenges of information and techniques', highlights Mr. Rajan Man Bajracharya.

Likewise, in response to the moderator's quick concern about the Digital Nepal Framework (DNF), Mr. Bajracharya noted despite its endorsement in 2019, there has been limited progress in the agriculture sector. He remarked that digital literacy has not been much highlighted in DNF. He emphasized that GeoKrishi has been entrusted with the assignment to draft the national-level digital agriculture strategy and action plan based on DNF. He also shared that the digital agriculture framework does not explicitly reference the Agriculture Development Strategy (ADS) 2015-2035. Therefore, the digital agriculture strategy is trying to converge the objectives envisioned by both the ADS and DNF. Additionally, he also underscored their other initiatives such as facilitating digitization of demand and supply of seeds and seed subsidy programs for

cereal crops such as rice, wheat, and maize, all of which are guided by the principles of DNF.

Mr. Rajan Man Bajracharya highlighted the major challenges in bridging the digital divide, particularly the lack of access to resources and information that deprives farmers, especially women farmers of acquiring new knowledge. Mr. Bajracharya noted that GeoKrishi has been conducting several awareness and literacy programs to address these challenges and elucidate the benefits of digital technology to them. Besides, he mentioned their proactive engagement with smallholder farmers through e-chapter, an advisory hub equipped with internet connectivity to provide bundled solutions and services to them. He explained these e-chautaris are housed in wards, municipality offices, cooperatives, and farm-based organisations mainly to connect farmers with agriculture experts.

Panelist 2: Mr. Arvind Shah- Co-founder of Khalti and Sparrow SMS

Mr. Arvind Shah outlined Khalti as a payment enabler with 3.7 million registered users, among which only 17 percent are female. He clarified that although not directly involved in the digitization of the agriculture sector or devising any products targeted to the farmers, they are open to collaborating with parties that work in the sector to ensure a reliable and efficient payment system. He shared that Khalti recently launched 'Smart Chhori' to empower daughters nationwide through digital and financial literacy. Through the initiative, they provided training to 10 thousand women to use the app capacitating them to adopt the technology. Likewise, Mr. Shah emphasized Khalti's efforts in simplifying the payment process to enhance the engagement of female users. In addition, he mentioned the initiative to sell Yomari using the Khalti platform but despite the people's pre-orders, they faced challenges meeting the demand and they had to ultimately discontinue the service. In addition, Mr. Shah remarked that they have been coordinating with Nepal Rastra Bank (NRB) and the Ministry of Finance (MoF) to start an initiative for enhancing digital/financial literacy. Furthermore, he mentioned that they organize quiz designed to promote financial and digital literacy and provide rewards to the winners within the Khalti platform.

'If we cannot secure the financial transactions, people will be reluctant to use them, and for this, the government should play a proactive role as the private

companies cannot address this challenge alone,' remarked Mr. Shah. Likewise, he urged developers and other private entities to maintain the efficiency of their applications and services as the problem in one server could disrupt the entire system, given the interconnected nature of systems within which multiple service providers operate. Furthermore, Mr. Shah highlighted the occasional mismatch between the policy provisions' ground realities. He also appreciated the operational efficiency of NRB and expressed that if all the government organizations could match its effectiveness, there would be marked improvement across various sectors.

Panelist 3: Dr. Smrittee Panta – Associate Academic Director and program head of BHM/BHTM Little Angles' College of Management

Dr. Smrittee Panta shared the findings of participatory action research conducted in Chitwan and Bardia, focusing on women entrepreneurs who were using the technology, the factors affecting the usage of digital technology among women, and the relation between technology adoption and women empowerment. Dr. Panta gave a brief overview of her respondents to inform the audience that the research findings do not depict the general scenario of the country. She further informed that the research included women engaged in agriculture and selling their products in one way or another to the market.

Dr. Panta highlighted that the women of these sites utilize various digital tools and platforms such as GeoKrishi app, YouTube, and Facebook to learn new knowledge and enhance their skills relevant to their farmwork and enterprise. She noted that women also recognized the time-saving benefits associated with using such technologies. Dr. Panta highlighted that the research adopted The Unified Theory of Acceptance and Use of Technology (UTAUT)- framework, and identified statistically that ease of learning and using applications is the foremost consideration influencing the intention to adopt digital technology. Additionally, facilitating conditions such as time and resource availability, technical support mechanism (in case any problem arises), and compatibility of the desired applications with their smartphones also influenced their intentionality of use. She emphasized in the case of marginalized women, societal perception i. e., how their use of the app is perceived socially, emerged as an additional factor. Hence, Dr. Panta concluded that non-marginalized women entrepreneurs are more likely to adopt digital technology than

marginalized women at the research sites. Likewise, Dr. Panta highlighted that the policy instruments have provisions that the technologies should be youth and women-friendly but fail to mention how this can be achieved. Hence, she emphasized the need for specific guidance for translating women and youth-friendly, policies into practice.

Dr. Panta expressed that several problems exist in the agriculture sector, such as the timely availability of seeds and fertilizers, irrigation, etc., that require innovations that are beyond the reach of digital technology. Hence, she urged everyone not to have unrealistic expectations from digital innovations alone. Dr. Panta suggested that application service providers engage extensively during the design phase to understand the needs and interests of the farmers, to ensure that the applications are truly beneficial to them. She stressed the importance of conducting several design thinking workshops to accommodate the needs of the farmers in the application. Dr. Panta believes understanding users' needs and their existing conditions is the prime factor for the effectiveness of the app. Likewise, she noted the significance of capacity development, suggesting that enterprise development training programs conducted by wards and municipalities should incorporate provisions for promoting digital tools so that the farmers can realize the usability of digital technology for their enterprise development.

4. Discussion session:

Speaker 1: Hrithika Rana, post-doctoral research fellow

Dr. Hrithika Rana, a Post-doctoral research fellow of Kathmandu University (KU) noted that the digital extension was promoted to facilitate easier access to extension services for the farmers in the context that the extension worker to the farmer ratio is 1:2000. She added despite significant investments in promoting digital extensions, progress is minimal. Dr. Rana warned if this situation continues, there will be limited advancement, and neither the conventional extension nor the digital extension will progress. It would instead result in the duplication of programs. Hence, Dr. Rana urged the policymakers to consider this perspective when formulating policies. In addition, she highlighted the sequential phases involved in adopting digital technology. Initially, she stated the knowledge phase, where individuals become aware of

digital tools and their benefits. Next is the persuasion phase, where farmer's social networks such as cooperatives' influence is crucial in fostering awareness and acceptance of digital technology. Following this is the decision phase, in which the adoption depends on individual needs such as weather, crop and market information, efficient time management, etc. She noted a common challenge – despite receiving information farmers often face the unavailability of the prescribed medicine or solution from the agrovet. Hence, she concluded that until the confirmation stage, the usability of the app be it by the male, female, or youth, decreases in each stage. Lastly, she also suggested that app developers think of ways to integrate local and indigenous knowledge.

Dr. Panta agreed with Dr. Rana that integrating local and indigenous knowledge is pivotal, highlighting its practice in various countries, and anticipated that the GeoKrishi app would also integrate farmers' knowledge. She also noted that the farmers do not rely on a single source for information for their farm-related issues as it is the most important component of their livelihood. Hence, they navigate through multiple layers of information before deciding to use a specific information.

Speaker 2: Mr. Govinda Raut

Mr. Govinda Raut of Muktinath Development Bank wanted to know if Dr. Smrittee Panta, in her research site, encountered any instances where individuals received misleading information due to the availability of several contents on various digital platforms on a single topic. Responding to this query, Dr. Panta underlined the lack of reliability of our existing database and emphasized the importance of maintaining an efficient database system.

Likewise, the speaker wanted to know whether Khalti, despite being the payment enabler, has any specific farmer-targeted initiatives or has planned for it similar to 'Smart Chori'. Addressing this concern, Mr. Arvind Shah reiterated that as the payment enabler, their services and products are focused on facilitating the payment process and have not made any initiatives directly linked to the benefits of the agriculture sector and women entrepreneurs. However, he remarked that being part of today's discussion, he realized the need to initiate programs targeted at empowering women.

The speaker also questioned if the GeoKrishi app uses satellite imagery, considering its capacity to provide real-time data, and if it can incorporate satellite imagery. Additionally, the speaker also sought to understand how the application could address the climate-related issues affecting the agriculture output. To his concern, Mr. Bajracharya informed that using satellite imagery, they provided crop suitability information to 100 Palikas based on geophysical, biophysical, and climatic parameters. He mentioned the challenge of utilizing remote sensing data in hills but had successfully employed it for rice health monitoring in Terai. However, the usability of such information in the Nepalese context is minimal.

Speaker 3: Krishna Prasad Sapkota

Mr. Krishna Lamsal emphasized that the Agriculture Perspective Plan and Agriculture Development Strategy have underscored the importance of advancing digital transformation in agriculture, a priority that has been embraced by the Nepal government. He reiterated that COVID-19 has been the major push factor for digital transformation across various sectors including agriculture. Mr. Lamsal shared his happiness regarding GeoKrishi's evolution, broadening its services and reach, and advised that focusing on creating localized videos could further enhance its impact. Similarly, Mr. Lamsal mentioned their efforts in digital soil mapping, which has helped educate farmers about micro-nutrients to farmers, as they struggle to differentiate between crop disease and nutrient deficiency. Lastly, he stressed that collaboration with the government is crucial to streamline these practices more effectively, which can only be achieved through strategic policy-making. Likewise, he also advocated for the necessity of sectoral inclusion in policy-making.

To the concern raised by Mr. Sapakota regarding GeoKrishi's collaboration with the government, Mr. Rajan Man Bajracharya mentioned GeoKrishi's close collaboration with 50/60 Palikas to help them improve and strengthen their extension services, noting the responsibility for smooth extension services lies with the local government. He further expressed their readiness to hand over their app to the local government and even presented their idea to the ministry. Likewise, Mr. Bajracharya shared that despite the resource crunch, they are underway to make crop-specific videos.

Speaker 3: Kabita Kunwar, CIMMYT

Ms. Kabita Kunwar informed that they have been working closely with GeoKrishi highlighting the impact of seemingly small digital interventions in the agriculture sector. For instance, timely SMS notifications regarding the top-dressing fertilizer in maize have significantly changed farmers' lives. She remarked that despite having multiple features in an app, the farmers use the best-suited features, informing weather forecasting as the most popular feature in the Geo-Krishi app, while market information remains underutilized. Likewise, she noted that CIMMYT has been working on land digitization and exploring the use of drones to apply fertilizers with other organizations is ongoing. She also emphasized that the concept of agriculture tool sharing can be beneficial to a community and also expressed the need for digital innovation in the irrigation sector. Furthermore, Ms. Kunwar shared that CIMMYT successfully distributed soil health cards to 5000 farmers last year, with plans to reach 10000 farmers this year. She emphasized the positive response from farmers regarding the usefulness of the soil health cards, suggesting the scalability of this concept for broader impact. To this, Mr. Bajracharya also reiterated that their engagement with CIMMYT for soil health card preparation is ongoing; however, he mentioned that it is not regularly updated due to the lack of appropriate soil labs.

Speaker 4: Sindrela Dewan, Forest Action

Ms. Sindrela Dewan from Forest Action highlighted that the lack of accessible markets and intermediaries poses a significant problem for farmers. In this context, she inquired if the GeoKrishi and Khalti apps have taken any initiatives to bridge the gap between producers and consumers. Regarding the market linkages, Mr. Bajracharya highlighted the importance of quality, quantity, and reliable supply as crucial factors to consider.

Dr. Maniram Banjade highlighted mobility constraints mainly due to gender-based roles and lack of safe transportation facilities as the major hurdle preventing women from progressing to higher nodes of the value chain. However, with the introduction of a digital system, their engagement at higher nodes of the value chain has increased by improving their access to market information. He also summarized that the major concern raised throughout the

discussion centered on methods to mitigate the risk factors associated with payment applications.

Mr. Bibhor Kayastha emphasized the critical need to focus discussions on increasing access to finance or credit to smallholder farmers or the actors at the lower nodes of the value chain. He pointed out that though private sectors have made strides in the digitalization of the agriculture sector, it remains considerably limited. Hence, he underlined the significance of discussing the roles of different stakeholders, including government institutions, to scale up these initiatives.

Remarks by Ms. Pushpa Gyawali, Agriculture Extension Officer, Department of Agriculture Development

Ms. Pushpa highlighted the evolution of extension services beyond the public sector, including private sectors, NGOs, and INGOs, which she remarked is leading to program duplication. Hence, she highlighted the need for collaboration between service providers and government organizations which would also be helpful to fulfill the staffing limitations at the local government, especially in the agriculture sector. She mentioned that the Ministry of Agriculture and Livestock Development, along with the Agriculture Department, developed a software- market price information system- that updates the everyday price of fruits and vegetables. She noted that the information can be assessed from the website of Kalimati Fruits and Vegetable Market Development Board. They have extended this software to update the daily price of vegetables and fruits of 11 vegetable wholesale markets under the Government of Nepal, to facilitate better marketing for farmers and consumers. Lastly, she also expressed the need to make user-friendly applications including the need to address the language barriers and high illiteracy rate among most users.

5. Concluding Remarks

Dr. Dil Khatri, Executive Director of SIAS shared this opinion on the transformative traction of digital technology within the agriculture sector, as it supports the production and marketing of agricultural products. However, he also noted the numerous challenges along with the prospects of digital technology.

Highlighting the gap between innovation and technology, Dr. Khatri reiterated the need to reduce the digital divide, as was highlighted by the Keynote speaker. He further stressed the need for investment in the infrastructures crucial for securing the efficient use of digital technology, particularly targeting the workforce, mainly women engaged in the agriculture sector. Furthermore, Dr. Khatri emphasized the significance of incorporating the needs, inputs, and knowledge of farmers in digital tools to ensure their user-friendliness. In addition, he expressed concern regarding the development of numerous applications in the market and advocated for a rather consolidated effort to develop reliable and efficient digital tools. Likewise, Dr. Khatri highlighted the sustainability challenges of innovations made through international support, citing its time and scalability constraints due to the limited funds. He mentioned the importance of ensuring data security for users emphasizing the role of policy and government institutions in this regard. Dr. Khatri stressed the necessity of clear policy provisions addressing all prevalent issues to foster effective implementation and utilization of digital technologies in the agriculture sector. Lastly, Dr. Khatri thanked the keynote speaker, all the panelists, and participants for their valuable time and contribution to the fruitful discussion.

6. Acknowledgements

We extend our heartfelt appreciation to the keynote speaker, panelists, and all the participants for their valuable time, participation, and contribution to a vibrant and fruitful discussion.

Annex 1: Participant's List

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Annex 2: Photos

