Online Conference Report

Importance and Role of Scale Appropriate Machinery in COVID-19 Response including Gender Sensitiveness and Awareness



Cereal Systems Initiative for South Asia



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CSISA COVID-19 Resilience Activity Partners



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CSISA COVID-Resilience Activity



Cereal Systems Initiative for South Asia

21 June 2021, Kathmandu, Nepal



Intensive cropping systems that include rice, wheat and/or maize are widespread throughout South Asia. These systems constitute the main economic activity in many rural areas and provide staple food for millions of people. Therefore, enhancing the yield and productivity of cereal production in South Asia is therefore of great concern. Simultaneously, issues of resource degradation, declining labor availability and climate variability pose steep challenges for achieving the goals of improving food security and rural livelihoods.

The Cereal Systems Initiative for South Asia (CSISA) was established in 2009 with a goal of benefiting more than 8 million farmers by the end of 2023. The project is an example of One CGIAR in action, and is led by the International Maize and Wheat Improvement Center (CIMMYT) and implemented jointly with the International Food Policy Research Institute (IFPRI), the Inernational Water Mangement Institute (IWMI) and the International Rice Research Institute (IRRI). Operating in rural 'innovation hubs' in Bangladesh, India and Nepal, CSISA works to increase the adoption of various resource-conserving and climate-resilient technologies, and improve farmers' access to market information and enterprise development. CSISA supports women farmers by improving their access and exposure to modern and improved technological innovations, knowledge and entrepreneurial skills. CSISA works in synergy with regional and national efforts, collaborating with myriad public, civil society and private-sector partners.

CSISA's Goals

- Facilitate the widespread adoption of resource-conserving practices, technologies and services that increase yields with lower water, labor and input costs.
- Support mainstreaming innovations in national-, state- and district-level government programs to improve long-term impacts achieved through investments in the agricultural sector.
- Generate and disseminate new knowledge on cropping system management practices that can withstand the impacts of climate change in South Asia.
- Improve the policy environment to facilitate the adoption of sustainable intensification technologies.
- Build strategic partnerships that can sustain and enhance the scale of benefits accrued through improving cereal system productivity.

With a new investment in the CSISA program, the USAID Mission in Nepal is supporting CSISA to rapidly and effectively respond to the threats posed by the COVID-19 crisis that undermine the recovery and sustained resilience of farmers in the FtF Zone of Nepal. This Activity includes Texas A&M University, Cornell University, and International Development Enterprises (iDE) as core partners. Activities involve two inter-linked Objectives that address CSISA's strengths in core areas needed to assist in COVID-19 response and recovery over an 18 month period (From July 2020- December 2021). The ultimate goal of the CSISA COVID-19 Resilience Activity is to develop mechanisms to support longer-term resilience among smallholder farmers and the private sector – with emphasis empowering youth and overcoming challenges faced by women headed farm households. At the same time, the Activity is assisting in efforts to increase smallholder farmers' understanding of, and capacity to protect themselves, from COVID-19. This is achieved through the dissemination of awareness raising messages on public health and by increasing economic opportunities for return migrants, smallholder farmers, and by encouraging resilience-enhancing irrigation.

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During the COVID-19 pandemic, the CSISA project faced many challenges because of lockdown protocols. Restricted mobility, market closures, absence of market actors and a lack of market information have particularly impacted large numbers of smallholder farmers, agricultural laborers and, particularly, women and youth. With farmers' income demolished, and remittances in sharp decline, migrant workers returned to their homes without cash, only to discover there were few employment opportunities at their rural location. Without the possibility of earning a living, they were therefore facing tough challenges in meeting their food and other household needs.

The CSISA-COVID-19 Response and Resilience Activity, led by CIMMYT and funded by the USAID/Nepal mission, rapidly and effectively responded to the threats undermining the recovery and sustained resilience of farmers in the Feed the Future (FtF) Zone of Nepal. The Activity Objectives I and II implementation period is July 2020 – December 2021. The two inter-related objectives tackled by the CSISA-COVID 19 Response and Resilience Activity are:

Objective I: Enable rapid, targeted, and effective agricultural COVID-19 crisis response through scaleappropriate farm mechanization and rural services provision;

Objective II: Break the smallholder irrigation bottleneck and build rural resilience to the COVID-19 crisis.

A virtual digital conference was organized on 21 June 2021. One hundred and forty stakeholders with extensive experience in Nepal/Asia were invited. Participants included national and international experts/ researchers in agricultural mechanizations, agronomists, Gender Equality and Social Inclusion (GESI) experts, agriculture engineers, academia, practitioners, field-based staff, scientists, agriculture senior officials, policy makers, members of civil societies, project staff, and private sectors including National Agriculture Machinery Entrepreneurs Association(NAMEA.) The main purpose of the online conference was to raise awareness of the demand for machine-based land preparation, planting, and harvesting services in COVID-19 impacted districts. Invited to present on the effects of the COVID-19 crisis on smallholder farmers and subsequent recovery activities were federal government ministries and departments from FtF districts: Prime Minister Agriculture Mechanization Project (PMAMP), International Non Government Organizations (INGOs), Community Based Organizations, (CBOs), the private sector, Nepal Agricultural Research Council, (NARC), and staff from the Agriculture Knowledge Center (AKC), in particular from FtF districts. All the presenters shared their experiences, their achievements and what they had learned during the recovery activities carried out in the FtF zone of influence. One common factor was that these activities have contributed greatly in the recovery process towards securing the income and livelihood of the affected populations.

In the closing remarks, Mr. Rewati Raman Paudel, secretary of Ministry of Land, Agriculture and Cooperatives of Lumbini province of Nepal, stated that he appreciated the conference as one which was very useful and timely. Mr. Paudel highlighted the scaling up of mechanization as very important for a country like Nepal in the context of an agricultural labor shortage.

List of Acronyms

4WT	Four wheel tractor
ABPSTC	Agribusiness Promotion Support and Training Center
AEPC	Alternative Energy Promotion Center/Ministry of Forest and Environment
АКС	Agriculture Knowledge Center
ADS	Agriculture Development Strategy (Ministry of Agriculture and Livestock Development, Government of Nepal)
СВО	Community Based Organization
CGIAR	Consultative Group on International Agriculture Research
CSISA	Cereal Systems Initiative for South Asia
CAIDMP	Center for Agricultural Infrastructure Development and Mechanization Promotion
CCAFS	CGIAR Research Program on Climate Change, Agriculture and Food Security
CHC	Custom hiring centers
CIMMYT	International Maize and Wheat Improvement Center
DSR	Direct seeded rice
DoA	Department of Agriculture
FtF	Feed the Future
FANSEP	Food and Nutrition Security Enhancement Project
FAO	Food and Agriculture Organization
GESI	Gender Equality and Social Inclusion
GoN	Government of Nepal
INGOs	International Non-Government Organizations
IRRI	International Rice Research Institute
IFPRI	International Food Policy Research Institute
iDE	International Development Enterprises
IWMI	International Water Management Institute
JRIP	Joint Rice Improvement Program
LSP	Local Service Provider
PMAMP	Prime Minister Agriculture Mechanization Project
PMU	Program Management Unit
NARC	Nepal Agriculture Research Council
NAMEA	National Agriculture Machinery Entrepreneurs Association
NSAF	Nepal Seed and Fertilizer
MoALD	Ministry of Agriculture and Livestock Development
MOLMAC	Ministry of Land Management, Agriculture & Cooperative
ТоТ	Training of trainers
USAID	United States Agency for International Development

1. Background

With the financial support of USAID and the Bill and Melinda Gates Foundation, the Cereal Systems Initiative for South Asia (CSISA) project was initiated in 2009 with the goal of increasing the productivity and resilience of millions of farmers by the end of 2023 for India, Nepal and Bangladesh. CSISA is led by the International Maize and Wheat Improvement Center (CIMMYT) and is implemented jointly with the International Food Policy Research Institute (IFPRI), the International Rice Research Institute (IRRI) and the International Water Management Institute (IWMI), in addition to numerous public and private sector partners. CSISA is about bridging the divide between research and impact. In rural Bangladesh, India and Nepal, CSISA:

- · works to increase the adoption of resourceconserving and climate-resilient agricultural technologies, and improve farmers' access to market information and enterprise development;
- supports women farmers by improving their access and exposure to modern and improved technological innovations, knowledge and entrepreneurial skills;
- collaborates with numerous strategic public, civil society and private-sector partners, aligning them in synergy with regional and national efforts.

COVID-19 consequences, like restricted mobility, market closure, absence of market actors and a lack of market information, have impacted a large number of smallholder farmers and laborers, particularly the women farmers. As agriculture contributes significantly to the Nepalese economy, the economy is also highly dependent on the informal sector. It too, has also been disrupted under the COVID-19 lockdown context, triggering widespread loss of jobs and income opportunities for informal workers and vulnerable families¹. Many of their products have either been left to rot in the field or sold in local markets at a low price. There are several incidences of ready products being destroyed by farmers due to the increased frustration of not accessing markets, getting fair prices for their produce and poor or no support from governments or other institutions². Landless people dependant on tenant farming, seasonal jobs like construction, or locally based and informal income-generating activities such as pulling food carts, repair and maintenance work, were very badly affected. Farmers were not able to pay back their loans. Farmers' income was demolished and they faced tough challenges in order to meet their food and other household needs. Remittances from outside also sharply declined. The same situation was also observed across the CSISA project areas in

Nepal. Despite the focus on public health aspects of COVID-19 and management of the lockdown, the government was very aware of the impacts in agriculture and land management. Various public and non governmental institutions began to address the challenges caused by COVID-19. MoALD³ has declared five notable policies to combat different adversities faced by farmers: (i) equal distribution of relief packages, (ii) easy loans for farmers, (iii) agriculture extension advisory service for farmers, (iv) government support for agricultural insurance, and (v) minimum support price for agricultural products. This declaration seeks collaboration and partnership among multiple actors like the private sector, commodity associations, and farmers themselves for effective implementation.

The CSISA-COVID response Activity, led by CIMMYT and funded by the USAID/Nepal mission, aims to rapidly and effectively respond to the threats posed by the COVID-19 crisis that undermines the recovery and sustained resilience of farmers in the FtF Zone of Nepal. As stated in the Summary, Activities involve two inter-linked Objectives that address CSISA's strengths in core areas needed to assist in the COVID-19 response and recovery over the next 18 months (from Jul 2020 - December 2021). The ultimate goal of the proposed Activity is to revive and develop market systems and agricultural development planning mechanisms to support longer-term resilience and to bounce back from the shock caused by COVID-19, the emphasis being on smallholder farmers and the private sector. In addition, activities will aim to empower youth and overcome the challenges faced by women.

Objective I: Enable rapid, targeted, and effective agricultural COVID-19 crisis response through scale-appropriate farm mechanization and rural services provision

This first objective focuses on the expanded use of scale-appropriate farm machinery to generate employment, lower production costs for farmers, and creation of new entrepreneurship opportunities in COVID-19 affected Nepal. The main partner in this Objective is international Development Enterprises (iDE) Nepal, who provide expertise on business models. Key outcomes from Objective I are the anticipated benefits to 4,500 individual farmers as the focus lies on expanding scaleappropriate land preparation, planting, irrigation, harvesting or post-harvest machinery services which will be provided by service providers or custom hiring centers.

Nepal Preparedness and Response Plan 2020 (NPRP 2020) 1

https://thehimalayantimes.com/business/farmers-forced-to-destroy-produce-due-to-lack-of-market/

³ Ministry of Agriculture, and Livestock Development

Objective II: Break the smallholder irrigation bottleneck and build rural resilience to the COVID-19 crisis

The second objective focuses on developing appropriate and sustainable irrigation planning and development in Nepal while also considering how irrigation can increase resilience and generate income for smallholder farmers in COVID-19 crisis-affected districts of the FtF Zone. The main partners for this Objective are International Water Management Institute (IWMI), Texas A & M University and Cornell University. Their role is to provide support on predictive models and scenario analysis to provide local, district and provincial level assessment of water resources. The Activity's ultimate goal is to develop mechanisms to support longer-term resilience among smallholder farmers and the private sector, emphasizing empowering youth and overcoming challenges faced by women-led farm households. At the same time, the Activity is expected to assist in increasing smallholder farmers' understanding of and capacity to protect themselves from COVID-19. This objective is planned to disseminate awareness raising messages on public health and increasing economic opportunities for returning migrants, smallholder farmers, and also to encourage resilience enhancement through irrigation support.

2. Purpose of the online conference

The main purpose of the online conference was to raise awareness and demand for machine-based land preparation, planting, and harvesting services in COVID-19 impacted districts. Therefore, the CSISA COVID-19 Response Activity organized an online conference on raising awareness of the importance and role of scale-appropriate machinery in COVID-19 response, including gender sensitivity and awareness.

3. Methodology/Approach

As this workshop was conducted during the lockdown situation in Nepal, face-to-face meetings were not held due to COVID protocols, so the workshop took place on a virtual platform. Though there were some limitations during the virtual meeting due to unstable internet connection and unfamiliarity with the online platform, the facilitators tried to make the workshop interactive and participatory by inviting relevant stakeholders from various field and agencies. Invited were national and international experts/researchers in agricultural mechanizations, agronomists, Gender Equality and Social Inclusion (GESI) experts, agriculture engineers, academia, practicians, field-based staff, scientists having extensive experience in Nepal/ Asia, senior agriculture officials, policymakers, civil societies, project staff, and private sectors e.g., National Agriculture Machinery Entrepreneurs Association, (NAMEA). Online media representatives were also invited to the online conference. Altogether, 139 participants actively participated in the meeting, including representatives from federal, provincial and local governments of Nepal.

A range of participants from a variety of organizations including federal government ministries and departments, Prime Minister Agriculture Mechanization Project (PMAMP), INGOs, CBOs, private sector, Nepal Agricultural Research Council (NARC), staff from Agriculture Knowledge Center (AKC), particularly from the FTF districts, were invited to present on the COVID-19 crisis on smallholder farmers and recovery activities.

A schedule for the workshop was developed and shared with the relevant stakeholders in advance. The conference adopted the methodology of PowerPoint presentations and breakout sessions for discussions. The schedule for the conference is attached as annex 7.1 and the participants list as annex 7.2. This report is a compilation of all the presentations and discussions held during the online conference.

4. Welcome speech and opening remarks

Welcome speech by Dr. Timothy Krupnik, Country Director Bangladesh and project lead of CSISA project in Nepal and Bangladesh:

At the start of the conference, Dr. Krupnik delivered a welcome speech to all participants and expressed his sincere thanks to all. He highlighted the importance of all topics and the GESI sensitivity of the topics. Dr. Krupnik encouraged active participation of all the participants by asking questions in chat and raising hands.

Opening remarks by Dr. Hari Bahadur K. C., Joint secretary, MOALD:

In his opening remarks, Dr. KC extended his wishes for the good health of everyone during the COVID-19 context. This event had successfully included 140 participants who had actively engaged in mechanization and machinery scaling themes during this difficult time. He also highlighted the importance of mechanization in the commercialization of Nepali agriculture and talked about the types of machinery and their suitability in various topographic contexts in relation to Nepal. He notably indicated the difficulties of using machinery in the hill and mountain regions of Nepal. Dr. KC expressed his worry about the dumping of some machinery due to the difficulties of operation, repair, and maintenance. He expressed his concerns on analyzing the usability/suitability of such types of machinery before distributing them to farmers. Though Nepal is proficient in land preparation mechanization and is improving in other agricultural areas such as planting, weeding, harvesting and threshing, the cost reduction of mechanization is also essential.

He also briefly highlighted the work of PMAMP. He stated that there were very few technical human resources available for the repair and maintenance of machinery. Therefore, he said that there is a need to develop local human resources for this essential service which would further increase the employment opportunities for youths and returnees in rural areas. Most of the machinery is imported from other countries, so he emphasized the need for self-reliance in mechanisation whilst speaking highly of NARC's mission on this journey towards developing machinery and self sufficiency. He also suggested engaging the media to promote machinery to farmers. Finally, he delivered his thanks to CSISA for organizing a successful workshop and requested to share the learning outcomes.

Opening remarks by Mr. Baikuntha Adhikari, senior official, PMAMP:

Firstly Mr. Adhikari commented on the timely organization of this conference for economic recovery. He was impressed by the work of CSISA during the COVID situation. He highlighted the joint intervention program of CSISA and PMAMP on rice rolling out with federal and state ministries and also the importance of mechanization for farmers. Furthermore he mentioned CSISA's work in the irrigation sector. During his presentation, he underlined the importance of women-friendly tools and machines for mechanization that would enhance agricultural productivity, create off-farm income, and job opportunities for returning laborers. He expressed his anticipation to discuss and hear more from other colleagues.

Opening remarks by Ms. Alexis Ellicot, COP, Kisan II

Ms. Alexis stated this conference was most timely and urgent for economic recovery. She mentioned that the CSISA COVID-19 response Activity had been impressive despite COVID-19 protocols such as lockdown, restricted movement and social distancing. She also praised the CSISA project collaboration program on rice which is implemented jointly with federal and state ministries. She highlighted mechanization as a crucial aspect for farmers' agricultural production from start to finish and also appreciated CSISA's works on irrigation recovery. Ms. Alexis also emphasized the importance of the conference from the perspective of gender equality and social inclusion. As women are highly involved in agriculture and the feminization of agriculture is taking place rapidly, women-friendly inclusive mechanization is further relevant in the context of robustness and increased productivity. It is equally important for off-farm income and job opportunities, particularly for returnees. She expressed her eagerness to be involved in further discussion and to hear more from other colleagues participating in the conference.

5. Presentations/questions and discussions

As the main objective of the conference was to create awareness among the stakeholders, partners and participants of the CSISA project, the presentation topics were wisely formulated to give a sense of actions delivered in the COVID-19 recovery and how those actions were bringing changes in the impacted populations and their further sustainability. The brief highlight of each topic of the conference with questions and discussions are presented below.

Presentation Tonics	Summary of presentation and discussion
Transie Dra	Summary of presentation and discussion
lopic: Broad overview of the CSISA project and raising awareness of the importance and role of scale appropriate machinery in COVID-19 response	In his presentation, Dr. Krupnik highlighted the background of the CSISA project in Nepal, including the recovery works done during the COVID-19 context. He mentioned that the CSISA project is important from the aspect of action research and its impact on Nepal's affected population where the project is being implemented. The project is being implemented through public-private partnerships. He also shared his concerns on the added shocks and stresses to the farming communities in Nepal due to COVID-19 and its effect on the agricultural sector. COVID-19 is not only a health sector issue but also impacts the social and economic aspects of the communities, adding further to the already existing rural challenges. Therefore, there is a need to assure and build the resilience of the affected communities from economic shocks.
encluding gender sensitiveness and awareness.	Dr. Krupnik also spoke of the agricultural landscapes in Nepal's terai, hills and mountains, and how they are very different from each other. These differences translate to different types of agricultural equipment requirements for agricultural mechanization as per their local suitability. He emphasized that agriculture can be very attractive to young people if appropriate mechanization in agriculture includes other job opportunities linked to mechanization such as machineries repairs and maintenance, etc. In this respect, the CSISA project is contributing to agricultural mechanization as well as creating job/ employment opportunities in associated jobs in rural areas.
Dr. Timothy J. Krupnik, CSISA	He highlighted the advantages of mechanization for crops and farmers. The project is working on
Krupnik, CSISA Project Leader in Nepal and CIMMYT Country Representative of Bangladesh	different aspects of value chains for machinezitori for Crops and farmers. The project is working off different aspects of value chains for machinezy and is developing new reports from the project, which will be released soon; a quick snapshot of the report was shared during the conference. The project will be suggesting the different options available for scale-appropriate mechanization along with appropriate and responsible mechanization, cost effective mechanization and easy repair and maintenance. The presentation highlighted the importance of the project in response to the COVID situation, as well as the labor and gender effects across Asia's farming systems. He emphasized the importance of reducing labor cost and increasing the income of farming families in the context of COVID-19. He also iterated that agricultural post-harvest activities are also affected by COVID-19, especially in hill-based farming systems. In this context, the role of machinery is crucial in response to COVID-19.
	Most of the returnee migrants were provided training on repair and maintenance and some of the machinery dealers hired them. He also talked about direct seeding to help reduce the COVID-19 effect and labor unavailability for the sowing of rice. He also highlighted the importance of gender and social inclusion for mechanization and development processes and how important it is in the context of Nepal. CSISA is also encouraging machinery ownership for women-owned farms. The project is also working to provide incentives and access to finance for mechanization for women farmers. He also emphasized the importance of helping men to become sensitive to women's contribution to agriculture.
Topic: Nepal Government Policies and future plan on scale appropriate agriculture machinery promotion	Dr. Shrestha shared Nepal government policies and plans on scale-appropriate agricultural technologies. He mentioned that mechanization is fairly new for Nepal as it just started about two decades ago and there were very few discussions on this agenda. In the context of youth migration and the demography shift during the Maoist insurgency in Nepal, there was a labor shortage in peak season. It is mainly women and old people who are mostly remaining in rural areas, fueling the feminization of agriculture. Due to the shortage of laborers, large hilly areas are left fallow, and crop production has declined sharply. The rural market centers develop due to the remittance flows from urban areas and foreign employment. Now, there are large numbers of returnees in rural areas due to COVID-19 and these returnee migrant laborours are the catalyst for mechanization.
Presenter: Dr. Shreemat Shrestha, Chief Director of Engineering, NARC and Prakash Kumar Sanjel, MOALD	In Nepal, though mechanization started around two decades ago due to the availability of Chinese machines, it was only in 2014 that the agricultural mechanization promotion policy came into effect. This policy focused on suitable mechanization, enhanced access for farmers, women friendly agricultural machines and institutional development for mechanization. However, it was developed just before the writing of Nepal's constitution and had to be revised. While developing the Agriculture Development Strategy (ADS) in 2015, a detailed discussion on mechanization was held. The Center for Infrastructure development and mechanization promotion contributed significantly to the mechanization aspects of Nepal. He also revealed that PMAMP will invest 130 billion Nepali rupees in pocket, block, and super zones on mechanization, mainly focusing on the distribution of machinery. Provincial-level mechanization programs are also taking place, but only one engineer is responsible and technology transfer is at a very low level. Local level agricultural mechanization programs are also doing a very good job. Agri-machinery entrepreneurs and the private sector are also realized the need for more technical training for repairs and maintenance as there is a gap in the training and transfer of this technology.

4

Presentation Topics Summary of presentation and discussion

Topic: Nepal Government....

Presenter: Dr. Shreemat

Shrestha, Chief Director of...

Topics: Role of PMAMP in Agriculture Mechanization in Nepal

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PMAMP in Bardiya







Presenters:

Chaitya Narayan Dangol, Mahesh Regmi, Dr. Tapendra Shah, and Kalash Ram Chaudhary At the same time, Dr. Shrestha indicated the importance of equity in mechanization, and the need to introduce female-friendly machinery. For this, more research programs are essential for appropriate business models. The finance sectors involvement in promoting gender-friendly mechanization is also required, as well as institutional reforms. He also pointed out that support was needed from CGIAR for research and extension, emphasizing the need to strengthen the educational program to develop medium-level technicians. Along with this, appropriate policies are needed for the manufacturing sectors. Although NARC is taking the lead on agricultural mechanization. Lastly he mentioned that as a way forward, not one technology fits everywhere; therefore, there is a need to develop more socially and geographically appropriate and female-friendly technologies. In this agenda, the role of the private sector and financial institutions are important for sustainable agricultural mechanizations.

Mr. Chaitya Narayan Dangol and his team from PMAMP shared agricultural mechanization initiatives through PMAMP. Mr. Dangol highlighted the history and objectives of PMAMP. He shared that PMAMP, over a period of 10 years, had a budget of around US\$1.12 billion; of which investment in agricultural mechanization was US\$ 0.09. The program is being implemented all over Nepal for 15 major agricultural crops⁴ and livestock. The program follows an implementation modality through a consolidated farming approach for super zones, zones, blocks and pockets. He also mentioned that the program had provided agricultural machinery, from land preparation to threshing, with a 50% subsidy to all eligible farmers. The program has established 569 custom hiring centers and distributed 1,255 small farm machinery. He also highlighted the increased productivity of grain crops through mechanization. At the same time, he spoke about the issues and challenges in mechanization, such as lack of easy access to repair and maintenance services, spare parts, poor quality of imported machineries, lack of testing and training facilities and so on. He also added need of drafting guidelines for operation of custom hiring services and establishment of training and testing centers in each province for effective and efficient use of machineries. Finally, he requested all stakeholders to join their hands and work together for successful mechanization in Nepal.

Mahesh Regmi, maize mechanization in Dang - Maize super zone, Dang

- Mr. Regmi presented the maize super zone which started in 2016 in Dang, where CSISA was already working. The major program of the super zone was to establish custom hiring centers and post-harvest centers and demonstrate new technology. The program also supported a number of learning centers established in different locations in the super zone from where farmers are encouraged to cultivate maize using a machine. He also highlighted that mechanization has reduced production, time and labor costs; hence, farmers were convinced of the benefits of using machnes for maize. He also shared the collaborative activities carried out with support from CSISA. These included demonstrations and technology dissemination, preparation of appropriate machinery specifications, machine evaluations and testing, machine modifications and feedback to traders, repair and maintenance for field-level problems, links with private dealers and also technical trainings on farm mechanization:
- Interventions in maize seeding vertical type seed drill was less efficient, so inclined plate type seed drill was evaluated and found to be very precise and better;
- Fluted roller type seed drill to vertical plate type seed drill;
- Seed sowing (jab planter) can plant around 0.23 hectare (7 kathha) of land per day;
- Maize weeder was also modified;
- Indian inter-cultivator, Chinese inter-cultivator and big tractor maize weeder (modified) also used;
- Electric thresher small modified to electric thresher medium customized to be operated with a tractor; it can thresh 4-4.5 tonnes of maize per hour;
- Grain dryer is being tested and as farmers are unfamiliar with this machine, CSISA is providing demonstrations on its use. Three tons of maize can be dried per hour but it depends on the moisture content of the maize;
- Other interventions Nepali hybrid variety RH10 introduced. This hybrid variety is introduced in rainy season maize:
- Increased production acres of spring season maize from 300 ha to 2,000 ha.

- Established maize-based industry in super zone area. Increment of maize productivity. Mr. Regmi also talked about the challenges faced during the program. There were many: unavailability of spare parts, no provision for certification, quality control very low, unwillingness for after-sale services, only very few crop-specific machines brought, no provision for a multi-disciplinary team, and less exposure of field level staff as well as the cost of machines were some of the major issues.

Dr. Tapendra Shah, Bardiya – Rice super zone Rajapur, Bardiya

Dr. Shah highlighted the PMAMP modernization aspect, which is mainly based on mechanization. Some of the highlights of his presentations were:

- Mechanization in rice super zone to help farmers efficiently manage farms from soil to seed (grain)
- Supporting farmers in introducing different appropriate small machinery and encouraging their use on 50 % subsidies.
- Establishment of seven different custom hiring centers run by different farmer groups: one is being run by entrepreneurs who are doing a good job.
- Number of different types of machinery distributed to farmers and cooperatives.
- Distribution of rice trans-planter, mini combine harvesters, mobile grain dryer, and a grain dryer.

5

Agricultural commodities (crops and livestock) like Paddy, Wheat, Maize, Vegetables, Potato, Citrus Fruits, Apple, Mango, Banana, Milk, Fish, Meat, Export Potential Commodities (Cardamom, Coffee, Ginger, Turmeric), Oilseeds and Honey.

Presentation Topics	Summary of presentation and discussion
Topics: Role of PMAMP	Other activities include: machine operation and maintenance training with the help of CSISA project, support to machinery repair centers, machine operation demonstrations, direct-seeded rice demonstration, awareness campaigns and jingles broadcasted in collaboration with the CSISA project.
Presenters: Chaitya Narayan	A demonstration was held in 8 hectare of land for four-wheeler rice trans-planter in collaboration with Agribusiness Promotion Support and Training Center (ABPSTC), Ministry of Land Management, Agriculture & Cooperative (MOLMAC) Lumbini province.
Dangot, Manesh	The immediate changes observed: tillage above 99 percent with machineries; transplanting is at initial stage; machines are doing around 80 percent of the harvesting, and all the threshing is being done by machine.
	The Issues: easy availability of spare parts, trained human resources for operation and maintenance, affordability of machine appropriate technology
	Finally he suggested working further to overcome the above-mentioned issues and problems to enable better mechanization and adoption of the technology.
	Mr. Kalash Ram Chaudhary, Agriculture Knowledge Center, Kailali
	Mr. Chaudhary highlighted the efforts for the mechanization of agriculture in Kailali District. Some of the highlights are as follow:
	- Wheat super zone around 2.300 hectares and oilseed zone around 1.500 hectares in Kailali
	- Agencies, including CSISA, involved in agriculture mechanization in Kailali
	- Conducted ToT to individual service providers and custom hiring centers on repair maintenance and operation of farm machinery.
	 Nearly 500 hectares of wheat sown using machinery.
	- 50% subsidy provided in scale appropriate agro-machineries.
	- Demonstrated zero tillage wheat in five different locations with NARC and CSISA.
	 Farmer field day and multi-stakeholder meetings were organized; radio jingle was broadcasted through local FM and radio with the help of the CSISA project.
	- Wheat crop harvesting by crop harvester being used by farmers
Topic: CIMMYT's effort on	Mr. Paudel shared the background of CIMMYT's activities and projects in Nepal. Some of the highlights of his presentations are as follows:
Agricultural Mechanization in Nepal: Revisiting	 CIMMYT/CSISA project started in 2009 and is working collaboratively with NARC, MoALD, DoA, PMAMP and other research and development partners to promote scale-appropriate farm mechanization
prospects for future	- Strong relationship between labor migration and the need for mechanization intervention and how mechanization can contribute to Nepal's SDGs targets.
P	 CIMMYT has been working on mechanization technologies from land preparation to post-harvest handling. CIMMYT has conducted surveys on the mechanization of land preparation. He mentioned the other land preparation interventions introduced, stating that their adoption has been very slow.
Presenter: Mr. Gokul Paudel,	 Seed drills for direct seed rice and wheat and CIMMYT's efforts on spreading seed drills in the Terai, rotavator tillage impacts, and rice trans-planter study findings.
Economist, CIMMYT International	 CSISA is also working on solar irrigation pumps, petrol/diesel pumps, and mechanized spreaders to enhance fertilizer use efficiency. He also talked about the spread of the combine harvester in Nepal. He spoke of the negative aspect of combined harvester adoption in Nepal, as in the incidence of crop residue burning. He also briefly shared about harvesting technologies being used in Nepal's Terai, such as other threshing machinery promoted by CSISA like the open drum thresher and peddle thresher, among other technologies.
	 Scale-appropriate maize systems machinery promoted by CSISA. He provided information on mini tiller adoption and its impact on rice and maize productivity. The demand for mini tillers are still high in the hilly region of Nepal. He expressed his concern that women are rarely operating mini tillers in the mid-hills.
	Lastly, regarding the prospects of mechanization in Nepal, Mr. Paudel stressed that quality control of farm machinery is crucial. Likewise, price control policies should be a high priority of GoN. The new federal-level agricultural mechanization policies should encourage private sectors to locally manufacture and reduce tariffs on spare parts. It should also prioritize developing local mechanics to make non–used machines functional, which would also create local employment opportunities.

6

Presentation Topics Summary of presentation and discussion

Presentation topic: CSISA efforts to improve access to finance in agriculture mechanization



Presenter:

Dr. Corey O'Hara, Country Director, IDE **Dr. O'Hara** highlighted the importance of access to finance in agricultural mechanization. He shared that there is a need for robust business plans to develop entrepreneurship in returnee migrants. Employment and income generation opportunities can be created across the value chains by establishing appropriate business models across mechanization. He also mentioned the value chain actors and access to finance as the most significant mechanization development barrier. He also highlighted some of the practical and policy-related and institutional challenges of access to finance for mechanization. Though Central Bank of Nepal is developing a policy to overcome those challenges, each bank has some barriers in providing loans for mechanization. Some of the factors considered as a high risk for the banks are: loan default due to frequent breakdown and damage of the machinery; financing requirements can be quite large though most investment was lesser than 4 lakhs (approx. US\$ 3,347); inability to provide collateral for loans, as due to the mobile nature of machinery, as unlike land, they can be easily transported from one place to another.

Dr. O'Hara also stated that banks are concerned that due to the open boarder of Nepal and India, the loanees can easily move from Nepal to India. There are also some cultural barriers, like not providing land as collateral for a loan. Another reason is the varying income source from the machines and income seasonality due to seasonal application of machinery.

He went on to discuss iDE's approach to mobilize improved access to finance for agricultural mechanizations. iDE has set up MoUs with banks and cooperatives to finance loans with very competitive rates, providing access to loans through cooperatives and the provision of subsidies on machineries loans. The payback period is very critical and therefore, negotiating is essential for setting up a delayed payment schedule. iDE has established MoUs with Muktinath Development Bank, Nabil bank, Mega Bank, and Century Commercial Bank for gaining finance. iDE has also linked service providers to different banks, creating demands for machinery operation and repair trainings and defraying cost to lenders of engaging risky clients. He also mentioned that profitable business models had been established for all major machinery types, and 73 new service provider enterprises have been established (with 87 machines) by returnee migrants.

Topic:

Gender and Social Inclusion issues and strategy for promoting GESI in Agriculture mechanization



Presenter: Dr. Manohara Khadka, Country Representative, Nepal, IWMI and Soma Rana, GESI Specialist, IDE. **Dr. Khadka** highlighted the importance of considering gender and social inclusion in promoting agricultural mechanization in Nepal. Historically, women have been involved in agriculture, but they are not recognized as productive farmers even though about 80% of women are involved in agriculture. Due to the migration of male youth out of Nepal, participation of women has increased in agriculture in all aspects of the production chain. The tools, machinery and technologies are not women-friendly. Therefore, we need to actively involve women in agriculture and make their profession suitable and profitable. Mechanization has great potential for empowering women as entrepreneurs, machine managers and operators in Nepal. Women-headed families are increasing in Nepal. The agricultural mechanization programs in 2014 discussed women-friendly machines and tools; however, it is not at a good pace yet. Questions need to be asked.. There are great opportunities and enablers for enhancing women-friendly mechanization such as the political inclusion of women in the state and non-state institutions at all levels, local, provincial and federal. She also stressed that remittances should be spent on farm machinery.

Though we are talking about women in mechanization and women in agriculture, only 11% of employees of public agricultural services are women, and women own only 30 % of agri-businesses. Though indigenous women and marginalized groups are interested in the machine repair business and technology, there are some social and gender barriers that need to be overcome. These are as follows:

- Agency access to and decision making, an enabling environment, participation in markets, and knowledge of production
- Barrier I Suitability of farm machines to the needs of women
- Barrier II Access to resources including finance.
- Barrier III Access to and control over resources.
- Barrier IV Women's participation in farm mechanization markets
- Barrier V Women's participation in farm mechanization governance
- Barrier VI Policy, social norms, perception and attitudes.

Dr. Khadhka also relayed some recommendations to enhance women's participation in mechanization such as (i) transformation in agri-mechanization and irrigation policies, (ii) services and resources from the perspective of a social, economic and gender stance, (iii) institutional changes, (iv) empirical knowledge and evidence.

Topic: KISAN II Experience in **Farm Machineries**



Presenter:

Harish Chandra Devkota, Agriculture Director- KISAN-II

Presentation Topics Summary of presentation and discussion

Mr. Harish Chandra Devkota, Agriculture Director for KISAN II presented the works of KISHAN II in the area of agricultural mechanization. In his presentation, he shared why farm mechanization in agriculture Scaling Appropriate is important and the reasons are as follows:

- To increase production and productivity by planting crops in time. ٠
- · Efficient utilization of seed and fertilizers.
- · Reduce women's workload by helping them adopt mechanization.
- Reduce post-harvest losses.
- Reduce the cost of production and increase competitiveness.
- See COVID-19 induced mechanization as an opportunity.

Status of Agriculture Mechanization in KISAN II ZONE

- Farmers in the hills still depend on human and animal power.
- Small machineries/tools are common in the hills such as mini tillers, two-wheel tractors, corn shellers, jab planters, seedling planters, paddle threshers, power sprayers, etc.
- Farmers in Terai are gradually increasing their dependency on farm mechanization.
- Farmers use machines in land preparation, planting/sowing, irrigation, plant protection, harvesting, threshing and transportations.
- More service providers (CHC) in mechanization are available in Terai as compared to Hills. Tractors and two-wheel tractors with attachments, combines, seed drills, reapers, threshers are commonly used in Terai.

Mechanization as an opportunity to address Covid-19

Wide range of impacts of COVID-19 observed in agriculture sector leading to

- · Low production
- Disruption in marketing and sales
- Shortage of agriculture inputs
- Shortage of labor
- Decreased incomes

Mechanization in supporting recovery and building resilience

Agriculture mechanization helps the speed of the food production process through:

- Increased yield/production
- Reduced production cost
- Reduced post harvest loss
- Saving labor and reducing drudgery

All the above can contribute to the recovery from crises and strengthen the resilience of farmers during COVID-19.

KISAN II approach to promote mechanization

- Cost-shared partnership with private sector partners
- Coordination with USAID partner project (CSISA, NSAF)
- · Coordination with GON (as under JRIP)

He also discussed the varieties of machineries sold by private sectors on a cost sharing basis in the FtF zones. The major machinery sold were Mini Tillers, Reapers, Seed Drills, Power Sprayers, Electric corn shellers, Corn sheller, Electric/Peddle Thresher, Electric Thresher, Eartho Spreader, Grain Dryer, Electric Motor Pump, Seedling Planter, Jab Planter, Cono Weeder, Laser Land Labeller etc. The details of all machinery promoted/sold can be seen in the attached presentation slides.

Coordination with CSISA:

- KISAN II partner MAF participated in in combine harvester operation and maintenance training.
- Orientation provided on recommended machinery in JRIP and business models for mechanization service delivery to MoLMAC, AKC, PMAMP and municipality staff.
- Trained 5 women farmers on reaper operation and maintenance (3 days). Now they cans provide reaping service in the community.
- One day reaper operation and maintenance training provided to 44 farmers in Bardiya, Kailali and Kanchanpur
- 11 female and 7 male farmers trained as a mobile mechanics for repair and maintenance of small machineries in Bardiya
- 3 demonstrations conducted in DSR in spring rice to find out optimum seeding date in Bardiya and Kailali

Presentation Topics Summary of presentation and discussion Topic: (SIAN) IL Experience in. Coordination with GON: Coordination with GON: Presenter: High IC coordinated with AKC in the promotion of mechanization in rice cultivation through JRIP in Lumbin and Sudurpaschim provinces. Sime of the challenges and learnings shared by KISHAN II project are as follows: Challenges: - Rough terrain is considered a barrie in mechanization in the Hills. Some of the challenges and learnings shared by KISHAN II project are as follows: Challenges: - Rough terrain is considered a barrie in mechanization in the Hills. Some of the challenges and learnings shared by KISHAN II project are as follows: - Inaud figure terrain is considered a barrie in mechanization to farmers. - Lack of access and available for repair and maintenance work. - No easy access to finance. - Unified after-sales service available from dealers. - Difficulty in getting spare parts. - Difficulty in getting spare parts. - Linkage between private sector partners and GON agencies helped farmers to adopt mechanization. - Linkage between private sector partners and GON agencies helped farmers to adopt machiners wrives with 300 armers in bang. Bander adoption. - Diradivition and Survey with 300 armers in working areas of Nepal. This assessment was done dynamication. - Diradivition and Survey with 300 armeres in bang. Bande Survey with 100 and mechanizatio		
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of Nepal machines because of issues like lack of labor, poor irrigation facilities, technologies and farm equipment, fragmented lands, lack of subsidies on equipment, and lack of appropriate government policies for local manufacturing.	Topic: Role of Private sector in scale appropriate machinery promotion in agriculture sector of Nepal	Mr. Gaurav explained that NAMEA is an association of private agricultural machinery and has members all over Nepal. NAMEA is working in association with the government and other organizations to promote agricultural machinery in Nepal. The association is conducting training and demonstrations for new technicians to provide after-sales services. He also highlighted that agri machineries like mini tillers, power tillers, 4WT greenhouse, drip irrigation and self-propelled machines are among the most equipment/machines in Nepal in the last decade. He also said that hilly regions still lack mechanization machines because of issues like lack of labor, poor irrigation facilities, technologies and farm equipment, fragmented lands, lack of subsidies on equipment, and lack of appropriate government policies for local manufacturing.
Presenter: Due to COVID-19, machinery use has increased in hilly regions. Farmers are still using stones for threshing in some places and using mud rack/bits and into socks for storing corols and code NAMEA	Presenter:	Due to COVID-19, machinery use has increased in hilly regions. Farmers are still using stones for

Gaurav Shrestha, Executive Committee Member - NAMEA. Due to COVID-19, machinery use has increased in hilly regions. Farmers are still using stones for threshing in some places, and using mud rack/bins and jute sacks for storing cereals and seeds. NAMEA is working to create a proper supply chain and after-sales service for agricultural equipment and machinery. It is also collaborating with the government and other organizations to overcome these challenges, as well as providing adequate support to the private sector for manufacturing, and where possible for the research and development of agricultural equipment and the production of spare parts for machinery at the local level. Support and cooperation from INGOs is also being sought.

Presentation Topics Summary of presentation and discussion

Questions and Open Dr. Rudra Shrestha from KISAN II project

Discussion

Dr Shrestha stated that Nepal is importing a large amount of machinery from India and China but that there had been no discussion about import taxation on machines or mechanisms which will enable traders to do business effectively in Nepal.

Mr. Gokul Paudel from CIMMYT/CSISA project

Mr. Paudel tried to clarify that 1% tax applies to individual machines. However, if you are importing other spare parts for machinery, about 40 - 50% tax is applicable. He also explained the government's rationale that spare parts are primarily used for industrial purposes. CSISA advocates that this provision is very high and therefore, the tariff should be exempted or lowered for agricultural machineries used primarily for agricultural purposes. The Government should devise such mechanisms to distinguish agricultural uses.

Mr. Harish Devkota from KISAN II project

Mr Devkota brought up a question regarding loans and stated that the project is promoting youth engagement in agriculture businesses, but this requires subsidized loans for the youth to establish and run. Businesses, however, are asked to provide collateral for the loan, and most of the youth are not in position to provide this, therefore, how this problem can be addressed?

Mr. Corey from iDE

Mr. Corey answered that banks are looking for land as collateral. However most of the families are reluctant to put their land as collateral for many reasons. iDE are advocating to provide collateral-free loans for machinery but this has not been realized at all. He stated that they would continue to push for this.

Mr. Gokul Paudel from CIMMYT/CSISA project

Mr. Gokul asked if a piece of machinery could be considered as collateral for the bank.

Mr. Corey from iDE

Mr. Corey replied that the bank does not accept machines as collateral because machines, once purchased, lose their value by half. There is heavy depreciation in its worth so it cannot be considered as collateral as it is high risk. A 4-wheel tractor can get a transportation loan and can be considered as certain level collateral for the loan.

Ms. Prabita Shrestha/Online media

Ms. Pabitra asked this question: How has CSISA project been working with different issues such as corruption and other ups and downs in the political system?

Dr. Timothy from CIMMYT/CSISA project:

CSISA works across South Asia, including Nepal. He mentioned that many research projects are facing various level of challenges. Our local staff are very much involved with all levels of government and are very experienced in working together with the government.

Mr. Gokul Paudel from CIMMYT/CSISA project

He stated that they were are not directly involved with government but rather collaborating with them and working with farmers so that they can choose appropriate technologies for their use.

Santosh Upadhyay

He stated that the Nepal Government had been supporting cooperatives and farmers for many years, but they put all machinery into same basket. Should that policy not be revised to be crop specific and therefore help motivate the use of those machineries?

Namita Nepal (CRS)

She asked what was being done to promote women friendly machinery at field level? She also continued by asking - how are we ensuring that sustainable training is given to the youth considering their position as migrant workers?

Mr. Gokul Paudel from CIMMYT/CSISA project

He replied that machinery is very heavy and therefore this is a difficult issue with regards to women. As machine size decreases, efficiency could be less, so it is a difficult task to find appropriate technology. We are working with some of the manufacturers in India and China to find suitable technology for women. This, he stated was an ongoing process and local manufacturers were needed to produce appropriate female technology. The development of local mechanics to be able to produce spare parts and also to make unused machines more suitable is also ongoing. He raised the question as to how much greenhouse gas emissions was produced by bullocks compared to the machinery used in agricultural operations, and emphasized that this project was trying to promote more eco-friendly technologies.

6. Closing of the conference

The conference was closed by some valuable and inspiring remarks by Mr. Rewati Raman Paudel, secretary of Ministry of Land, Agriculture and Cooperatives of Lumbini province of Nepal. Mr. Anil Chandra Neupane facilitated the closing session. At the end, Mr. Neupane expressed his huge thanks to all the presenters and participants.

Mr. Paudel, in his remarks, mentioned that this awareness conference program was very useful to all of us who are directly or indirectly supporting and involved in learning about agricultural mechanization. He also highlighted that scaling up of mechanization is very important for countries like Nepal as most of the workforce are migrating to urban centers and foreign employment which has led to the country facing an agricultural labor shortage. In context, mechanization support, particularly in COVID-19, in the FtF zone in Nepal is very relevant and important. He also mentioned that, at present, Nepalese agriculture is mostly handled by women and elderly people, so agricultural practices must be made safe, easy and friendly for this group. In agriculture, mechanization could be a critical measure. He continued by saying that most of agricultural machinery is imported from India and China and there are is a scarcity of spare parts in Nepal and these are often very costly.

Therefore, spare parts should be produced in Nepal so that they can be easily accessible and affordable. He also stressed that skilled human resources and labor should be produced and trained with priority so that these skilled workers could enhance agriculture productivity.

Though there are machines and equipment available, they are not meeting the needs of our farmers and are not of good quality. Therefore, NARC should prioritize this agenda in their activities. Testing of the machine is necessary to ensure good quality and in this regard, our development partners should help us. He also expressed that NAMEA should also develop some relevant activities to support smallholder and women farmers. There is some unhealthy competition among the suppliers, so we need to encourage a healthy environment for good machinery supplies. He also expressed his satisfaction that today's conference had discussed all these aspects openly and in a way which was fruitful for future action. Many questions were raised and genuine suggestions were given which would provide much food for thought for all participants.

At the end, **Dr. Krupnik, expressed his sincere thanks to all the attendees** for their very active participation and engagement during the whole conference.

7. Annexes

Annex 7.1 Schedule of the workshop

Conference Topic: Importance and role of scale appropriate machinery in COVID-19 response including gender sensitiveness and awareness.

Date: 21 June 2021

Time	Activities	Presenter or Facilitator
10:30-10:35	Welcome Speech	Dr. Timothy J. Krupnik, CSISA Project Leader in Nepal and CIMMYT Country Representative of Bangladesh
10:35-10:40	Opening remarks	Dr. Hari Bahadur K.C Joint Secretary, Planning and Development Aid coordination Division, Ministry of Agriculture and Livestock Development
10:40-10:45	Opening remarks	Mr. Baikuntha Adhikari, Program Director, or Representative from PMAMP
10:45-10:50	Opening remarks	Alexis Ellicott, Chief of Party, KISAN-II
10:50-11:00	Remarks from USAID	USAID speaker TBD
11:00-11:20	Broad overview of the CSISA project and raising awareness of the importance and role of scale appropriate machinery in COVID-19 response including gender sensitiveness and awareness	Dr. Timothy J. Krupnik, CSISA Project Leader in Nepal and CIMMYT Country Representative of Bangladesh
11:20-11:35	Nepal Government Policies and Future plan on Scale appropriate Agriculture machinery promotion	Dr. Shreemat Shrestha, Chief, Director of Engineering, NARC and Praskash Kumar Sanjel, Center for Agricultural Infrastructure Development and Mechanization Promotion, MOALD
11:35-11:50	Role of PMAMP in Agriculture Mechanization in Nepal	PMAMP - Chaitya Narayan Dangol, Mahesh Regmi, Dr. Tapendra Shah, and Kalash Ram Chaudhary
11:50-12:05	CIMMYT's effort on Agricultural Mechanization in Nepal: Revisiting the past and prospects for future	Gokul Paudel, Agriculture Economist, CIMMYT International
12:05-12:20	Open discussion	Facilitator: Dr. Anil Chandra Neupane CIMMYT International
12:20-12:35	Gender and Social Inclusion issues and strategy for promoting GESI in Agriculture mechanization	Dr. Manohara Khadka, Country Representative – Nepal, IWMI and Soma Rana, GESI Specialist, IDE.
12:35-12:50	CSISA efforts to improve access to finance in agriculture mechanization	Corey O'Hara, Country Director, IDE
12:50-13:05	Role of Private sector in scale appropriate machinery promotion in Agriculture sector of Nepal	Gaurav Shrestha, Executive Committee Member, NAMEA.
13:05-13:20	Open discussion	Facilitator: Subash Adhikari, CIMMYT International
13:20-13:35	KISAN II Experience in Scaling Appropriate Farm Machineries	Harish Chandra Devkota, Agriculture Director- KISAN-II
13:35-13:50	COVID-19 pandemic and agricultural machinery services in CSISA working areas of Nepal: Insights from panel surveys.	Dr. Amjath Babu, Agricultural Economist (Modelling and Targeting) CIMMYT-CSISA Bangladesh
13:50-14:10	Open discussion	Facilitator: Dr. Rudra Bahadur Shrestha, Enabling Environment Director, KISAN-II
14:10-14:15	Consortium of agriculture mechanization expert	Dr. Dev Raj Niraula, President, NSAE
14:15-14:20	Final Remarks and vote of thanks	Dr. Rebati Raman Poudel, Secretary, Ministry of Land Management, Agriculture and Cooperative, Lumbini Province

Annex 7.2 Conference Participants

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10	Naryan Pd. Khanal	CIMMYT International	Business Development Manager	
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