

TRIP REPORT –ROADMAPS EXPOSURE VISIT FOR SUSTAINABLE AGRICULTURE MECHANIZATION IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)

REPORT DATE: August 21, 2019

TRAVEL DATES: August 12-14, 2019

TRAVEL FROM: Kathmandu

TRAVEL TO: CoochBehar, West-Bengal

PURPOSE:

- To orient and sensitize government and other private stakeholders from Province 1 about CIMMYT, SRFSI and especially about the Roadmaps project, its objectives and phases of implementation.
- To sensitize the group of participants and share the business models and successes on agriculture mechanization by Satish Satmile club “o” Pathaghar (SSCOP).

OVERVIEW:

Roadmaps is a project funded by ACIAR with the purpose to facilitate the development and implementation of ‘participatory roadmaps’ that create an enabling environment for sustainable agricultural mechanization in Province 1 and 2 of Nepal from March 2019 till June 2020. CIMMYT had a series of meeting with Provincial government officers of Province 1 for implementing the Roadmaps project. The idea of organizing an exposure visit to West Bengal for government officials and private sector partners from Province 1 on agricultural mechanization was generated during one of such meetings with the representatives from different government and non-government stakeholders. The objective of this visit will be to observe the ongoing activities being implemented by Satmile Satish Club and cooperatives in CoochBehar and have new learnings related to agricultural mechanization. The outcome will be identifying the ideas and concepts, which could be replicated in Province 1 to contribute to increased and sustainable agricultural mechanization and improved livelihoods of smallholder farmers of Province 1. Therefore, the visit was conducted from August 12-14, 2019 with 11 representatives from Province 1.



ACTIVITIES, ACCOMPLISHMENTS, AND DISCUSSIONS:

August 12, 2019

Anjana travelled from Kathmandu to Bhadrapur by flight and then to Kakarvitta by land where all the participants' for the exposure visit were supposed to meet. Altogether 12 (11 participants and Anjana) then started travelling to Coochbehar, West-Bengal after having had lunch at Kakarvitta.

They reached Coochbehar at around 3 pm and went directly to SSCOP for orientation and conducting the activities as scheduled in the plan. The SSCOP team welcomed everyone and the session quickly started with brief introduction among all the participants. Amal Roy, Secretary of SSCOP, started with orientation on business models and economics of farm equipment, which lasted until late evening. He shared the journey of SSCOP from the start; they are affiliated with NABARD since 2005. He also shared the transition of farmers club to farmers' producer organization and now they are being upgraded to farmers' production company. They are working in the sector of agriculture from 2009 onwards. Later on, everyone travelled to the hotel in Coochbehar.



Stayed overnight at CoochBehar.

August 13, 2019

The following day started earlier than scheduled at 8 am. The sessions were on farm equipment under CASI technology focused on ZT-MCP and rice transplanter with in-depth discussion on its use, models and pricing, availability in the market and associated servicing and maintenance issues. There was on-farm demonstration for rice transplanter in an unpuddled land where the participants also practiced it. It was followed by a visit to one of the self-help groups run by Hosne Ara Begum and the participants had the opportunity to interact about the rice seedling factory and their business models. Another on-site demonstration was carried out for ZT-MCP where the team from SSCOP shared their experiences of using it for different crops such as wheat, maize, jute and lentils. The issues related to machinery were also discussed.

The participants were also interested to explore about other allied businesses such as fisheries and poultry. Therefore, a brief on-site visit was planned for demonstrating and explaining them. The “Roadmaps” project was briefed among the participants along with the planned activities and what was the next step of actions expected from them. SSCoP and the participants thanked CIMMYT for organizing the exposure visit. Lastly, the session was closed by thanking the SSCOP team for hosting the exposure visit; MoLMaC especially the chief of Agriculture division for facilitating both with the government and private stakeholders.



Stayed overnight at CoochBehar.

August 14, 2019

The day started with a visit to Ghughumari market for observing the marketing strategy of the farmers’ and fishermen. Later on after breakfast, the journey for returning back to Nepal started. We had lunch at Kakarvitta and the team decided to visit one of the participant’s cooperatives named Nepal Multipurpose o-operative Society Ltd. (NMC-Coop) which was nearby.

Stayed overnight at Biratnagar.

August 14, 2019

Anjana travelled back to Kathmandu by flight.

SUMMARY OF ISSUES AND CHALLENGES:

- The time for the visit was very short to capture everything and therefore had to adjust the timings by starting early and finishing up late.
- Participants had their own interest area and therefore sometimes it was difficult to meet their expectations.
- The organizations wanted to share very detailed information about their work, which would be lengthy, and because of the time constraints, the organizer had to interrupt the conversation many times.

SUMMARY OF NEXT STEPS:

- Conduct a meeting with Ministry of Land Management and Cooperatives of Province 1 in Biratnagar.
- Form working groups for building roadmaps to sustainable agriculture mechanization in Province 1.

Conclusion:

Overall, the exposure and sensitization visit conducted by CIMMYT in close collaboration with Ministry of Land Management and Cooperatives of Province 1 was successful. The participants were very much enthusiastic and active to learn the business models and agriculture mechanization practiced in Cooch Behar. The participants shared that the visit was fruitful to them and they look forward to working together for achieving common goal of promoting agricultural mechanization in P-1.



Annex 1: [Schedule](#)

Annex 2: [List of participants](#)

Annex 3: [Pictures](#)

ROADMAPS WORKSHOP IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)
Manisha Shrestha, Communications Specialist

REPORT DATE: Oct 01, 2019

WORKSHOP DATE: Sept 27, 2019

TRAVEL FROM: Kathmandu

TRAVEL TO: MoLMAC, Biratnagar

PURPOSE:

- To collaborate with provincial governments to develop appropriate plans to build and maintain enabling environment for Nepali farmers to apprehend and hone their skills in sustainable agricultural mechanization.
- To link Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), farmer groups, farmers and other stakeholders interested in sustainable agricultural mechanisation.

OVERVIEW:

ACIAR funded Roadmaps Project loomed with an aim to develop capacity for sustainable agricultural mechanisation in Nepal. Led by CIMMYT, this project targets Province One and Province Two of Nepal where the SRFSI (Sustainable Resilient Farming Systems Intensification) Project has been working since 2012.

Previously, CIMMYT had a series of meeting with Provincial government officers of Province One for implementing the Roadmaps project, which was soon followed by an exposure visit to West Bengal (for government officials and private sector partners from Province One) to observe the ongoing activities being implemented by Satmile Satish Club O Pathagara in CoochBehar and have new learnings related to agricultural mechanization that can be replicated in Province One to contribute to increased and sustainable agricultural mechanization and improved livelihoods of smallholder farmers.

After the visit, it is the first workshop on Roadmaps conducted on 27th September at the Ministry of Land Management, Agriculture and Cooperatives (MoLMAC), Biratnagar which was attended by sixteen participants- government officials and private sector partners, including Dr. Bimal Kumar Nirmal (Secretary of MoLMAC) and Dr. Rajendra Uprety (Division Chief of MoLMAC). The workshop started with a discussion over a broader common vision for Agriculture in Province One and gradually narrowing down to the current status, the challenging factors and the role of policies to support sustainable agricultural mechanisation in Province One.

September 27, 2019

Brendan and Manisha travelled from Kathmandu to Biratnagar via first flight to Biratnagar and then accompanied by Anjana and Prasanna. We then headed to the Ministry of Land Management, Agriculture Cooperatives (MoLMAC) where we were led to a meeting hall to conduct our workshop.

All the participants from the ministry as well as private sector gradually gathered up in the meeting hall for the Workshop. The Workshop commenced at 11a.m with a brief introduction of the participants. Dr. Brendan led the presentation with a formal introduction of CIMMYT team followed by a quick introduction of the Roadmaps Project highlighting the partnership between CIMMYT and Province 1 (and Province 2) of Nepal and linking MoLMAC farmer groups, farmers and other stakeholders interested in sustainable agricultural mechanisation from mid- 2019 to June 2020.

Dr. Brendan then moved on to highlight why this Roadmaps Project is necessary which aims to strengthen the capacity of communities and governments to build and maintain the enabling environments (that are required for Nepali farmers to embrace mechanisation as they move toward more sustainable farming systems) through structured dialogue and thus, helping strategic planning for transformational change.

Dr. Brendan then moved on to explain what “Conservation Agriculture based Sustainable Intensification” is and what is the targeted work plan for Province One. For detail explanation, Dr. Brendan distributed Roadmaps Manual to help focus on the purpose and roadmapping process.

After a short break, the workshop resumed with question and answer sessions to come up with a common vision regarding development of conservation agriculture in Province One. As an ice-breaker, Dr. Brendan started with a question on the purpose of each individual to attend the workshop. Following the ice-breaking question, the second one was to confirm their vision on agriculture in Province 1. To which, majority of the participants expressed their vision to boost mechanisation in agriculture so that farmers can benefit in terms of investment and yield and also to set up commercial agri-business in value chain emphasizing on the establishment of custom hiring centre. Next question was on what is their broader vision as to they want to do as a working group. To this, many participants answered that they have a vision to establish custom hiring centre and provide services to the farmers, and also develop resource centres related to agriculture. Some also pointed out the need to make farmers aware about machines and their benefits. Finally, the last question was on the participants’ understanding of inclusive development in their practical life. Many defined it as a coordination and collaboration of all agriculture related stakeholders. Some even defined it in terms of age group, gender, caste and religion.

The end of question answer session was marked by a short 15 min snack break. The workshop resumed with Dr. Brendan’s presentation on the insights from Bangladesh and India, prepared by Emma. Here, he focused on how these two countries have adopted different approaches to agricultural mechanisation and it is up to Province One to decide which approach suits the best.

Next was Anjana who continued with her presentation on Institutional Analysis reflecting on the process and learnings gathered. She also pointed out the results of the need assessment of service providers conducted in Dhanusha.

The baseline assessment started with the first question was on the definition of Sustainable Agriculture Mechanisation. Many of the participants believed it to be a cost effective, profitable and efficient utilization of machinery in agriculture which can be used for multiple crops with long-term usage. The second question was on the current status of Sustainable Agricultural Mechanization in Province One. Participants unanimously agreed that it is still at crawling stage but it is definitely a right time to introduce machines so that we can attract youth (who are more focused on migration) by introducing them to business model as well.

To our third question on baseline assessment- what is enabling Sustainable Agricultural Mechanization in Province 1, participants focused on the lack of labour which is a burning issue and because of labour shortage, participants strongly believe that it is an easy to promote mechanization. Some even pointed out the fact that even migrated youth are seeking more opportunities back in Nepal. Others emphasized on how customers are well aware and well informed about the chemicals used in the food products imported from India and so there is a growing demand of the locally grown crops.

Our fourth question was what is limiting Sustainable Agricultural Mechanization in Province One. According to the participants, one of the most challenging factors is farmers diverting from agriculture as they see more economical benefit outside agriculture. In addition, there is also a lack of social recognition for farmers. After highlighting the limitations, the focus shifted to the policies. The fifth question was on what policies might influence (positive or negative) sustainable agricultural intensification in the Province. Participants were proud to state that their Provincial government is willing to work on sustainable agriculture but they accept that there are problems in implementation process. They also believe that the farmers are not getting appropriate market price for their yield. Another issue that emerged was that no matter how efficient the work has been at policy level, knowledge are not efficiently disseminated at all levels.

The sixth question was about the gaps in our ability to understand and promote sustainable agricultural mechanization in Province one. All the participants agreed on the misuse of subsidy at both receiving and distributing ends. They wanted to know on how subsidy works in West Bengal through NABARD and Satmile Satish Club.

To the final baseline assessment question on who else should be involved in roadmapping process, the participants added agro-vet, mechanical support providers and banks (as financial support providers).

With these baseline assessment questions, we concluded our workshop with a compilation of common vision and ended up signing a declaration of a collaborative effort to promote the development of sustainable agricultural mechanisation in Province One.

Annex 1: [Attendance of the participants](#)

Annex 2: [Signed Commitment](#)

ROADMAPS WORKSHOP IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)

REPORT DATE: Dec 02, 2019

WORKSHOP DATE: Nov 24, 2019

TRAVEL FROM: Kathmandu

TRAVEL TO: Chitwan

PURPOSE:

- To support the members of the working group to visit the 4th Agriculture Mechanization Fair in Chitwan as well as interact with the representatives from Province 2.
- To conduct the second workshop with the working group and identify the activities that they are interested in to build sustainable agricultural mechanization in Province 1.

OVERVIEW:

ACIAR funded Roadmaps Project supported the representatives from the Roadmaps working group of P-1 to participate and observe the Agri-mech fair in Chitwan. The group comprised of participants representing government and non-government stakeholders. The working group arrived Chitwan on November 22 and had a guided tour by Prasanna (Technical officer) at the Agri-mech fair. The next day was a Symposium organized by CIMMYT on “Sustainable agriculture Intensification in Terai” which the members attended. Later, on the same day, a brief meeting was conducted with the working group.

Discussions:

The meeting commenced at 3 pm with a review of the discussions of the last workshop focusing on the “Roadmaps cyclic process” as well as sharing the objectives of the meeting. The members were provided with the vision and the current status of agricultural mechanization which was decided by the working group in the last workshop. Then the members brainstormed the interventions or steps required to reach the vision from the current status. The members were divided as per the organization and there were eight different groups (MoLMAC, DoAD, Chanda Mohana Irrigation, AKC Jhapa, AKC Sunsari/Morang, NMC, JBS and Maharanijhoda) who worked in a team to identify the steps required. The responses were then collected individually and grouped under themes which matched each other.



Figure 1 Roadmapping Exercise

| Broader Theme | Responses |
|--|---|
| Knowledge Generation | <ul style="list-style-type: none"> - Training about new technology and machines both to the farmers and the field technicians or extension workers - Demonstration in farmer's field training the farmer about the equipment and technology and the whole processes - Dissemination of information about crops, insect pest diseases from plant clinic to the farmers and officers through awareness program (media, workshops) - Public awareness on the importance and need for agricultural mechanization in Nepal |
| Exposure visit (farmers and decision makers) | <ul style="list-style-type: none"> - Exposure visits in neighboring countries - Exposure to Farmers field School approach |
| Price Justice | <ul style="list-style-type: none"> - Price policy - Minimum Support price - Policy on Crop insurance |
| Land utilization | <ul style="list-style-type: none"> - Introducing cluster farming - Land consolidation to use machines and new technology - Farming in barren or unused land - Information and guidelines for utilizing land appropriate for farming |
| Farmers Status | <ul style="list-style-type: none"> - Respecting farmers - Promoting agriculture as a business |
| Production information and input center | <ul style="list-style-type: none"> - Availability of fertilizers on time - Collaboration with technical engineer for information on input status, access and availability |
| Machine | <ul style="list-style-type: none"> - Availability of land levelling machines - Policy for import of machines (ensure quality, price, geographically appropriate, reduce tax, subsidies) - Strong after sales support is required - Access to credit and loans for machine purchase |
| Capacity building | <ul style="list-style-type: none"> - Training and capacitating the information providers and technical staff - Availability of trained human resources and technical person - Capacity building of farmers (Community farming, commercial farming, pilot project in coordination with stakeholders) |

| | |
|--|--|
| | <ul style="list-style-type: none"> - Trained operators or skilled manpower who has sound knowledge about the machine for operation and maintenance - Hands-on training program for agricultural machinery, handling, repair and maintenance |
| Irrigation | <ul style="list-style-type: none"> - Facility of year-round Irrigation based on geographical area (Assurance is needed for the farmers) - Increase water use efficiency: a. Method of irrigation b. crop water requirement knowledge |
| Seeds | <ul style="list-style-type: none"> - Introduce improved varieties of seeds that goes along with the new technology - Seed resource center for storage as well as improved access when required |
| Post-Harvest Processing Support center | <ul style="list-style-type: none"> - Market linkages (access, infrastructure) - Processing facility of finished crop for value addition (local products do not get paid well compared to imported products) |
| Custom Hiring Centers | <ul style="list-style-type: none"> - Establishment of CHC with proper policy and operation manual - Involvement of private sectors such as cooperatives or NGOs - Linking Agri-machinery subsidy program to farmers' groups, cooperatives, private organization |
| Subsidies | <ul style="list-style-type: none"> - Regular monitoring of subsidy on agricultural machinery - Subsidies in fertilizer and seeds is required to target small holder farmers |
| Recommendations | <ul style="list-style-type: none"> - Mechanization in irrigation should go hand in hand with Agri mechanization (Chanda Mohana Irrigation) - Development of policy for implementation of land consolidation and provide enabling environment (MoLMAC) - Involvement of private sectors (AKC Jhapa) - One community one technician policy - Preparation of specifications of agriculture machinery suitable for different regions (DoAD) - Research should be done based on technology and geographical area (AKC Jhapa); Comparative study after using machines (soil condition, cost-effectiveness) |

The group also discussed on what could be done during this planting season as two of the cooperatives (NMC Coop and Maharanijhoda) already booked minimum till seed drill from the Agri-mech fair and were interested to practice it in wheat and maize. It was decided that CIMMYT would support by providing technical support with the help of Prasanna. Similarly, another NGO from Morang also showed interest in practicing it. It was discussed and decided that JBS would provide all the inputs and land for the demonstration and CIMMYT would provide the transportation cost for the drill and technical support. In the meeting, representative from MoLMAC (Planning Division) shared that it will be difficult to allocate budget for the machines or any other activities as a part of Roadmaps Activities at this point of time as the government process is lengthy if amendment is required. He also committed that if the planned demonstrations work then they can allocate budget while preparing the budget for the coming fiscal year to promote agri-mech activities in P-1.



Figure 2 Road mapping exercise

SUMMARY OF NEXT STEPS:

- Prasanna to provide technical support on the day of planting at all three sites.
- CIMMYT to arrange Seed drill for planting in JBS site in Morang.
- CIMMYT to arrange another workshop/meeting for the working group in Biratnagar; the members suggested that the workshop should be for two days so that all the actions required are identified and responsibilities divided among the members.

Annex 1: [Attendance of the participants](#)

Annex 2: [Schedule](#)

ROADMAPS WORKSHOP- 3 IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)
Manisha Shrestha, Communications Specialist

REPORT DATE: Feb 13, 2020

WORKSHOP DATE: Feb 11- 12, 2020

TRAVEL FROM: Kathmandu

TRAVEL TO: Biratnagar

PURPOSE:

- To move a step ahead in Roadmaps project in Province 1: review Rabi planting activities and learnings from the working group members; and discuss 5 Roadmaps- Rabi harvest; Next Kharif; Long-term Kharif; Next Rabi; and Long-term Rabi.
- To discuss and spot capacity gaps that needs to be addressed in Province 1, including any potential technical training and workshops.

OVERVIEW:

ACIAR funded Roadmaps Project have been supporting the representatives from the Roadmaps working group of P-1 to carry out sustainable agricultural mechanization in the province. The group comprised of participants representing government and non-government stakeholders. The working group gathered in MOLMAC, Biratnagar office on 11th Feb afternoon where the platform was officially opened by Dr, Rajendra Uprety (Division Chief, MOLMAC), who also briefly summarized previous meetings and encouraged all the participants to come up with such an action plan where MOLMAC, CIMMYT and rest of the group can come together and contribute their bit for a common goal. The next day (12th Feb, 2020) was a half-day meeting that mainly focused on activities where the members brainstormed about their vision (regarding this Rabi, Next Rabi, Kharif and briefly on long-term Rabi and Kharif), challenges they are facing, solutions for the challenges, actions to resolve the issues and partnership/request which can help in issue reconciliation.

Discussions- Day 1:

The meeting commenced at 12.30 noon on 11th Feb, 2020 at MOLMAC, Biratnagar meeting hall with a review of the discussions of the last workshops as well as sharing the objectives of the current meeting. The members were officially informed about the extended duration of Roadmaps project up to March 2021 and provided with a review on project's progress focusing on the technical support. Followed by Prasanna's brief highlight on the progress of technical aspect, Anjana proceeded with "pause and reflect" session with the participants where they were directed to think about any achievements that might have missed regarding the commitment that the working group had signed at the first workshop, specially:

- i) In strengthening coordination among stakeholders interested in sustainable agricultural mechanization.
- ii) In facilitating process for establishment of resource centres/ custom hiring centres.
- iii) In advocating and promoting options for sustainable agricultural mechanization.

After Brendan and Anjana welcomed new members and thanked everyone for getting together and for their contribution, Prasanna presented on four recent demonstration activities that took place on different locations with mixed lesson learned:

1. **Zero Tillage Seed drill Demonstration at Dhanpalthan and Rangeli:**

Jiwan Bikash Samaj (JBS) of Rangeli, Morang with Roadmaps support conducted zero-till seed drill demonstration in around 2 bigha 5 kattha (1.5ha) of land on 13 December 2020. The machine was provided by Chandan Mehta from Bhokraha. Wheat was sown first using this machine which went pretty well, and the farmers are liking it so far. No issues are being faced on wheat so far. However, there are some issues when we used the same machine on maize. There has been the issue of weed. Later it was found out that herbicide was not sprayed properly. So, it's been decided to go for manual weeding. Another issue in maize is unproportionate grapping. Since this mechanical issue has been existing for some time now, Prasanna proposed few options like either modify the machine at local level or move on to Precision Seed Drill (which is not a zero-tillage technology, but the tines can be changed to zero till tines).

JBS feedback: In short, yes, the demonstration on maize failed. But it is more of a lesson learned than a failure. Since it was our first attempt and we were not fully aware ourselves. We had also provided all the inputs from JBS to the farmers so that they don't have to bear any loss in case of failure. But my question is if we already know that the national machine (that branded machine) does not work on maize, why should we ask for the same machine? Or, we could have just worked on wheat and not maize if it was already tried-and-tested that it does not work in maize. As for weeds, why did we use the machine on the plot where the herbicide was not sprayed?

So, my first learning is that the machine should be perfect and, we should be made aware of all the prerequisite before the use of the machine. And for future use, the hiring centers who will provide these machines to the framers should be perfectly equipped with highly skilled technicians.

As for wheat in four locations in Dhanpalthan has been good but in Rangeli, it was not good. So, it also proves that the machine itself is not a complete failure but for maize, it just does not work.

Chandan's feedback: I am a farmer and a businessman for quite a long time. Since 2017 I have been using this technology in agriculture. In my experience, there are many requirements that need to be fulfilled to get best results from this machine. If we miss anything, the machine will

not work. I am still learning to use this machine on maize. I have used this machine both on wheat and maize successfully.

Adarsha Agro (Hari Silwal): I have experienced the need of zero tillage technology in our farming system today. But due to our land structure, we are not being able to use this machine efficiently because we find overlapping issue and gapping issue, but I have not experienced any issue in yield though. May be this call for some mechanical modification the machine. I was also introduced to a new machine (shows a video in his phone and we requested to share with us in viber) which is cost efficient and seem to work well as well. Maybe we can connect this machine with zero till technology???

Nepal Krishi Company (Vivekananda Jha): It could also be that the seed quality of the maize was not good enough.

2. Seed drill demonstration at Gauradaha in minimum tillage field:

The demonstration was carried on 28 November 2019. The demonstrated field was minimum tilled. One of the service providers from Gauradaha Mr. Ashok Chudal purchased this Multicrop seed drill which is attached to a four-wheel tractor. He is also providing services to farmer as rental basis and as contract farming basis. His target is to do in Zero tillage field in coming season.

Prasanna: This machine is slightly better than the national (branded) drill but the same problem of gapping still exists.

Ashok Chudal: I used this seed drill machine on 4 bigha land in maize successfully. This is not the machine's fault. It is the operator who needs to be highly skilled to make the machine work efficiently and the quality of the seed needs to be good too. The problems arise only when the size of the maize is not proportionate and when the land is not levelled properly. There is no defect in the machine itself.

Bharat Sedai: From the feedback collected from the farmers, I modified the hexo-blade (??) of the machine and it works well in maize too.

3. Another demonstration at Gauradaha, Jhapa:

Another demonstration was at Gauradaha, Jhapa with maize. Similar machine- same brand and same mechanism (few modifications done) was attached on two-wheeler tractor. The machine did not function well due to the structure of soil (balaute maato). But the next day the farmer found that birds were picking the seed and the seed was not dropped in a proper line. So, he tilled his land and broadcasted the seeds again.

Adarsha Agro: May be minitiller in a tractor might help with these types of problems.

4. Demonstration at Morang:

Demonstration at Morang was with the operation of minitiller seed drill along with other small machineries like brush cutter, weeder and jab planter in collaboration with a local cooperative Nitya Bachat Thata Rin Sahakari Sanstha and farm machinery trader Kuber and sons on 30 December 2019. The seed dropping was not an issue here, but the problem started when the machine was moved from one spot to another. When moved, the seed dropping continued without stopping and the machine had to be lifted literally to move from one spot to another which was a very difficult task.

After a short reflection on the demonstration activities, Brendan lead the team to think and discuss about how to do things better for next Rabi. Anjana added that we need to find out the issues, solutions or improvements and the ways to solve the problems.

Some common issues faced while using zero till machine stover/straw getting stuck while operating the machine. Bharat Sedai shared that if we spray decomposer and then operate the machine, the issue gets solved to some extent. On the same issue, Chandan Mehta added that one extra operator is needed while operating the machine to check and clear the straw. If you can't keep an extra operator to check, then you must use happy seeder.

Dr. Rajendra Uprety (Division Chief, MOLMAC) informed all the participants to come up with the list of machineries and development of skilled operators they need so that we can see if MOLMAC or Roadmaps can help. He said he can also look upon 50- 50% share from government side. He expressed that government wants to support those who are passionate to do the required work.

Other participants including Ashok Chudal and NMCOOP expressed their idea that it is the mentality that needs to be changed because people are less interested to gain new skills and knowledge rather more focused on stipend and snacks they receive when they attend a meeting or workshop. Thoughts are more focused on immediate monetary benefits. To this discussion, Adarsha Agro added a solution that the way we approach farmers need change as well because the method we are using now tend to push them to think selfishly (by giving some free seed or fertilizer for attending meetings and workshops).

After lunch, the discussion was focused on ***the things that can be done this Rabi- now till the harvest. What is the short-term vision specifically for 3-4 month period? The focus will be on mechanization- what are the issues? How can they be solved? What kind of support you want?***

NKC: Previously NKC bought a maize harvester which was too big and expensive (cost around 10 million). And that machine required big area to operate. Now they have ordered a small harvest that harvests everything maize, wheat, mustard etc. from China via trading house (not company itself) which costs around 3 million hoping that it will help sufficiently in small area coverage.

NMCOOP highlighted the problem of weeds to which Adarsh Agro mentioned that there is a Honda weeder which performs better than Korean weeder. He also mentioned that Indian technology is better for our scenario (land structure) because the spare parts are easily available. So, it is easy to

maintain and find better experienced operators. He also stressed that harvester is equally important because Jhapa VDC and Kankai VDC is the largest producer of maize. In addition, Dryer is also essential because it helps in seed storage and helps maintain seed quality. Mechanically harvested and mechanically dried maize is internationally claimed to be the best quality. Currently there is 20% loss rate in maize which can be reduced to 5-6% if we can provide a complete solution (with harvester and dryer) to the farmers.

With this discussion, we were able to link NMCOOP with Adarsha Agro where Hari Silwal from Adarsha Agro expressed his ability to make the Honda Weeder Machine available from Birtamode to NMCOOP.

Re-directing the group on the agenda of exploring vision, problems and solutions (short-term):

NKC:

- operator training including maintenance (harvester, dryer, rice transplanter). Note: they have already ordered a dryer.
- Planning to start a female centric seedling factory for spring rice (like Satmile). So, they require rice transplanter operation training to female farmers. Female farmers don't have specific skills and they are not technically sound. So, providing just a machine is not enough.
- Open for any technical support (operator training) from Roadmaps or the Ministry.

Adarsha Agro:

- Vision: Provide good quality work to farmers as a service provider
- Action: Investing on machine, developing skills and planning to introduce drone spray
- Request:
 - At least 50% support from the Ministry in harvester
 - Roadmaps support on knowledge sharing on how to get rid of diseases (like fall armyworm); from where and how to get good quality seed; what sort of fertilizer to use and what are the measurements and when to use.
 - Roadmaps support on technical knowledge sharing and skill development training.

Chandan Mehta:

- Farmers have very limited knowledge. They need to be made aware about how to manage weed in zero tillage technology and how to control weed. Firstly, they need to have a skill to identify weed and what herbicide to use for different types of weed. So, imparting technical knowledge is required.
- Request:
 - Machinery Support (50% by government)
 - Introduction of new technology and equipment and their operation (Roadmaps)

Bharat Sedai:

- We need small equipment which are easy to operate and easily affordable- Request financial support from the Ministry.
- Help with providing hybrid seed for maize- request to the Ministry
- Technical support to middle class and smallholder farmers is highly needed.
- Can support each other like by providing certain type of maize seed variety if required for livestock.

Dr. Rajendra Uprety after listening to the working groups requested them to work together with their mayor and form a revolving fund where the Ministry will add the same amount of fund as the municipality have allocated for trading of required machineries.

Maharanijhoda:

- Problem: Maintenance of machineries.
- Problem: Less information on which machine is good. Since soil type is different in different locations, one machine may not be fit in all locations.
- Solution: Proper and authentic information shared on which machine is better (request to Roadmaps)
- Solution: Training on machine operation
- Request: Help farmers link with market better (to the Ministry)

Dr. Rajendra Uprety: If you believe you need skilled operators the most, the Ministry and Roadmaps will help your operators in developing required skills. The Ministry will also help you link with the banks.

Kumar Ghimire (Irrigation Division): Not a short-term plan but...

- Problems: Farmers are engaged in various activities, but irrigation department are not aware about it. There should be a proper connection between farmers, their activities and irrigation department.
- Solution: With good connection, there will be better and proper planning.

JBS:

- Plan: To harvest using machine
- Issues: Need qualified technician to operate the machine.
- Need research on- find out if the selected location was good enough for maize...find out why it didn't work
- Need research on- the best machines to be used (practically proven).
- Need research on- the best market for maize and wheat harvest.

Amidst our workshop, Dr. Bimal Kumar Nirmal (Secretary, MOLMAC) and Mr. Ram Bahadur Thapa (State Minister, MOLMAC) paid a brief visit to show their support to Roadmaps and working groups in our common goal to improve linkages and capacity to create and maintain enabling environments to smoothen the pathways for increased CASI mechanization.

Discussions- Day 2:

The half-day meeting commenced at 8 am on 12th Feb, 2020 in the same MOLMAC meeting hall. This meeting was based more on activities than discussion where the members of working group (like, NMCOOP, NKC, Adarsha Agro) came up with specific points on their vision, challenges, solutions, actions and requests regarding this Rabi, next Rabi, long-term Rabi, next Kharif and long-term Kharif.

1. ADARSHA AGRO

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|-----------|---|--|---|---|--|
| IMMEDIATE | Efficient mechanization in commercial farming- focus is on Maize | <p>Lack of skill in operation and maintenance of machines.</p> <p>Knowledge about appropriate machines according to land structure.</p> <p>Not aware of different business models.</p> <p>Stakeholders are not fully participating.</p> <p>There should be some assurance of better results.</p> | <p>Use of Indian branded machines because easy to operate and maintain...easily available spare parts.</p> <p>Use of efficient and appropriate machines.</p> <p>Complete service provided through CHC and even buy the produce from the farmers.</p> <p>Make technical and financial fund available</p> | <p>Purchase well known Indian branded Combine Harvester and Dryer and start the operation.</p> <p>Harvest currently sown maize and spring paddy, mechanically dry the seed and purchase them from farmers.</p> <p>Store the seeds properly and sell them in the market at a suitable time.</p> <p>Request to PMAMP for Harvester and MOLMAC for Dryer has already been submitted.</p> | <p>Operator training from Roadmaps.</p> <p>Financial Support from MOLMAC.</p> <p>Joint training (on Dryer maintenance+ dealership of machine's spare parts+ technical knowledge) from MOLMAC and Roadmaps.</p> <p>Research and Development from Roadmaps</p> |
| LONG-TERM | Efficient mechanization in commercial farming- focus is on Maize and Rice | <p>Operation and management of agricultural equipment.</p> <p>After sales service.</p> | <p>Use of appropriate Indian branded equipment.</p> | <p>Purchase well known Indian branded Combine Harvester, Dryer, Rice Transplanter</p> | <p>Support from Roadmaps on research and technical trainings.</p> |

| | | | | | |
|--|--|--|--|---|---|
| | | <p>Develop the network of stakeholders</p> | <p>Use of efficient and appropriate equipment</p> <p>Enhance service from CHC including buying of produce from the farmers and market linkages.</p> <p>Develop regional hub for mechanization and develop a network for CHCs to link services and form easy access.</p> <p>Research on location specific appropriate machine</p> | <p>and Drone Spray. And start operating the machines after renting the fields from farmers.</p> <p>Buy farmers' produce at a fair rate and use Dryer to dry the seed. Also rent the Dryer to farmers if they require it.</p> <p>Store the seeds properly and sell them in the market at a suitable time. Also see the rice at their own mill.</p> | <p>Financial, Technical, Monitoring and Regulatory support from MOLMAC.</p> <p>Support from MOLMAC to develop and establish regional hub for CHCs.</p> <p>Machinery revolving fund development in collaboration with local government and MOLMAC.</p> <p>Research and development on better interaction between farmers that can lead to better performance and implementation of Good Agricultural Practices</p> |
|--|--|--|--|---|---|

2. NMCOOP

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|-----------------------|---|--|--|---|--|
| THIS RABI | Ready to sow rice using rice transplanter | Weed management + irrigation Conducting training on rice transplanter operation and seedling production | Use of herbicides and manage weed. Provide trainings. Easy availability of equipment. | Check the availability of herbicide and weeding machine- will use it provided financial support | Making equipment available training on machine operation and other technical aspects - Subsidy or financial support on the purchase of machines |
| NEXT RABI | Develop maize, paddy and wheat farming | Easy availability of zero tillage machine, seed, fertilizer and technical knowhow | Availability of technical knowledge and train the locals | Aware the farmers and build confidence on technology | Financial support from MOLMAC and technical support from Roadmaps |
| LONG-TERM RABI | Develop maize, paddy and wheat farming + Farmers' inclusion | Provide required technical trainings on equipment from CHCs. | Land consolidation and enhance the use of equipment like: Laser Land Leveller Zero Tillage Harvester Dryer etc. | Easy access to equipment and technical support as per the requirement of the machines. Help make farmers technically sound | Create an environment where it is easy to work together with MOLMAC, Roadmaps and other cooperative and organizations. |
| NEXT KHARIF | Develop paddy farming at farmers' level | Encourage farmers to use machines | Exhibit machines and start a demonstration to enhance the use of machine | Managing the operation of CHC. | Support from MOLMAC, local government and Raodmaps form service provider. |

| | | | | | |
|-------------------------|--|---|--|---------------------------------------|--|
| | | | | Develop the system of service centers | |
| | | | | Develop skilled manpower | |
| LONG-TERM KHARIF | Develop kharif cropping system at farmers' level | Develop CHC Easy access to agricultural equipment and machines | Farmers need to be aware about the use of agricultural equipment | | |

3. NKC

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|------------------|---|--|---|--|--|
| THIS RABI | Started conducting mustard harvesting demo to promote mechanization in mustard harvesting Mechanization establishment in maize from cultivation to marketing | Large Area Plots Unaware farmers Crop Care Harvesting issues like a smaller number of harvester, less use of harvester due to increase in moisture, no drying facility, no proper marketing channel etc. | Conducting demos at various plots Link with AKC Providing Harvester facility Link feed industry/ local traders/ service providers to harvest, drying and storage | All the facilities are available but there is no proper linkage among farmers, stakeholders to feed industry | Work together with local stakeholders Support from MOLMAC and Roadmaps to develop and enhance proper linkages |
| NEXT RABI | Promotion of mechanization in value chain of | Creation of large blocks | Mobilization Aware farmers and link them | Meetings on the agenda of social mobilization | Local Stakeholders |

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|--------------------|--|--|--|---|--|
| | paddy (Spring paddy) | <p>Rental cost of machines</p> <p>Coronavirus outbreak in China to import machines</p> <p>Train female labor on seedling production and operation of rice transplanter</p> <p>Training on Harvester operation</p> <p>Creation of entrepreneurs with agro-machinery expertise</p> <p>Purchasing rice mill machine</p> <p>Mobilization of farmers to participate in enterprise</p> | <p>with bank for working capital loan</p> <p>Conduct training to various farmer groups</p> <p>Conduct meetings/ workshops/ exposure visits as per the requirement</p> <p>Government subsidies on machines</p> <p>Social mobilization</p> | <p>Ongoing effort to make farmers aware</p> <p>Conducting trainings to farmers by next week</p> <p>Working on training+ Establishment of Dryer+ Subsidy for the government</p> <p>Wider communication Regarding business aspect</p> <p>Aware the farmers about business</p> | <p>Commercial banks</p> <p>Women farmer group, MOLMAC and Roadmaps working together</p> <p>Support from local stakeholders, MOLMAC and Roadmaps for technical training</p> <p>Support from MOLMAC and JVS for subsidy/ financial support</p> <p>Support from MOLMAC to communicate business models</p> |
| THIS KHARIF | Extend the coverage area of paddy to 200 Hectare | <p>Availability of proper seed (Short Cylinder Time Rice)</p> <p>Farmers' agreeing to having their share on rice mill</p> | <p>Hybrid seed promotion</p> <p>Social mobilization</p> <p>Online platform for marketing</p> <p>Roadmaps recommendation on machines</p> | | <p>Local stakeholders + Farmer service providers + MOLMAC + Roadmaps</p> |

| | | | | | |
|--------------------|-----------------------------------|---|--|--|--|
| | | Establish rice mill | | | |
| | | Marketing of rice | | | |
| | | Establishment of machinery maintenance centre | | | |
| NEXT KHARIF | Extend the area up to 500 hectare | | | | |

4. MAHARANIJHODA

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|------------------|--|---|---|---|---|
| IMMEDIATE | Lessen cost of production and increase productivity through agricultural mechanization | Land Management Identify appropriate machine and their management Irrigation Weed Management in paddy and maize Agricultural Technician | Land consolidation program and participation Proper management of seed, fertilizer and herbicides Management of skilled technicians | Management of land and soil improvement Availability of machines through CHC like Rice transplanter, Laser land leveller, Thrasher, Reeper etc. Installation of shallow tubewell Training on development and operation of machines/ development of workshops or activities | Partnership between Regional Agricultural Directorate and local government Partnership between Roadmaps and other organizations for technical support Partnership with Nepal Agriculture Cooperative Central Federation |

| | | | | | |
|------------------|--|--|--|--|--|
| | | | | like exposure visits. Trainings and Services | |
| LONG-TERM | Lessen cost of production and increase productivity through agricultural mechanization | <p>Land Management</p> <p>Identify appropriate machine and their management</p> <p>Technical Knowhow (Use and maintenance)</p> <p>Irrigation</p> <p>Management of agricultural equipment</p> <p>Agricultural Technician</p> <p>Marketing of the produce</p> <p>Research and Development</p> <p>Insurance</p> | <p>Application of land consolidated farming</p> <p>Capacity development of CHC</p> <p>Shallow Tubewell</p> <p>Agriculture Service Centers</p> <p>Management of selling of produce</p> <p>Conducting demonstration programs</p> | <p>Management of land and soil improvement</p> <p>Encourage smallholder farmers to use machines like Tractor, Rice transplanter, Harvester, Dryer etc.</p> <p>Management of shallow tubewell</p> <p>Service for seed, fertilizer, technical support, herbicides etc.</p> <p>Buy the seed from farmers and create link with maize seed industry</p> <p>Crop Produce</p> <p>Use of equipment</p> | <p>Partnership between provincial ministry, regional agricultural directorate, local government and agriculture Knowledge Centre</p> <p>Technical support from Nepal Krishi company</p> <p>Linking local agrovet and other related company and cooperatives</p> <p>Support from NARC for crop produce</p> <p>Support from Roadmaps for machine operation</p> |

5. Chanda Mohana Irrigation Management Office

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|--------|--|---|--|--|--|
| RABI | Promoting Conservation practices in agriculture through mechanization | Water Users' Association (WUA) is not actively involved | WUA needs to be made aware or organized (either in form of cooperative) Provide technical support | Awareness program Link farmers for better coordination between CHC | MOLMAC NGOs NARC Public Private Organizations |
| KHARIF | Paddy cultivation (introducing rice transplanter, weeder, combine harvester, post-harvest facilitates) | CHC Land Fragmentation | Hired from different stakeholders Land Consolidation | Motivate farmers to purchase machines either privately or in a group Initiate through pilot programs Forming different farmers' group for minimum 20 hectare for paddy transplantation | MOLMAC/ WUA/ Irrigation/ NGOs |

6. Gauradaha Ekikrit Krishi Farm (Bharat Sedai) and Chudal Khgarid Bikri Kendra (Ashok Chudal)

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|------------|------------------------------------|---|--|---|---|
| SHORT TERM | Planning and preparation for maize | What are the interpretations of planning? | Land preparation including irrigation, disease management, quality seeds and fertilizers | Irrigation facility, disease controlling farming system, relevant technical knowledge | Partnership at local level, Agriculture Knowledge Centre, Roadmaps and Gauradaha Ekikrit Krishi |

| | | | | | |
|------------------|---|--|--|--|---|
| | <p>Production</p> <p>Lessen production risk</p> <p>Lessen cost and time consumption in maize production</p> <p>Use of machines like Reaper and Seed Drill</p> | <p>What production?</p> <p>Ways to face production challenges/ Ways to reduce risk</p> <p>Seed Diseases Production Marketing</p> <p>Successful utilization</p> | <p>Maize and spring paddy</p> <p>Technical knowledge, skill, soil structure etc/ insurance on produced crop</p> <p>Quality graded seed/ Control of diseases Use of technology to lessen investment cost Linkage to the market</p> <p>Training at local level for mechanical operations</p> | <p>(from Mangsir/ November- Falgun/ February)</p> <p>Sown non-graded seed Sown using seed drill</p> <p>Sown using seed drill</p> | <p>Farm (Bharat Sedai) and Chudal Khgarid Bikri Kendra (Ashok Chudal)</p> <p>Partnership at local level and Gauradaha Ekikrit Krishi Farm (Bharat Sedai) and Chudal Khgarid Bikri Kendra (Ashok Chudal)</p> |
| LONG TERM | <p>Better plan, better production, less challenges, less risk and better market linkage</p> <p>Use of equipments</p> | <p>How to achieve the vision</p> <p>Technical Knowledge and Skill</p> | <p>technical knowhow better connection between buyer and producer insurance</p> <p>Technical Training</p> | <p>Irrigation facility, Knowledge about diseases and how to control them, land preparation</p> <p>Traditional farming- extensive use of machines</p> | <p>Partnership between government and non-government organizations and Gauradaha Ekikrit Krishi Farm</p> |

7. Chanda Mehta (Akaha vegetable and Fruit production Cooperative)

| | VISION | CHALLENGES | SOLUTIONS | ACTION | REQUESTS (PARTNERSHIP) |
|------------------|--|--|---|--|--|
| THIS RABI | Use of ZT machine in Wheat and Maize Carry out agricultural mechanization | How to deal with Fall Armyworm Scarcity of Machine/ Finding new appropriate machines/ enhance technology | Insecticide awareness Participatory support in machine purchase/ technical support in machine operation and maintenance | Spraying Using currently available ZT machine | Support from Agriculture Knowledge Centre and Roadmaps Support from Agriculture Knowledge Centre |
| NEXT RABI | Promote technology Wide use of ZT machine Employ Field Technicians at different locations land levelling Help farmers who have used ZT machine | How to conduct discussions on technical issues Where to find Laser land leveler and appropriate tractor Who will provide required support to the ZT farmers? | Technical support Participation of such organizations who are better connected with farmers Government subsidy to purchase laser land leveler- they are too expensive | Encouraging farmers from his own past experiences. Have submitted a proposal to AKC for support | Support from MOLMAC and Roadmaps Joint support from MOLMAC, Roadmaps and AKC Support for Roadmaps and MOLMAC |

During the meeting, role of Prasanna was also discussed with all the working groups and it was decided that Prasanna can provide support with Zero Tillage Multi Crop Planter (operation, calibration, maintenance) and Weeder operation too. But need to find other sources for support on operation and maintenance of Rice Transplanter and Combine Harvester (required for June).

The group also requested for domestic and international traveling workshops (like in Dang, South India, Punjab, India Agri-Mech Fairs etc.) but have not worked out on who will be the provider, receiver and other expenses and logistic costs etc.

SUMMARY :

- Nepal Krishi Company (NKC) has agreed to host Harvester Machine Training to operators from different organizations if the organizations are able to bear all the logistic costs (like travel, accommodation and food). So, all agreed to provide a complete cost calculation (regarding logistic- travel, accommodation and food) from their side.
- Decided that Prasanna will continue providing his expertise and technical support to Directorate, as well as other working groups as required.
- Working groups have requested various trainings like, seedling production, mechanical rice trans-planter (operation and maintenance).
- NMC highlighted two models of which one is suitable for cooperatives: 1. Forming different groups with the farmers and bringing them under one umbrella and provide support in various agri inputs including knowledge 2. Linkages with vendors (fertilizer, seeds and herbicides) 3. Machineries and equipment's 4. Irrigation and 5. Economic support. It was discussed and decided in the meeting that if co-operatives are committed to accomplish point 1 and 2, then MOLMAC and CIMMYT would be able to provide required support as per point 3, 4 and 5 in collaboration with the respective cooperatives.
- Agreed to hold next meeting in a month's time. Tentative time and detailed schedule will be circulated prior to fixing a definite meeting date for next workshop.

Annex 1: Attendance

ROADMAPS VIRTUAL WORKSHOP IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)
Manisha Shrestha, Communications Specialist

REPORT DATE: May 22, 2020

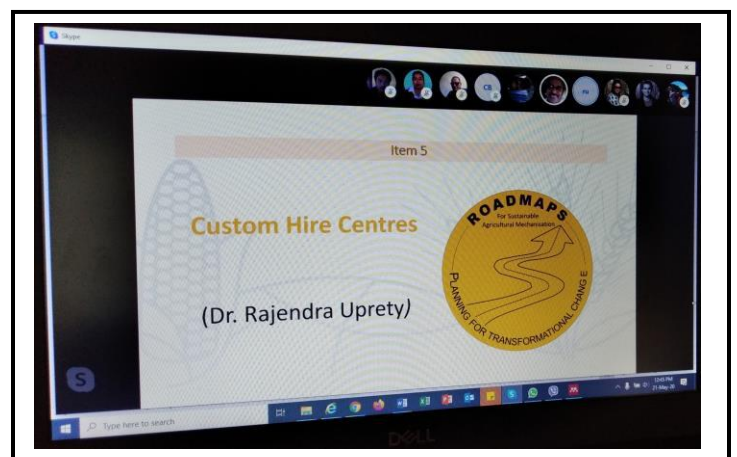
WORKSHOP DATE: 21 May, 2020

CONNECTED FROM: Kathmandu

CONNECTED TO: Province 1

PURPOSE:

- To have an update on COVID-19 and impact on agriculture in Province 1.
- To maintain collaborative environment and review 'Roadmaps' so far
- To plan for reopening after lockdown ends.
- Focus discussion on Kharif 2020 Sustainable Agricultural Mechanization Roadmap
- To discuss on Custom Hiring Centers in Province 1



OVERVIEW:

ACIAR funded Roadmaps Project plans to support the representatives from the Roadmaps working group of Province 1 to carry out sustainable agricultural mechanization in the province. Due to a COVID-19 national lockdown since 23rd March (10 Chaitra 2076), there has been disruption in the planned activities. Though the initial period of lockdown was much focused on just figuring out the logistics of working remotely, we could no longer delay getting back to our Provincial partners and try every possibility to continue the support so that we could get agricultural activities going and minimize the adverse effect on food security as much possible.

On 21st May, the working group joined Skype meeting at 10.30am. The meeting proceeded smoothly and lasted till 1pm where the participants discussed on the impacts of COVID-19 lockdown in agriculture, and the plans that can be put into immediate action to ease farm activities and support smallholder farmers.

DISCUSSION:

The virtual meeting commenced at 10.30 am on 21st May with Brendan's greeting and Anjana introducing all participants who had joined the call. She then moved on to briefly present the agenda of this meeting.

The first discussion on the update of COVID-19 was initiated by Dr. Rajendra Uprety, Division Chief, MoLMAC. He mentioned that COVID-19 lockdown has not affected on the production of agricultural products, but it has really made it difficult for the farmers to take their produce to the market, especially perishable agricultural products has been badly affected by COVID-19 lockdown. The lockdown has also affected the availability of seed and fertilizers along with the availability of machineries and equipment which are mostly imported from India. Apart from that, since the availability of storage facility is not the same in all areas, smallholder farmers are facing difficulties. At the same time, spread of fall army worm is also seen which has raised concern among the farmers. In such situation in order to keep agriculture sector going smoothly, the provincial government is planning to establish (in partnership) 5-6 fully functional CHCs which are capable to provide thorough help to farmers.

After Dr. Uprety, NMC Cooperative representative- Ramchandra Uprety put his opinion on how cooperatives are coming up to help farmers in situation of COVID-19 lockdown but despite trying their best, many cooperatives are failing due to lack of awareness and insufficient support. He believes that though this lockdown has created immense difficulty to farmers, it has also created an opportunity to cooperatives to work in agriculture, increase their members and involve them in farm activities. Agriculture has now become a reliable sector that can provide job opportunities to youth who have returned back home (jobless) due to COVID-19 pandemic and also there is a lot to be done to help farmers not only in increasing their produce but also to link them with market where they can easily sell their produce and get a good deal.

To this, Hari Silwal from Adarsha Agrovet added that the government should prioritize capacity building of cooperatives. They should come up with an organized plan to help farmers with seed and fertilizers.

Next on the third agenda, Brendan and Anjana briefly presented progress and updates on Roadmaps so far including Rabi Harvest. Brendan shared the larger roadmaps of Province 1 in which CIMMYT is currently working based on the information and planning that were discussed on previous workshops.

This review was followed by a focused discussion on Kharif (Barkhe Bali) 2020 Sustainable Agricultural Mechanization Roadmaps. Vivekananda Jha from Nepal Krishi Company (NKC) started the discussion by informing the working group members that they have decided to organize Rice Transplanter (RTP) demo covering both seedling preparation and transplanting in 30 bigha land and they are expecting visitors from Jhapa and Morang.

NKC, along with Nepal Multipurpose Cooperative Society (NMC-COOP) put forward their view that future plan needs to be prepared in such a way that all can move along with COVID and also expressed

their strong belief that the lockdown will come to an end soon. Sticking to this belief, NKC also expressed the possibility of organizing a training (including both operational and maintenance aspect) since the previous plan of getting support from Satmile Satish Club is not possible under current situation, but NKC also emphasized on designing a thorough training course. Brendan is of the opinion that CIMMYT (Dr. Mahesh Gathala) can help with curriculum development. However, NKC did not explicitly requested for any support to conduct the trainings at this stage.

Yogendra Mandal, Chiarman of Jeevan Bikas Samaj (JBS), informed that they are also planning to use Rice Transplanter (RTP) in 2-3 bigha land in Kathari if the machine is made available because the existing machine they have needs to be repaired since some spare parts of the machine is not available. To this issue, Dr. Rajendra Uprety quickly confirmed that the spare parts are available with Kuber and Sons (agricultural equipment dealer) and thus, can help get their machine repaired.

Dr. Rajendra Uprety (MoLMAC) requested NKC to conduct a demo on walk-behind Rice Transplanter and a complete package training on seedling preparation. To this request, NKC expressed their readiness to provide their technical support to JBS in conducting the demo and also 2-3 days training on seedling preparation around the first week of June.

Another topic for discussion was seed production. Mainly, Chiranjibi Bhandari from Maharani Jhoda Small Farmers Cooperative and Yogendra Mandal from JBS expressed their strong interest in seed production to which Dr. Rajendra Uprety (MoLMAC) promised to get detail information on seed availability in 3-4 days.

Chairanji Bhandari from Maharani Jhoda also mentioned that they have a rice transplanter that needs to be repaired. If repaired, they are planning to use it on 2-3 bigha land in Jhapa. When NKC declared their inability to provide another machine to Maharani jhoda (due to distance), it was decided that Prasanna (CIMMYT) will coordinate with SSCOP for spare parts availability and help get the machine fixed. Rajendra Uprety (MoLMAC) also confirmed that he will coordinate with other rice super zones to arrange Rice Transplanter in Jhapa.

Regarding the possibility of DSR demo, NKC confirmed that conducting a demo is not a big issue and can be done in 5 kattha land but in order to take it to larger scale, they need some data/ information on input cost, productivity comparison etc. NKC said the people are reluctant to use DSR because they believe DSR brings weed problems. Brendan then shared CIMMYT's info about DSR to the group which included all the data about yield, irrigation water use, energy use, labor use, production cost etc.

Finally, the last agenda of the meeting was Custom Hiring Centers. On this topic, Dr. Rajendra Uprety informed the group that MoLMAC has planned to support 5-6 fully equipped Custom Hiring Centers in three districts and high possibility of this plan to be implemented in coming fiscal year. If this plan goes well, MoLMAC is considering to extend this support next year to more CHCs. He emphasized that the Custom Hiring Centres should be fully equipped (which means they should have all the basic agricultural equipment required like, Laser Land Leveller, Tractor, Seed Drills, Weeder and Harvester) and can provide a thorough service to the farmers. According to Dr. Uprety, this will not only help farmers but also promises a lasting establishment of such CHC. In addition, Dr. Uprety also highlighted

that the CHC should also have a plan to expand (like, having a warehouse and drying machines)- which can be the next step.

The 2-hour virtual meeting thus concluded, and the main points of this meeting are listed below:

1. NKC expressed the possibility of organizing a training (including both operational and maintenance aspect) but emphasized on designing a thorough training course.
2. JBS is planning to use Rice Transplanter (RTP) in 2-3 bigha land in Kathari. NKC ready to provide technical support to JBS in conducting the demo and also 2-3 days training on seedling preparation around the first week of June.
3. Everyone to participate in the RTP training.
4. RTP also to be used in un-puddled field.
5. Adarsha Agrovat and NMC ready to conduct demonstration if machines are made available.
6. Dr. Rajendra Uprety (MoLMAC) will get detail information on seed availability in 3-4 days.
7. Prasanna (CIMMYT) will coordinate with SSCOP for spare parts availability and help get the machine fixed for Maharani Jhoda. Rajendra Uprety (MoLMAC) will also coordinate with other rice super zones to arrange Rice Transplanter to Maharani Jhoda in Jhapa.

List of participants:

1. Dr. Rajendra Uprety (Division Chief, MoLMAC)
2. Ram Chandra Uprety (NMC-COOP)
3. Yogendra Mandal (Jeevan Bikas Samaj)
4. Vivekananda Jha (Nepal Krishi Company)
5. Chiranjibi Bhandari (Maharani Jhoda Cooperative)
6. Hari Silwal (Adarsha Agrovat)
7. Saraswati Shrestha (DoAD)
8. Prasanna Shrestha (CIMMYT)
9. Brendan Brown (CIMMYT)
10. Anjana Chaudhary (CIMMYT)
11. Manisha Shrestha (CIMMYT)

ROADMAPS VIRTUAL MEETING IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)
Manisha Shrestha, Communications Specialist

REPORT DATE: November 13, 2020

MEETING DATE: November 12, 2020

CONNECTED FROM: Kathmandu

CONNECTED TO: Province 1

MEETING AGENDA:

- Province 1 update (COVID and other)- NMC & NKC
- Review of supported Kharif Activities-Maharanijhoda & JBS
- Discussion and updates on Custom Hiring Centers (Dr. Rajendra)
- Discussion of supported Rabi possibilities
- Any Other Business

DISCUSSION:

The virtual meeting commenced at 1.30pm on 12th November with Brendan's greeting and Anjana introducing all participants who had joined the call. She then moved on to briefly present the agenda of this meeting.

The first discussion on started from Nepal Krishi Company and NMC Coop who shared the updates on COVID situation in Province 1 and highlighted that the maize price has decreased, and the farmers are facing difficulties due to shortage of fertilizers and pesticides. Adarsha agrovet shared that they have been training operators on their own with technical support from NKC for operation of harvesting machines. They also emphasized that the gap of information flow between farmers and agricultural experts increased due to lockdown. JBS shared that they have initiated the process for purchasing machines for CHC and thanked MoLMAC and CIMMYT for support.

Dr. Rajendra Uprety (MoLMAC) after listening to all the COVID updates, shared the focus of the Ministry. He elaborated that the effect of the COVID-19 pandemic especially on smallholder farmers indicates an urgent need for recovery steps to be introduced, which can alleviate their stress and help them resolve emerging challenges. Dr. Uprety emphasized that the Ministry wants to help both farmers and businesses focusing on agri-mechanization. And they have been working on the selection of cooperatives for CHC as the bidding process has already begun. He also emphasized the need to provide a complete package for farmers and need an efficient team for operation.

Regarding the end progress of Kharif season, Nepal Krishi Company provided their updates on Mechanical rice transplanter and seedling production training. Similarly, Jeevan Bikas Samaj, Morang and Maharanijhoda, Jhapa also informed about Mechanical rice transplanter, for which technical support was provided by NKC and facilitated by CIMMYT. Maharanijhoda shared that the experiment on paddy using MRTP was good with better production and plans to purchase drum seeder from Kuber

& Sons and requested if there is any scope to get technical support for planning land consolidation. The discussion then led to the question of future possibilities for Rabi 2020.

JBS plans to cultivate maize in 200 bigha using precision-maize planter in coming Rabi by tilling the land but also plans to experiment with ZT maize again using the previous learnings. NMC coop mentioned that they will continue using as well as renting out minimum tillage for maize planting. Maharanijhoda plans to attempt consolidated farming and also focus on seed production this time. Dr. Rajendra pointed out the fact of underutilization of machines and requested the working group members to seek assistance and coordinate with the team.

Brendan focusing on roadmapping process, summarized how the process works. He clearly explained how everyone in the working group should understand the current status and have a clear picture of future vision (where they want to be, or how they have envisioned the future should be like). Now, the roadmapping process should include all the essential activities like, research, promotion, training etc. that will create an enabling environment to make the future vision possible.

After clarifying the roadmapping process, Brendan re-emphasized on the possibilities for Rabi 2020 (i.e., trainings/ demonstrations/ experts/ policy support for CHC) leading to a long discussion with the members of the working group. As a result, a request was made from P1 working group for laser land leveller/ happy seeder training with the main objective to develop technical skills of machine operators in sustainable agriculture for improving their employability as well as the livelihoods of smallholder farmers. CIMMYT team thanked the working group members for participating and decided that the operators training could be arranged either at AMTRC, Nawalpur or RARS, Tarahara for LLL, happy seeder and ZT seed drill and encouraged the team members to grab this opportunity to train their operators. NKC and JB's would coordinate with each other and JBS to experiment with happy seeder from NKC.

List of participants:

1. Dr. Rajendra Uprety (Division Chief, MoLMAC)
2. Ram Chandra Uprety (NMC-COOP)
3. Yogendra Mandal (Jeevan Bikas Samaj)
4. Vivekananda Jha (Nepal Krishi Company)
5. Chiranjibi Bhandari (Maharani Jhoda Cooperative)
6. Hari Silwal (Adarsha Agrovet)
7. Saraswati Shrestha (DoAD)
8. Brendan Brown (CIMMYT)
9. Anjana Chaudhary (CIMMYT)
10. Manisha Shrestha (CIMMYT)

ROADMAPS VIRTUAL MEETING IN PROVINCE 1

BY: Anjana Chaudhary, Assistant Research Associate (social sciences)
Manisha Shrestha, Communications Specialist

REPORT DATE: March 04, 2021

MEETING DATE: March 04, 2021

CONNECTED FROM: Kathmandu

CONNECTED TO: Province 1

MEETING AGENDA:

- Updates on Rabi planting
- Updates on Rabi harvest
- Discussion on Pre-Kharif Planning
- Share information on new project

DISCUSSION:

The virtual meeting commenced at 10 am on 4th March 2021 with Brendan's greeting and Anjana introducing all participants who had joined the call. She then moved on to briefly present the agenda of this meeting.

The first discussion on started from Nepal Krishi Company. Vivekananda Jha Informed that they have been focusing on Rice. The work of installing Rice Mill and Dryer is in progress, which is done by using Indian technology. Jha also informed that for spring rice they have distributed seed (pusa basmati/ long grain rice) for 100 bigha and planning to start from Jestha and Asar (i.e. mid-May to Mid-July). Since this variety is of export quality, they believe that farmers will benefit. Also, they have introduced a system to insure the product of farmer with 3-7 bigha, trusting it will benefit and motivate more farmers. They are also preparing to bring recently released variety of paddy by Punjab University to the market.

NMC Coop shared that the minimum tillage seed drill bought during Agri Mechanisation Fair at Chitwan in 2019, which they had used as a trail last year, is being rented out to farmers and they are preferring the machine (along with bed maker machines) and the demands are gradually increasing. They want to focus on maize and wheat production. But they have not planned anything about spring rice as they don't have Rice Transplanter.

Adarsha Agrovat (Hari Silwal) informed about the seed drill they used for maize, which was very satisfactory due to cost efficiency and good germination. They are working on dryers as well for maize and wheat.

Jeevan Vikas (Yogendra Mandal) discussed their experience about visiting different agri-machinery manufacturing companies in India and have targeted to buy machines not only focused on maize/wheat but all kind of crops. He suggested that when it comes to purchasing machinery, they need to be explored properly and check the efficiency of machines before purchasing.

He elaborated on experimenting with maize (n 1.5 bigha land) this year and how it was a learning experience for them. Now they have a clear understanding of what mistakes they made last year, and how they have improved this year. Mandal also informed that they are preparing for spring paddy using MRTP and has produced paddy seedling. However, the main thing he is concerned about is the seed because farmers here are paying way too much for seeds coming from India (more than double) and there's no system to check and control it.

Dr. Rajendra Uprety (MoLMAC) after listening to all the updates, shared the focus of the Ministry. He said that to address agri-labor shortage issue and to lessen the cost of production to motivate the farmers, the Ministry has decided that agri- mechanization is the best way to prosper. But it is also true that due to the lack of efficient and knowledgeable machine operators, many machines are not used at optimum level. So, Dr. Uprety emphasized that the Ministry wants to help as much as possible to help both farmers and businesses focusing on agri-mechanization. And they have already issued a notice regarding selected cooperatives for CHC and planning a discussion with relevant parties in a week's time to finalize machineries for CHCs, after which CIMMYT will be approached for capacity building based on selected machines.

When asked about the benefit of Operator's Training that took place from Dec 1 to Dec 4 at AMTRC, Nawalpur, NMC COOP expressed that they are now more confident to use the seed drill machine they have. Jeevan Bikas added that their competency using Reaper-Binder machine has improved so drastically that now they have already ordered the machine.

The discussion was soon followed by request made to CIMMYT, like to facilitate to improve the chain for purchasing machines/ repair & maintenance; and to MoLMAC to modify and customize the customs policy (taxation and all). Adarsha Agrovat requested to add more maize planters for scaling out. And DoAD requested CIMMYT support in developing machine operation and maintenance experts.

All the participants are encouraged to increase coordination among the group, cooperatives interested in CHC are requested to coordinate and identify the pockets where they can support each other or require support from others. In addition, information about new project was also shared in the team. After the end of Roadmaps Project (which was extended till June 2021), a new project will be implemented in next year which will focus not only in agri-mechanization. All the participants were informed that we will soon get together and discuss in detail about this upcoming new project (which is still in proposal phase currently).

List of participants:

1. Dr. Rajendra Uprety (Division Chief, MoLMAC)
2. Ram Chandra Uprety (NMC-COOP)
3. Yogendra Mandal (Jeevan Bikas Samaj)
4. Vivekananda Jha (Nepal Krishi Company)
5. Chiranjibi Bhandari (Maharani Jhoda Cooperative)
6. Hari Silwal (Adarsha Agrovat)
7. Saraswati Shrestha (DoAD)

8. Brendan Brown (CIMMYT)
9. Anjana Chaudhary (CIMMYT)
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