

Co-creating pathways to reduce food losses in the tomato supply chain in Madhya Pradesh

A MULTI-STAKEHOLDER CONSULTATION

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INTRODUCTION

WRI India in partnership with the Centre for Advanced Research and Development (CARD) conducted a stakeholder consultation on November 18, 2022, at Bhopal, Madhya Pradesh (MP), India. This consultation aimed to share and validate the key findings from an ongoing research initiated by WRI India on assessing post-harvest losses in the tomato supply chain in MP and co-creating pathways to reduce food losses in the tomato supply chain. The key objectives of this study, which was initiated in 2021, were to identify and explore the scope of piloting interventions in specific supply chains that integrate landscape restoration and principles of reduced food loss while integrating clean energy access solutions that support livelihoods, improve resource use efficiency, and strengthen the food systems. The stakeholder consultation brought together 42 diverse participants including supply-chain stakeholders and study team members who discussed actionable interventions to reduce losses along the supply chain. Participants included key supply chain actors (farmers, wholesalers, traders, transporters, processors), nongovernmental organizations (NGOs) working on the tomato supply chain in a similar region, and experts in post-harvest management, including government officials.

The consultation began with a welcome note and context setting by Dr. Ruchika Singh, Director, Sustainable Landscapes and Restoration, WRI India, and Dr. Vivek Sharma, Chairman, CARD followed by a round of introductions by all participants.

Shweta Lamba (Senior Project Associate, WRI India) presented the findings from the ongoing study on assessing post-harvest losses “and waste” in the tomato supply chain with a detailed presentation. The presentation included the key objectives, methodology, findings, potential interventions, and a way forward for the study. The presentation concluded with a round of questions

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and answers, notably on the scope of the study in terms of the supply chain with an emphasis on the importance of the pre-harvesting stage (production) for the quantum of food losses. The study, however, by design, limits its scope to considering the issues and challenges arising after the harvesting of tomatoes up to their arrival for retail marketing. This session was followed by breakout group discussions by the participants.

KEY DISCUSSION POINTS

All the participants were organized into three breakout groups for focused group discussions on identifying key interventions to reduce losses in the tomato supply chain. The learnings from desk research and field indicate that behavioral change, infrastructure, and policy are key factors in reducing losses in perishables, so three breakout groups were formed. Each group was represented by diverse stakeholders to obtain inputs from across the supply chain. A set of pre-designed questions, provided in advance to the participants, guided the discussion in each group with facilitation support from the moderators (see Appendix C for the questions developed for all the three group discussions).

The following sections summarize the key discussion points and interventions identified in each group.

Breakout group 1: Behavioral change and capacity building

The discussion started with participants recognizing the importance of and need for behavioral change in reducing food losses. The following key determinants of behavioral change were discussed:

- **Need assessment:** First, there is a need to clearly demarcate the areas in the supply chain where behavioral interventions are needed to reduce losses. The group suggested further research to identify the major causes of food loss and understand the scope of the required behavioral interventions.
- **Development of training modules:** The group emphasized the need for evidence-based training modules to ensure adoption and sustainability. A cluster-wise identification of areas for behavioral change can be undertaken to ensure inclusiveness. Capacity building should start at a higher level (for example, the training of trainers) so that quality changes can be achieved on the ground at scale.
- **Adoption and sustainability:** To ensure the adoption and sustainability of behavioral interventions, it is important to engage with all the supply chain actors, such as farmers, laborers, transporters, traders, and retailers.
- **Impact:** Long-term change requires creating an enabling environment by building awareness, imparting training, and providing handholding support to ensure the sustainability of any intervention.
- **The key stakeholders identified for behavioral interventions were farmers and retailers, because high losses have been reported at the farm and retail levels. There is a need to increase the quality of tomatoes produced because quality can improve shelf life further up the supply chain. Interventions include training on agronomic practices, post-harvest practices, awareness of the end-to-end supply chain among all stakeholders (number of stages, touchpoints, costs), market information at both the regional and national levels, and diverse marketing channels.**

One of the actors identified during the discussion that can drive interventions for behavioral change was agronomic institutions such as Krishi Vigyan Kendras (KVKs) and NGOs, which can support evidence-based knowledge for training. The existing self-help groups (SHGs) and farmer producer organizations (FPOs) can be used for outreach, and new SHGs and FPOs can be created if necessary. Start-ups working in this field can also be engaged to train farmers.

Breakout group II: Infrastructure and innovation

The discussion started with an examination of how interventions in infrastructure and innovation can be applied in the tomato supply chain. Several interventions aimed at improving shelf life, processing, and storage were discussed. The key interventions suggested by the group were as follows:

- **Solar dryer:** Processing surplus tomatoes or the ones that do not fetch attractive returns is key to reducing food losses. Solar dryers can help utilize the surplus quantity and increase its shelf life through processing. Organizations such as Raheja Solar Food Processing offer to buy back the processed material to ensure market linkage. There is a huge demand for dried tomatoes in both the domestic and international markets.
- **Rain shelters:** There is a substantial risk of losses during the production stage, especially from unseasonal rainfall, excessive sun, and frost during winter, which can be reduced through support structures such as rain shelters. Rain shelters can be made using bamboo and green nets (these are cheaper and allow air circulation). However, they have a limited life of 3–4 years.
- **Sheds for temporary storage and primary processing:** Sheds are available on large farmers' land. However, such structures are needed by small and marginal farmers. These structures can protect the harvested produce from the sun during the day and during sorting and grading activities. The sheds can be built for collectivized farmers/groups to improve access for small and marginal farmers.
- **Customized crates for tomatoes:** To address the problem of losses during the handling and transportation of tomatoes, especially the tomatoes at the bottom of the crate, the group suggested an improved crate size that carries a similar or less weight (≤ 25 kg) but is wider than deeper to prevent losses. This crate design will also improve transparency for the buyer at the next stage. Pawan from Udyogini informed the group that this idea has already been adopted by Mother Dairy, which provides 10 kg crates to farmers, whose losses have reduced.
- **Improved packaging:** For several perishable fruits and vegetables, crates are packaged with cushioning to avoid losses during transit. The same method can be used for tomato crates, with waste from paddy or other crops serving as the cushioning.
- **Weighing scales at the village/block level:** For tomatoes, sales are based on crates at the farm and intermediary levels. The availability of weighing scales at the farm and community levels can encourage farmers to weigh their produce and measure food losses due to numerous factors (such as temporary storage and exposure to the sun). This would also empower farmers to negotiate prices based on weight per crate.
- **Other interventions:** The interventions discussed included using the existing railway network for the transportation of perishables to avoid delays and poor roads, collating data from seed companies to forecast and improve data on production, and using refrigerated transport with advanced technologies such as geotagging of vehicles to improve and speed up the transport of perishables.

The group identified farmers and intermediaries (such as traders, transporters, and wholesalers) as the key stakeholders for interventions. The actors that can drive interventions on the infrastructure and innovation fronts are government bodies, by leveraging the existing SHGs and FPOs; corporates, by using their corporate social responsibility schemes; and food companies, by making their supply chains more efficient.

Breakout group III: Policy and incentives

The discussion started by identifying various schemes working directly or indirectly on food loss and post-harvest management, such as the Mission for Integrated Development of Horticulture (MIDH); PM Kisan SAMPADA Yojana (Integrated Cold Chain and Value Addition Infrastructure); Creation/Expansion of Food Processing and Preservation Capacities (Unit Scheme); Infrastructure for Agro-processing Clusters; Food Safety and Quality Assurance Infrastructure; Human Resources and Institutions – Research & Development; Operation Greens (for tomato, onion, and potato), Rashtriya Krishi Vikas Yojana; State Micro Irrigation Scheme in Madhya Pradesh (MPWRD); One-District-One-Product Scheme and Start-up India Scheme in Madhya Pradesh; and Direct Benefit Transfer Scheme on Public Financial Management System.

The group identified farmers and farmer groups as the key stakeholders in food loss reduction, especially in the tomato supply chain at the farm level. The role of consumers, processors, and retailers in reducing food losses was also discussed; however, implementing interventions at the farm level was identified as more effective, based on the group participants' experiences. The group acknowledged that there are various schemes to which farmers have limited access, especially due to the digital divide. The existing schemes are available on a first-come-first-served basis, which is accessible mostly to technologically advanced farmers or their families. Thus, the group agreed that there was a need to raise awareness about the existing schemes and provide training and assistance at the block level to help farmers apply to these schemes. Further, the group discussed the key actors that can drive collaborative work on policy and incentives, which were identified as unions, retailers, processors, the local community, and media. The group also working in collaboration with key actors/stakeholders may promote better action coordination on policy, incentives, and knowledge sharing.

After the plenary session, the findings from each breakout group were summarized by each team for all the participants. Anurag Shrivastava, former Commissioner of Horticulture, Madhya Pradesh, presented the key takeaways from the discussions in the breakout groups and briefly described the challenges and opportunities in the horticulture sector in MP.

CONCLUSION AND CLOSING REMARKS

The consultation was concluded by Mr. Parasuram, Former chief secretary, Government of Madhya Pradesh and senior fellow, WRI India who emphasized institutional mechanisms as the key process for reducing post-harvest losses. There is a growing need to sustain existing institutions and technological innovations in order to address the problems that farmers face, such as food loss.

A vote of thanks was given by WRI India and CARD, with a summary of the key inputs from the discussion to aid the ongoing project on the tomato supply chain. Going forward, the key action points are as follows:

- The inputs from the stakeholder consultation will feed into the working paper, which will be shared with all the stakeholders.
- Discussions will be held with market stakeholders such as private organizations, processors, wholesalers, and retailers to continue discussions on exploring interventions to reduce food loss.
- The scope for pilot interventions in the study area to reduce losses in the tomato supply chain will be explored.

LIST OF PARTICIPANTS

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ABOUT WRI INDIA

WRI India is a research organization that turns big ideas into action at the nexus of environment, economic opportunity, and human well-being.

Our challenge

Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our vision

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

Our approach

COUNT IT

We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

CHANGE IT

We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

SCALE IT

We don't think small. Once tested, we work with partners to adopt and expand our efforts regionally and globally. We engage with decision-makers to carry out our ideas and elevate our impact. We measure success through government and business actions that improve people's lives and sustain a healthy environment.



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