FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

Innovation Lab for Legume Systems Research

The Future of Lentil Systems in Nepal:

Workshop and Expert Perspectives on Lentil Production Systems and Potential Opportunities

Recommendations and Rankings

January 27/28, 2022

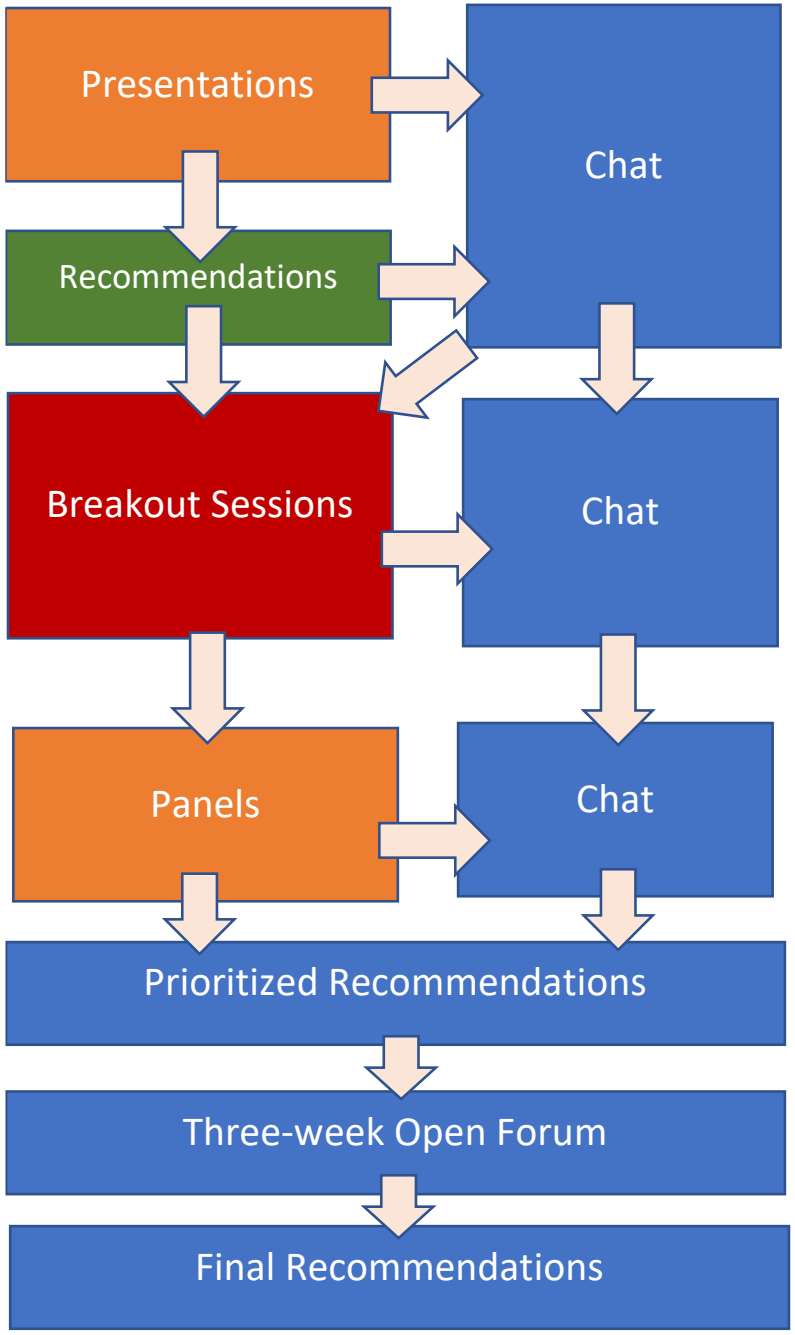
Presented by:
Feed the Future Innovation Lab for Legume Systems Research

USAID
FROM THE AMERICAN PEOPLE

MICHIGAN STATE
UNIVERSITY

Dec 15-16, 2021 : Lentil Workshop Participants

- Registration: 103 individuals
- Attendance: varied between 50 and 70 individuals depending on day and session
- Organizations: Academia (17), Civil society (7), Government (31), Private Sector (12), Producer/farmer (3), Research Institution (19), and Other (14)
- Gender: Female (17), Male (80), Other/Prefer not to specify (6)
- Age: Under 30 (9), 30 or older (80), Prefer not to specify (14)



Process

- Collection of presentations and recommendations
- Collection of comments from chat
- Discussion of presentations, recommendations and chat in breakout sessions
- Collection of discussion in breakout sessions
- Collection of chat from breakout sessions
- Panel discussion based on presentations, recommendations, breakout sessions, and chat
- Prioritized recommendations on day 2 by area
- Opening of forum for voting on prioritized recommendations and adding comments
- Collection of votes and comments on prioritized recommendations
- Presentation of results of the workshop process to the USAID mission in Nepal to guide funding priorities

Questionnaire Structure

- 6 broad categories (Agronomy, IPM, Genetics and Breeding, Seed Systems, Markets and Trade, and Nutrition and Gender)
- List of recommendations in each category for ranking
- Reasons for ranking (Why do you think your top ranked recommendation for the category is the most important?)
- Potential approaches/solutions (What type of programs or activities would address your top {highest ranked} recommendation?)

Questionnaire Participants

- Total Responses Recorded: 56
- Blank or unusable Responses: 12
- ‘Internal’ Responses: 9

- Responses included: 35

(not all respondents provided rankings for all categories)

Questionnaire Participants

	Registered Attendees	Questionnaire Responses
Organization		
Academia	17	4
Civil society	7	4
Government	31	7
Private Sector	12	5
Producer/farmer	3	1
Research Institution	19	12
Other	14	2
Gender		
Female	17	3
Male	80	32
Prefer not to specify	6	0
Age		
Under 30	9	2
Age 30 or older	80	31
Prefer not to specify	14	2
Total Individuals	**103**	**35**

Agronomy Recommendations

Rank	Recommendation
1	**Better seed systems, increasing genetic diversity, address stress, especially water-logging**
2	**Better government and private sector investment in lentil**
3	**Better climate forecasting and information dissemination**
4	Better bundled training at farm level for use of inputs, soil health in conjunction with IPM
5	Better attention to location and cropping system (inter/mono) needs
6	Production assisted through improved irrigation/drainage systems
N=35	

Potential Solutions For Agronomy Recommendation #1

Better seed systems, increasing genetic diversity, address stress, especially water-logging

- High yielding and stress tolerant varieties with improved agronomic practices (sowing method, basal fertilizer doses, land preparation, drainage techniques for excess water from field, among others)
- Quality seed delivery system that encompass PPP
- Seed system that responds to the specific needs of women and marginalized communities

Potential Solutions For Agronomy Recommendation #2

Better government and private sector investment in lentil

- Improved partnership articulated from MoALD to NARC to engage private sector actors
- Massive bulk production programs, subsidies on quality seeds and minimum support price for lentil, assured market system, production inputs easy access and biotic and abiotic stress management
- Lentil market monitoring system, as it frequently fluctuates with time

Potential Solutions For Agronomy Recommendation #3

Better climate forecasting and information dissemination

- Climate forecasting and precautions or preventives measures
- Root rot disease management as well as used balanced fertilizer
- Context specific management practices and better forecast system

IPM Recommendations

Rank	Recommendation
1	**Promote seed treatment, crop rotation, appropriate row spacing, sun drying of seeds, proper sanitation, and canopy management for management of biotic stresses**
2	**Emphasis on integrated, including biotic and abiotic control**
3	**More proactive (soil health, genetic diversity, varietal development) rather than reactive approaches**
4	Develop a risk map of pest and diseases of lentil by (lentil) production domains
5	Better information services, especially for early warning and smart applications of controls
N=31	

Potential Solutions For IPM Recommendation #1

Promote seed treatment, crop rotation, appropriate row spacing, sun drying of seeds, proper sanitation, and canopy management for management of biotic stresses

- Crop rotational demonstrations/ field trials to show the effect of rotations on diseases/pests/t/weeds and crop yields
- Plant density /spacing trials
- Educational programs for farmers and higher Ph.D. level education for a young scientists

Potential Solutions For IPM Recommendation #2

Emphasis on integrated, including biotic and abiotic control

- Appropriate variety development, proper irrigation and drainage system appropriate soil and seed condition are the major activities help in IPM program.
- Resistant breeding followed by cultural practices that reduce the intensity of insect pests. Diversified cropping systems that enhance the activity and abundance of natural enemies should be popularized among the farmers.
- Low cost, women friendly, and use of inputs available locally

Potential Solutions For IPM Recommendation #3

More proactive (soil health, genetic diversity, varietal development) rather than reactive approaches

- Increase general awareness of Nepalese lentil growers for key production constraints in their regional area and how to manage using IPM through regional workshops, such workshops must build a trusting relationship with these growers.
- Multi-location variety testing
- Work with agricultural development offices at municipal level to improve IPM strategies

Genetics and Breeding Recommendations

Rank	Recommendation
1	**Focus on stress resistance, especially water-logging and associated diseases/pests**
2	**Focus on varietal replacement**
3	**Connect breeding to market preferences**
4	Revise policy to improve genetic diversity, integrate land races into breeding programs for improved adaptability and nutrient value
5	Develop site/area and cropping system specific variety recommendation
6	Stress nutrition yield and health index yield in breeding programs
7	Employ marker assisted selection to help shorten the breeding cycle
N=30	

Potential Solutions For Genetics & Breeding Recommendation #1

Focus on stress resistance, especially water-logging and associated diseases/pests

- A big emphasis on addressing water-logging in nearly all suggested interventions
- Technology development through participatory approach
- Screening of germplasm and elite lines for resistance or tolerance to waterlogging at field and lab conditions

Potential Solutions For Genetics & Breeding Recommendation #2

Focus on varietal replacement

- Create linkages between breeding activities and seed systems (forward and backward loop)
- Water-logging resistant varieties

Potential Solutions For Genetics & Breeding Recommendation #3

Connect breeding to market preferences

- This would involve Lentil Breeders, Private sector, economists, constraint specialists and Agribusinesses to develop Product Profiles, by also engaging farmer groups.
- Development of breeding product profiles for each market segment/agro-ecology

Seed Systems Recommendations

Rank	Recommendation
1	**Increase availability of new varieties**
2	**Varietal replacement strategies that include seed strategies**
3	**Support the creation of seed production hubs**
4	Develop and build the capacity of cooperatives to produce seed
5	Stabilize seed and grain markets through policy (reduce barriers for trade)
6	Incorporate demonstrations trials for farmers
N=29	

Potential Solutions For Seed Systems Recommendation #1

Increase availability of new varieties

- Subsidies program for commercial grower on seed along with production inputs.
- More Ag extension service
- Establishment of the Community Seed Bank with series of preferences on the variety so that the farmers can choose such variety easily

Potential Solutions For Seed Systems Recommendation #2

Varietal replacement strategies that include seed strategies

- A seed system that links all the activities from breeding to varietal adoption
- Varietal replacement rate followed enhanced capacity of cooperatives for quality seed production, adequate varietal options through participatory varietal selection are the key areas to be taken into consideration
- Develop strategies on the steps in varietal replacement in the target production areas through seed availability and demonstrations to the farmers to ensure better and sustained adoption of the new varieties with specific timelines

Potential Solutions For Seed Systems Recommendation #3

Support the creation of seed production hubs

- Work through PMAMP to develop seed super zones
- Informal seed system

Market and Trade Recommendations

Rank	Recommendation
1	**Develop lentil trade policy framework for import/export and domestic markets based on a comparative advantage study**
2	**Improve post harvest storage**
3	**Improved purity and quality to compete in local and in/with international markets**
4	Recognize, regulate, and incorporate informal trade into the value chain
4	Develop locally available consumer responsive product profiles through trait discovery and low cost phenomic and genomic tools in the breeding pipeline
6	Enhanced aggregation and post harvest infrastructure for producers and millers
7	Conduct study on market segmentation as there is not just one market
N=28	

Potential Solutions For Markets and Trade Recommendation #1

Develop lentil trade policy framework for import/export and domestic markets based on a comparative advantage study

- Improve the purity and quality as per need
- Subsidies for farmers on inputs and making self sufficient in lentil production
- Quality seed and grain maintenance programs, post harvest and safe storage activities

Potential Solutions For Markets and Trade Recommendation #2

Improve post harvest storage

- Post harvest management trainings, availability of good storage facility, use of post harvest loss minimization technology
- Linking the Producers with the actual traders rather than the “middleman"

Potential Solutions For Markets and Trade Recommendation #3

Improved purity and quality to compete in local and in/with international markets

- Promote value addition to compete with imported products
- Incentives/business promotion for local lentil firms across the value chain
- Explore options for import substitution and export promotion
- Leverage on the unique selling point of Nepal's lentil

Nutrition and Gender Recommendations

Rank	Recommendation
1	**Support for cooperatives is important for increasing women's participation, especially women's cooperatives or women-led cooperatives**
2	**Greater integration of women in the early stages of the value chain, especially varietal selection**
3	**Greater attention to biofortified lentils through low-cost phenotyping tools**
4	Close gender gap by gender-inclusive digital tools. Gender sensitive training on use of DESIS (digitally enabled seed information system)
N=27	

Potential Solutions For Nutrition & Gender Recommendation #1

Support for cooperatives is important for increasing women's participation, especially women's cooperatives or women-led cooperatives

- Education empowering women
- Nutrition (plant-based protein)
- Inclusive seed systems

Potential Solutions For Nutrition & Gender Recommendation #2

Greater integration of women in the early stages of the value chain, especially varietal selection

- Gender inclusive tools and techniques, training, awareness about nutrition value
- Involvement of women farmers in variety demonstration program, training of women in product diversification of lentil
- Develop community-based structures that challenge norms for women's involvement in decision-making

Potential Solutions For Nutrition & Gender Recommendation #3

Greater attention to biofortified lentils through low-cost phenotyping tools

- Biofortified lentil distribution through food supply
- Gender oriented breeding product profiles
- Women skill development on variety of food item preparation from lentil

High-Level Synthesis

Market responsive seed systems

- Breeding and distribution of stress resistant quality seed (especially water-logging)
- Nutrition phenotyping for varietal selection
- System of varietal replacement based on micro-climates/cropping systems
- Production and distribution hubs, perhaps using cooperatives

Improvement in farm level extension systems for lentils

- Bundled extension training (agronomics, proactive/biotic/abiotic/smart IPM)
- Increased use of demonstration farms/plots and minikits
- Weather forecasting and information systems (SMS/Smartphone)
- Capacity development for women at farm/cooperative/agribusiness levels
- Development and use of gender responsive digital technologies

High-Level Synthesis

Evidence-based policy frameworks for the lentil sector

- Study domestic/international trade (comparative advantage)
- Better understanding of regional opportunities/barriers
- Better understanding of consumer demand/need, especially in nutrition
- Better mapping of market segmentation
- Policy framework that addresses the above issues with targeted incentives/subsidies

Better integration of value chain

- Consumer/producer responsive varietal selection using multi-stakeholder platforms
- Community-based cooperatives for seed systems, production, gender integration
- Improve post-harvest linkages and infrastructure (storage, transportation, market data, quality control)
- Support for value-added investments (packaging, processing, marketing, technologies)

Next Steps

Mission Feedback

Recommend Mission Consultation with Local/Regional Subject Experts

Jointly Identify Priority Projects

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THANK YOU

This presentation was made possible through support provided by the U.S. Agency for International Development (USAID) under the terms of contract No. 7200AA20LA00002. Any opinions, findings, conclusions, or recommendations expressed here are those of the authors alone and do not reflect the views of USAID or the United States Government.

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