



**Workshop on Best Practices in Mung bean (Green gram)  
Seed Production, Quality Control and Maintenance**  
29 February - 01 March 2016  
Magway, Myanmar

**Workshop Report**



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## Executive Summary

APCTT in partnership with the Network Activities Group (a national NGO) and the Department of Agricultural Research (DAR) of Myanmar organized a **'Workshop on Best Practices in Mung bean (Green gram) Seed Production, Quality Control and Maintenance'** in Magway, Myanmar from 29 February-01 March 2016. The workshop was part of the capacity building component of the project titled *'An Integrated Rural Economic and Social Development Programme for Livelihoods Improvement in the Dry Zone of Myanmar'* which is funded by the Livelihoods and Food Security Trust Fund (LIFT - <http://www.lift-fund.org>) and aims to support livelihoods improvement and food security in the country's Dry Zone that suffers from a high incidence of poverty.

The objectives of the workshop were to:

- i Understand the constraints in Mung bean seed production in the dry zone of Myanmar; and
- ii Identify solutions to improve the Mung bean seed production systems in the dry zone of Myanmar.

Twenty eight participants (including 42.9% women) attended the event representing lead farmers, farmer associations, NGOs and LIFT implementing partners involved in Mung bean seed production, key nodal agencies of the government including Department of Agricultural Research (DAR) and the private sector (entrepreneurs as well as representatives from seed farms) and the United Nations Office for Project Services (UNOPS).

The workshop was led by qualified International and national experts and was conducted in a participatory and interactive mode with active engagement of the participants. During the workshop, the constraints in Mung bean seed production in the dry zone of Myanmar were brainstormed with the participants through interactive discussions to identify key challenges and technical barriers related to Mung bean production. Based on the observations, a few best practices and solutions for fixing problems in Mung bean seed production were shared with the participants. This workshop also covered aspects of different seed production systems at the level of: individual farmers, farmer groups, non-governmental organizations and the private sector.

Feedback received from participants in the wrap up session was very positive. While 21.4% of the participants perceived the overall meeting as excellent, the rest 78.6% rated the workshop as good. In addition, 71.4% of the participants felt that they would be able to use all or most of the knowledge gained though the workshop. Overall, the workshop helped to strengthen the capacities of participants in terms of understanding and applying best practices for enhancing climate resilience in the seed production, quality control and maintenance aspects of Mung bean crop.

# Workshop on Best Practices in Mung bean (Green gram) Seed Production, Quality Control and Maintenance

29 February-01 March, 2016, Magway, Myanmar

## Workshop Report

### I. Introduction

Mung bean (*Vigna radiata* (L.) R. Wilczek var. *radiata*) is one of the most important food legume crops in South, East and Southeast Asia, where 90% of global production currently occurs. It is also known as mung, moong, green gram, golden gram, Chickasaw pea, Oregon pea and chop suey bean. Mung bean is a relatively drought-tolerant and low-input crop that can provide green manure as well as livestock feed and thus is favoured by smallholder farmers. It is an important rotation crop for rice farmers in Myanmar. Mung bean has an average benefit:cost ratio of 3.4, in comparison to 1.4 for rice. Despite holding such great promise, Mung bean is often grown in marginal lands making it prone to a number of abiotic stresses causing tremendous yield loss. Non-availability of seed of improved varieties, pests and diseases and poor crop management practices are also major factors contributing to the yield gap. Tolerance to abiotic stress is more important in terms of climate resilience as this property is a major factor in the crop's adaptation to new environment. Terminal heat and drought stress may lead to considerable flower drop and reduction in the overall yield. As the climate changes over a period of time, the synchrony between the climate and crop commonly gets disrupted. Given the economic importance as a short-term cash crop, Mung bean holds great potential in enhancing income for small holder farmers. Hence, there is a need to strengthen the capacities of key stakeholders involved in Mung bean production in the dry zone of Myanmar in terms of understanding and applying best practices for enhancing climate resilience in the seed production, quality control and maintenance aspects of Mung bean crop.

APCTT in partnership with the Network Activities Group (a national NGO) and the Department of Agricultural Research (DAR) of Myanmar organized the **'Workshop on Best Practices in Mung bean (Green gram) Seed Production, Quality Control and Maintenance'** in Magway, Myanmar from 29 February-01 March 2016. The workshop was part of the capacity building component of the project titled *'An Integrated Rural Economic and Social Development Programme for Livelihoods Improvement in the Dry Zone of Myanmar'* which is funded by the Livelihoods and Food Security Trust Fund (LIFT - <http://www.lift-fund.org>) and aims to support livelihoods improvement and food security in the country's Dry Zone that suffers from a high incidence of poverty.

### II. Workshop objects and programme

The objectives of the workshop were to:

- i Understand the constraints in Mung bean seed production in the dry zone of Myanmar; and
- ii Identify solutions to improve the Mung bean seed production systems in the dry zone of Myanmar.

The programme comprised of presentations and discussions on the constraints in mung bean seed production in the dry zone of Myanmar and to identify possible solutions to improve the mung bean seed production systems (the detailed programme is enclosed as Annex I). As part of the analytical work of the project, APCTT is developing two case studies on 'Policies, Institutions and Processes to

support Value Chains for Seed Development for Pulses, Legumes and Oil Crops in the Dry Zone of Myanmar’ and Stakeholder Mapping in the Seed Development Value Chain for Pulses, Legumes and Oil Crops in the Dry Zone of Myanmar” through engagement of two local experts. The results of these case studies were also presented during the workshop to complement the learning and for getting feedback from the participants.

English-Myanmar and *vice versa* language translation services were provided by the host during the workshop. This was a time consuming process which reduced the time available for discussions, but was nonetheless necessary for conduct of the workshop.

### III. Participants and resource persons

Twenty eight participants representing a diverse stakeholder group including lead farmers, farmer association representatives, NGOs, researcher institutions, key nodal agencies of the government including Department of Agricultural Research (DAR), the United Nations Office for Project Services (UNOPS) and the private sector actively participated in this workshop. Forty three percent of the participants (12) were women.

The workshop was led by qualified International and national experts and resource persons as follows:

- 1 Dr. Tun Shew, Head, Peas and Beans Division, Department of Agricultural Research (DAR), Myanmar
- 2 Dr. Ramakrishnan M. Nair, Vegetable Breeder – Legumes, AVRDC - The World Vegetable Center, South Asia Regional Office, Hyderabad, India
- 3 Mr. Tin Maung Shew, National Consultant for APCTT for ‘Policies, Institutions and Processes (PIP) to support Value Chains for Seed Development for Pulses, Legumes and Oil Crops in the Dry Zone of Myanmar’ case study, Yangon, Myanmar.

The list of participants is enclosed as **Annex II**.

### IV. Discussions and key learning outcomes

**Introduction and workshop background:** The workshop was inaugurated by a Senior Official of the Department of Agricultural Research (DAR) of Myanmar. He presented an overview of various Government initiatives and discussed about the challenges and opportunities for promoting Mung bean seed production, quality control and maintenance in the country. While reiterating the support of LIFT Fund for Myanmar, the Fund representative stressed upon the importance of strengthening capacity of all relevant stakeholders associated with the Mung bean seed production process. They include farmers, Government extension staff, private sector companies and the credit sector as well. The APCTT representative presented a background of the project and the workshop aimed at knowledge-sharing and capacity building of relevant stakeholders in Myanmar. The inaugural session was concluded with a round of self-introduction by participants and a brief discussion on their expectations from the workshop.

**Constraints to Mung bean seed production – biotic and abiotic stresses:** The workshop commenced with presentation and discussion on various constraints (e.g. biotic and abiotic stresses) to Mung bean seed production with illustrated examples. The discussion focussed on the stress factors affecting Mung bean seed production in Myanmar with respect to: biotic stresses such as major diseases (viral, fungal and bacterial), and major pests (sucking, cutting & chewing and storage pests); and abiotic stresses such as temperature (high or low), water logging or drought and salinity.

The participants were provided expert advice as to how these biotic and abiotic stresses could be identified and assessed for taking timely and appropriate preventive measures.

**Constraints to Mung bean seed production – agronomic practices, infrastructure facilities:** A discussion was held to understand the constraints related to various agronomic practices (e.g. site selection, land preparation, fertilizer application, seed rate and seed treatments, methods of sowing and intercultural operations), and infrastructure facilities (e.g. method of harvesting, storage facilities and seed production system) for Mung bean cultivation and seed production in Myanmar. The participants were provided necessary knowledge, information and advice to help them address the challenges.

**Case studies on oilseeds, pulses and legumes:** To complement the learning and for getting feedback from the participants, the outcomes of two case studies on ‘Policies, Institutions and Processes to support Value Chains for Seed Development for Pulses, Legumes and Oil Crops in the Dry Zone of Myanmar’ and Stakeholder Mapping in the Seed Development Value Chain for Pulses, Legumes and Oil Crops in the Dry Zone of Myanmar” were presented and discussed in the workshop. Comments and suggestions were received from policy makers, experts and participants for further strengthening the case study reports.

**Open forum on constraints to Mung bean seed production:** An open forum discussion was held among the participants on various constraints in Mung bean seed production, quality control and maintenance in Myanmar. While the participants shared their experiences and practices, their specific questions and concerns were answered by the participating international and national experts.

**Agronomic practices:** Various agronomic practices used in Mung bean seed cultivation and production were presented and discussed with specific reference to Myanmar. They include site selection, land preparation, fertilizer application, seed rate and seed treatments, methods of sowing and intercultural operations. The participants were apprised about the methods and benefits of line sowing as a good agronomic practice in Mung bean seed cultivation.

**Crop protection:** After identifying the biotic and abiotic stresses affecting Mung bean seed production in Myanmar, a discussion was held on suggested methods and techniques for effective management of these factors. The focus was on major diseases such as Mungbean Yellow Mosaic Disease (MYMD), *Cercospora* leaf spot, Powdery mildew and Bruchids, as well as major pests such as Pod borer and Beanfly. Some key management methods that were suggested include the use of resistant varieties and controlling the spread of the vector for disease control, as well as pest control using neem oil/formulations and straw mulching.

**Harvesting and storage:** Harvesting and storage comprise an important stage in the Mung bean seed production process. The participants were presented with best practices of manual and mechanical harvesting, sun and solar drying, moisture control in seed, as well as storage of seeds in jars, manila envelopes, cloth or mesh bags, plastic containers or foil envelopes. Furthermore, the international expert presented and discussed two possible options of seed production system which could be adopted for Myanmar such as: seed production through departmental agencies; and community based village seed production system. The participants deliberated on the feasibility of adopting these systems in the country.

**Open forum:** In the final open forum session of the workshop, the participants discussed specific action points necessary for promoting Mung bean seed production, quality control and maintenance in Myanmar. Some of the action points suggested for future activities include: collection of data on cropping systems in major Mung bean growing regions, coverage of different Mung bean varieties, diseases and pests; making the data centrally available for better planning purposes; identification of

Mung bean Yellow Mosaic Virus (MYMV) – strain and the biotype of its vector, Whitefly; creation of a seed production zone comprising of plant protection hub, storage facilities and market information centers for Mung bean seeds; need-based capacity building of various stakeholders in the areas of agronomic practices, pest and disease control, postharvest technology, quality control, Mung bean processing and value added products, market linkage, and so on. This session saw active engagement of participants who shared their experience and thoughts that helped articulate the recommended action points. The feedback indicated that the workshop was well received by the target participants.

## V. Conclusion

This workshop focused on brainstorming on the constraints in Mung bean seed production in the dry zone of Myanmar and identifying possible solutions to improve the Mung bean seed production systems. There was active engagement of various stakeholders [such as lead farmers, farmer association representatives, NGOs, researcher institutions, key nodal agencies of the government including Department of Agricultural Research (DAR) and the private sector] involved in Mung bean seed production in Myanmar. The workshop deliberations helped APCTT to develop a blue print for future activities that could be implemented in Myanmar to strengthen the value chain for Mung bean production through policy, technology and market related interventions. This workshop also provided a valuable platform for the World Vegetable Centre (AVRDC), APCTT's knowledge partner for this workshop to understand the various needs and constraints of farmers in the dry zone of Myanmar and to plan launch of new and improved Mung bean varieties in Myanmar to meet these needs through their ongoing project funded by the Australian Centre for International Agricultural Research (ACIAR).

The workshop realized the importance of focusing on capacity building of various stakeholders in the Mung bean seed production process through a wider multi-stakeholder engagement. It highlighted the need for all stakeholders to share knowledge, experiences and best practices to achieve the desired outcomes which would not help policy makers in planning and implementation but also in strengthening the capability and skill of relevant stakeholders associated in the Mung bean seed production process.

The workshop was quite interactive between the international expert, policy makers and target beneficiaries of Myanmar with active engagement of the participants. Feedback received from participants in the concluding session was very positive and impressive. Most of them indicated that they found the workshop useful in terms of enhancing their knowledge and skill (detailed results of the workshop evaluation are enclosed in **Annex III**). Finally, the workshop made key recommendations towards strengthening the Mung bean seed production system of Myanmar and building capacities of relevant stakeholders to help them address specific problems and challenges in various stages of the seed production process. This LIFT funded capacity building programme also provided a great opportunity to contribute to the International Year of Pulses 2016 (IYP 2016) declared by UN General Assembly to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production aimed towards food security and nutrition.



## Annex I: Workshop Programme

**Day 1: Monday, 29 February 2016**

TIME	SESSION TITLE	SESSION DESCRIPTION
8.30 – 9.00 am	<b>Registration</b>	<b>Registration of participants</b>
9.00 – 10.00 am	<b>Session 1: Inaugural session</b>	<p><b>Inaugural Address</b> – Dr. Tun Shwe, Head, Peas and Beans Division, Department of Agricultural Research (DAR), Myanmar</p> <p><b>Opening Remarks</b> – Mr. Harald Kreuzscher, Programme Officer, LIFT Fund</p> <p><b>Background to the Workshop</b> – Dr. Krishnan S. Raghavan, Coordinator, Technology Transfer, APCTT-ESCAP</p> <p><b>Self-introduction of participants and a brief discussion on expectations from the workshop</b></p> <p><b>Group Photo</b></p>
10.00 – 10.20 am	Coffee break	
10.20 am – 12.00 pm	<b>Session 2: Constraints to mung bean seed production</b>	<p><b>Biotic Stresses</b></p> <p><b>Abiotic Stresses</b></p> <p><b>Discussion</b></p> <p><i>Resource Person: Dr. Ram Nair, AVRDC – The World Vegetable Center</i></p>
12.00 – 1.00 pm	Lunch	
1.00 – 2.30 pm	<b>Session 3: Constraints to mung bean seed production</b>	<p><b>Agronomic Practices</b> – Dr. Ram Nair, AVRDC</p> <p><b>Infrastructure Facilities</b> – Dr. Ram Nair, AVRDC</p> <p><b>Outcome of APCTT-led Case Studies on Oilseeds and Pulses and Legumes</b> –</p> <ul style="list-style-type: none"> <li>- Mr. Tin Maung Shwe, Consultant, APCTT-ESCAP</li> <li>- Dr. Satyabrata Sahu, Coordinator, Technology Intelligence, APCTT-ESCAP</li> </ul> <p><b>Discussion</b></p>
2.30 – 2.50 pm	Coffee break	
2.50 – 5.00 pm	<b>Session 4: Open Forum on Constraints to mung bean seed production</b>	<b>Discussion on various constraints in Mung bean seed production, quality control and maintenance</b>
5.00 – 5.15 pm	<b>Session 5: Wrap up of the Day</b>	<p><b>Key Learning Points</b></p> <p><i>Resource person: Dr. Ram Nair, AVRDC – The World Vegetable Center</i></p>

**Day 2: Tuesday, March 1, 2016**

<b>TIME</b>	<b>SESSION TITLE</b>	<b>SESSION DESCRIPTION</b>
8.30 am – 10.00 am	<b>Session 6: Agronomic practices</b>	<b>Pre-sowing Preparations</b> <ul style="list-style-type: none"> <li>- Site Selection</li> <li>- Land Preparation</li> <li>- Fertilizer Application</li> <li>- Seed Treatments</li> <li>- Methods of Sowing</li> <li>- Intercultural Operations</li> </ul> <i>Resource person: Dr. Ram Nair, AVRDC – The World Vegetable Center</i>
10.00– 10.20 am	Coffee break	
10.20 – 12.00 pm	<b>Session 7: Crop protection</b>	<b>Management of Biotic and Abiotic Stresses</b> <i>Resource person: Dr. Ram Nair, AVRDC – The World Vegetable Center</i>
12.00 – 1.00 pm	Lunch break	
1.00 – 3.00 pm	<b>Session 8: Harvesting and storage</b>	<b>Stage of Harvest</b> <b>Methods of Harvesting</b> <b>Storage Methods</b> <i>Resource person: Dr. Ram Nair, AVRDC – The World Vegetable Center</i>
3.00 – 3.20 pm	Coffee break	
3.20 – 4.50 pm	<b>Session 9: Open Forum</b>	<ul style="list-style-type: none"> <li>- <b>Q&amp;A on Best Practices in Mung bean seed production, quality control and maintenance</b></li> <li>- <b>Summary of workshop outcomes</b></li> <li>- <b>Follow up actions</b></li> </ul> <i>Moderators: Dr. Satyabrata Sahu, Coordinator, Technology Intelligence, APCTT / Dr. Ram Nair, AVRDC – The World Vegetable Center</i>
4.50 – 5.00 pm	<b>Session 10: Closing remarks</b>	<b>Closing Remarks</b> <ul style="list-style-type: none"> <li>- <i>Dr. Krishnan S Raghavan, APCTT-ESCAP</i></li> <li>- <i>Mr. Harald Kreuzscher, Programme Officer, LIFT Fund</i></li> <li>- <i>Mr. Bobby, CEO, Network Activities Group (NAG)</i></li> </ul>
5.00 – 5.15 pm	<b>Evaluation</b>	<b>Meeting Evaluation</b>

## Annex II: List of Participants

### **National Participants:**

1. Ms. Than Than Soe, Deputy Staff Officer, Department of Rural Development, Magway, Email: sunshinegirl2589@gmail.com, Tel: 09-791467165
2. Ms. Hlaing Ei Mon, Upper Division Clerk, Department of Rural Development, Magway, Email: hlainglay0070@gmail.com, Tel :09-792491512
3. Dr. Tun Shwe, Director, Division Head of cereal oil seed crops & Food Legumes, Department of Agricultural Research, Nay Pyi Taw, Email:dtshwe@gmail.com , Tel: 067-416554, 09-43129426
4. Mr. Kyaw Swar Win, Assistant Research Officer, Department of Agricultural Research, Nay Pyi Taw, Email:kyawswarwin059@gmail.com, Tel: 09-420727152, 09-780101970
5. Mr. Soe Win, Senior Research Assistant, Department of Agricultural Research, Nay Pyi Taw, E-mail: Soewin25@gmail.com, Tel: +959 9420700569
6. Ms. Thida Aung, Junior Research Assistant, Department of Agricultural Research, Nay Pyi Taw, Email: tartaraung14@gmail.com, Tel: 09-448546441
7. Dr. Khin Thida One, Lecturer, Yezin Agricultural University, Email:[09khinhida@gmail.com](mailto:09khinhida@gmail.com), [Tel: 067-416512](tel:067-416512), 09-978318660
8. Mr. Khin Maung Win, Director, Department of Agriculture, Magway, Email: [doamagway@gmail.com](mailto:doamagway@gmail.com), [Tel: 09-6560500](tel:09-6560500), [09-5240805](tel:09-5240805)
9. Mr. Kyaw Kyaw Htun CESVI, Agronomist, Yeneyaung Township, Magway, Email: kyawkyawhtunpma@gmail.com, Tel: 0943129403, 09797858421
10. Ms. Su Le` Mon Mon, CESVI, Agronomist, SalinTwp, Magway, Email: sulemonmon.008@gmail.com, Tel: 09-402661173, 09-977002199
11. Mr. Aung Aung, CESVI, Township Co-ordinator of Yeneyaung Township, Magway, Email: aungaung.ewispd@gmail.com, Tel: 09-401564521, 06021254
12. Mr. Tin Ngwe, Drip Irrigation Assistant , ADRA Myanmar, Myit Chay, Pakokku Township, Email: abbtster@gmail.com, Tel: 09-253527766
13. Mr. Aye Naing , Project Manager, Golden Plain Livelihood Development Services Co-op Ltd, Email: admin@gpmyanmar.org, ayenaingpm@gpmyanmar.org, Tel: 09-428138384
14. Mr. Sein Maung, Farmer, Tatkone Township, Mandalay Region, Tel: 09-420766388, 09-797663190
15. Mr. Sein Than Kyaw, Farmer, Head of Nathar Myay Farmer Association, Ayardaw Township, Sagaing Region, Tel: 09-256621795,09-780919896
16. Ms. Tin Zar Win Pyae Kyaw, Field Assistant, Myanmar Agro Action, Taunggyi, Shan State, Email: tinzarwinpyaekyaw@gmail.com, Tel: 09-402551425,09-798267325
17. Mr. Aung Kyaw Kyaw, Managing Director, 999-Mahar Thamardi Trading Co-Ltd, Myingyan Township, Mandalay Region, Email: triplenineoilmill@gmail.com ,Tel: 066-21056,09-2029969
18. Mr. Soe Lwin Aye, Farmer, FDA- Farmer Development Association, Magway, Tel: 09-259106360
19. Mr. Poe Ni, Trader, Vice President of Traders& Brokers Organization, Magway
20. Ms. Mi Mi Cho, Assistant Director (Divisional Seed Section Incharge), Department of Agriculture, Oilseed Agriculture Research Centre, Magway Region, Tel: 063-23157, 09-256420813
21. Dr. Tin TinKhaing, Associate Professor, Principal of Magway Campus, Yezin Agricultural University, Magway Region, Email:tntnkhaing@yahoo.com, Tel: 09425272450, 09973738030

### **United Nations Office for Project Services (UNOPS) staff:**

1. Mr. Harald Kreuzscher; Program Officer, Livelihood and Food Security Trust Fund (LIFT);United Nations Office for Project Services (UNOPS); No.12(o), Pyithu Lane, 7 mile, Mayangone Township, Yangon; Myanmar; Email: Haraldk@unops.org; Tel: +95-9-450034649.
2. Mr. Than Tun; Focal officer for UNOPS livestock and agriculture projects; United Nations Office for Project Services (UNOPS); Yangon; Myanmar; Email: ThanT@unops.org; Tel: +95-1-657-657278, 657280~7, 657703~ 4.

**Economic and Social Commission for Asia and the Pacific (ESCAP) staff:**

1. Dr. Krishnan Srinivasaraghavan, Coordinator, Technology Transfer, Asian and Pacific Centre for Transfer of Technology (APCTT) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), APCTT Building, C-2 Qutab Institutional Area, New Delhi, India, Email: srinivasaraghavan@un.org, Tel: +91-11-3097-3758
2. Dr. Satyabrata Sahu, Coordinator, Technology Intelligence, Asian and Pacific Centre for Transfer of Technology (APCTT) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), APCTT Building, C-2 Qutab Institutional Area, New Delhi, India, Email: sahus@un.org, Tel: +91-11-3097-3756

**Experts and Consultants:**

1. Dr. Ramakrishnan Madhavan Nair, Vegetable Breeder – Legumes, AVRDC - The World Vegetable Center, South Asia Regional Office, ICRISAT Campus, Patancheru 502 324, Telangana, India, E-mail: ramakrishnan.nair@worldveg.org, Tel: + 91 40 3071 3756
2. Mr. Tin Maung Shwe, Myanmar National Consultant for APCTT for PIP case study on value chains for seed development, E-mail: tetlutin@gmail.com, Tel: +95-9-73038412

**Network Activities Group (NAG) staff:**

1. Ms. Myo Ma Ma Than; Program Officer, NAG; Yangon; Myanmar; Email: myomamathan3@gmail.com; Tel: +95 18010751, 09254913560.
2. Ms. Khin La Pyaye Win; Knowledge Management and M&E Officer; NAG, Yangon; Myanmar; Email: lapyaye@gmail.com; Tel: 09971402057.

## Annex III: Workshop Evaluation Summary

### Introduction

The workshop was aimed at understanding the constraints and identifying possible solutions to improve the Mung bean seed production systems in the dry zone of Myanmar. Twenty eight participants including 43% (12) women who took part in the event responded to the feedback survey. The participants included 8 representatives from government ministries or departments (28.6%), 4 from international NGOs (14.3%), 6 from local NGOs (21.4%), 5 from university/research institutes (18%), 3 from the private sector (10.7%) and the rest from other organizations. Seven (35%) respondents were from LIFT implementing partner organization.

The workshop evaluation form used for obtaining feedback from participants is enclosed as Annex IV.

### Understanding the training content and content coverage

A large majority of the participants (88.5%) who responded to the corresponding question in the survey confirmed that they had understood all of the workshop content. Furthermore, 74% of the participants felt that the workshop had covered all the areas that they expected to learn about.

### Usefulness of the content

Participants were invited to rank the usefulness of the training content and quality of processes and logistics from 'excellent' to 'weak'. Scores were given for each evaluation criteria: weak – 1, average – 2, good – 3, and excellent – 4. The table below presents the results. In terms of content, the participants evaluated each key technical session. The sessions which received the highest number of excellent or good ratings were **session 2** - Constraints to Mung bean seed production - Biotic and Abiotic Stresses (96.2%) and **session 6** - Agronomic Practices – Pre-sowing Preparations (88.8%). All other sessions were also rated as excellent or good by over half the participants: **session 3** - Constraints to Mung bean seed production – agronomic practices, infrastructure facilities, brief summary of case studies (77.8%), **session 7** - Crop Protection – Management of Biotic and Abiotic Stresses (81.4%), **session 8** - Harvesting and Storage (84.6%) and **session 9** - Best practices in Mung bean seed production, quality control and maintenance (87.5%). The average score for all content was calculated as 3.1 (4 – the highest).

Content	Excellent (4)	Good (3)	Average (2)	Weak (1)	Average Score
Constraints to Mung bean seed production - Biotic and Abiotic Stresses (Session 2)	18.5%	77.7%	3.7%	-	3.1
Constraints to Mung bean seed production – Agronomic Practices, Infrastructure Facilities, Brief Summary of Case Studies (Session 3)	7.4%	70.4%	22.2%	-	2.8
Agronomic Practices – Pre-sowing Preparations (Session 6)	37.0%	51.8%	11.1%	-	3.3
Crop Protection – Management of Biotic and Abiotic Stresses (Session 7)	25.9%	55.5%	18.5%	-	3.1
Harvesting and Storage (Session 8)	26.9%	57.7%	15.4%	-	3.1
Best practices in Mung bean seed production, quality control and maintenance (Session 9)	16.7%	70.8%	12.5%	-	3.0

## Relevance of new knowledge and ability to use it

More than 96% of the participants who responded to the corresponding question felt that the workshop had equipped them with the right knowledge to improve the way they work. The participants felt that they would be able to use all (21.4%) or most (50.0%) or about half (25.0%) of the knowledge gained though the workshop.

All (5)	Most of it (4)	About half (3)	A little (2)	Nothing (1)
21.4%	50.0%	25.0%	3.6%	-

The workshop evaluation form asked the participants that rated “all”, “most of it”, or “about half” to list key learnings they obtained in the workshop. Some of the learnings mentioned by the participants were:

- Constraints to mung bean production
- Management of biotic and abiotic stresses  
Agronomic practices, land preparation, site selection, seed selection, sowing method, fertilizer application, crop protection, pesticide application, quality control, seed treatments, methods of harvesting, post-harvest handling and storage
- Seed multiplication, seed distribution
- Prevention and control of yellow mosaic virus disease and white fly
- Efficient use of *Trichoderma* and *Rhizobian* with compost
- To consider flowering time because of flower falling due to heat

## Changes/improvements to be made as a result of the workshop

Some changes or improvements that participants pointed out they are planning to make in their work as a result of the workshop were:

- “Would apply methods of protecting diseases and pesticides.”
- In protecting pest diseases  
“Instead of Multiple cropping, crop rotation should be practiced.”  
To give huge favor to more profitable crops
- “Soil condition and weather are crucial for crops.”  
Choice of proper fertilizer
- Establishing seed village for quality seeds  
How to wisely use pesticides
- To solve the farmers' seed insufficiency, seeds which are drought resilience and disease tolerance
- How to develop seed market and organize interested farmers
- Good cultural practices.
- “I will reapply in supervising the research work of my masters and Ph.Ds students who are studying in Mung bean.”

## Whether planning to act as a Trainer

When asked whether participants planned to act as a trainer to train others, 88.9% of those who responded answered ‘Yes’ and 11.1% answered ‘No’.

Some of the groups that participants planned to train included:

- Local farmers
- Departmental staff
- Seed bank committee
- Farmer Development Committees

- NGOs
- University graduate students
- Researchers

Some of the focus areas for the planned training were:

- Land preparation and crop protection for mung bean
- Seed treatment, sowing
- Stages of sowing and seed production
- Seed selection, quality control and maintenance
- Harvesting and storage
- Post-harvest Management of seed

Below are some of the comments provided by participants in the workshop evaluation forms:

- "To local farmers to make documentation and be aware how much of pesticides and other chemicals should be applied in cultivation."
- Training for farmers such as 'Best practices of several stages from mung bean plantation, harvesting to storage'
- "Training of systematic agricultural practices, disease protection techniques and storage to farmers from other regions"
- "I will share knowledge, skills and practices to new staff. I will share all steps of mung bean production including hybridization."
- "I will conduct training to my colleagues and farmers from knowledge and good cultural practices and seed production system especially to farmers."
- "Researchers to be trained for best practices"

### Quality of processes and logistics

Participants were invited to rank the quality of processes and logistics from 'excellent' to 'poor'. Scores were given for each evaluation criteria: poor – 1, fair – 2, good – 3, and excellent – 4. The table below presents the results.

In terms of processes, all the participants rated the agenda and flow as excellent or good. For facilitation and feedback, 96.4% of the participants considered them to be excellent or good. The average score for processes was calculated as 3.3 (4 – the highest).

In terms of logistics, on average more than 50% of the participants considered them excellent and more than 45% rated them good in all categories together. The average score for logistics was calculated as 3.5 (4 – the highest).

		Excellent (4)	Good (3)	Fair (2)	Poor (1)	Average Score
<b>Process</b>	Agenda and flow	42.8%	57.1%	-	-	3.4
	Facilitation and feedback	35.7%	60.7%	3.6%	-	3.3
<b>Logistics</b>	Pre-meeting communication	62.2%	33.3%	4.2%	-	3.6
	Meeting facilities	35.7%	53.6%	10.7%	-	3.2
	Accommodation	61.1%	38.9%	-	-	3.6
	Food	48.1%	48.1%	3.7%	-	3.4
	Administrative assistance during the meeting	46.4%	53.6%	-	-	3.5

## Meeting expectations

For 75% of the participants, the meeting met their expectations to a very large (10.7%) or large extent (64.3%). For the rest 25% of the participants, the meeting met their expectations to a moderate extent.

Very large (4)	Large (3)	Moderate (2)	Small (1)
10.7%	64.3%	25.0%	-

## Meeting overall

From the workshop evaluation forms received, all of the participants perceived the meeting as excellent (21.4%) or good (78.6%). Nobody perceived it to be either fair or poor.

Excellent (4)	Good (3)	Fair (2)	Poor (1)
21.4%	78.6%	-	-

## Aspects to be improved in the future

This section indicates the key areas that can be taken into consideration in the organization of similar events in the future. These areas are based on the suggestions that participants expressed during the evaluation.

**Invitations** – Seven participants provided suggestions on inviting more participants such as farmers, farmers representatives covering more townships, staff officers from agricultural departments and local experts in Mung bean seed production.

**Presentations and Contents** – A participant felt that the training contents should be handed out in advance so that the workshop could become more participatory. Another suggested preparing the handouts with color images to study clearly. It was also suggested to use charts, video click and field observation methods that would be more effective. Another participant felt the need for more effective translation for farmers and those weak in English proficiency.

Regarding the contents, a participant noted that the presentations did not cover disease protection techniques in details while another expressed the need to cover more on agronomic best practices. There were also several suggestions to include: topic on Mung bean processing to produce value-added products; a practical section for field observation; short field trip; and video show for knowledge sharing.

**Logistics** – A participant commented that the chairs in the workshop meeting room were inconvenient and uncomfortable to sit for a long time.

## Other comments

- "Learning about crop disease, seed treatment and storage was enjoyable."
- "I like best practices, quality control and maintenance of mung bean."
- "Learnt about best practices of mung bean seed treatment, quality control and storage. I will apply them to our workplace. LIKE this workshop much!"
- "I like this workshop because I got new information, knowledge for mung bean production."
- "I like this meeting so much. I got many technical knowledge from this meeting. I want to participate in your meeting more in future, if I can get more chances."



## Annex IV: Workshop Evaluation Form

### Workshop on Best Practices in Mung bean (Green gram) Seed production, Quality Control and Maintenance

29 February–01 March 2016, Magway, Myanmar

## Evaluation Form

1. **Name (optional):** \_\_\_\_\_

2. **Gender:** Male  Female

3. **Organization Type (tick one):**

<input type="checkbox"/>	Government ministry or Department
<input type="checkbox"/>	Non-governmental organization (international)
<input type="checkbox"/>	Non-governmental organization/civil society (local)
<input type="checkbox"/>	University/research institute
<input type="checkbox"/>	International or bilateral organization
<input type="checkbox"/>	Private sector
<input type="checkbox"/>	Other (please specify) _____

4. **Is your organization a LIFT Implementing Partner?** Yes  No

5. **In which region of Myanmar do you work?** \_\_\_\_\_

6. **Did you fully understand all workshop content?** Yes  No

*If not, please specify what elements you did not understand:*

7. **After the workshop, how would you rate your knowledge and understanding of:**

	Excellent (4)	Good (3)	Average (2)	Weak (1)
Constraints to Mung bean seed production - Biotic and Abiotic Stresses (Session 2)				
Constraints to Mung bean seed production – Agronomic Practices, Infrastructure Facilities, Brief Summary of Case Studies (Session 3)				
Agronomic Practices – Pre-sowing Preparations (Session 6)				
Crop Protection – Management of Biotic and Abiotic Stresses (Session 7)				
Harvesting and Storage (Session 8)				
Best practices in Mung bean seed production, quality control and maintenance (Session 9)				

8. Has the workshop equipped you with the right knowledge to improve the way you work?

Yes  No

*If 'not', why not?*

9. Is there an area that you expected to learn about but the workshop did not cover?

Yes  No

*If 'yes', please specify what area:*

10. How much of what you learned (knowledge and skills) will you be able to use in your work?

All (5)	Most of it (4)	About half (3)	A little (2)	Nothing (1)

If you answer "A little" or "Nothing", please give the reasons why:

11. If you answer 'All' or 'Most of it' or 'About Half', please list maximum of THREE learnings.

12. a. What are you going to adopt or change in your daily work and long term work plan as a result of this workshop? If nothing, please respond to question 12b.

12. b. If you are not going to adopt or change anything in your daily work and long term work plan as a result of this workshop, please provide a brief reason:

13. Are you planning to act as a trainer to train others in using any of the new knowledge and skills?

Yes  No

14. If 'yes', please specify who (what target group) you are likely to train and what content (knowledge, skills and practices) you will probably include in the training.

If 'not', why not?

15. How would you rate the usefulness and quality of the meeting in terms of processes and logistics?

		Excellent (4)	Good (3)	Fair (2)	Poor (1)
<b>Process</b>	Agenda and flow				
	Facilitation and feedback				
<b>Logistics</b>	Pre-meeting communication				
	Meeting facilities				
	Accommodation				
	Food				
	Administrative assistance during the meeting				

16. To what extent did the meeting meet your expectations? (tick box)

<i>Very large (4)</i>	<i>Large (3)</i>	<i>Moderate (2)</i>	<i>Small (1)</i>

17. How do you rate the meeting overall? (tick box)

Excellent (4)	Good (3)	Fair (2)	Poor (1)

18. What aspects of the meeting could be improved in the future?

19. Do you have additional comments on the overall meeting, on what you liked or disliked?

**Thank you for your inputs!**