Training on Forecast Interpretation, Translation and Communication

Activity Report

11-13 September 2013, Nay Pyi Taw, Myanmar

The Training on Forecast Interpretation, Translation and Communication was convened by the Department of Meteorology and Hydrology in Myanmar as part of the project "Reducing risks of tsunamis, storm surges, large waves, and other natural hazards in low elevation coastal zones", supported by the United Nations Economic and Social Commission for Asia and the Pacific through the Trust Fund for Tsunami, Disaster and Climate Preparedness in Indian Ocean and Southeast Asian Countries.

1 Introduction

Effective forecast application for managing resources and reducing disaster risks requires a process of understanding and transforming forecast information into a form that is relevant to users. This process is constrained by the mismatch between the scientific nature of forecasts and the non-scientific background of forecast users. In Myanmar, user demands for easy-to-understand information products and capacity to interpret and translate them for application in decision-making have been articulated since the 8th Monsoon Forum in 2012.

1.1 Training Objectives

In response to user demands, the Training on Forecast Interpretation, Translation, and Communication was held from 11-13 September 2013 in Naypitaw, Myanmar. Specifically, the training aimed to build capacity of participants to:

a) Understand the science behind hazards
b) Understand the science behind forecast generation
c) Appreciate the process of forecast generation
d) Be aware of forecast products available in the country, including associated uncertainties
e) Evaluate how these products could be useful, in view of hazard-sensitive activities and decision context
f) Apply products in identifying potential impacts to systems that could be at risk
g) Identify options to manage these potential impacts, and
h) Identify ways for closer collaboration between forecast/information providers – the Department of Meteorology and Hydrology (DMH) – and forecast user institutions.

1.2 Structure

The training program was divided into modules (M) and sessions (S), as follows:

Table 1. Forecast Translation Training Outline
M1: Weather and Climate
M1S1: Weather and Climate Dynamics
M1S2: Weather and Climate Forecasts: Generation, Interpretation, and Communication
M2: Floods
M2S1: Floods in Myanmar
M2S2: Flood Forecasts and Warnings: Generation, Interpretation, and Communication
M3: Forecast Translation
M3S1: Understanding Probabilities
M3S2: Translating Forecasts into Impact Outlook and Response Options
M4: Other Hazards: Earthquake and Tsunami
M4S1: Earthquake and Tsunami
M4S2: Earthquake Information Products: Generation, Interpretation, and Communication
M4S3: Tsunami Information Products: Generation, Interpretation, and Communication
M5: Communicating Risks
M5S1: Risk Communication

1.3 Participants

A total of 24 trainees from 9 government and non-government organizations, listed below, participated in the training:

- Department of Agriculture (DOA)
- Department of Fisheries (DOF)
- Directorate of Water Resources and Improvement of River Systems (DWIR)
- Department of Health (DOH)
- General Administration Department (GAD)
- Local Government Administration, Kungyangon
- Local Government Administration, Pyinsalu
- DMH
- Myanmar Radio and Television (MRTV)

1.4 Resources

Resource persons for the training were from DMH and RIMES. The training employed the following methodologies:

- Presentations
- Interactive discussions
- Case study analysis
- Practical exercises

The national language was used during the training.

2 Highlights of the Training

2.1 Opening Session

Mr. Kyaw Moe Oo, Deputy Director General, DMH, delivered the welcome address on behalf of Dr. Hrin Nei Thiam, Director General. Mr. Kyaw Moe Oo stressed that the training is geared to enhance capacity of user institutions to apply forecast/warning information at different timescales. He assured participants that the resource persons shall endeavor to simplify the explanation of scientific/technical terminologies and concepts used in forecasts.

Ms. Ruby Rose Policarpio, Institutional Development Specialist, RIMES, provided a rationale for the training: RIMES' prior work in Asia revealed lack of users' understanding of forecasts and the absence of mechanism for converting forecasts into sector-specific operational language and management strategies. She cited the 1997-1998 severe El Niño, for which forecast of up to six (6) months lead time was available. Climate-sensitive sectors did not use the information for developing mitigation strategies, resulting to tremendous economic losses, particularly in the agriculture sector. She then facilitated participant introductions and expectations, and introduced the objectives, scope, and methods of the training.

2.2 Module 1: Weather and Climate

M1S1: Weather and Climate Dynamics. Mr. Chit Kyaw of DHM introduced the climate setting of Myanmar, which included weather and climate processes and drivers, seasonal characteristics, extreme events and their impacts, observed trends, and climate projections.

M1S2: Weather and Climate Forecasts – Generation, Interpretation, and Communication. Mr. Chit Kyaw also presented DMH's forecast information products; inputs, models, and the complex process used in their generation; and uncertainty associated with these products. Participants were given orientation on terminologies, symbols, and color codes used in these products.

Importance of seamless forecasts was emphasized, i.e. the use of forecasts of different timescales. Seasonal climate outlook has higher uncertainty, hence could be used in planning. Medium- and shorter-term forecasts have lower uncertainty compared to the seasonal outlook; hence could complement, for application in contingency planning and livelihoods decisions. Two- to three-day forecasts have the lowest uncertainty.

The session also covered DMH's dissemination system, highlighting the institutional arrangement, redundant channels of communication, and communication of forecast uncertainty.

2.3 Module 2: Floods

M2S1: Floods in Myanmar. Ms. Tin Yi of DMH's Hydrology Division presented the country's flood profile, classification of floods affecting Myanmar, flood-prone areas in the country, long-term flood frequency, and significant flood events and their impacts.

M2S2: Flood Forecasts and Warnings – Generation, Interpretation and Communication. This session included presentations on and discussion of the process of generation of water level/ flood forecasts, from water level monitoring, collection and transmission of station data, process of analysis, models used in flood forecasting, model output evaluation, to issuance of forecast. Water level monitoring, during the Southwest monsoon season, was especially underscored.

Participants were given orientation on available flood forecast products at different timescales, definition of terminologies used, and threshold levels employed for flood warning. Uncertainty in flood forecasts was explained – uncertainties in weather forecast input and in hydrological and

hydrodynamic models all contribute to flood forecast uncertainty. The session also covered the dissemination system through redundant channels.

2.4 Module 3: Forecast Translation

M3S1: Understanding Probabilities. This session introduced the concept of probability of exceedance or the likelihood of a certain climate parameter being exceeded, on the average, in a defined period. The session put emphasis on interpretation of historical data and constructing plausible inferences based on forecast and historical observation data. An exercise was facilitated to aid participant understanding of the concept – participants were tasked to analyze the potential rainfall characteristics in the coming southwest monsoon, using historical data, probability of exceedance, and the forecast.

M3S2: Translating Forecasts into Impact Outlook and Response Options. This session provided tools for transforming forecasts into impact outlook and management strategies/measures for application. An exercise grouped participants based on the sectors they represent (livestock, fisheries and rural development; agriculture and forestry; and health and general administration), and facilitated their analysis of forecast-based potential impacts and response options. Outputs from each group, as shown below, were then presented in the plenary.

Group 1. Livestock, Fisheries and Rural Development

Activity	Forecast	Location	Elements at Risk	Potential Impact	Capacities	Response
Fingerling production	Seasonal Forecast: Below normal rainfall for Early monsoon period	Sagaing	• Fingerlings	• Decrease in survival rate	• Established water and stock management strategies	• Water and stock management • Disease control
Grow-out culture		Mandalay	• Growth rate	• Decreased water level • Decreased growth rate • Diseases • Death of species	• Established water management strategies	• Water management • Disease management
Fishing	Seasonal Forecast: Above normal rainfall for early monsoon period	Tanintharyi	• Fish species • Fshermen	• Decreased catching rate • Unsafe for fishermen	• Communication system	• Establishment of fishermen shelters • Early warning
Fish culture	Seasonal Forecast: Above normal rainfall for peak monsoon period	Ayeyarwady	• Ponds	• Flooding of ponds • Escape of fish species	• Availability of mitigation paraphernalia	• Provision of nets to be put up around the ponds • Provision of other materials to protect the fish specifies inside the pond
Inland fishing		Ayeyarwady	• Fish species	• Damage to fishing nets due to strong water current	•	•
Fingerling production	Seasonal forecast: Below normal rainfall for late monsoon period	Sagaing	• Fingerlings	• Decline in fingerling production • Decreased income due to decrease in production	• Reservoir	• Water reservoir management • Brood stock management

Group 2. Agriculture and Forestry						
Activity	Forecast	Location	Elements at Risk	Potential Impact	Capacities	Response
Sesame, groundnut, pigeon pea, and mung bean growing	Seasonal Forecast: Below normal rainfall for early monsoon period	Sagaing	• Crops	• Soil moisture will be insufficient to support crop growth • Decrease in crop yield	• Water harvesting and management technologies	• Train farmers in water harvesting and management strategies such as: - Cultivation practices to reduce soil moisture losses - Application of recommended organic and chemical fertilizer rates for strong resistance - Prior to sowing, soil should be thoroughly prepared • Advise farmers to grow drought-resistant and early-duration varieties
Paddy cultivation	Seasonal Forecast: Below normal rainfall for the peak monsoon season	Sagaing	• Paddy	• Water will be insufficient to achieve high yield • Sown area and yield of paddy would decrease	• Water harvesting and management technologies	• Train farmers on: - Recommended rate of organic and chemical fertilizers for strong resistance • Advise farmers to use early duration, drought-tolerant, and upland rice varieties • Before sowing, thoroughly prepare soil to improve water holding capacity
Ground nut, sunflower, and wheat cultivation	Seasonal Forecast: Below normal rainfall for the late monsoon period	Sagaing	• Yield and quality of crops	• Soil moisture will be insufficient to achieve high yield	• Water harvesting and management technologies	• Train farmers in: - Cultivation practices that reduce soil moisture losses - Application of recommended rate of organic and chemical fertilizers for strong resistance • Advise farmers to grow drought-resistant, short-duration varieties
Tree planting	Seasonal Forecast: Normal rainfall for the early monsoon period	Bago	• Risk is minimal at planting time	•	•	•

Group 2. Agriculture and Forestry						
Activity	Forecast	Location	Elements at Risk	Potential Impact	Capacities	Response
Maintaining plantation Weeding	Seasonal Forecast: Below normal rainfall for the peak monsoon season	Bago	• Young plants	• Plants are very sensitive in their early stage • Death of plants/ seedlings	• Water tanks	• Provision of water supply for maintenance of plants • Patching
Maintaining plantation Weeding	Seasonal Forecast: Normal rainfall for the late monsoon period	Bago	• Risk is minimal	•	•	• Enrichment planting • Gap planting

Group 3. Health and General Administration						
Activity	**Forecast**	**Location**	**Elements at Risk**	**Potential Impact**	**Capacities**	**Response**
Hospital and public health management	Seasonal Forecast: Normal rainfall for the early monsoon period	Bago (possibility of flooding)	• Community • Hospital • Health services delivery • Drug supply	• Crowded condition at camps • Spread of diseases like acute respiratory infection, influenza • Food poisoning	• Disaster response/ rapid response teams • Availability of emergency drugs • Human resource	• Camp services preparation • Preparation of shelters/evacuation areas • Immunization • Disease surveillance and early response
Hospital and public health management	Seasonal Forecast: Below normal rainfall for the peak monsoon period	Bago	• Water supply • Staff • Health service delivery	• Disease outbreak (diarrhea, typhoid fever)	• Disaster response/ rapid response teams • Availability of emergency drugs	• Collaboration with DMH for early warning • Collaboration with MRCS • Disease surveillance and response
Hospital and public health management	Seasonal Forecast: Normal rainfall for late monsoon period	Bago	• Community • Hospital • Health services delivery • Drug supply	• Crowded condition at camps • Spread of diseases like acute respiratory infection, influenza • Food poisoning	• Disaster response/ rapid response teams • Availability of emergency drugs Human resource	• Camp services preparation • Preparation of shelters/evacuation areas • Immunization Disease surveillance and early response

2.5 Module 4: Other Hazards – Earthquake and Tsunami

M4S1: Earthquake and Tsunami. This session sensitized participants on the earthquake and tsunami risks in the country. The session covered earthquake triggers, Myanmar's seismicity, earthquake and tsunami-prone areas, and historical earthquake and tsunami events and their impacts.

M4S2: Earthquake Information Products – Generation, Interpretation, and Communication. This session familiarized participants on DMH's National Earthquake Data Center (NEDC), which operates 24/7 for earthquake monitoring and tsunami early warning. The session covered earthquake detection, monitoring, data acquisition and analysis, and standard operating procedure (SOP) for earthquake bulletin generation and dissemination. The session assisted participants in interpreting earthquake magnitude and intensity.

M4S3: Tsunami Information Products – Generation, Interpretation, and Communication. This session presented and discussed DMH/NEDC's tsunami warning system, which includes SOP for warning generation based on analysis of earthquake magnitude and epicenter and on information from regional tsunami warning centers, information products, and dissemination. The session also aided participants in the interpretation of tsunami bulletins.

2.6 Module 5: Communicating Risks

M5S1: Risk Communication. The session discussed the basics of risk communication and design of risk communication materials. Case studies allowed participants to learn from documented experiences. A facilitated exercise assisted participants in the design of risk communication materials.

2.7 Closing Session

Dr. Hrin Nei Thiam, delivered the closing remarks, and emphasized the need to forge stronger partnerships between DMH and user institutions, for enhanced application of user-relevant forecasts. Awarding of Certificates of Appreciation for resource persons and Certificates of Completion for participants followed.

3 Training Outcomes and Recommendations

All 24 participants from agriculture, fisheries, water resource, transport, health, and disaster management sectors, including the media, completed the training. The training provided yet another venue for forecast provider and user interaction toward usable forecasts and actionable warnings. All participants were appreciative of the relevance of the training to their work. Annex 1 provides the feedback received from participant evaluation.

Participants provided the following recommendations for future trainings:

- Translation of the training manual into Burmese
- Increase the time allotted for each session to allow more in-depth discussions
- Regular conduct of the training
- Training to also target local level decision-makers

Annex: Training Evaluation

The training was evaluated based on participants' assessment of:

a) Degree to which training objective was met
b) Relevance of topics covered
c) Contents of the training
d) Time allotted for the sessions
e) Usefulness of the materials provided
f) Knowledge, competence, clarity, and level of engagement of trainers/resource persons
g) Benefits of the training

The following figures present the evaluation results:

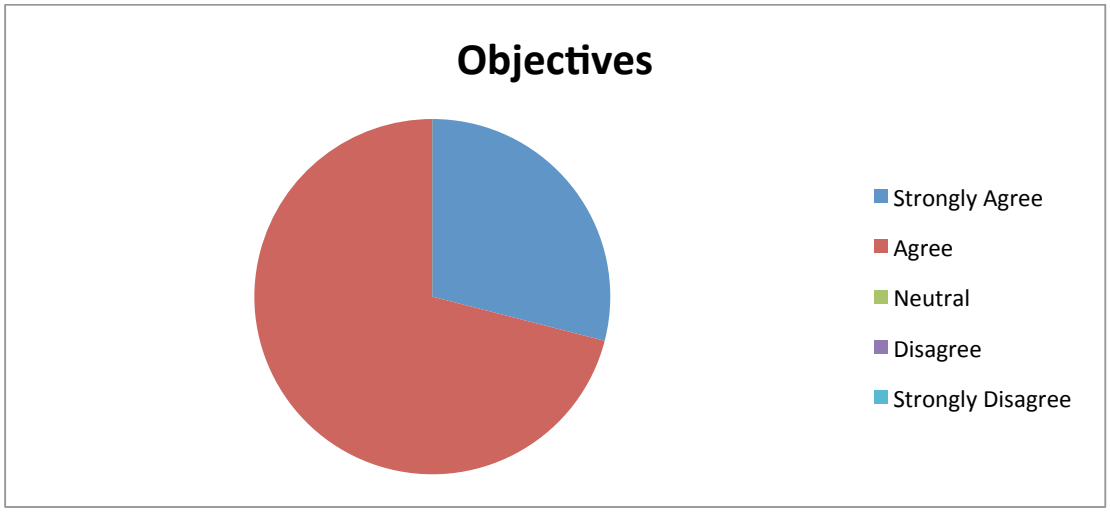

Figure 1. All participants agreed that the objectives of the training were met

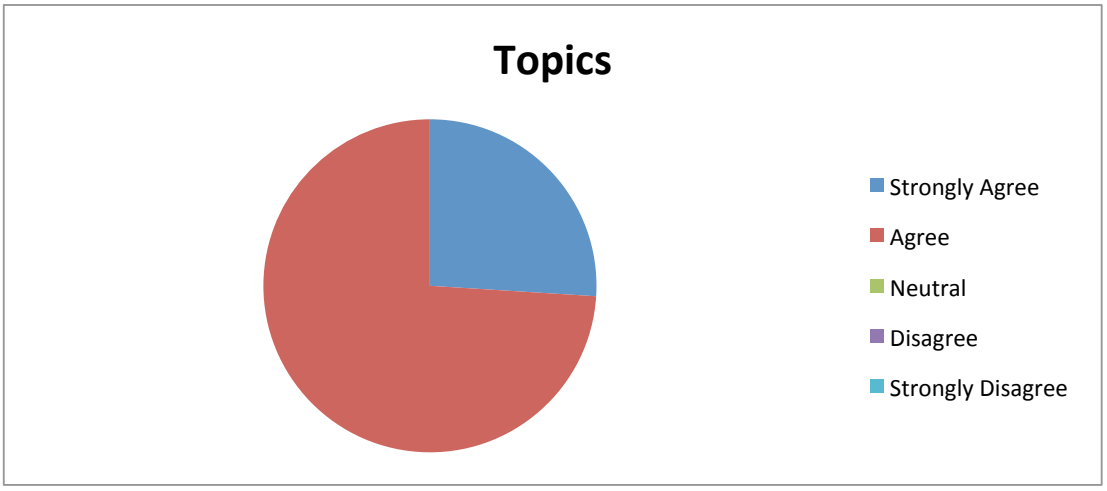

Figure 2. All participants found the topics relevant

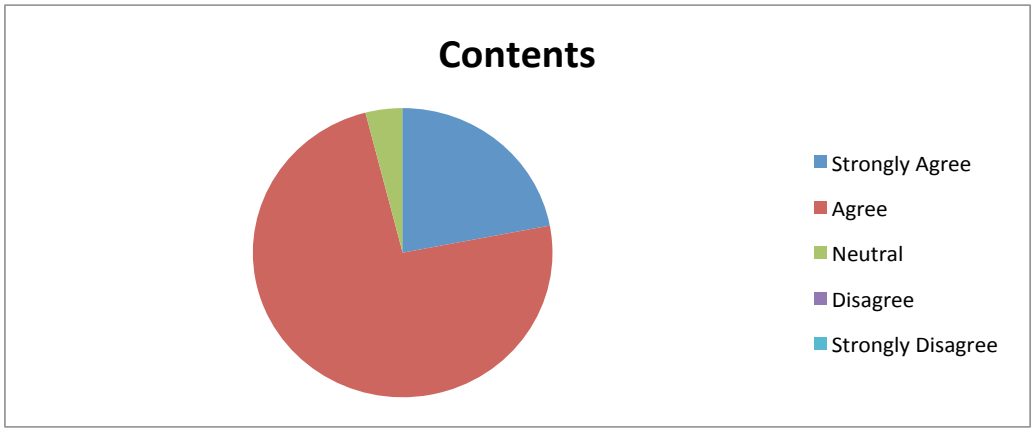

Figure 3. About 96% of the participants found the contents of the training well organized

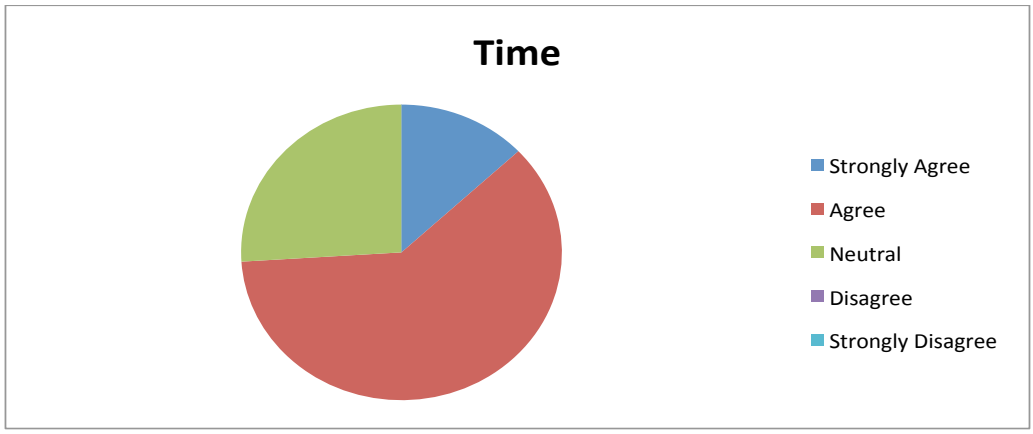

Figure 4. About 74% of the participants found the time allotted for the sessions sufficient

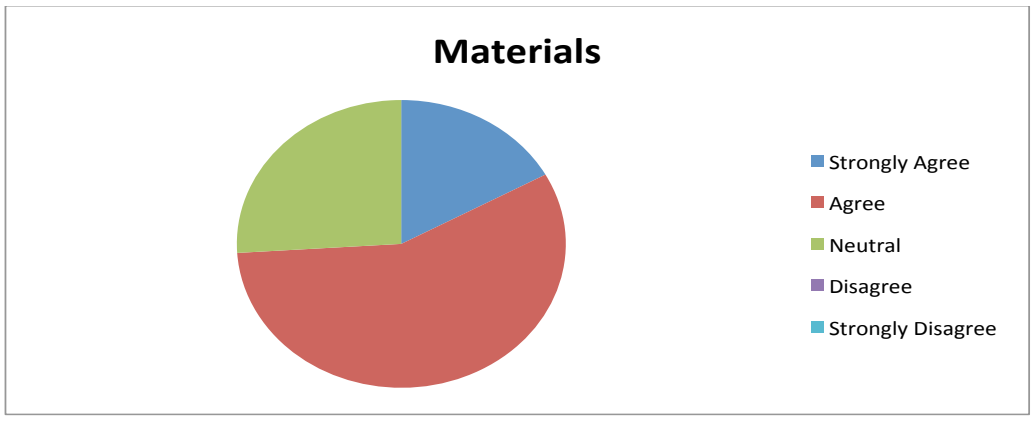

Figure 5. About 74% of the participants found the training materials were useful and easy to understand

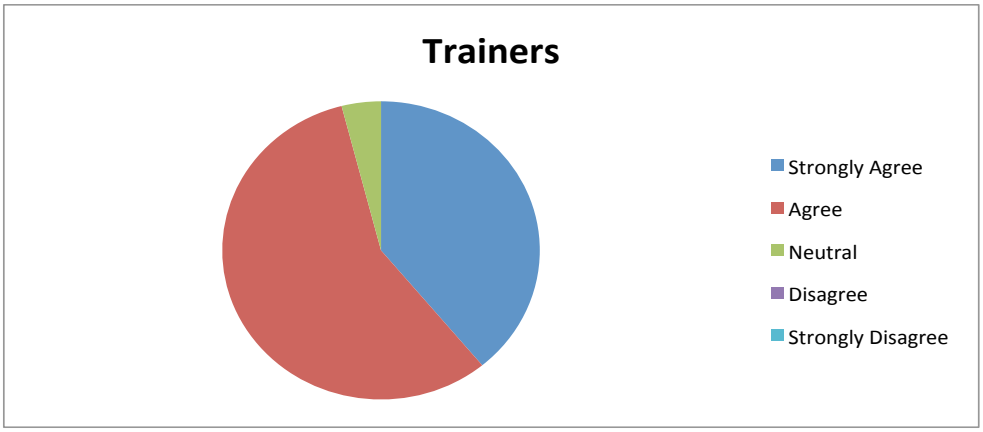

Figure 6. About 96% of the participants found the trainers knowledgeable, competent, clear, and engaged well with the participants

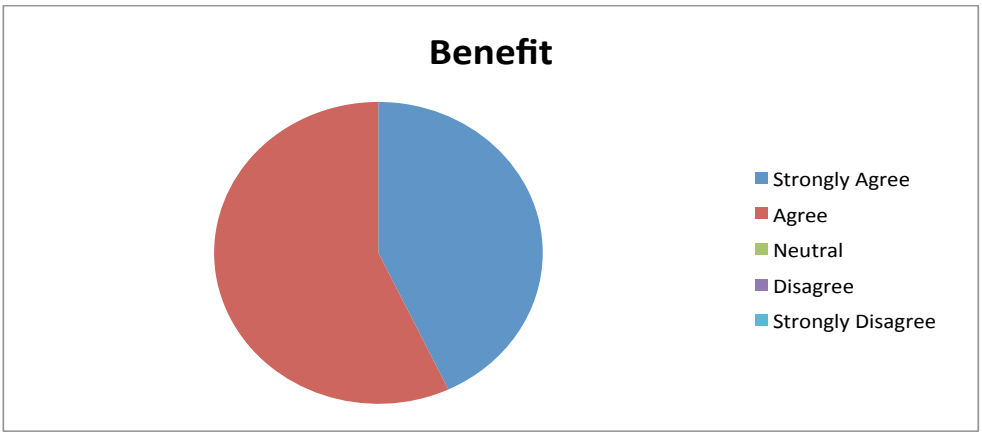

Figure 7. All participants indicated that the training was beneficial for them and their institutions

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