Activity Report

8th Monsoon Forum

Myanmar

7-8 May 2012
Nay Pyi Taw, Myanmar

11 May 2012
Yangon, Myanmar

The 8th Monsoon Forum was made possible through the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)-supported "Reducing risks of tsunamis, storm surges, large waves, and other natural hazards in low elevation coastal zones", and the European Commission (EC) and Food and Agriculture Organization (FAO)-supported "Linking information and Decision-Making to Improve Food Security". The World Meteorological Organization (WMO) and the Regional Integrated Multi-hazard Early Warning System (RIMES) provides technical assistance. The 8th Monsoon Forum was organized by the Myanmar Department of Meteorology and Hydrology (DMH).

Background

The Monsoon Forum, a platform for dialogue between forecast producers and sectoral forecast users, geared towards the better understanding of forecast products and services by user institutions and the understanding of the information needs of different sectors by forecast providers, was introduced in Myanmar in 2007. Different programmes, implemented by RIMES, facilitated the Monsoon Forums. The forum intends to enhance the application of multi-hazard warning, through a cycle of forecast delivery, forecast application, receipt of feedback and tailoring forecast/warning information to suit the needs of the different stakeholders.

The 8th Monsoon Forum was co-supported by the programmes "Reducing risks of tsunamis, storm surges, large waves and other natural hazards in low elevation coastal zones" supported by the UNESCAP, and "Linking information and decision-making for Food Security" supported by the EC and FAO.

In Nay Pyi Taw, the Monsoon Forum was held on 7-8 May 2012. Subsequently, a half-day Monsoon Forum was conducted on 11 May 2012 in Yangon to share the seasonal outlook to representatives from UN institutions, INGOs, NGOs, and other development workers in the country.

Participants during the 8th Monsoon Forum in Nay Pyi Taw

The 8th Monsoon Forum was attended by 40 participants coming from DMH and various information user institutions like the Ministry of Agriculture and Irrigation, Department of Agriculture, Department of Fisheries, Irrigation Department, Relief and Rehabilitation Department, Information and Public Relation Department, General Administration Department, Ministry of Health, Ministry of Commerce, media organizations including state media, United Nations Office for the Coordination of Humanitarian Affairs (OCHA), head of local governments from programme pilot sites (Kungyangon Township and Pyinsalu Sub-Township), and other key institutions. In Yangon, there were 41 participants in the Monsoon Forum. Participants came from UN institutions, INGOs, NGOs, other development organizations, and DMH.

<u>Nay Pyi Taw</u>

Opening Program

Dr. Hrin Nei Thiam, Director General, DMH, delivered her opening remarks. In her remarks, Dr. Thiam discussed the importance of the Monsoon Forums, as an avenue for interface between DMH and forecast information user institutions, for DMH to better understand the differential needs of user institutions and introduce initiatives to improve forecast products and services to suit user demands and needs. It also targets that forecast user institutions have a better understanding of forecast products and services. She proceeded to mention some of the comments, on the forecast products and services by DMH, made by user institutions during the 7th Monsoon Forum conducted in 15 November 2011. She thanked

the different institutions for the comments as those would provide guidance to DMH in improving its products and services.

Dr. Thiam espoused the changing climate in the country and mentioned the new records for rainfall and temperature, from different stations, during the dry season. She said that climate information application is very important, especially in view of the variations in climate.

Subsequently, Ms. Bui Thi Lan, FAO Representative in Myanmar, delivered her remarks. She underscored that Asia has always been affected by all kinds of disasters, and stakeholders, especially farmers, always suffer from disaster impacts. She cited that any advance information that would be made available to climate information stakeholders in the country would be very helpful to facilitate preventive/mitigation measures. She said that improvements can be made in forecast products and services to better suit stakeholders requirements.

Ms. Ruby Rose Policarpio, Institutional Development Specialist, delivered her remarks on behalf of RIMES. She espoused that forums are a platform for regular discussion between DMH and forecast user institutions so that issues and concerns pertaining to forecast information application are discussed and addressed. She emphasized that as part of the UNESCAP-supported programme on "Reducing risks of tsunamis, storm surges, large waves and other natural hazards in low elevation coastal zones", issues and concerns about geological hazards, like earthquakes, landslides and tsunamis, would be integrated into the forums. She emphasized that there remains a lot of room for improvement in the understanding of user institutions of warning information, including their limitations and uncertainties. She continued that feedback from stakeholders should be able to guide DMH to enhance its products and services.

Ms. Policarpio highlighted that in enhancing forecast information application, there is a need for improvement in forecast products and services by technical warning institutions like DMH; enhancement of capacity of intermediary institutions to interpret and translate warning information into impacts outlook and response options; and enhancement of capacity of stakeholders to respond to warning information/bulletins/advisories.

Representatives from key partner institutions, like the Department of Fisheries, Myanmar Red Cross Society, Ministry of Agriculture and Irrigation, Ministry of Health, and Department of Agriculture, then rendered their remarks. All highlighted the importance of warning information as guide for decision making.

The introduction of participants followed.

Following that, Dr. Hrin Nei Thiam delivered the overview of the Monsoon Forum.

Proceedings

DMH Products and Services: Weather and Climate, Hydrological and Geological

In this presentation, DMH highlighted its mandates. It then outlined its climate services information system. In the presentation, the different climatic zones in the country were presented. The presenter highlighted DMH's coordination and cooperation with other institutions/agencies for early detection, development and issuance of warning. It was emphasized that in Myanmar, DMH has the responsibility and mandate relating to meteorological, hydrological and seismological warning services.

Moreover, meteorological observation network, hydrological observatories, and earthquake monitoring stations were discussed. The presentation highlighted the areas prone to different hazards. It then focused on the hazard calendar for the country. The discussion of meteorological, hydrological and seismological products and the processes involved in generating forecasts/warning followed. Warning dissemination mechanisms, up to the community level, were also presented.

Verification of the Dry Season Outlook

DMH presented the monthly minimum and temperature forecast and observed values from December 2011 to March 2012. It also presented the precipitation forecast and observed values for the same period, and the forecast and observed storm frequencies for the dry season. Subsequently, new rainfall records for 2012 were presented. DMH presented the following conclusions, for the winter season (DJF) and summer season (March and April):

- In December, very severe cyclone "Thane" caused heavy rainfall in Sagaing, Mandalay, Magway, Tangon, and Bago Regions and in Kachin, Shan, Rakhine and Kayah States
- No cynclone occurred from January to April 2012
- Storm frequency forecast was good during the winter season, and missed during the summer season
- Minimum temperature was generally normal and above normal during the winter season
- Lowest winter night temperature observed was -3°C at Hakha on 14 January 2012
- Extreme temperature recorded was 46.1°C at Chauk on 17 April 2012
- Based on statistical analysis, forecast for minimum and maximum temperature were good
- New rainfall record was established, for 2012, in the following areas in January

Date	Station	New 24-hour record	Old Record	Record Year
3 January 2012	Kawthong	80 mm	69 mm	66
14 January 2012	Kyeikhame	75 mm	42 mm	30
31 January 2012	Myeik	82 mm	69 mm	62

Verification of the Water Level Forecast for the Low Flow Season

DMH presented the forecasted and observed water levels for the different stations in Myanmar. Based on statistical analysis, DMH presented the following verification results:

- For the period 15 November to 15 December, forecast for nine (9) of the 15 stations installed along the Ayeyarwady River were rated good; forecast for four (4) stations were rated excellent; and forecast for two (2) stations were rated fair
- For the period 16 December 2011 to 15 January 2012, of the 15 stations in Ayeyarwardy River, forecast for five (5) stations were rated excellent, forecast for six (6) stations were rated good, and forecast for four (4) stations were rated fair.
- For the period 16 January to 15 February, forecast for eight (8) stations were rated excellent, while that for seven (7) stations were rated good.
- Of the five (5) stations established along the Chindwin River, forecast for three (3) stations were rated good, and forecast for two (2) stations were rated excellent for the period 15 November to 15 December
- For the period 16 December to 15 January, of the five (5) stations established in Chindwin River, forecast for three (3) stations were rated excellent, while forecast for two (2) stations were rated good.
- For the period 16 January to 15 February, forecast for four (4) stations were rated excellent, while forecast for one (1) station was rated good.

- Verification for minimum alert water level was rated as excellent

Review of the agro-climatic condition for the dry season

DMH presented the following conclusions for the dry season:

- Except during the first week of April, below normal rainfall was observed in the whole country, during the dry season
- Maximum temperature gradually increased from Mawlamyine, deltaic areas to Central Myanmar during the dry season
- Except during the 3rd week of January, minimum temperature increased from Northern to central region and from deltaic to central region from January to April 2012
- During the first week of January, large amounts of potential evapotranspiration (PET) values were recorded in the central Myanmar from January to April 2012
- Except April, soil water balance condition was deficit over the whole country during the dry season.

Linking Information and Decision Making

This session was presented by FAO. As part of the presentation, FAO discussed the impacts of climate-related hazards in countries in Southeast Asia. It highlighted that though climate events cannot be avoided, disasters can be through the application of climate information. The link between climate information and food security was then discussed. FAO explained that the programme "*Linking information and decision-making for food security*" is aimed to contribute to improve food security policies and programmes in order to reach MDG 1. It then discussed the three (3) types of food security information which are 1) market information and intelligence, 2) chronic food insecurity and livelihoods and vulnerability assessment, and 3) climate information. FAO explained that the programme supported Monsoon Forums to facilitate dialogue between information producers and users.

Subsequently, FAO presented the food security conceptual framework, and the climate impacts on food security. It highlighted the following recommendations to link climate information to decision-makers:

- Disseminate information to appropriate actors
- Translate information into easy to understand and use information for specific sectors
- Use information at the national, provincial, and community levels
- Provide information for plans and decisions
- Enhance understanding and awareness among stakeholders
- Mainstream into policies and strategies for better application

FAO then presented some of the best practices to link climate information to decision-makers.

Sharing of views/feedback by different climate-sensitive sectors on the dry season outlook and performance:

Relief and Rehabilitation Department

The Relief and Rehabilitation Department pointed out the various programmes it implements relative to climate/warning information. It underscored that better cooperation, among stakeholders, should be fostered to enhance receipt and application of warning information. The presenter highlighted that the National Disaster Management Committee chaired by the Prime Minister oversees all matters pertaining to disaster risk management. He espoused that in 2009, the Standing Order for Disaster Management was released by the Myanmar government.

He stressed that early warning should be able to prompt response from different sectors. He also observed improvements in the forecast provided by DMH, as forecast for Cyclone Giri was disseminated three (3) days before it crossed the country.

OCHA

OCHA likewise emphasized on the strong collaboration that is needed, among the institutions involved in disaster risk management/early warning. He cited that the use of information issued by DMH during Cyclone Giri resulted to the activation of local level institutions, hence the impacts of the cyclone was minimal. The presenter underscore the importance of information that is delivered on time, uses the right methods, and is coupled with capacity building for users. He advocated that information should not sit in meeting rooms but should be disseminated to the public.

OCHA also emphasized the different programmes it supports relative to the application of warning information. The discussion stressed the importance of local NGOs in disaster risk management/early warning system. The presenter emphasized that aside from an efficient warning system, there should be an efficient response system.

Irrigation Department

The Irrigation Department discussed about the damages to embankments during the monsoon season. The presenter mentioned that Ayeyarwaddy Division is very critical during the flooding season as there are areas which are lower than the river level. He proceeded to discuss that within the division, around 500,000 acres is supported by embankments. He highlighted some low-cost projects, using indigenous materials to prevent landslide.

Feedback from programme pilot sites on receipt of tsunami warning on 11 April 2012

Kungyangon Township

Mr. Kyaw Zayar Linn shared his experience during the 11 April 2012 tsunami warning. He cited that the tsunami warning was not uploaded on DMH website on 11 April. According to Mr. Linn, he was not able to receive warning from DMH, but heard the information from CNN.

He suggested that DMH should use radio in disseminating information as villages prefer to use radio.

According further to Mr. Linn, they were able to gain lessons from Cyclone Nargis, hence the township gives importance to building its preparedness to natural hazards.

Pyinsalu Sub-Township

Mr. Ye Aung of Pyinsau Sub-Township delivered the presentation. He mentioned that they were not able to receive the tsunami information on time. He recommended for DMH to enhance the dissemination of tsunami warning information.

Presentation of the seasonal climate outlook

DMH presented the following summary for the 2012 Monsoon Season outlook:

Early Monsoon Season

- Early monsoon period is the establishment of monsoon over Northern Myanmar by end of June

- Southwest Monsoon is likely to set in Southern Myanmar areas and deltaic areas on 15-19 May; Central Myanmar on 22-26 May; Northern Myanmar areas on 2-7 June
- Out of two (2) Low Pressure Areas, one (1) may intensify into depression
- Moderate to strong monsoon over Andaman Sea and Bay of Bengal is likely during the early monsoon period
- Rain will be above normal in Upper Sagaing, Ayeyarwaddy, Taninthayi Regions and Kachin State; about normal rain is expected in Magway and Bago regions and Rakhine, Kayah, Kayin and Mon States; and below normal rain in the remaining regions and states.

Mid-Monsoon Season

- Mid-monsoon is a period from 1st July to end of August
- Out of three (3) Low Pressure Areas, two (2) may intensify into depression at the North Bay.
- Moderate to strong monsoon over Andaman Sea and Bay of Bengal is likely during the mid-monsoon period
- Rainfall anomaly forecast: Rain will be above normal in Upper Sagaing, Ayeyarwady, Taninthayi Regions and Kachin State; about normal rain is expected in Magway, Bago regions, Rakhine, Kayah, Kayin and Mon States; and below normal rain in the remaining regions and states

Late Monsoon Forecast

- Late monsoon is a period starting from 1st September to the date of monsoon withdrawal from the whole country
- Out of three (3) Low Pressure Areas, two (2) may intensify into depression.
- Weak to moderate monsoon over Andaman Sea and Bay of Bengal is likely during the late monsoon period
- Rainfall anomaly forecast: Rain is likely going to be above normal in Bago, Yangon, Taninthyi Regions and Chin, Shan, Rakhine, Kayin, and Mon States; about normal rain is expected upper Sagaing, Mandalay, Magway and Ayeyarwaddy Regions and Kachin State; and below normal rain in the remaining regions and states

Onset and withdrawal of Southwest Monsoon

- Southwest Monsoon is likely to set into the whole country by 1st dekad of June 2012
- Southwest Monsoon is likely to retreat from the whole country by 1st dekad of October 2012

Presentation of the general long range water level forecast

DMH presented the following general long range water level forecast which was issued on 28 April 2012:

- During the months of May and June, the water levels along the Ayeyarwady, Chindwin, Thanlwin, Sittoung, Dokhtawaddy, Bago, Shwegyin and Ngawun Rivers is likely to rise above the present water levels but may not reach their respective danger levels
- During the months of July and August, the water levels may exceed, one time each, their respective town danger levels at Hkamti, Homalin, Mawlaik, Kalewa and Monywa stations along the Chindwin River; at Katha, Mandalay, Sagaing, Pakokku, Nyaung Oo, Minbu, Magway, Seiktha, Hinthada and Zalun stations along the Ayeyawaddy River; at Myitnge station at Dokhtawaddy River; Shwegyin at Shwegyin River; Ngathaingchaung station at Ngawun River; Bago station along Bago River; and two times each at Toungoo and Madauk stations at Sittoung River; and Hpaan station at Thanlwin River

- During the months of September and October, the water levels may exceed, one time each, their respective town danger levels at Hkamti, Homalin, Mawlaik, Kalewa and Monywa stations of the Chindwin River, at Hinthada and Zalun stations at the Ayeyawaddy River; at Myitnge station of Dokhtawaddy River; at Toungoo and Madauk stations of Sittoung River; and Hpaan station of Thanlwin River.

Presentation of the agro-climatic bulletin

This was presented by DMH. The definition of agro-meteorology and parameters that are observed daily were discussed. DMH specified the 17 agro-meteorological stations in the country. Definitions of scientific terminologies and concepts, used in agro-climatic bulletins, were discussed. DMH provided a sample of its agro-meteorological bulletin.

Working group discussion on the development of impacts outlook and response options and presentation of outputs.

The participants were divided into three (3) groups, based on their sectors. The participants were to discuss the seasonal outlook and analyze the likely conditions/impacts on their sectors, and the responses that can be introduced to enhance productivity and/or mitigate possible impacts. The participants were provided the following guide questions, as focal subjects for discussion:

1) Based on the seasonal outlook, what would be the most likely condition/impacts on your sectors?
2) What would be possible strategies to enhance productivity and/or mitigate impacts in your sectors for the monsoon season?
3) In your sector, how would you communicate the seasonal outlook, together with a set of advisories, to the grassroots level?
4) What can you recommend to improve the conduct of Monsoon Forums in the future?

Participants actively engaged in discussion during the exercise on developing impacts outlook and response options

The different working groups outputs are as follows:

Group I

Agriculture Planning, Agricultural Service, Agricultural Research and Irrigation Department

<u>Question 1. Based on the seasonal outlook, what would be the most likely condition/impacts on your sectors?</u>

- Agriculture activities can proceed in areas with normal rainfall.
- In areas where above normal and below normal rainfall are anticipated, agricultural activities can proceed but caution/preparations should be put in place

Question 2. What would be possible strategies to enhance productivity and/or mitigate impacts in your sectors for the monsoon season?

- Farmers should consider crops based on a) growing of varieties, b) growing time c) resistance to flood/drought
- During the harvest season, farmers should prepare to reduce possible losses by putting in place facilities like grinding machines, storage facility and shelter
- Authorities should store water in the dam during the early monsoon period, as surplus water is expected. Authorities can later use the stored water to irrigate areas that need water.
- Prepare and clean canals and irrigation facilitates before the rainy season
- Use of rainwater for irrigation in the dry zone
- Introduce new methods for water harvesting
- There might be some impacts during times of heavy rain in the central region on peanuts and sunflower. Farmers should shift to suitable varieties.
- In areas with anticipated higher rainfall, Sloping Agriculture Land Technology (SALT) can be introduced
- Systematic application of fertilizer to enhance health of plants.

Question 3. In your sector, how would you communicate the seasonal outlook, together with a set of advisories, to the grassroots level?

- Communicate information should be disseminated through media, radio and tv programmes
- Pamphlets and other materials should be used to disseminate information to grassroots level.
- Climate information can be integrated into farmers' training center

Question 4. What can you recommend to improve the conduct of Monsoon Forums in the future?

- DMH should provide complete information
- DMH and stakeholder institutions should establish constant
- Severe weather and special weather updates should be disseminated in a timely manner

Group II

General Administration Department, Relief and Rehabilitation Department, local government representatives

Question 1. Based on the seasonal outlook, what would be the most likely condition/impacts on your sectors?

- Preparation for farming can be done on time
- Preparation for shelter, food, water supply, health should be put in place

Question 2. What would be possible strategies to enhance productivity and/or mitigate impacts in your sectors for the monsoon season?

- ensure water supply in areas with anticipated below normal rainfall
- In case forecast of thunderstorms are received, communities should cut tree branches
- Preparation for plants' diseases/infestation should be done
- High yield quality seeds should be introduced

Question 3. In your sector, how would you communicate the seasonal outlook, together with a set of advisories, to the grassroots level?

- Forecasts should be disseminated fast

- General administration department to disseminate the information to the local governments – districts, townships, communities and villages
- Village libraries should be used in disseminating information materials

Question 4. What can you recommend to improve the conduct of Monsoon Forums in the future?

- DMH should provide more reliable data
- DMH should provide more comprehensive presentations – language should be more simple, weather and climate terminologies should be defined, and region-wise weather/climate forecast should be provided

Group III

Fisheries, Myanmar Red Cross Society, Ministry of Health, Forestry Department

Question 1. Based on the seasonal outlook, what would be the most likely condition/impacts on your sectors?

- In case of adverse conditions, communicable and waterborne diseases might rise
- Fishing might be affected in case of cyclones, thus possibly decreasing fisheries production
- Fishing boats and material losses might be incurred
- There might be decrease in survival rate of plants

Question 2. What would be possible strategies to enhance productivity and/or mitigate impacts in your sectors for the monsoon season?

- Prevention and control of diseases outbreak
- Vector control activities, latrine construction, garbage disposal, safe water supply, clean and fresh food supply
- Preparation of mobile clinics
- Immunization of measles and tetanus vaccines
- Nutrition promotion and quality food supply
- Prepositioning of disaster preparedness stocks and emergency response units
- Updating of contingency plans, disaster preparedness plans, and SOPs
- Conduct of simulation exercises, mock drills and capacity building for enhanced responses to possible hazards
- Establishment of protection mechanisms for fishponds
- Establishing of alarm system for fishermen to alert them of adverse weather condition

Question 3. In your sector, how would you communicate the seasonal outlook, together with a set of advisories, to the grassroots level?

- Utilization of mobile phones
- FM radio stations and local radio network
- Extension services
- local authorities and local NGOs
- Communication networking with the village level through various institutions (MRCS, MMCWA, village leaders, religious leaders, etc.)

Question 4. What can you recommend to improve the conduct of Monsoon Forums in the future?

- Identify the gaps in climate forecast/warning information application in the country
- Promote and improve the utilization of decision-support tools
- Resource mobilization

- Networking with other countries and warning centers for enhanced forecast/warning information
- DMH to strengthen its capacity in generating forecasts
- Establishment of better equipment and adaptation of modern techniques
- Establishment of radar and early warning network
- Coordination and cooperation with other institutions

Yangon

As mentioned earlier, the Monsoon Forum in Yangon was a half-day activity intended to share the seasonal outlook to stakeholders from UN institutions, INGOs, NGOs and other development organizations. Technical presentation from DMH were the same as those presented in Nay Pyi Taw. Responses from stakeholders, with regards to the dry season outlook and performance, and the possible implications of the monsoon season outlook were shared.

Key Discussion Points

- **Improvement of forecast products and services**
  Spatial and temporal resolution of forecasts should be improved. It was encouraged that DMH provide region-wise weather forecast, to encourage better application of climate information.

  To improve DMH forecast products and services, installation of radars and other equipment were suggested. Upgrading of existing communication equipment was also discussed. Cooperation between international, regional and other institutions, to enhance the capacity of DMH to generate forecast information was raised.

- **Enhancement of delivery of weather/climate forecast information and advisories**
  Forecasts should be delivered in a more user-friendly manner. Terminologies and concepts have to be simplified in order for forecasts to be easily understood and applied by stakeholders. Collaboration between DMH and key user institutions to develop sectoral impacts outlook and response options was encouraged.

- **Enhancement of dissemination of forecasts/warning information**
  - Weather and climate
    - Timely dissemination of special weather updates, especially during severe weather conditions
    - It should be ensured that the General Administration Department will be able to receive forecast information, so that it can disseminate the same to all local governments, including the grassroots level. The roles of local authorities (district administration) in disseminating information to the townships and communities/villages should be emphasized.
    - Capacity of user-institutions and end-users of forecasts, to interpret, translate and apply forecast information, should be enhanced.
    - Regular and timely updates of bulletins should be provided to user institutions like the Department of Agriculture. DMH is updating its agro-climatic bulletin every 10 days and these updates should be provided to user institutions. Contact details have to be updated to ensure bulletins are received by concerned institutions.
    - Use of appropriate communication mechanisms to reach the vulnerable sectors and the grassroots level

- Tsunami warning
    - Many stakeholders were not able to receive tsunami warning on 11 April 2012
    - Programme pilot site officials were not able to receive warning information from DMH on the tsunami warning, on 11 April 2012, but initiated communication with DMH to confirm the tsunami warning, and initiated action.
        - In Pyinsalu, an earthquake was felt on 11 April 2012. Immediately following the earthquake, Mr. Ye Aung, Sub-Township Administrator, called Mr. Chit Kyaw of DMH, and the latter confirmed that tsunami warning was issued. The Sub-Township Emergency Committee was dispatched to observe the sea and instruct people living along and near the coast to evacuate.
        - In Kungyangon, the earthquake was not felt, but Mr. Kyaw Zayar Linn, Township Administrator, heard the information from CNN. He then called DMH's Mr. Chit Kyaw who confirmed the tsunami warning. The township government initiated response and kept monitoring the warning from DMH until 17:00 on 11 April. DMH advised for them to await the cancellation of the tsunami warning.
    - Dissemination of tsunami warning should be enhanced to ensure receipt, by all concerned stakeholders, of warning information.
    - Collaboration between all concerned institutions should be forged
    - In communities, mechanisms have to be put in place to ensure that officials can disseminate warning to community people
    - DMH should ensure that warning is received by the General Administration Department

- **Traditional observations**
    - In Pyinsalu, fish migration was observed before Nargis. "*Ngaknoenyo"* fish were found in rivers and streams. Ants came out from underground during Nargis. This year, "*Ngaknoenyo"* fish again again appeared in Pyinsalu. Local constituents were worried because of this manifestation.

- **Education of forecast users to encourage forecast application**
    - Experiences in the past points to stakeholders not believing the warnings from DMH (e.g. forecasts on Nargis and the Magway flash flood). Education of stakeholders should be undertaken so that they can understand warnings better and initiate necessary action.
    - Sometimes peope believe all the information they hear and read about hazards without confirming these with DMH. All issues about hazards should be confirmed with DMH because it is the authorized institution for hazard warning in Myanmar.
    - Media should have a better understanding of forecast/warning information from DMH. Sometimes the confusion comes from media practitioners' limited understanding of forecasts, and hence, this affects their reporting of information.
    - Education of people in the community and grassroots level will require proper mechanisms. Because of their limited access to television, radio, and newspapers/magazines, among others, an effective mechanism has to be designed to reach them. Discussions with community people might be

necessary to effectively educate them about hazards and forecast/warning information.