SEASONAL DISASTER MONITORING USING SATELLITE DATA

Bangladesh is a developing country. It has the facility to utilize Space technology in order to promote socio-economic development of the country. SPARRSO acts as the center of excellence and national focal point for the peaceful applications of space science, Remote sensing and geographic information system (GIS) in Bangladesh. SPARRSO is a satellite technology based research and development organization of the government of the People's Republic of Bangladesh. It has been working with an integrated multi disciplinary field to ensure maximum benefit of satellite technology for disaster risk reduction and sustainable development of the country.

SPARRSO has an operational Advanced Satellite Ground Station. This station owes its origin to an Automatic Picture Transmission (APT) satellite ground station that was established in Bangladesh in 1968. Since then the station has several up-graded valuable services to the nation. The station is now able to acquire data from five different satellites (USA based 3, China based 1 and Japan based 1) and regularly receives hourly data from FY-2 & MTSAT and half hourly during unusual weather, on-average 6(six) hourly from NOAA-AVHRR and daily from AQUA & TERRA MODIS satellites.

Monitoring Disaster using Satellite technology

Bangladesh is one of the most disaster prone countries in the world. Cyclone, flood, draught, Nor'wester, tornado, cold wave, fog etc. are the common phenomena in this country. SPARRSO can monitor these disaster using satellite data.

Monitoring Cyclone

Cyclone is one of the major natural disasters in Bangladesh very often causes significant damages. SPARRSO has been working on monitoring of such devastating event using satellite based monitoring system and has already made a significant progress. SPARRSO regularly provides information to the concerned authority. NOAA, FY-2G/E data are being used for monitoring day-to-day weather condition over and around Bangladesh. The same data are being used to determine and predicted the cyclone tracks in the country.

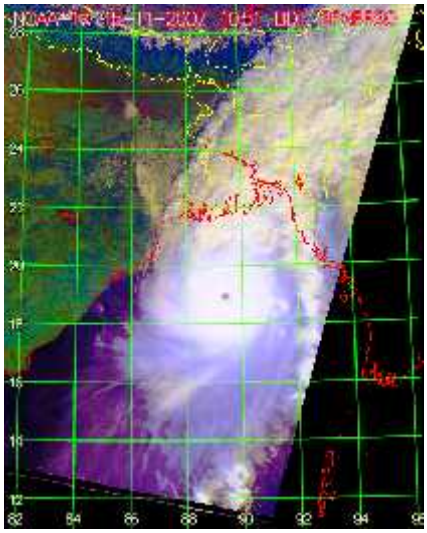

Fig. 1: Cyclone SIDR (NOAA)

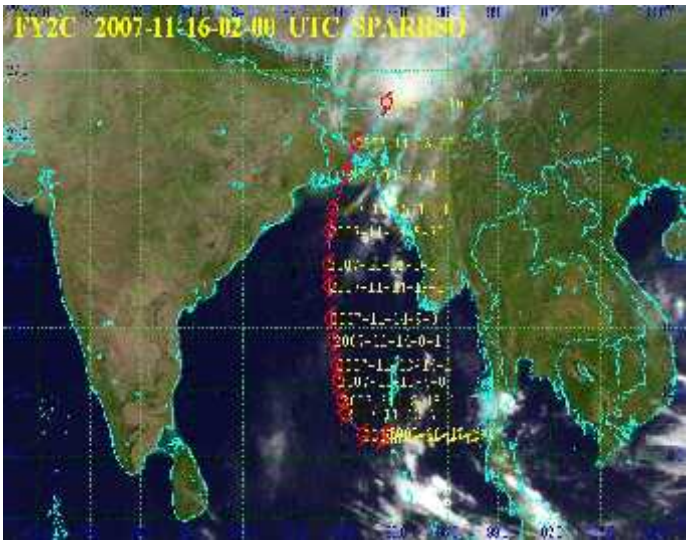

Fig. 2: Track of cyclone SIDR

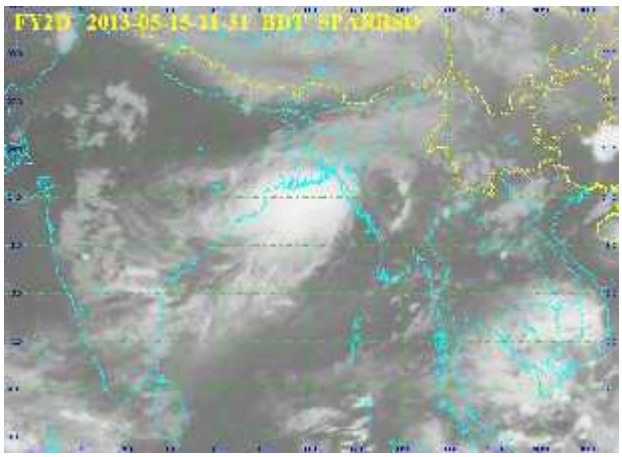

Fig: 3: Cyclone MOHASEN (FY-2)

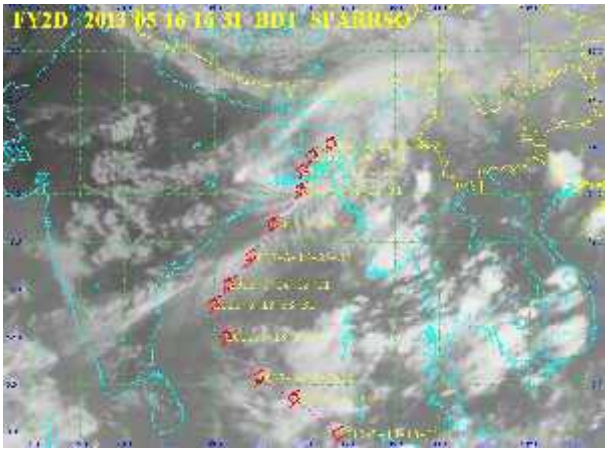

Fig. 4: Track of cyclone MOHASEN (FY-2)

Monitoring of Weather and rainfall

SPARRSO ground station receives images from the satellites which are used to monitor the formation and evolution of cloud systems for daily weather of the country on regular basis.

Bangladesh is an agrarian country under tropical monsoon climate. Its agro- economic activities and biodiversity are mainly influenced by the monsoon rainfall. So, estimation of rainfall is very important for the country. SPARRSO scientists estimate rainfall using FY-2G/E and NOAA satellite data acquired by its own satellite ground station.

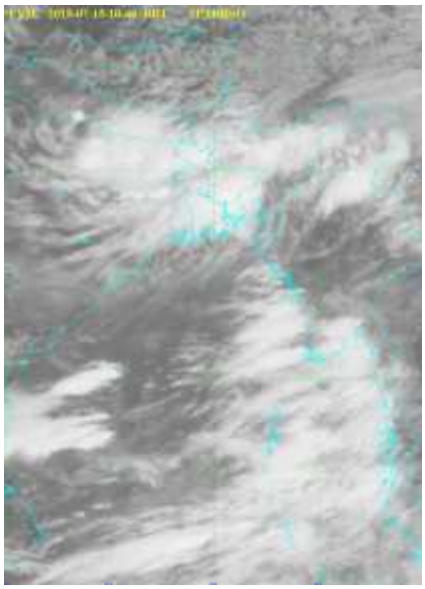

Fig. 5: Rainfall estimation (FY-2)

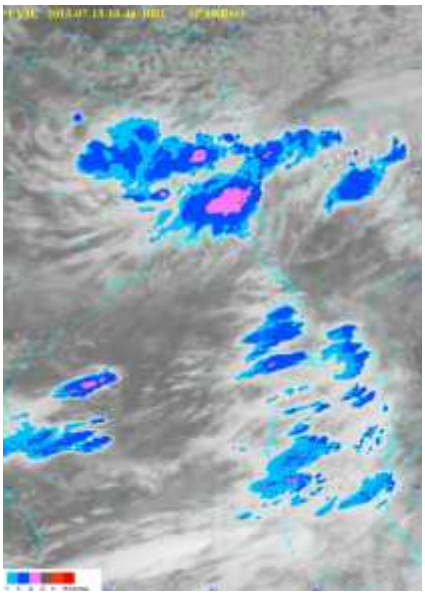

Fig. 6: Rainfall estimation (FY-2)

Monitoring of cold wave with fog extension

Fog is a natural weather phenomenon that usually occurs in Bangladesh during winter season. Remote sensing images are very useful for monitoring such natural events and its directional movement. SPARRSO monitors the formation and movement of cold wave as one of its routine activities based on data received at its own FY-2G/E and NOAA-AVHRR ground station. Normally cold wave comes at the end of December and early January. Satellite images acquired in the visible and infrared regions of the solar spectrum showed appreciable sensitivity to the presence, properties and spatial distribution of fog. During the period of cold wave, air temperature drops down significantly and the atmosphere remains foggy. The shape of the wave and its directional movement are very much visible on the satellite images.

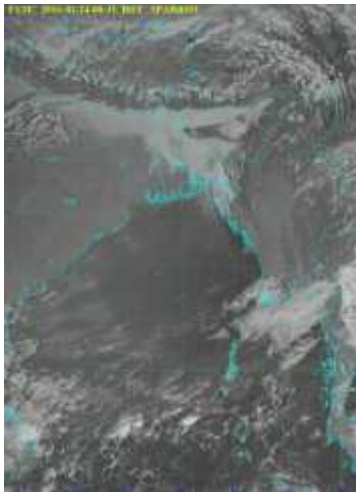

Fig. 7: Cold wave with fog (FY-2E)

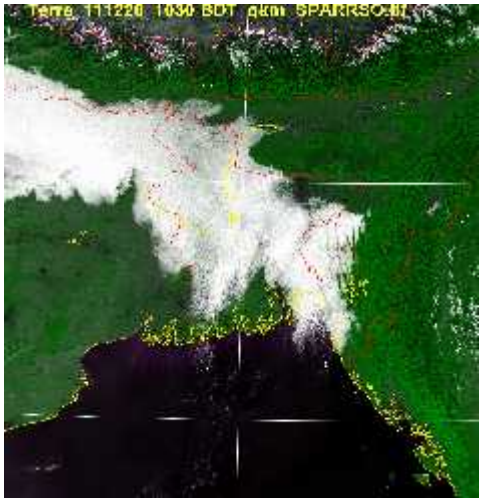

Fig.8: Cold wave with fog (TERRA MODIS)

Monitoring Nor'wester, Tornado

Being one of the disaster prone countries, Bangladesh faces Nor'wester and tornado activities every year. The pre-monsoon weather condition is favorable for formation of such events. They are formed suddenly, usually on land and are extremely localized. Their duration is very short and thus very difficult to locate them and make effective forecasts. SPARRSO monitors these disasters by FY-2G/E satellite data

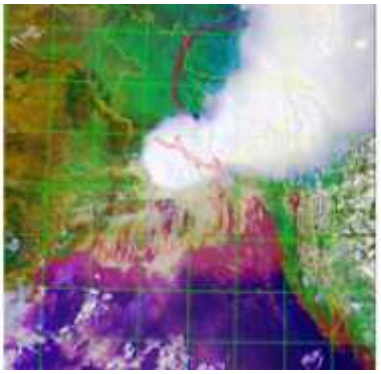

Fig. 9: Monitoring Nor'wester (MTSAT Satellite data)

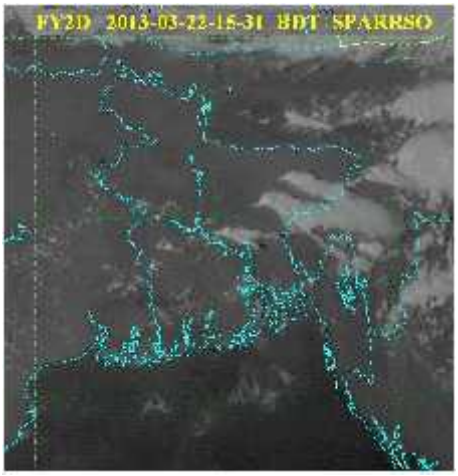

Fig. 10: Monitoring Tornado (FY-2)

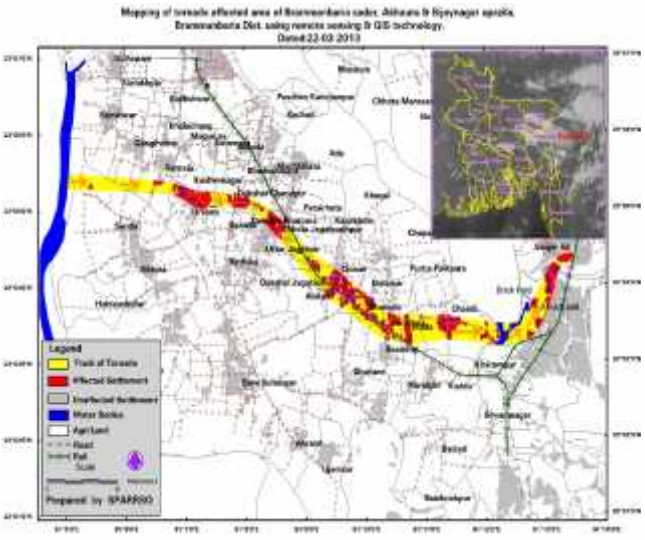

Fig. 11: location & Path of Tornado.