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**Committee on the Peaceful
Uses of Outer Space**
Scientific and Technical Subcommittee
Fifty-eighth session
Vienna, 19-30 April 2021

**International cooperation in the peaceful uses of outer
space: activities of Member States**

Note by the Secretariat

I. Introduction

1. At its fifty-seventh session, in 2020, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities (A/AC.105/1224, para. 34).
2. In a note verbale dated 16 October 2020, the Office for Outer Space Affairs of the Secretariat invited Member States to submit their reports by 13 November 2020. The present conference room paper was prepared by the Secretariat on the basis of a reply received in response to that invitation.

II. Reply received from a Member State

Bangladesh

[Original: English]
[16 April 2021]

The contribution by Bangladesh is reproduced in the form in which it was received.



Annual Report (2020-2021) on Bangladesh's Space Activities

1. **Introduction:** Bangladesh Space Research and Remote Sensing Organization (SPARSO) is a statutory research and development organization under the Ministry of Defence. Since 1980, SPARRSO has been working at the forefront of disaster (flood, cyclone, water logging, river and coastal erosion, etc.) and natural resources (agriculture, forest, water resources, etc.) monitoring in the country. It has also been playing important role for dissemination of remote sensing technology in the country through training.

2. Recent activities in the applied fields of remote sensing

a. **Food Security:** SPARRSO estimates acreages of the major rice crops (*Aman* and *Boro*) based on remote sensing technology and provides these information to the Ministry of Agriculture,

Ministry of Food, and Statistics & Informatics Division (SID), regularly. The estimated area of Aman crops in 2020 is 5.556 million hectares.

b. **Flood monitoring:** SPARRSO has developed a complex multi-layered flood area model to estimate area of extended flood based on satellite images. The system has been operational since 2015. The system is now capable of providing information on the area of extended flood, damages created by it and population exposed to flood. The map of flood occurred in Bangladesh in July-August 2020 is shown in Figure 1.

The extended flood area in the 35 flood-affected districts in 2020 was about 1,745,366 hectares which is about 22.33% of the total area of flood-affected districts and 11.83% of the total area of the country. The total settlement area affected by the flood was about 381,610

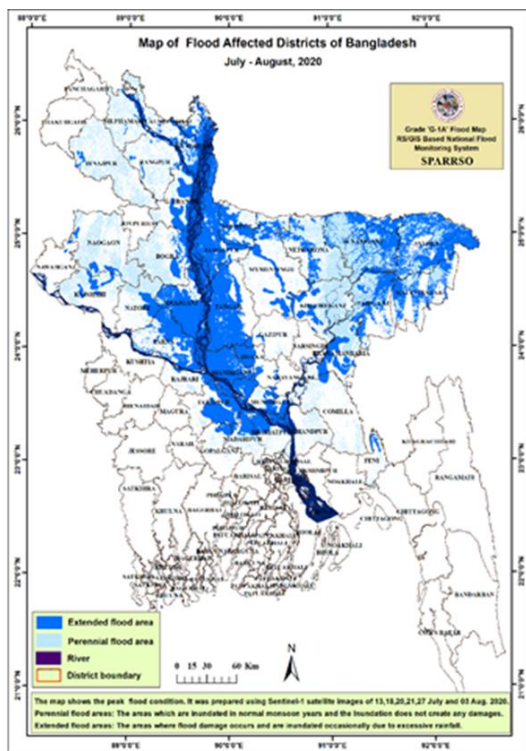


Figure 1. Map of flood July-August 2020.

hectares and the total population affected by the floods was about 4,849,758.

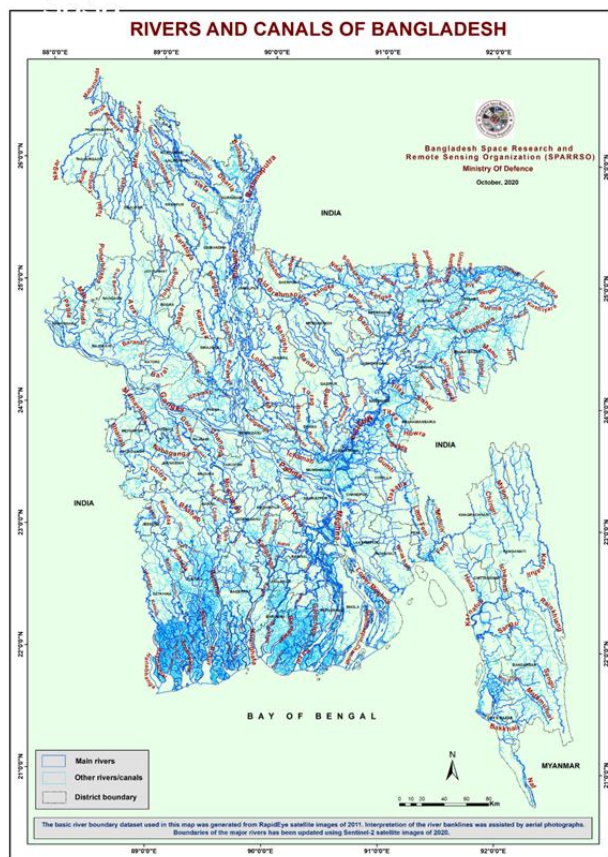


Figure 2. River and canals of Bangladesh in 2020.

c. River monitoring: SPARRSO is going to set up an operational river monitoring system in the country based on remote sensing technology. This system will have decadal datasets of the river networks of the country since 1970s as well as the updated datasets and will be capable of providing updated information on the plan form morphological changes in the rivers of the country. The updated river network of the year 2020 is shown in Figure 2. The backward projection of the river datasets is going on for generations of the past decadal datasets. Research work has been initiated for prediction of erosion in the rivers and it is expected that within the next three years, the system will be capable of providing early warning of river erosion.

3. **Research works:** A total of seventeen research works are being carried out under the Annual Research Program 2020-2021 of SPARRSO. The research themes have been selected in alignment with the targets of the SDGs. Title of some of the research works are given below:
 - a) Remote sensing-based rice crop yield forecasting using MODIS-NDVI (SDG-2);
 - b) Investigation on the applicability of microwave and optical satellite images for assessment of rice crop area at early stage of crop life cycle (SDG-2);
 - c) Remote sensing based assessment of crop water requirement of Boro Rice using SEBAL Model (SDG-2);
 - d) Detection of potential water logging areas using remote sensing techniques (SDG-11);
 - e) Establishment of remote sensing based drought monitoring system (SDG-13); and
 - f) Monitoring long-term changes in the Sundarbans' Mangrove due to coastal erosion: analysis of indicators and causal factors (SDG-15).

4. Launching of geostationary satellite: The first Bangladeshi geostationary communications and broadcasting satellite 'Bangabandhu-1' named after the Father of the Nation Bangabandhu Sheikh Mujibur Rahman was launched on 12 May 2018. The satellite is now in operation. Feasibility study for 'Bangabandhu-2' satellite is going on.

5. Other activities and achievements

a) SPARRSO has been implementing a development project titled 'Establishment of Geographic Information System of the Coastal Areas of Bangladesh and Marine Fishing Zones Identification System Based on Remote Sensing and GIS Techniques'. The duration of the project is three years and will be completed in December 2021.

b) SPARRSO is awarded 'Best Spirit of Co-operation' in 2018 by the Asia Pacific Space Co-operation organization (APSCO) in recognition of leading the project "Establishment of a Framework for Researches on Application of Space Technology for Disaster Monitoring in the APSCO Member States". The second phase of this project will be kicked-off in April, 2021. SPARRSO will lead the second phase.

c) In the special publication of the UN-ESCASP titled 'Geospatial Practices for Sustainable 2020: A Compendium', the following two research based operational works of SPARRSO have been included:

- Extended Flood Area Mapping System; and
- Satellite Imagery and Data to support the Agriculture Sector.

6. Future Plan: SPARRSO has undertaken short, medium and long-term future plans in 2020. The main components of the plans are given below:

Short-Term: Establishment of advanced satellite ground stations and conducting feasibility study for development and launching of own earth observation satellite. A development project aligned with the short-term plan is under-way for approval.

Mid-Term: Establishment of Assembly, Integration and Testing (AIT) Lab and Development & launching of own earth observation satellite.

Long-term: Establishment of space-complex having up-to-date technical capability and launching of earth observation satellite using indigenous technology.