

Questionnaire on the use of space science and technology for global health

1. Please describe existing or planned formal cooperative agreements and other institutional arrangements (memorandums of understanding, letters of agreement, frameworks of collaboration, etc.) between the health sector and other sectors directly involved in space activities at the national level.

Indian Space Research Organisation (ISRO), Department of Space of Government of India has signed the following MoUs:

1. An MoU with National Medicinal Plants Board, Ministry of AYUSH for mapping of rare and endangers species(2017).
 2. An MoU with Central Bureau of Health Intelligence, Ministry of Health & Family Welfare for creation of National Health Resource Repository (NHRR) based on geospatial data(2017).
 3. An MoU with National Institute of Malaria Research, Indian Council of Medical Research (ICMR), Ministry of Health & Family Welfare for Geo-Health Analytics for Vector Borne Diseases (Malaria, Dengue and Chikungunya) using Geoinformatics(2018)
 4. An MoU with State Government of Bihar on disaster management support through space data(2019). Under this, a geoportal was created for the state of Bihar health department for identification of COVID-19 containment zones, buffer zones and boundaries for effective planning and monitoring.
2. Please provide recommendations regarding the establishment of a dedicated platform for effective coordination among United Nations entities, other international organizations and relevant actors on space and global health issues.

Dedicated common platform will be useful for sharing of the datasets, methodologies, the best practices and success stories where space technology has been effectively used in the health sector.

3. Please describe existing or planned policy-enabled environmental and governance mechanisms for removing barriers to the effective use of space-based technologies in support of global health.

In order to meet the growing demand of remote sensing data and need for involving the participation of Indian industry to bridge the gap between the demand and supply, a comprehensive remote sensing policy of India is being worked out. This draft policy aims at dealing with any data access and use issues for effective use of space based technologies.

4. Please describe existing or planned policies on open data-sharing and participatory approaches to developing and improving access to geospatial information relevant to global health.

ISRO's satellite and geospatial information are made available on Bhuvan geoportal which is having various tools for visualization, analysis and participatory approaches of analytics and solutions. Further, many satellite and geospatial datasets are made available freely as an open-data for improving the access to users.

5. Please describe existing or planned efforts related to the geotagging of all assets relevant to health systems, including health information systems.

The project named National Health Resource Repository is aimed at collecting health resources datasets existing in India covering both government and private resources. This is the first effort in the country in the field of health census, wherein the data is being collected using a Tab based App, having 7000+ attributes. More than 2 million healthcare establishments spread across 2.5 million enumeration blocks will be mapped in 707 districts of India. This initiative will create a web-based and geo-mapping enabled single platform of all the health resources, which inter-alia includes, hospitals, diagnostic labs, doctors and pharmacies, etc., and will comprise of the data on health infrastructure, human resource and the availability of medical facilities in each health establishment in the country.

6. Please describe existing or planned inter-sectoral coordination and cooperation for effective international, regional, national and subnational capacity-building activities relevant to the application of space science and technology in the field of global health.

A large number of professionals and officials from Ministries are provided training for utilizing space technology in the field of health. Short-term courses for the same are organized regularly. Similarly, pilot studies are being carried out jointly with relevant Ministries as a capacity building activity at national level.

7. Please describe existing or planned mechanisms to engage educational institutions and other capacity-building mechanisms in motivating young health professionals to acquire skills and abilities required to efficiently use advantages provided by space technology, science and applications at an early stage in their careers.

Educational Institutional level linkages can be imparted using effective satellite communication technology to reach out to professionals located in remote part of the country, on the lines of Telemedicine.

8. Please describe existing or planned mechanisms to better integrate space-derived data and information into decision-making processes related to global health, and to harmonize and share such data.

There are several case studies to utilize space technology for decision making related to health. The recent examples of Covid-19 studies have also demonstrated customized geo-portal to track the pandemic and update common public on current situation of Covid-19 spread, high resolution data to map the hotspots for containment with buffer zones to manage the pandemic, support in geotagging all the home quarantine patients and enabling them from a simple-to-use dashboard for provision of the essential services, medical facilities, tool for 'free food for the needy' with easy navigation functionality to reach food to the needy at various locations etc.

9. Please describe how space technology and applications are integrated into health-related emergency planning and management and disaster management plans.

Under Disaster Management Support Programme of ISRO, National Remote Sensing Centre (NRSC) of ISRO has developed National Database for Emergency Management that hosts and continuously updates the information on Health facilities such as hospitals, primary health centers (with details of location, address etc.), private clinics, medical shops etc., up to village level. The database maintains other infrastructure layers such as transport network.

10. Please describe key activities, reference documents and plans relevant to the topic "Space for global health".

Currently, no published documents on space for global healthcare are available to our knowledge .

11. Please provide an overview of existing and planned practices and initiatives in the current uses of space (technology, applications, practices and initiatives) in support of global health and identify gaps, if any, in the following areas:

- a. Telemedicine and tele-health;

In India, the tele-medicine system is operational for rural and remote areas of India and has been useful for connecting the populace in these areas with specialty hospitals. In the recent past, tele-consultation facility between pilgrimage places within the Indian territories has been also realized.

The gap areas or challenge is the maintenance of such system in the village areas and coordination among all stakeholders.

- b. Tele-epidemiology and environmental health;

Using Space technology for GIS mapping of diseases particularly in relation to their geographical distribution has been done successfully for mapping of village level ecological risk of malaria; niche modelling for Kala-azar; early warning tools for malaria; early warning system for the outbreak of Japanese encephalitis, etc.

c. Space life sciences;

(No specific inputs)

d. Disaster and health emergency management;

India actively participate in global/ regional disaster management efforts including International Charter 'Space and Major Disasters' and Sentinel-Asia (under Asia Pacific Regional Space Agency Forum – APRSAF). India, through ISRO, has been sharing the Indian Remote Sensing satellite data of medium to high resolution as and when the Member States activate the requests.

e. Other.

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