



VISUAL: STAR

What does our space research organisation really do?

Data processing at the ground station can offer immense benefits



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India's recent moon landing success raised a lot of curiosity and interest in Bangladesh and Pakistan. The question many people raised was: "Why couldn't we achieve something like this?" Bangladesh's Space Research and Remote Sensing Organisation (SPARRSO) came under scathing criticism from netizens.

Intrigued, I decided to find out more about SPARRSO from its website.

Founded in 1968 as the American space programme's Automatic Picture Transmission (APT) ground station, it is supposed to contribute to national development by peacefully applying space science and technology (vision statement). In 1972, when NASA launched its Earth Resources Technology Satellite (ERTS) - later renamed Landsat - SPARRSO continued active collaboration with it and later with Japanese and European space programmes.

That partnership has continued since. In May last year, NASA integrated its satellite data with observations from Bangladesh Meteorological Department (BMD) to enhance the country's ability to forecast extreme weather events. That means SPARRSO is active, but either it is not informing the public of its work or not meeting expectations. According to its website, SPARRSO had only two achievements in over 50 years: 1) NASA Group Achievement Award in 1986 and 2) Bangladesh Independence Award by its chairman in 1998. It offers only five data sets to the citizens, which are 33 years out-of-date (maps and images covering Dhaka, Chattogram, and Bangladesh, published between 1985 and 1990). There are only eight ongoing research programmes with a combined budget of just under Tk 88 lakh (\$80,000 at the current exchange rate). With such a paltry allocation, we cannot expect any earth-shattering (or moon-shattering?) performance.

We, however, must be realistic. SPARRSO's mission is not necessarily sending lunar missions but using space technology for peaceful purposes. As such, it can focus on leveraging this technology and supporting Bangladesh's development journey. A few cases in other countries might clarify this point. In 2012, India launched a programme called KisanMitr (Farmers' Friend) to give farmers free personalised weather forecasts (from satellite data) and agricultural advice via SMS three times a day. Research showed that it increased the use of rainwater as a groundwater or surface irrigation substitute.

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In Brazil, the police hardly ever investigated environmental crimes because locating isolated illegal deforestation was difficult. In 2018, it adopted the online forest monitoring platform Global Forest Watch, which detects areas of tree cover loss using satellite imagery. With this, the police can quickly identify areas of illegal deforestation and combat them more effectively.

Senegalese farmers have improved their yields and reduced losses due to disease by monitoring crop health and identifying areas of crop stress with satellite imagery. Aside from agriculture, there are many other fields where satellite imagery and advanced data processing can offer valuable insights. These include environmental conservation, disaster management, urban planning, infrastructure development, water resources management, public health management, and disease control. Each area can immensely benefit from satellite data but discussing them in a short article is impossible. Using satellite data effectively, Bangladesh can unlock space programmes' transformative potential for a more prosperous and sustainable future.

Here is a case. Landsat satellites cover the earth every 16 days and provide data for free downloading within a few minutes. However, such data are not precise as their pixel size is 30m (i.e., a 30x30m block on the ground becomes one number in the satellite data). These data cannot help in detailed studies that require higher precision. However, commercially available satellites offer accuracy in centimetres, even millimetres. These are expensive and not easily available. SPARRSO can act as a medium to procure such data and disseminate it to government and private users, charging a fee to recover the cost (making it commercially viable).

Bangladesh's space programme can indeed do a lot on the ground. But that needs sustained investment in education, research, joint programmes with universities and research organisations, technology transfer from advanced countries, and a long term vision. Launching satellites is only one part of a space programme; the more significant part remains how the data is processed to glean valuable insights.

The programme, in collaboration with the Global Partnership for Sustainable Development Data, uses Artificial Intelligence (AI) to predict crop yields and enhance food security by guiding the farmers, planning food storage and transport, and helping policymakers focus on the most vulnerable communities.

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farmers optimise their irrigation schedules. It improves crop yields and saves water, reducing the risk of crop failure due to drought. The Directorate of Resource Surveys and Remote Sensing (DRSRS) is working on a national digital programme for a satellite-based AI-powered crop monitoring and yield forecasting system. With it, the farmers will make smart and data-driven farming decisions, and monitor crops. Last year, Kenya joined UNCTAD's CropWatch programme to monitor its crops better and protect them from floods and other hazards. CropWatch uses satellite data to monitor crop conditions and integrates this with other climate-related data on drought, pests, and disease for better farm management.

None of these countries, save India, sent satellites into space but effectively uses data from others' satellites. Essentially, they collect relevant data from various sources, process them to produce useful information, and deliver the products effectively to the end users (e.g., farmers).

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Gender equality is the investment we need to make



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The SDG Gender Snapshot 2023 report was launched earlier this month. This publication is the latest instalment in the annual series jointly produced by UN Women and UN Department of Economic and Social Affairs (UN DESA). The report provides a comprehensive analysis of gender equality progress across all 17 Sustainable Development Goals (SDGs). Even with significant progress in certain sectors, as we approach the halfway mark of the 2030 Agenda for Sustainable Development, monumental challenges remain.

Let's take a closer look at the progress made towards each goal. Goal 1 of the 17 SDGs is "No poverty." Regarding this, the report forecasts that by 2030, 8 percent of the global female population (approximately 342 million women and girls) will continue to live on less than \$2.15 a day. Only 42 percent of countries have sex-disaggregated poverty data readily available, impeding targeted interventions. For "Goal 2: Zero hunger", the report finds that while progress in narrowing the gender gap in food insecurity has been made, roughly 24 percent of women and girls may still experience

in "Goal 7: Affordable and clean energy," approximately 341 million women and girls could lack access to electricity by 2030, with clean cooking fuels remaining out of reach for many. Universal electricity could elevate 185 million women and girls from poverty by 2050, and modern cookstoves could prevent 6.5 million pollution-related deaths.

As for "Goal 8: Decent work and economic growth," disrupted careers, care responsibilities, and wage discrimination mean women only earn a third of the global income generated by labour. For each dollar men earned in labour income, women earned only 51 cents. The gender wage gap and underrepresentation of women in the labour force continue, indicating the need for policy reforms to ensure equitable opportunities and wages.

When it comes to "Goal 9: Industry, innovation and infrastructure," women hold 21 percent of STEM (science, technology, engineering, and mathematics) jobs and only one in three researchers is a woman. Gender disparities in technology and innovation persist, hindering women's participation in STEM fields and impeding progress in

third of these women and girls could find themselves living in inadequate housing or slums. Moreover, women with disabilities, representing approximately 18 percent of the female population, face heightened challenges. A 2022 study indicated that a mere 27 percent of 190 countries and regions explicitly protected the rights of women with disabilities.

Regarding "Goals 12-15: Responsible production and consumption, climate action, life below water, life on land," up to 158 million more women and girls might find themselves in poverty by mid-century due to worsening conditions fuelled by global warming. This represents 16 million more than their male counterparts. An alarming 236 million more women and girls may experience food insecurity, compared to 131 million men and boys. Despite these numbers, only 55 of the world's national climate action plans include gender-specific adaptation measures, and only 23 recognise the vital role of women as change agents in the fight against climate change.

For "Goal 16: Peace and strong institutions" the snapshot report states that since 2017, the number of women and girls in conflict-affected areas has surged by 50 percent, tallying up to 614 million by 2022. In 2023, those in extremely fragile areas were especially vulnerable, facing higher poverty rates and increased food insecurity. Intimate partner violence is 2.4 times higher in extremely fragile contexts compared to non-fragile settings.



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PHOTO: AFP

moderate to severe food insecurity by 2030. Gender disparities in agriculture persist, with limited access to land, resources, and ownership affecting productivity. Regarding "Goal 3: Good health and well-being" the report finds that while maternal mortality reduced globally from 2000 to 2020, progress has stagnated since 2015. High maternal death rates in sub-Saharan Africa and Central/Southern Asia highlight inequalities in healthcare access and quality.

For "Goal 4: Quality education" the report finds that increases in girls' enrolment in education are commendable, but nearly 110 million girls and young women could remain out of school by 2030 if the progress stalls. Gender gaps in education and training opportunities persist, affecting future earning potential and overall development.

On the other hand, "Goal 5: Gender equality" has witnessed limited progress, with just two of this goal's indicators nearing their targets. No indicator has fully met its aim. Deep-seated biases persist, marked by unequal health access, unequal political representation, economic gaps, and inadequate legal defences. Critical data for monitoring progress is missing in many countries. Furthermore, 28 countries do not recognise women's equal rights in marriage and divorce. Globally, 19 percent of young women are married before age 18, and there is a notable disparity in leadership roles.

Analysing "Goal 6: Clean water and sanitation", the report states that while more women now have access to safe drinking water, around 380 million women and girls live amid high or critical water stress, a number projected to increase to 674 million by 2050 due to climate change. Similarly,

emerging technologies like artificial intelligence. On "Goal 10: Reduced inequalities", gender discrimination comes in many forms and remains commonplace, undermining human rights. According to the

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latest available data, up to 21 percent of people living with HIV reported being denied health care in the past 12 months, and up to 26 percent of women living with HIV reported that their treatment for the virus was conditional on taking contraceptives.

On "Goal 11: Sustainable cities," by 2050, urban areas are expected to house 70 percent of the world's female population, totalling 3.3 billion. Alarming trends suggest a

regarding "Goal 17: Partnerships", a dire need for enhanced financial backing exists in countries where gender equality lags the most. The yearly budget dedicated to gender equality as a principal objective remains low at \$5.7 billion, just 4 percent of total bilateral aid. This minimal support, coupled with the fact that only one in four countries actively tracks gender equality funding, underscores the challenges faced in achieving parity.

The 11 biggest hurdles for women's equality by 2030 are lack of women in leadership, poverty and lack of economic opportunities, workplace discrimination and inequalities, an imbalance in unpaid care work, social norms and cultural practices, inadequate access to education and health care, food insecurity, violence against women and girls, inadequate funding for gender equality initiatives, legal barriers and poorly enforced legislation, and lack of access to clean energy and sanitation.

The SDG Gender Snapshot 2023 report advocates for an integrated, holistic approach to advancing gender equality, involving multi-stakeholder collaboration and sustained financial backing. Neglecting to amplify efforts and invest in gender parity jeopardises the entire 2030 Agenda for Sustainable Development.

It is evident we are doing even worse than we realised on gender equality. The price tag for SDG 5 - achieving gender equality and women's empowerment - is in. We can afford it, we need to pay for it. We know that an additional \$360 billion per year is needed to achieve gender equality in developing countries across key global goals. This is less than one fifth of the \$2.2 trillion spent globally on military expenditure in 2022.