

Grassroot Space Innovation for Socio-Economic Resilience in Policy-Limited Nations

Evidence from Nepal

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Starting From Scratch: Nepal's Policy Vacuum

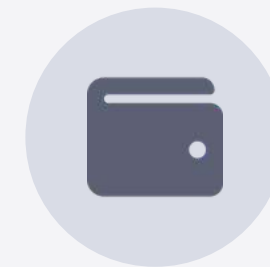
As of 2026, Nepal has none of the usual starting conditions for a space programme.



No national space law



**No dedicated space agency
or regulatory body**

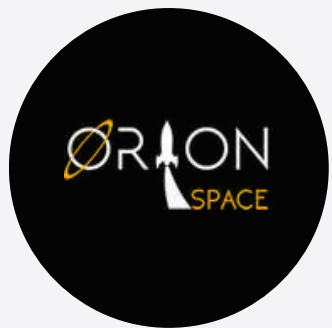


**No dedicated public
funding line**

And yet — space activity did not stop.

What Emerged Anyway: A Grassroot Ecosystem

Five community-led initiatives, documented 2024–2026 through project reports, public activity tracking, and informal interviews.



Orion Space
Pico-satellites



Mach24 Orbitals
*Hybrid/Sounding
rockets*



**Antarikchya
Pratisthan
Nepal (APN)**
High-school CubeSats



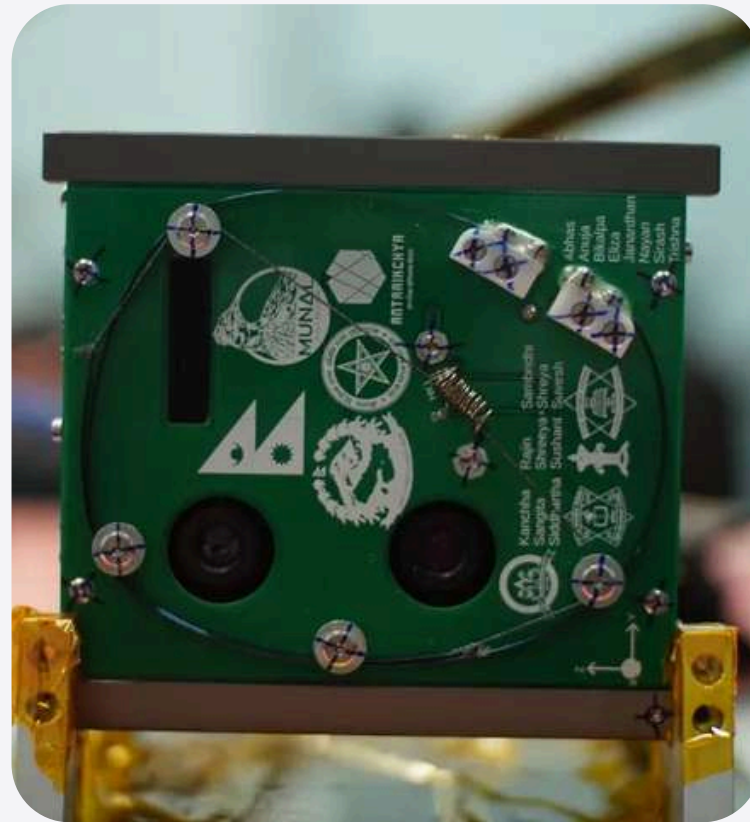
**Nepal Astronomical
Society (NASO)**
*Policy advocacy,
Analog Astronaut
Mission and Space
Research*



**Nepalese Space
Research
Association
(NESRA)**
*Astronomy, Space
Science and Asteroid
search campaigns*

What have we achieved?

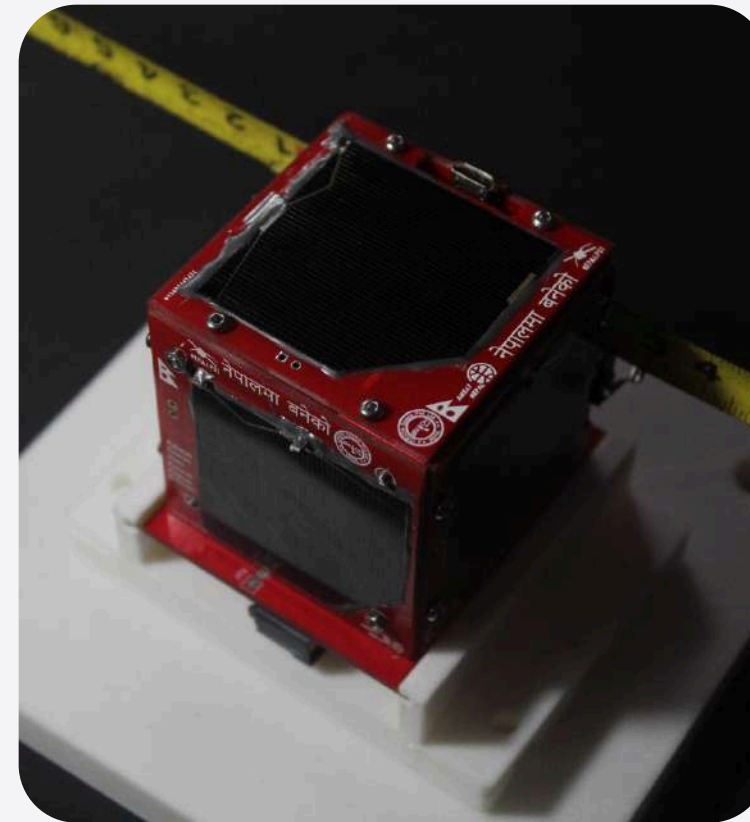
1. Four Satellites in Space



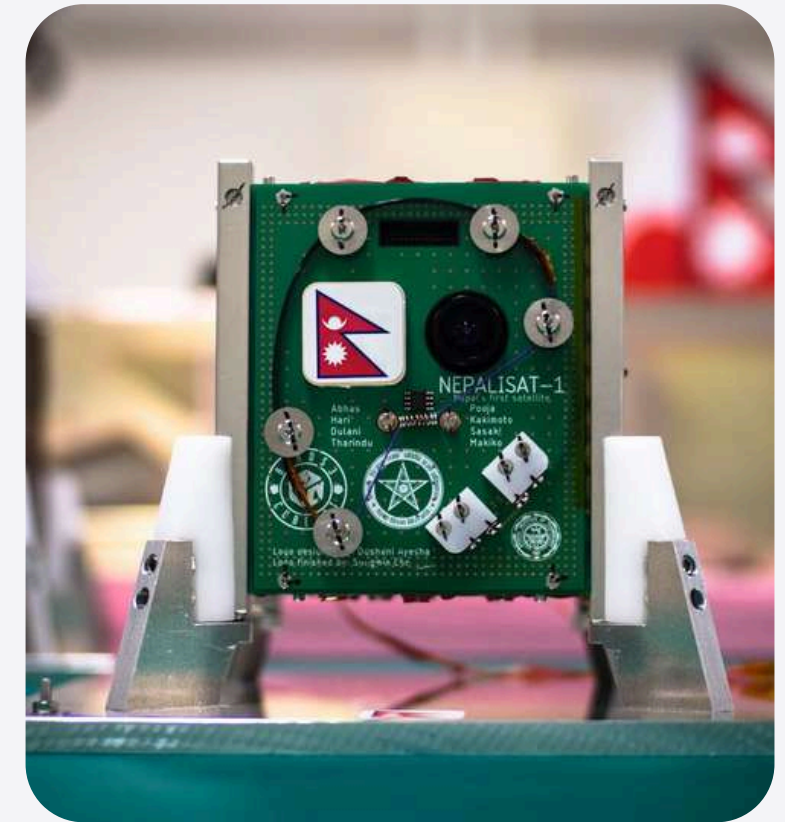
Munal



Slippers2sat

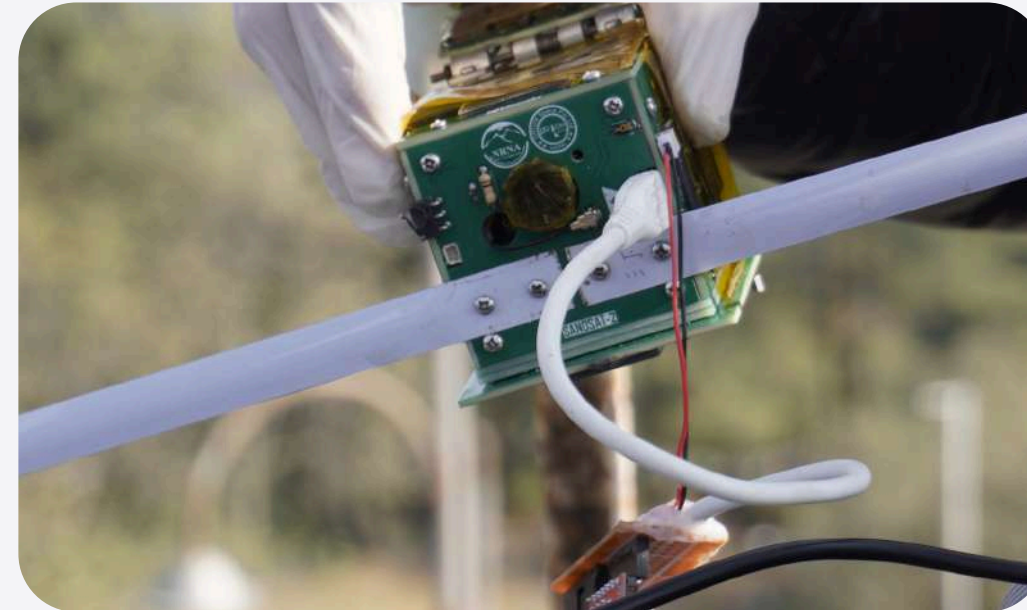


Sanosat-1



Nepalisat-1

2. Research and Innovation



3. Education and Outreach



3. Capacity Building



4. Emergence of New Space Era



Resilience Mechanism 1

Extreme Frugal Innovation

Low Cost by design

Build to cost less than the commercial equivalent by design, not by accident



Open-source designs

Shared hardware and software designs replace costly proprietary systems.



Recycled materials

Locally sourced and reused components substitute for imported parts.



Volunteer labour

Student and hobbyist teams do the engineering that a paid programme would otherwise fund.

Financing and Partnerships Beyond the State



Diaspora-Led Crowdfunding

Small, remittance-based contributions from Nepalis abroad bypass limited domestic financing and provide a transnational alternative to venture or government funding.



International Barter Partnerships

Ground-station access and student training are exchanged for launch opportunities, for example, through UNOOSA's Access to Space for All initiative.

What This Built

Four measurable outcomes from three low-cost mechanisms.



Talent retained

Young engineers stay in-country instead of emigrating for space careers.



Micro-jobs created

Local 3D printing and electronics assembly around active projects.



Supply chains built

Domestic sourcing for components once imported at high cost.



Policy pressure generated

Visible successes give policymakers a reason to act.

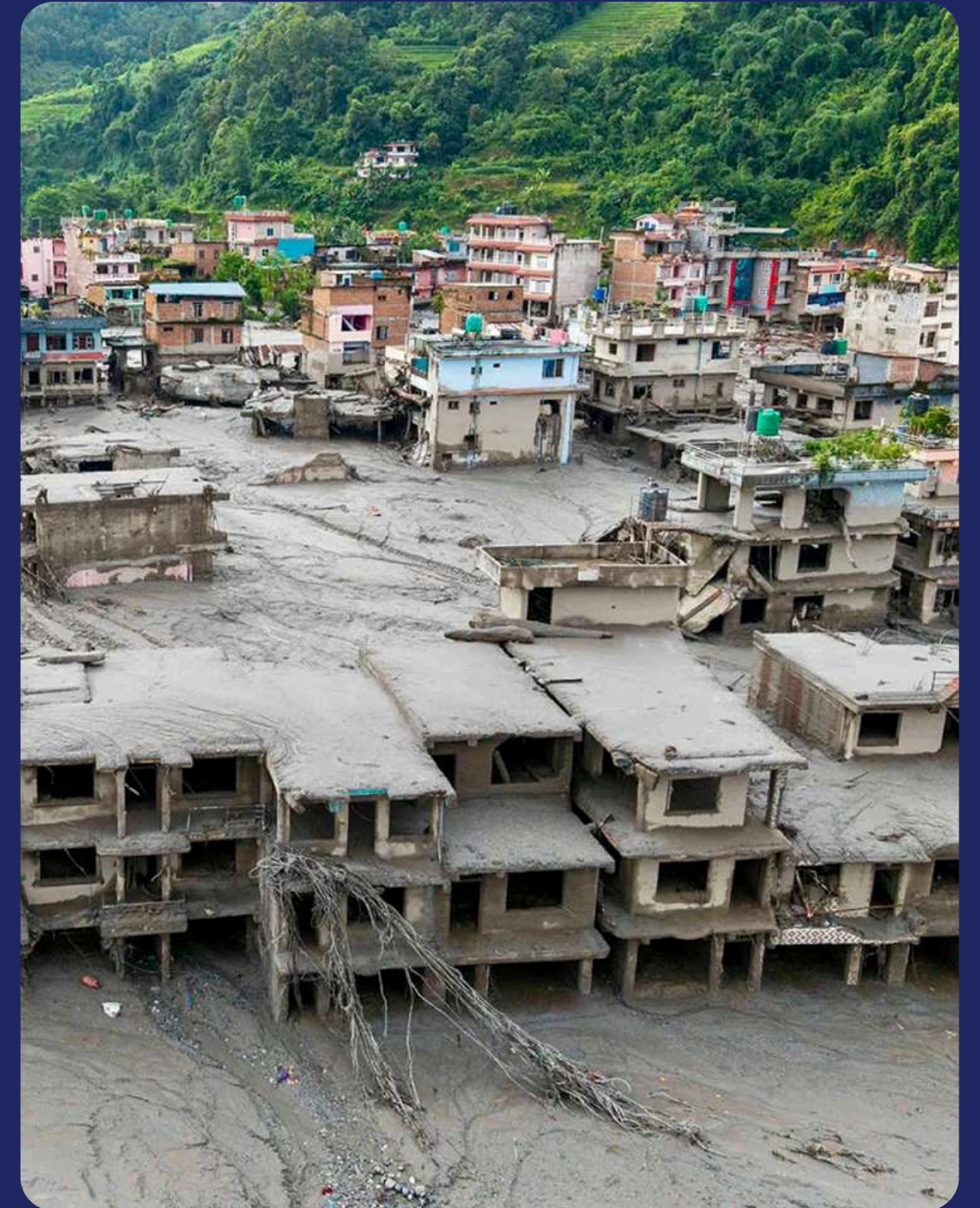
26-27 AUGUST 2026 · NEPAL-TIBET BORDER, RASUWA DISTRICT

This Isn't Hypothetical

On 26 August 2026, a Himalayan glacier partially collapsed above the Bhote Koshi river, triggering flash floods across the Nepal-Tibet border the second major glacial-hazard flood in this same corridor in about a year. Hundreds are confirmed dead, and well over a thousand remain missing as search and rescue continues.

Within hours, satellite imagery helped confirm the cause was a glacier collapse, not the earthquake first suspected. The hazard was visible from space; turning that visibility into a warning, before the next one, is the work still undone.

The same satellites already behind your weather app and your farmer's calendar can be pointed at this. The only question is before, or after.



Ten Challenges We Identified in Nepal — Watch For These Too

From Khanal & Shrestha, IAC-25 : patterns likely to recur wherever a space sector starts from zero.



Four of these are the highest-leverage places to start — next.

Recommendations: Turning Challenges Into Action

Four of Nepal's ten challenges, addressed — with a named institution and a number, not just a suggestion.



Security & Disaster

Tackles: weak international partnerships, no regulatory body
Standing SAR/optical tasking agreements — not a domestic EO satellite.

Philippines: 5 partner satellites, 1 flood response, 0 owned.



Public Health

Tackles: lack of public awareness, inadequate government priority
Co-fund an Earth-observation-fed disease early-warning system.

D-MOSS dengue system: live in 7 countries; ~\$9B/year at stake.



Economic Development

Tackles: financial constraints, inadequate space players
Fund grassroots capacity as workforce policy, not science policy.

>90% cost reduction vs. commercial equivalents (Nepal).



Agriculture & Water

Tackles: geographical constraints, limited university pipeline
Bundle crop and water monitoring into existing disaster tasking.

Same SAR pass already maps flooded rice fields (Philippines).

From Evidence to Policy

This research is no longer only academic. As an advisor to Nepal's National Space and Aeronautical Advisory Committee, I am now working to translate these grassroots lessons —micro-financing, open hardware, and international partnership into the country's first national space policy.

Thank you — let's connect.

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