

FloodLens Incheon

Youth-Powered Flood Intelligence

Students help reveal the flood risks that fixed sensors miss.

PILOT PROPOSAL · 20–30 STUDENTS · ONE RAINY SEASON



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Built for this forum's theme, not fitted to it after the fact

IDRLF 2026 theme: *“Translating Locally-led Resilience into Action in the Age of Complex Risk and Digital Transformation.”*



“Locally-Led Resilience into Action”

Songdo students, already engaged through the Onhappy network, turn SDG education directly into a flood hotspot map for their own city, resilience led by the community that lives the risk.



“Complex Risk & Digital Transformation”

Data-flagged priority zones (rainfall, elevation, incident history) plus a verified smartphone protocol bring digital tools to hyper-local flood observation.



Incheon Metropolitan City: Asia-Pacific's first MCR2030 Resilience Hub (2021)

FloodLens extends Incheon's existing resilience commitments and All-of-Society engagement priorities into a concrete, youth-led pilot, not a new mandate, but a way to act on one already in place.

Cities can't act on flood risks they can't see

Two blind spots keep critical local risks invisible.



Observation Gap

Sensors cover major roads and low points; alleys, drains, and footpaths stay invisible.



Education–Action Gap

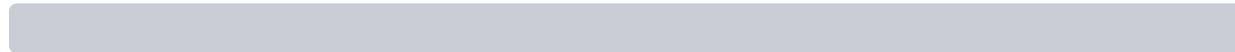
Students learn the SDGs in class but rarely get a real role in producing city data.

Existing Sensor Coverage



Main roads only

Unmonitored Blind Spots



Alleys & footpaths

FloodLens Fills the Gap



Student observations added

Illustrative concept, not an actual sensor map; see References for source data.

“Fixed sensors tell us what happens where sensors exist. Citizens help reveal what happens between them.”

A documented coastal risk, tested in a compact, mappable pilot site



WHY INCHEON?

A coastal city with documented flood exposure

In 2017, roughly 100mm/hr rainfall flooded 2,000+ households across Incheon's old town.



WHY SONGDO?

A compact, scalable pilot geography

Reclaimed tidal-flat ground, an existing youth network, and smart-city infrastructure make it a practical place to test and scale.



My Starting Point: the Onhappy Program

Through Onhappy, I taught SDG 6 (clean water and sanitation) to Incheon high schoolers. They were already engaged. The missing piece was a way to turn that engagement into action.

SDG 6 Clean water focus

Incheon High-school cohort

Existing Youth network ready

Data identifies where to look. Students verify what's actually there.

Data prioritizes where to look. Sending students, not sensors, turns that verification into civic learning.

A priority zone near her school was flagged by rainfall and elevation data. After the rain subsides, a student visits, photographs standing water, checks if the drain is blocked, and logs GPS + time. One verified point updates the map.



AI prioritizes: data narrows the search

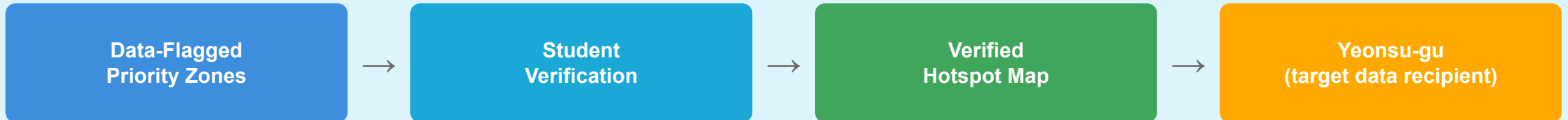
An AI model layers rainfall, elevation, and past flood reports to recommend candidate zones, so students verify only the spots that matter most, not the whole city.



Students verify: ground-truth & safety

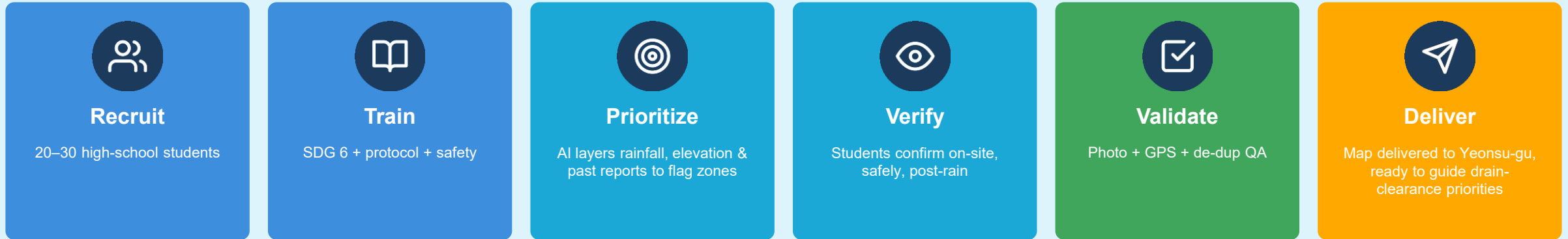
Standard protocol · photo + GPS + timestamp · duplicate filtering. Students confirm what AI can't see: clogged drains, debris, real street-level conditions.

HUMAN + AI PIPELINE

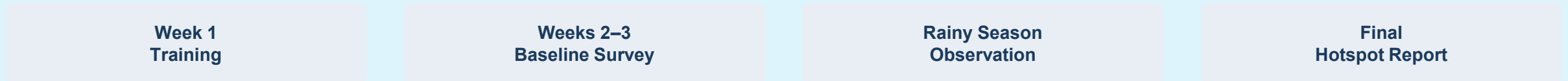


Data targets the search. Students verify the truth. The city acts.

One rainy season in Songdo, step by step



TIMELINE



Who runs it

Presenter coordinates recruitment & training with Onhappy; students self-verify with teacher sign-off. The hotspot map and a recommendation memo go to Yeonsu-gu as data recipient: a low-cost, hyper-local dataset its public-works team can use to prioritize drain clearance and maintenance ahead of heavy rain.

What students gain

- Eligible for recognition as volunteer hours, subject to school/partner approval
- Research-portfolio-ready record: methodology, data, and findings
- Can be linked to school SDG / creative-experience programs where applicable
- Top observers present at a student showcase + named credit in the final report

Not just another crowdsourced flood map

	PetaBencana (Indonesia)	Ramani Huria (Tanzania)	FloodLens (Incheon)
Crowdsourced flood mapping	✓ Yes	✓ Yes	✓ Yes
Dedicated youth engagement program	✓ Yes	● Partial	✓ Yes
★ Linked to a K–12 school curriculum (SDG 6)	Not documented	Not documented	✓ Yes
Structured dry-day / pre-storm surveys	Not documented	● Partial	✓ Yes
★ AI layers data to prioritize survey zones	Not documented	Not documented	✓ Yes

★ = FloodLens's core differentiators. "Not documented" means not found in publicly available program materials; not a confirmed absence. See References.

FloodLens's novelty isn't the technology; it's the pipeline: AI-prioritized targeting plus a school curriculum that turns directly into city-facing disaster data. A drone or official could collect the same photo; only a student walks away with a role in producing their own city's resilience data.

What this pilot delivers, and how it scales beyond Songdo

What This Pilot Delivers

20–
30

Youth citizen
scientists
trained

3–5

Observation
zones
mapped

1

Rainy-season
dataset

1

Verified
hotspot map

1 Proposed city-facing recommendation report

Global Scaling

Test in Incheon → Validate what works → Localize for each city's schools, connectivity, and hazard type.



PetaBencana.id (Indonesia): 300+ certified Youth Climate Ambassadors (ages 15–30) across Indonesia leading local flood reporting.



Ramani Huria (Tanzania): university-student-led, sensor-free mapping (World Bank/HOT-funded), used by Ward Executive Officers for flood planning.



Built for low connectivity: offline capture, auto-sync when back online.

Supports Sendai Framework Target F: international cooperation to developing countries.

BEFORE: Students learn about climate resilience. → AFTER: Students produce data for climate resilience.

Students gain: SDG training → field research → data literacy → real civic impact.

Disaster resilience is often framed as a technology or infrastructure challenge. But resilience is ultimately about human infrastructure.

FloodLens turns climate education into locally actionable resilience data.

Let's pilot FloodLens Incheon together.

- 20–30 students, 3–5 zones, one rainy season
- A verified hotspot map, delivered to Yeonsu-gu as the pilot's data recipient
- A repeatable model other coastal cities can adopt

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Sources for the facts cited in this proposal

2017 Incheon flooding (≈100mm/hr, 2,000+ households)

Republic of Korea Ministry of the Interior and Safety, disaster annual reports (재해연보), July 2017 edition; contemporaneous domestic news coverage. Figures are order-of-magnitude estimates, not a single confirmed count.

Songdo reclaimed-land waterfront development context

Incheon Free Economic Zone (IFEZ), public waterfront-development materials (송도국제도시 워터프런트 사업).

PetaBencana.id: Youth Climate Ambassadors program

Yayasan Peta Bencana, official Youth program page, info.petabencana.id/youth: "300+ fully certified Youth Climate Ambassadors, 34 provinces" (2023 figures).

Ramani Huria: Dar es Salaam flood-mapping project

World Bank GFDRR feature "Taking Disaster Risk Management to New Heights"; Humanitarian OpenStreetMap Team (HOT) project documentation, [hotosm.org](https://www.hotosm.org).

Onhappy program teaching experience (SDG 6, Incheon)

Presenter's own program participation and lesson records.

IDRLF 2026 theme

UNDRR official events listing: "International Disaster Resilience Leaders Forum Incheon 2026 (IDRLF2026): Translating Locally-led Resilience into Action in the Age of Complex Risk and Digital Transformation," undrr.org/events.

Incheon as Asia-Pacific's first MCR2030 Resilience Hub

UNDRR news release, "Incheon City is the first Resilience Hub in Asia-Pacific" (23 November 2021), undrr.org.

Sendai Framework Target F

UNDRR, "Sendai Framework at a Glance": Target F: substantially enhance international cooperation to developing countries through adequate and sustainable support, by 2030.

Two notes on scope: (1) Figures describing the pilot itself (student counts, zones, timeline) are proposed targets for this application, not measured results. (2) The AI prioritization step is a proposed methodology; exact input data and model would be finalized with a city or research partner before the pilot begins.