Becoming Good at AI for Good

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The promise of AI to improve lives and protect vulnerable people and ecosystems has not yet reached its potential

AI for Good (AI4G) is a movement within the field of AI
- **Goal:** further progress towards "good" outcomes
- Loosely guided by the UN Sustainable Development Goals (SDGs) and priorities within local communities

Our approach to AI4G
- We collaborate with *partner organizations (POs)* on AI4G *projects*
- POs define "good"

Case Study - Finding Solar Farms in India from Satellite Imagery
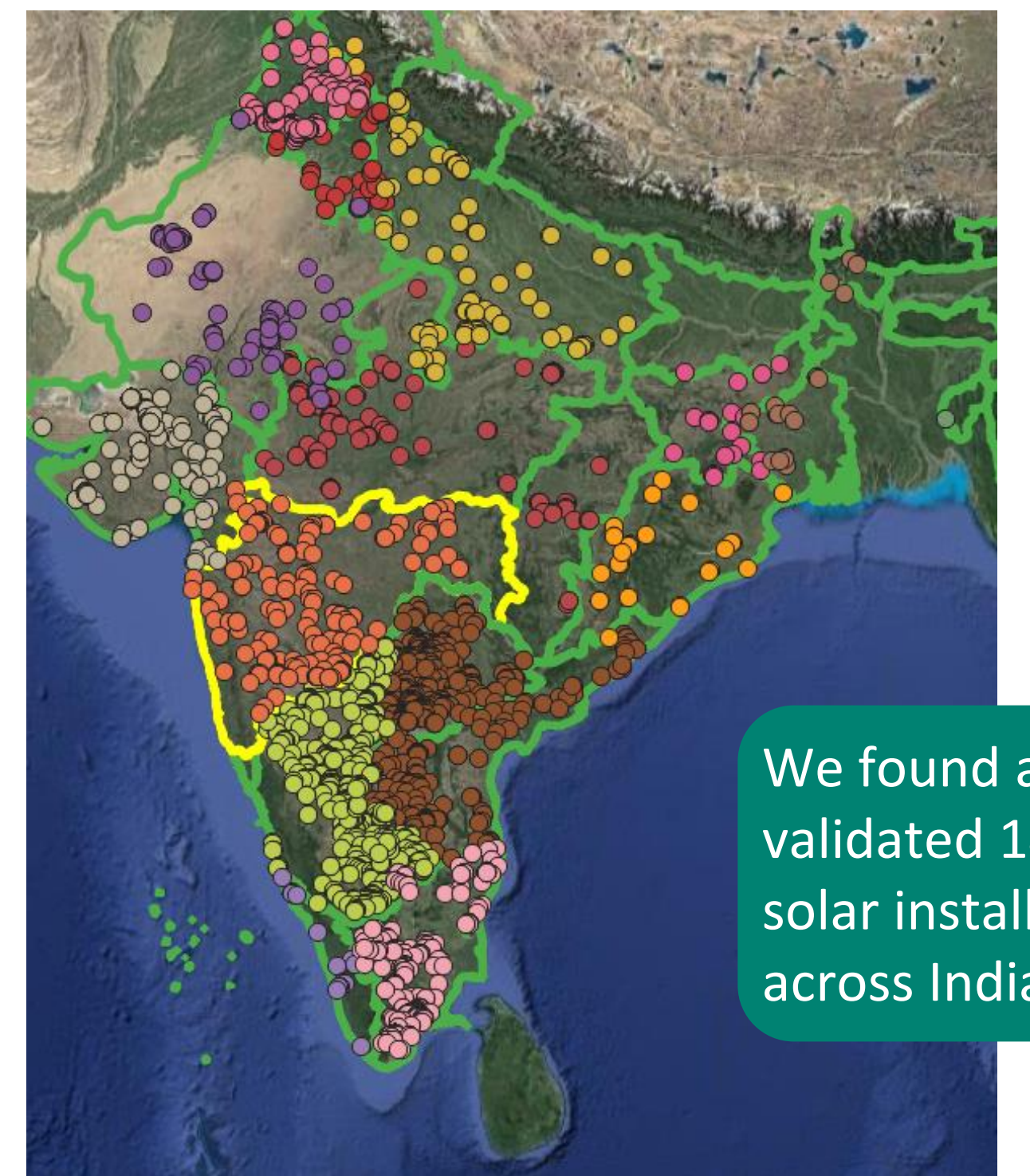
We found and validated 1422 solar installations across India

We distill our experience with AI4G projects in 11 takeaways across four areas:

Communication

1. Setting realistic expectations from AI Educating POs about AI's limits and opportunities is a core part of an AI4G project. Potentially unrealistic expectations for AI can often be reframed

2. Project scoping To ensure we develop solutions that are practically useful, project scoping needs to be an ongoing dialogue with the PO

Data

3. Adapting to previously collected datasets It is important to understand the associated metadata and collection process when using previously collected data

4. Dealing with subjective data annotation In several socially important domains, labels suffer from subjective annotation

5. Creating training and test sets with the application scenario in mind So that the model's ability to generalize to unseen instances of input is measured

Modeling

6. Incorporating domain expertise Endeavor to incorporate the PO's domain expertise in model dev

7. Model development with resource constraints Consider a project's constraints during deployment in advance

8. Evaluation and metrics Incorporate domain-specific metrics in training or determine which ML metrics are relevant

9. Humans in the loop AI4G projects require humans in the loop to some extent. Active learning enables POs to engage with modeling

Impact

10. Uphill path to deployment and adoption Maintaining deployed models requires long-term commitments. Focusing on time saved instead of pure ML metrics helps with adoption

11. Measuring impact Domain experts within POs should define mission-related impacts; work with the PO to quantify immediate (workflow or analysis enhancement) and farther-removed (mission-related) impacts

Problem
- NGO wants to select locations for solar farm construction that minimize ecological harm
- Needs to know where existing solar farms are
- Only 72 point-labels of locations of solar farms in two states were available

Takeaway 3 – working with previously collected data

Approach
- We used an interactive web app to fine-tune a model that clustered similar pixels to create weak labels

Takeaway 9 – human in the loop

- We incorporated OpenStreetMap data to remove areas of roads, snow and water

Takeaway 6 – incorporating PO domain expertise

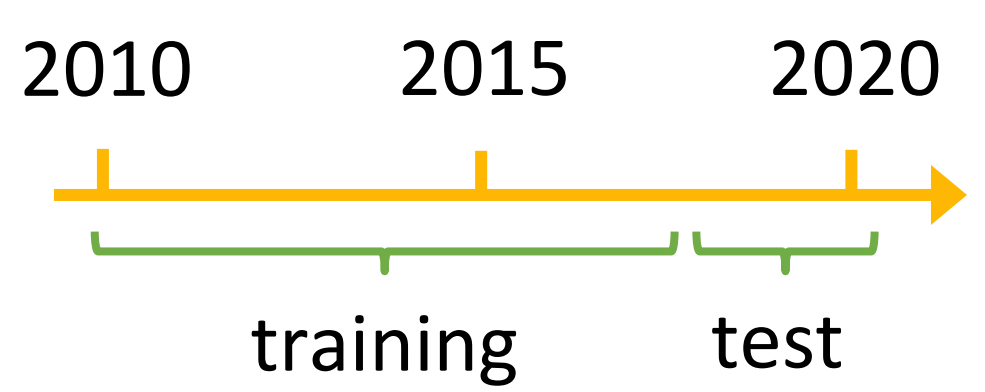## Takeaway 1 – Setting realistic expectations from AI

Example: Detecting fish species from underwater cameras with a high accuracy on rare species

- This goal likely not possible to achieve on very rare species
- Instead, initiate data collection and labeling for rare species

Takeaway 5 – Creating training and test splits correctly

Generalize temporally

2010   2015   2020

training   test

Generalize spatially

| Disaster 1 | Disaster 2 |
| Disaster 3 | Disaster 4 |
| Disaster 5 |

training   test

Paper:

AAAI / ACM conference on ARTIFICIAL INTELLIGENCE, ETHICS, AND SOCIETY