



DISRUPTIVE TECHNOLOGIES FOR DEVELOPMENT

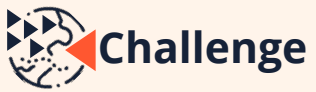
Green and Blue Footprints  
Tool: Decision Support for  
Living Cities

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## Green and Blue Footprints Tool: Decision Support for Living Cities



## Challenge

**Natural ecosystems are at odds with the forces of unplanned urbanization.** Comprehensive, reliable and low-cost geospatial data on urban green/blue is urgently needed for governments to manage urban expansion in a sustainable and resilient manner.



## Solution &amp; Technology Used

“Green & Blue Footprints Tool” that can delineate and characterize urban green and blue footprints by leveraging **high-resolution satellite/drone imagery, machine learning, and interactive visualization.**



## Implementation

The project team will engage with the Indonesian Ministry of Agrarian Affairs and Spatial Planning/ National Land Agency (ATR/ BPN) to develop, execute and validate the pilot.



## Impact

**Protection of biodiversity & natural habitats in and around cities:** Leveraging evidence-based development control measures. **Replicability & Scalability ease:** Using open-source code and repositories like GITLAB will allow the solution to scale globally.



## Green and Blue Footprints Tool: Decision Support for Living Cities

*Pilot Results*

The team **developed the green and blue footprints tool** and **produced highly accurate urban green/blue mapping** in Jakarta and other regions, leveraging satellite/drone imagery, AI, and interactive visualization.

- **Developed the geospatial tool through rapid iterative prototyping process:** Optimized AI algorithms, evaluated the model and reflected user feedback over a series of 2-4 weeks rounds in close collaboration with the Land Development Control directorate.
- **Analyzed land cover changes in Jakarta from 1989-2018:** The findings highlighted the rapid decline of green areas in the city from 90%(1990) to 70%(2018).
- **Produced Jakarta waterbody delineation map:** The team developed a water delineation map that meets regulatory standards with a 15% increase in average data accuracy compared to existing data.
- **Built a highly scalable and accessible tool:** The tool produced a map of 219 water bodies over 40 locations with a 90% accuracy. A web-based dashboard allows easy data dissemination.



## Partners

- **Client:** Land Development Control Directorate of the Ministry of Agrarian and Spatial Planning (ATR)  
WBG: ITS Innovation Lab and Geospatial Operations Support Team (GOST)



## Green and Blue Footprints Tool: Decision Support for Living Cities

### Pilot Results

#### Relevance in the age of Covid-19

- The green/blue tool offers options for remote supervision and strengthens development control mechanisms by leveraging satellite/drone imagery and AI/machine learning.
- In doing so, it reduces the need for on-site surveying, which is challenging in the context of constrained mobility brought about by the Covid-19 crisis.

#### Next Steps & Beyond DT4D

- **Extending the tool's use cases:**
  - The team will analyze land parcel overlaps with waterbodies and develop an early-warning system for green space destruction and water encroachment.
- **Facilitating the adoption of disruptive technologies in WBG operations:**
  - This project demonstrated the potential of using satellite/drone imagery and AI in urban planning and investments.
- **Project outcomes will be shared with the following WBG projects:**
  - National Urban Development Project(NUDP), Program to Accelerate Agrarian Reform(One Map Project), and a pipeline geospatial project.
- **Paving the way to sustainable and technology-based urban development**
  - The rapid disappearance of the urban green and blue areas in Jakarta, as proven by the project, served as a compelling argument in launching the Sustainable Cities Impact Program by the Global Environment Facility (GEF).