Burundi

AN INNOVATIVE APPROACH TO MANAGING GEOGRAPHICAL INFORMATION SYSTEM SUPPORT FOR A LARGE-SCALE INDOOR RESIDUAL SPRAYING CAMPAIGN IN BURUNDI

GIS

SCIENTIFIC DAYS

BURUNDI

INTRODUCTION

OCB MSF Project: Kininya project (Ruyigi province)

MSF Context of intervention: Malaria
➢ Malaria is the leading cause of morbidity and mortality
➢ Year-round malaria cases, with peak during the rainy season

MSF Malaria prevention via Vector Control
➢ **Bednets:** resistance for insecticides, holes, ...
➢ **IRS:** Indoor Residual Spraying, spraying of insecticides on walls and ceilings

For IRS to be effective:
1. No house should be left unsprayed
2. Micro planning is essential
3. Uncovered areas need to be identified to increase coverage to optimize impact on malaria transmission

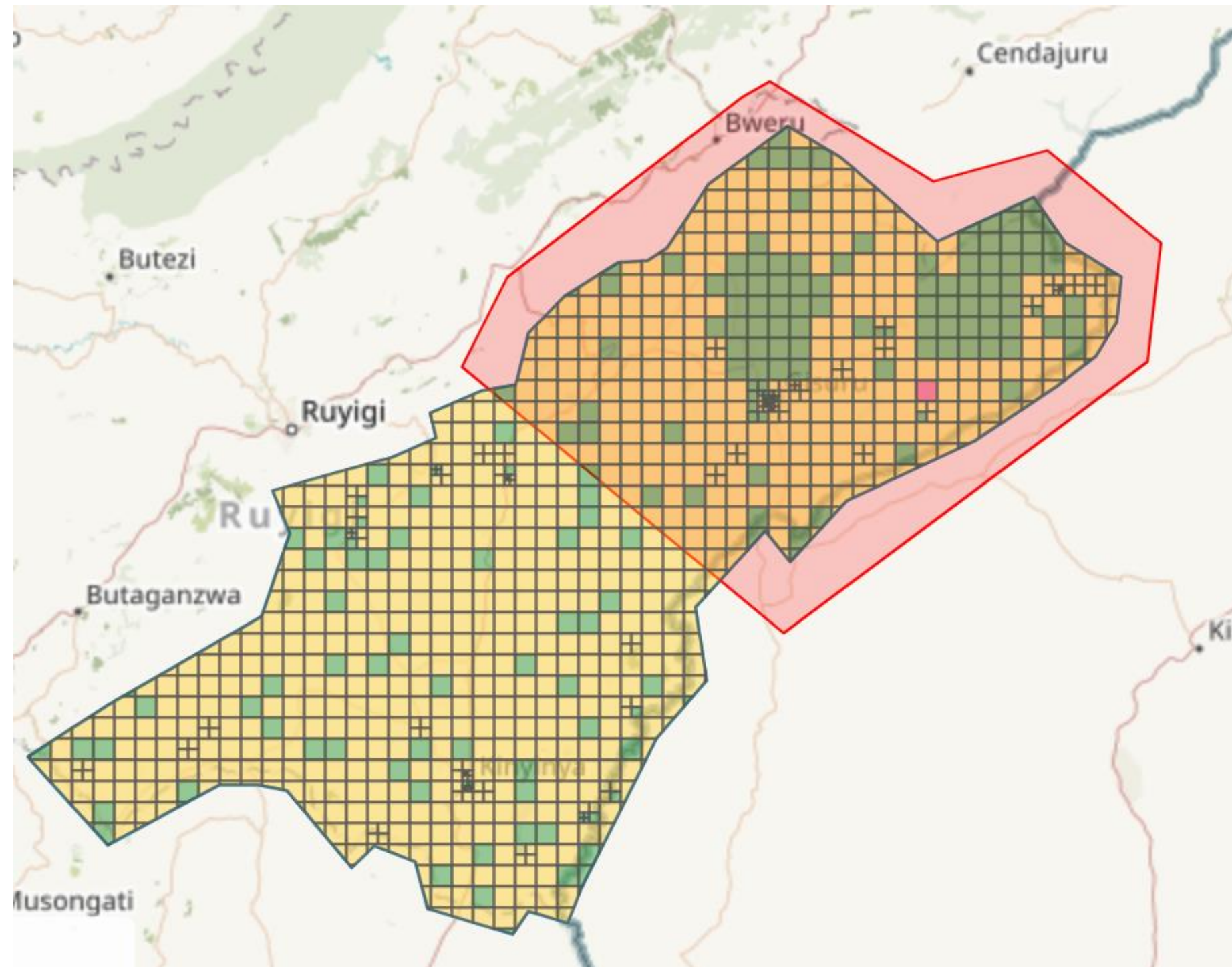**Organization + Monitoring + Real time evaluation and adaptation are key factors**

METHODS

Missing Maps Activation

Creation of an estimated geo-referenced household database to support planning and IRS coverage monitoring

➢ **Mapping:** 73,827 housings mapped in 1 month and 11 days
➢ **Population estimation:** 300,000 persons over 1,000 km2

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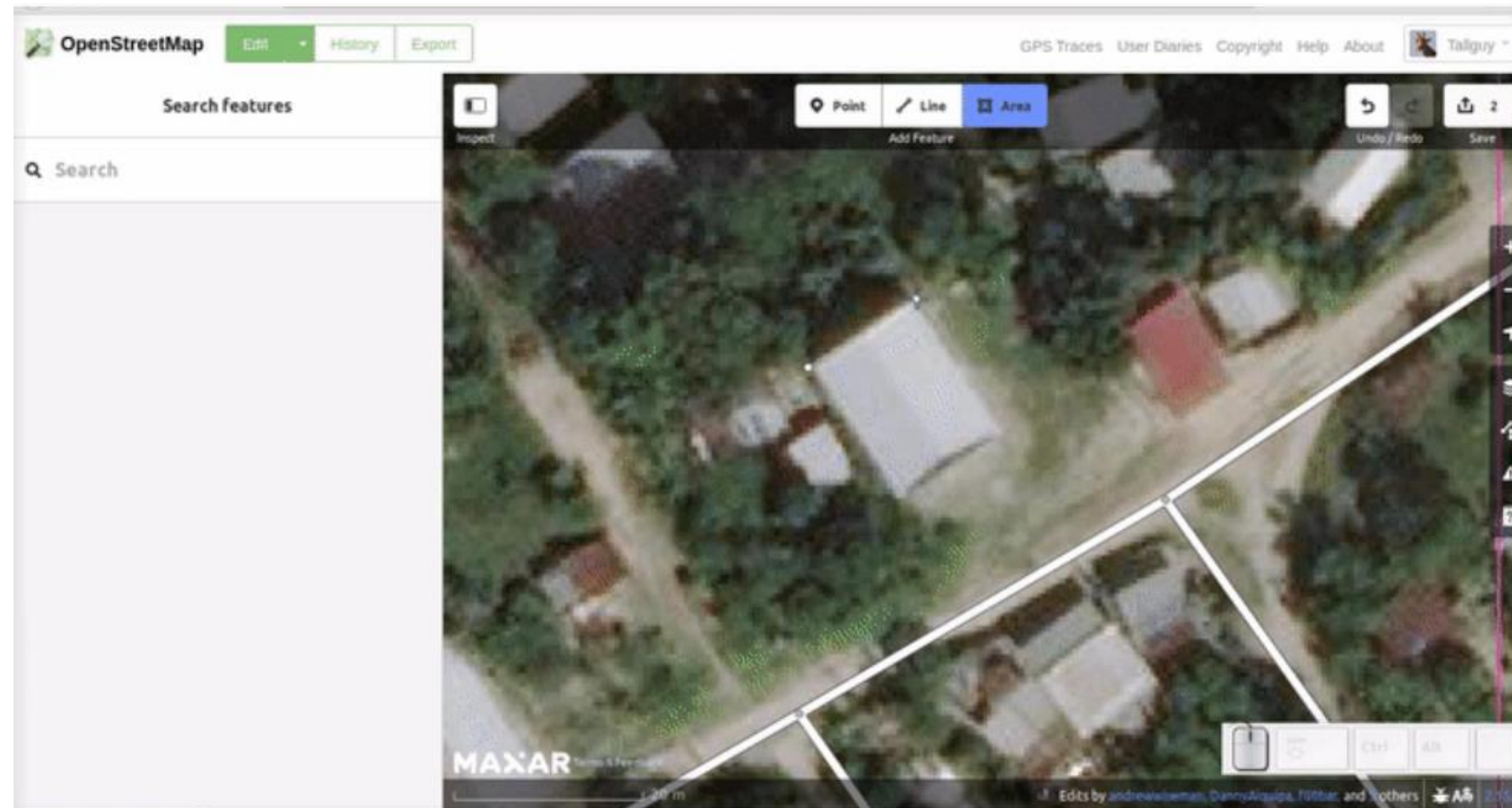
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DOCTORS WITHOUT BORDERS

This innovation project did not involve human participants or their data; the MSF Ethics Framework for Innovation was used to help identify and mitigate potential harms.

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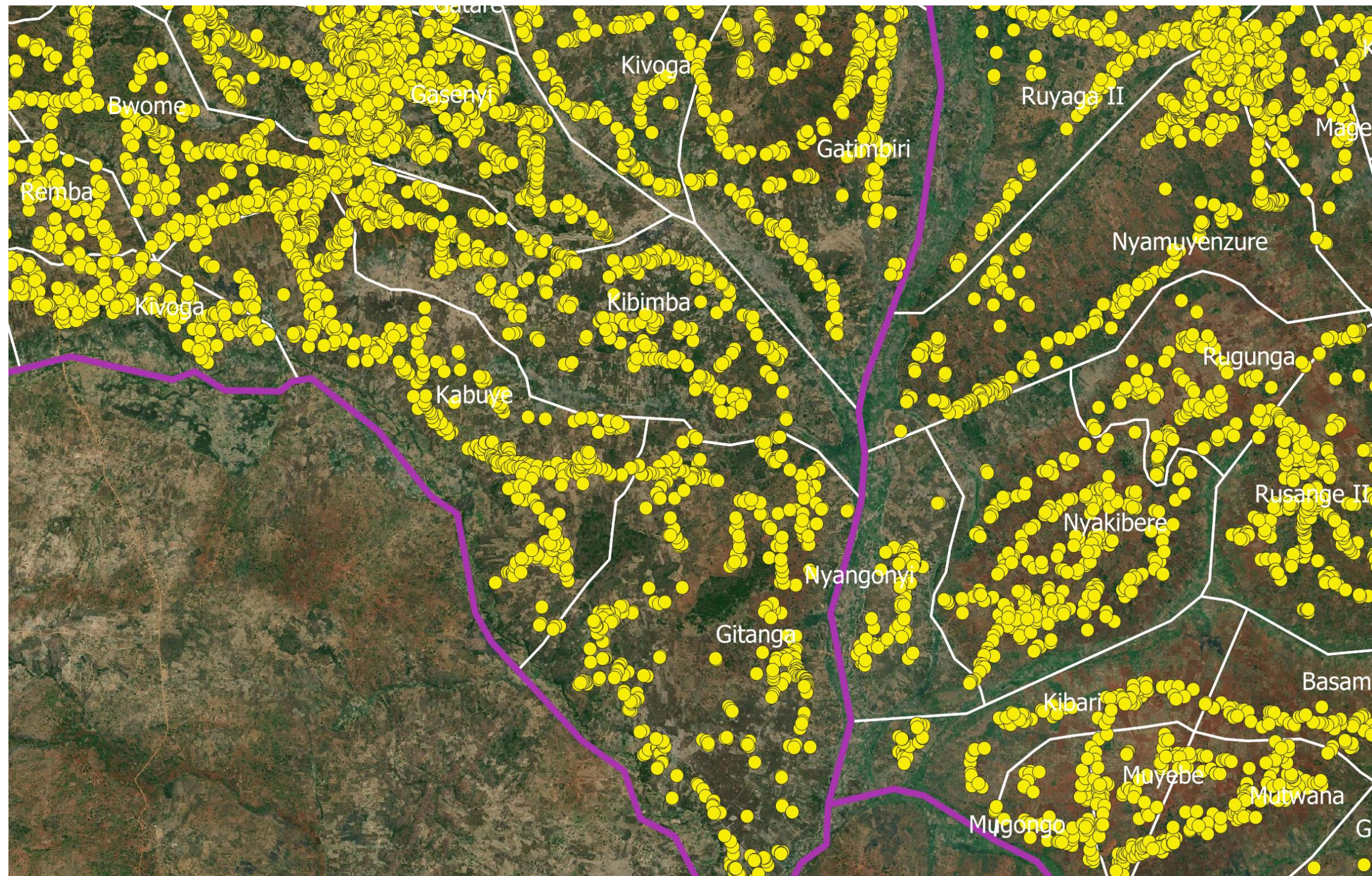➢ **Population estimation:** 300,000 persons over 1,000 km2

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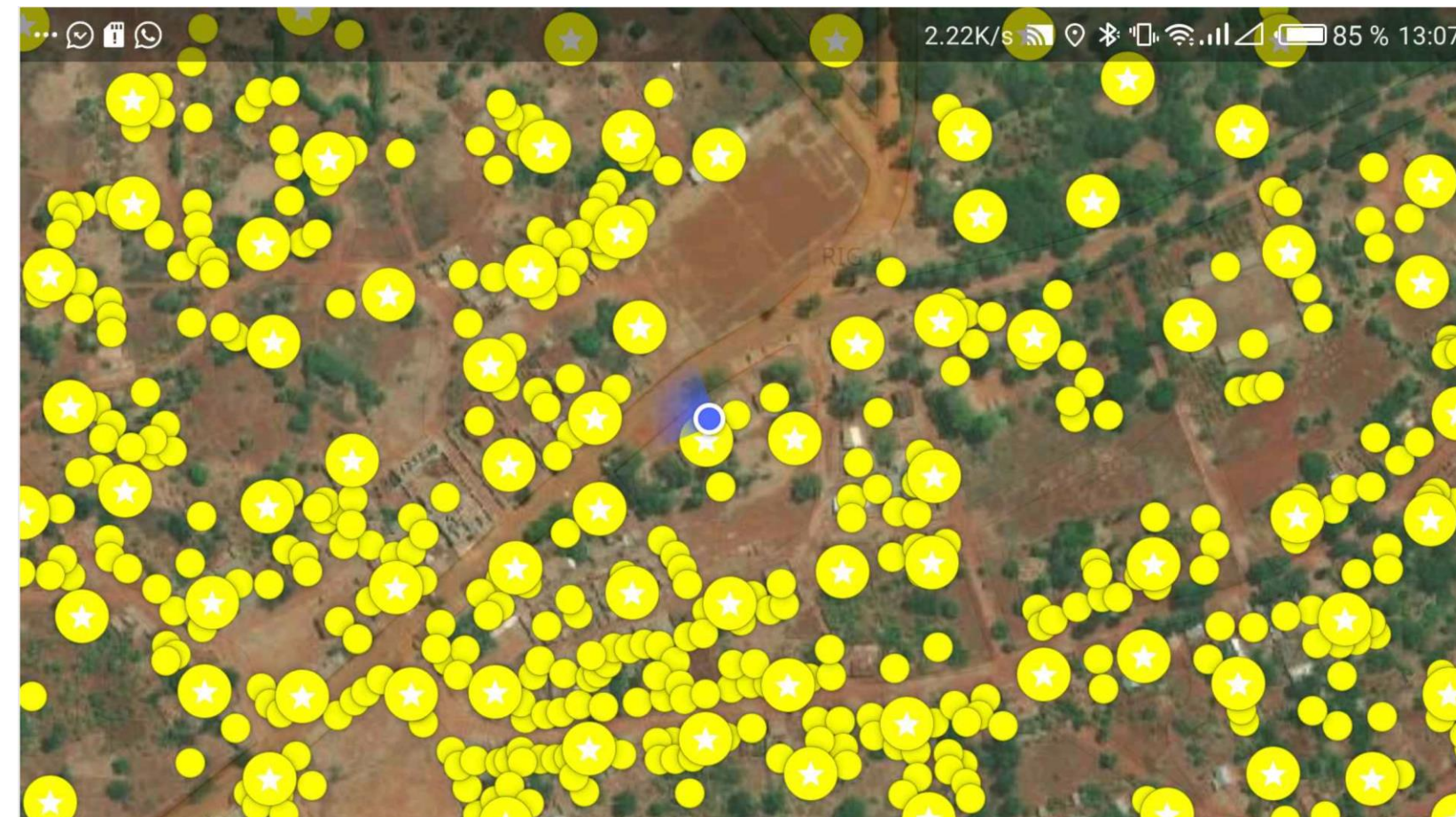➢ **Population estimation:** 300,000 persons over 1,000 km2

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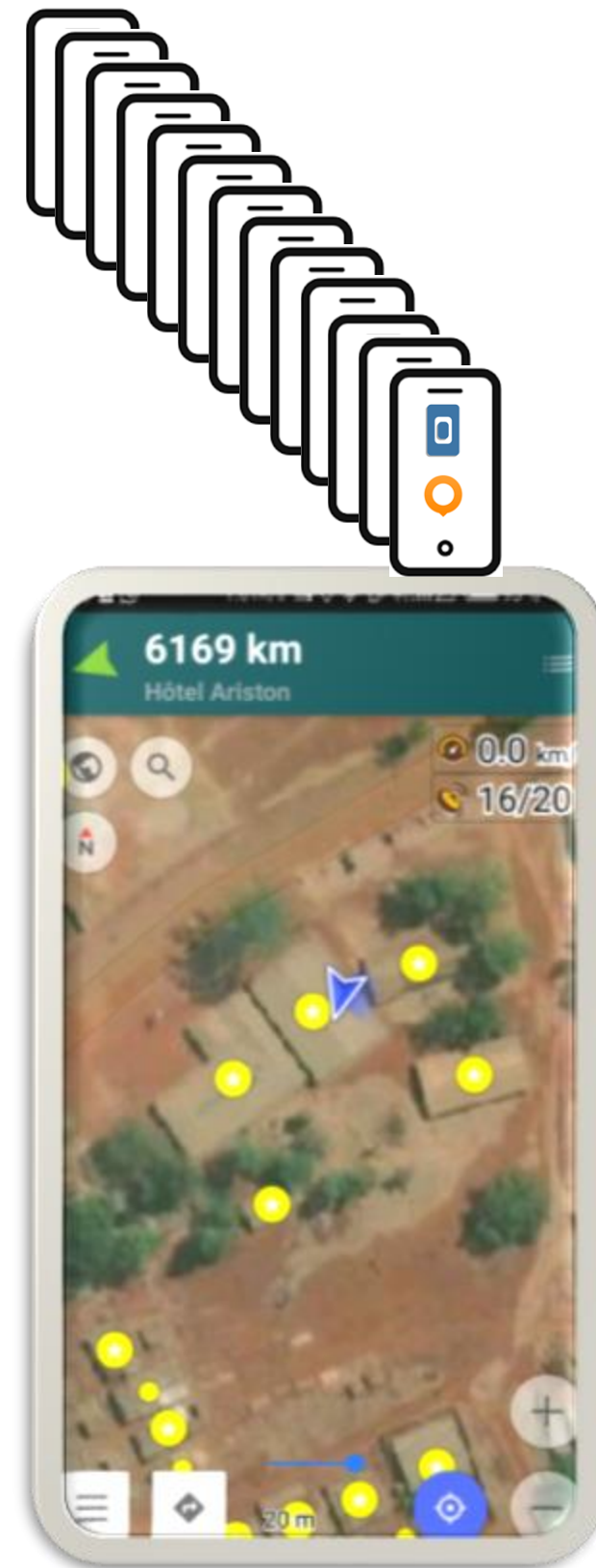

Mobile Data Collection System

Use of two interlinked mobile applications - Kobo Collect and OsmAnd for offline data collection and daily analysis of activities

➢ **OSMand:** for the navigation and daily follow-up of field teams
➢ **Kobo Collect:** for offline darta collection and daily analysis of activities

Use of ICT technologies for improved connectivity

➢ **NUC server:** to provide secure and stable IT solution for centralizing data
➢ **2 mobile aggregation kits:** to provide independent, resilient connectivity to the server and smartphones for data synchronization
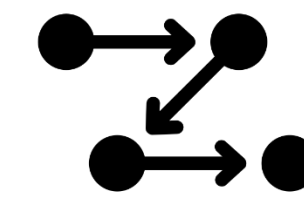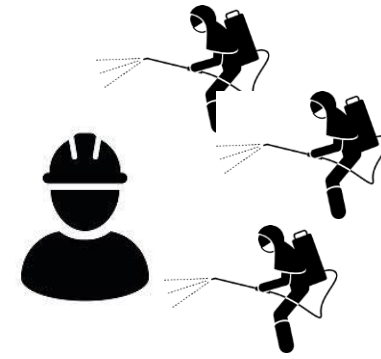
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SCIENTIFIC DAYS

Server   **Supervisor**   **Team leader**

Daily workflow

Daily workflow of activities

- ➢ Briefing - preparing the daily work
- ➢ Team leaders & workers in the field
- ➢ Data synchronization & analysis
- ➢ Debriefing with the team

**GIS &
Watsan**   **Debriefing**

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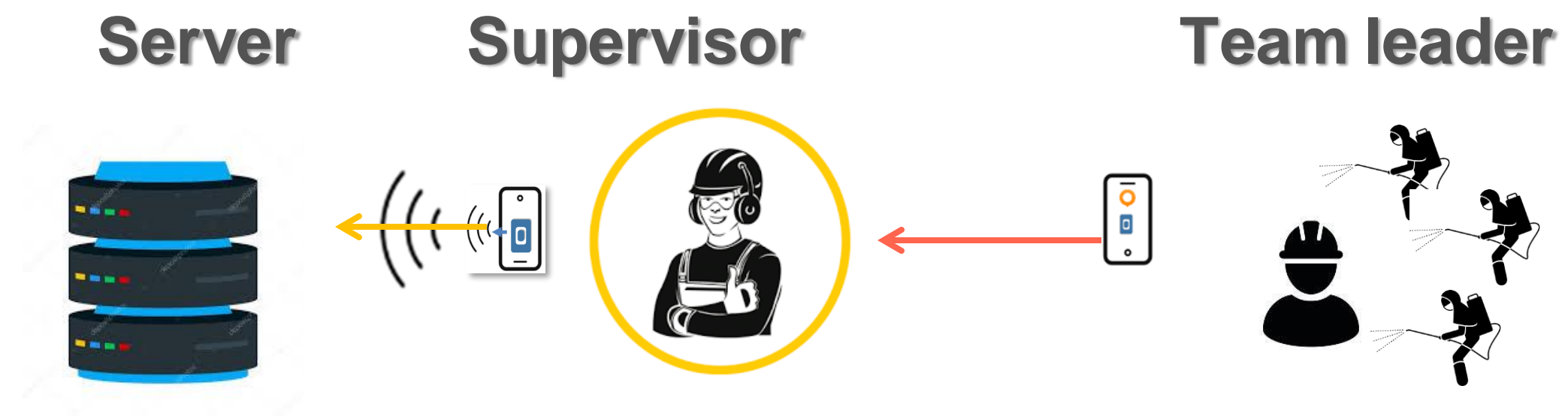
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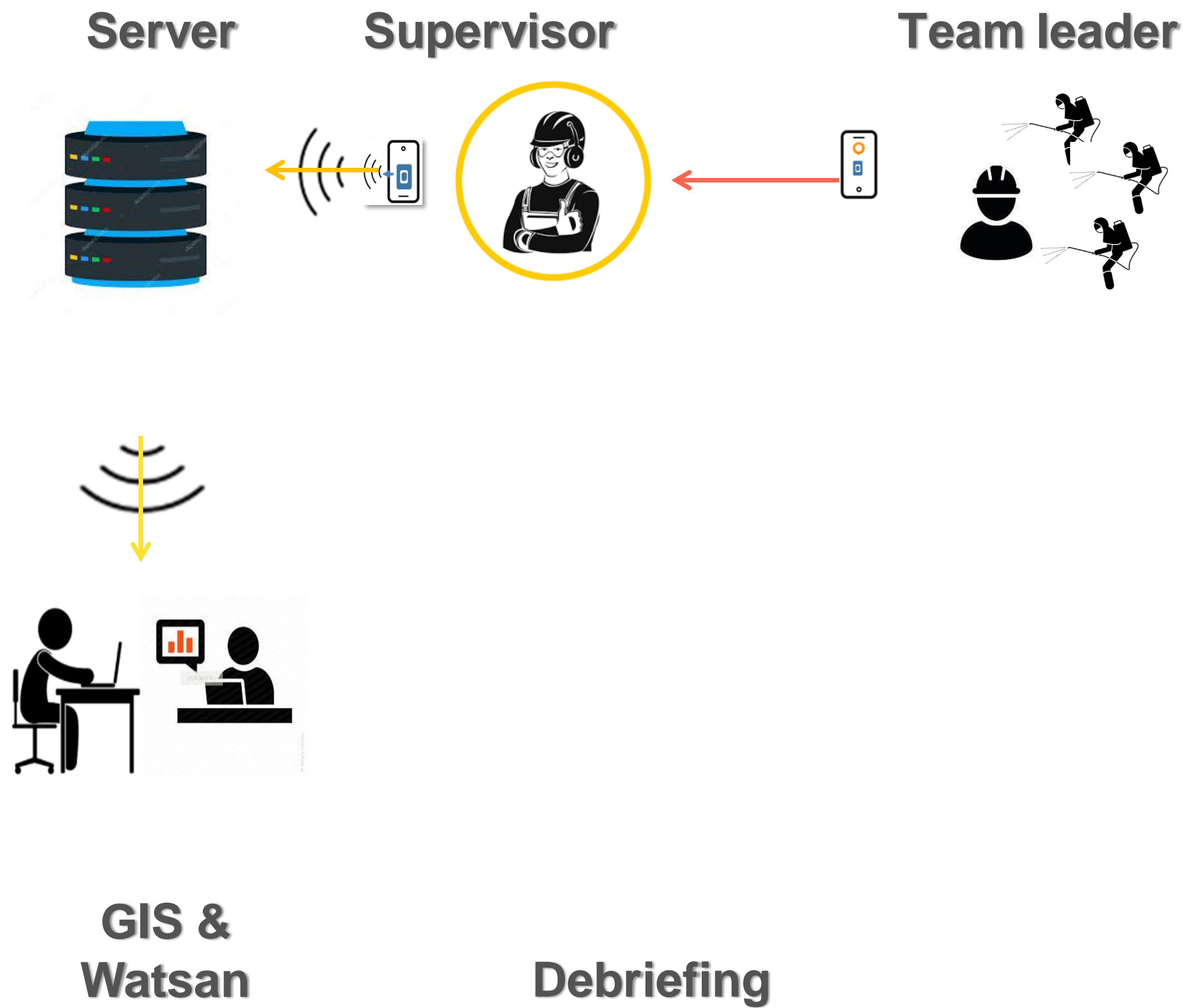
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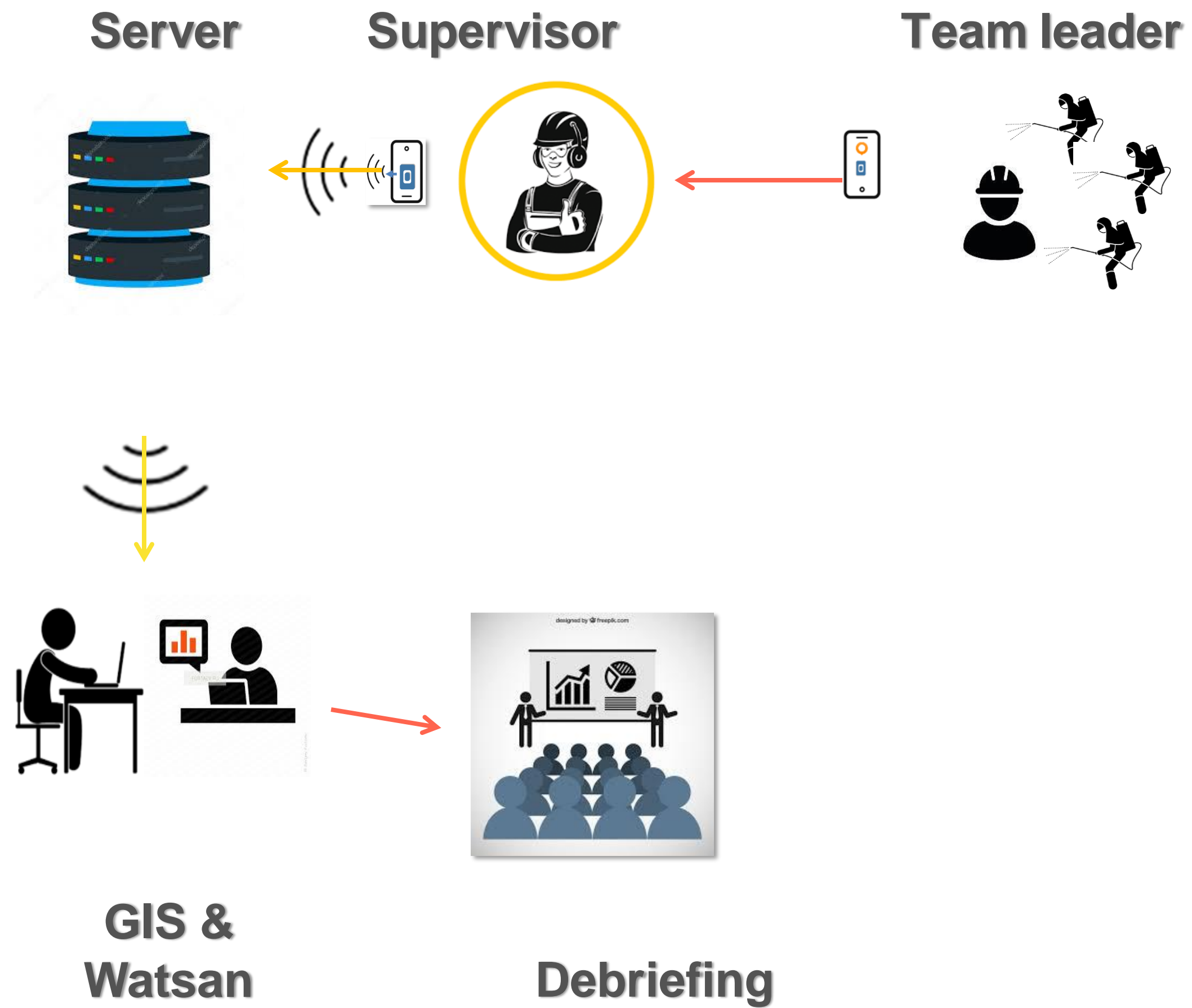
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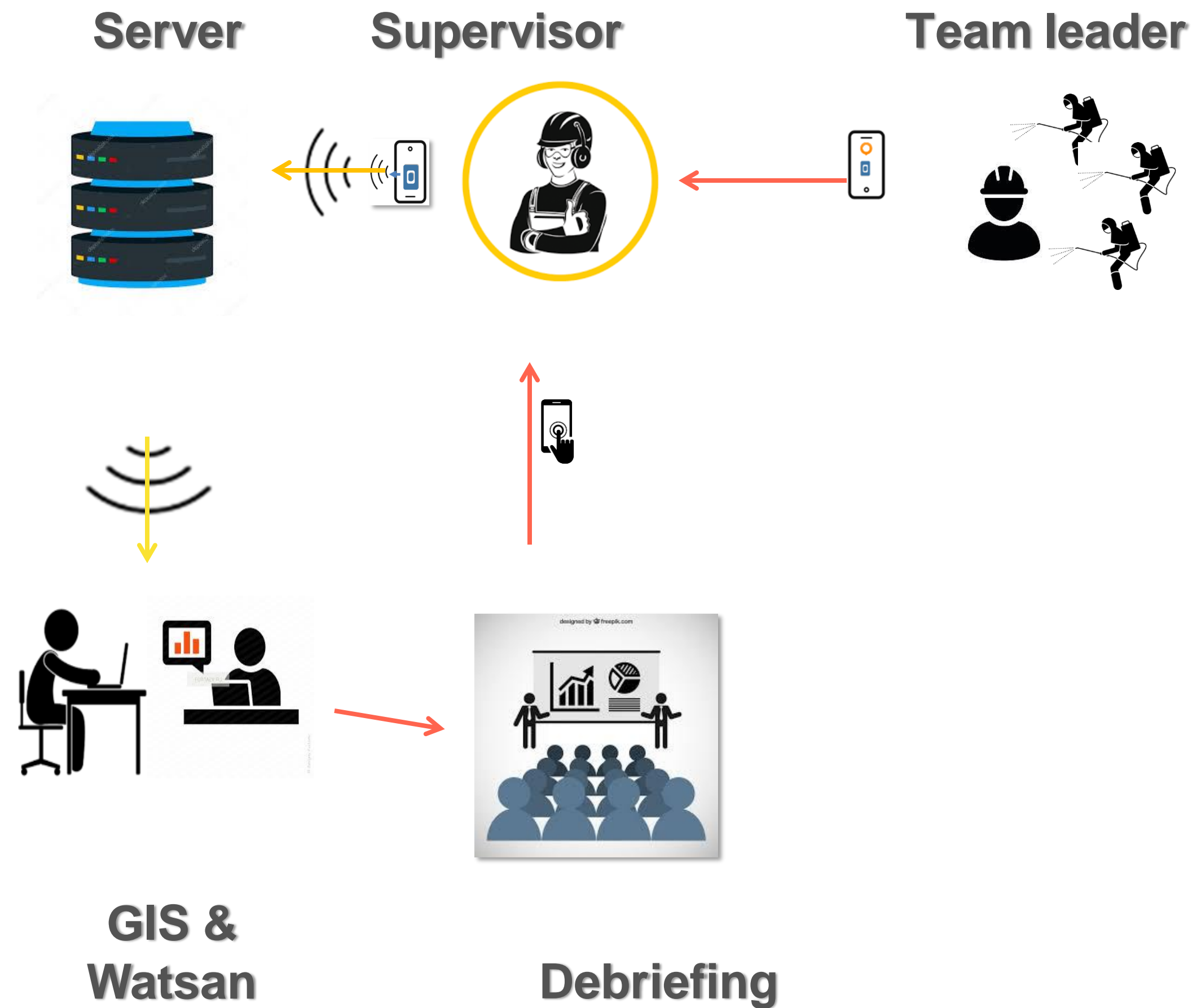
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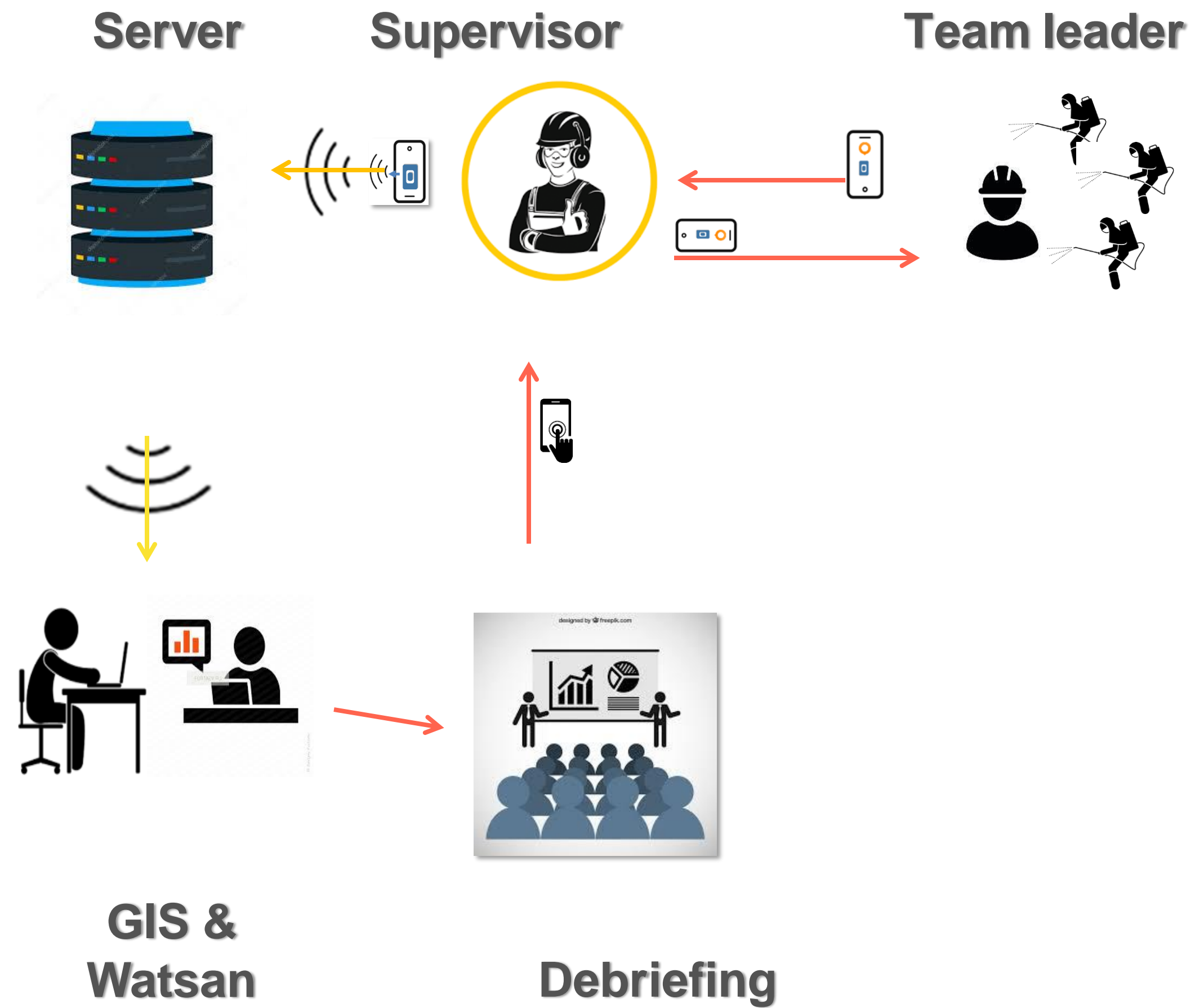- ➤ Data synchronization & analysis
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Real time monitoring of field team progress

Daily debriefing: close follow-up of spray coverage looking at:

➢ Number of sprayed houses

➢ Number of refusal cases

➢ Number of closed houses

➢ Number of uninhabited houses

➢ Quantity of insecticide used

➢ Cumulative percentage of coverage

➢ Problems identification

➢ Suggested solutions
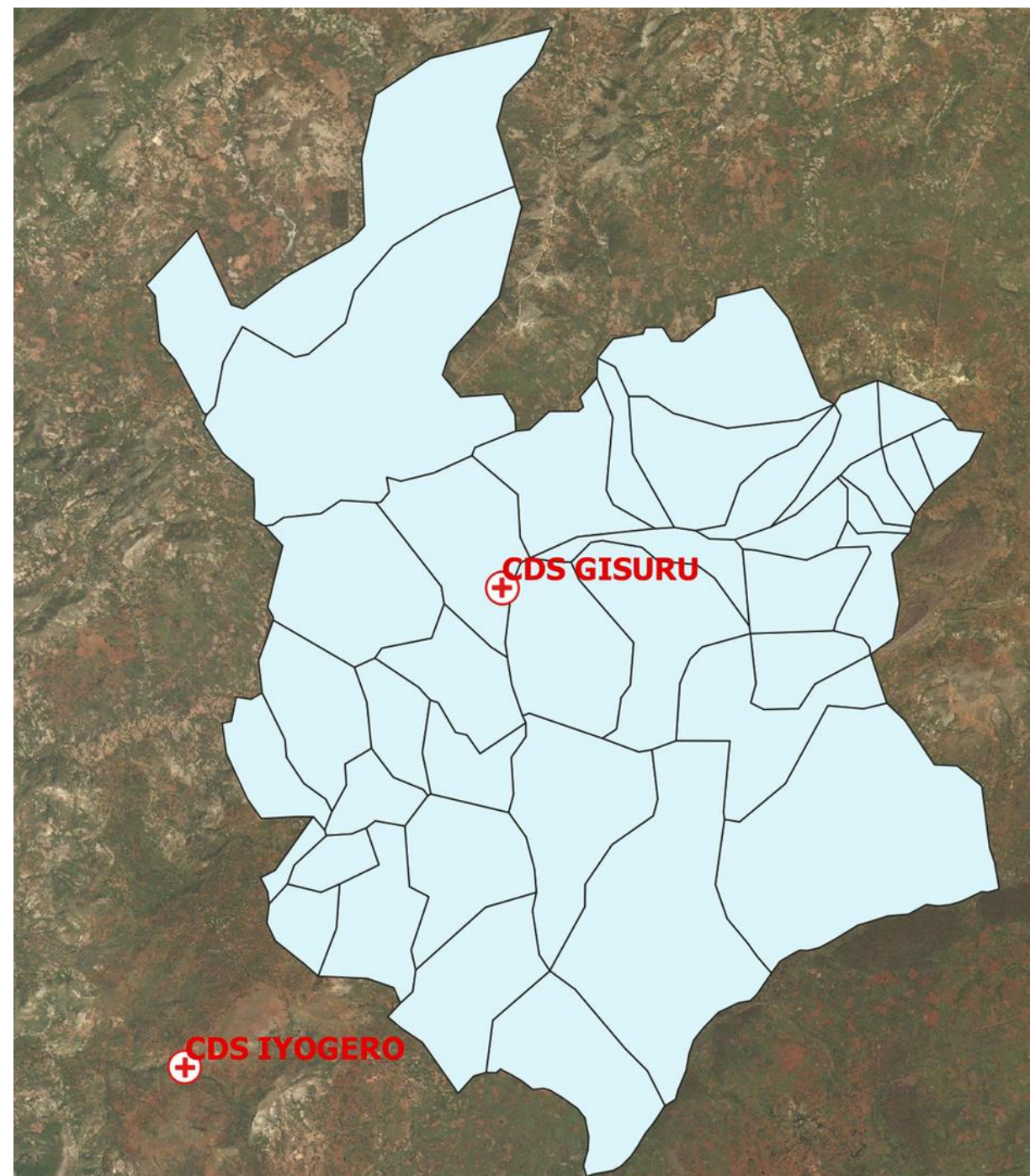
RESULTS

97%
HABITATIONS
60,530 sprayed/
62,370 identified

94%
TOILETS
51,522 sprayed/
54,885 identified

87%
ANIMAL SHELTERS
28,874 sprayed/
33,248 identified

91%
PROTECTED PEOPLE
286,938 protected people/
315,465 total

➢ A spray coverage of **97%** (12% above WHO recommendations) was achieved

➢ The workflow provided fast, stable connectivity for data transfer, enabling **enumeration and real-time monitoring**

➢ **Daily access** to accurate, real-time data facilitated informed decision-making and effective adaptation of spraying activities

➢ **Collaboration with GIS / ICT** specialists allowed the implementation team to focus on quality supervision and improving coverage equity

Result overview:

➢ Number of partially sprayed homes: 799 → 1.3%

➢ Number of non-pulverized dwellings for "refusal": 727 → 1.2%

➢ Number of homes not sprayed because "closed": 1113 → 1.8%

➢ Number of bottles of "Actellic 300cs" used : 31272

➢ Average number of homes sprayed per bottle: 1.9

CONCLUSION

GIS support provided highly operational gains:

➢ **Identification of structures**: number, localization, type, accessibility

➢ Get the **real numbers** (counted on map) instead of estimated numbers

➢ **Macro-planning**: amount of insecticides, number of teams & days of work

➢ **Micro-planning**: spraying activity management (per day, per team,..)

➢ Implementation: **visualization of progress** of spraying and coverage

➢ **Real time monitoring** of sprayed house, identification of unsprayed houses

➢ Team performance, accessibility: **quick adaptation possible**

➢ Field adapted offline data collection

➢ The new workflow **enabled high quality IRS implementation** at the necessary scale and within the given timeframe

➢ This workflow has **potential for replication** in other settings if the required ICT / GIS skills are available.

➢ It is acknowledged that integrating GIS-supported micro-planning for smaller scale IRS campaigns might not be necessary, but where this threshold is remains to be seen
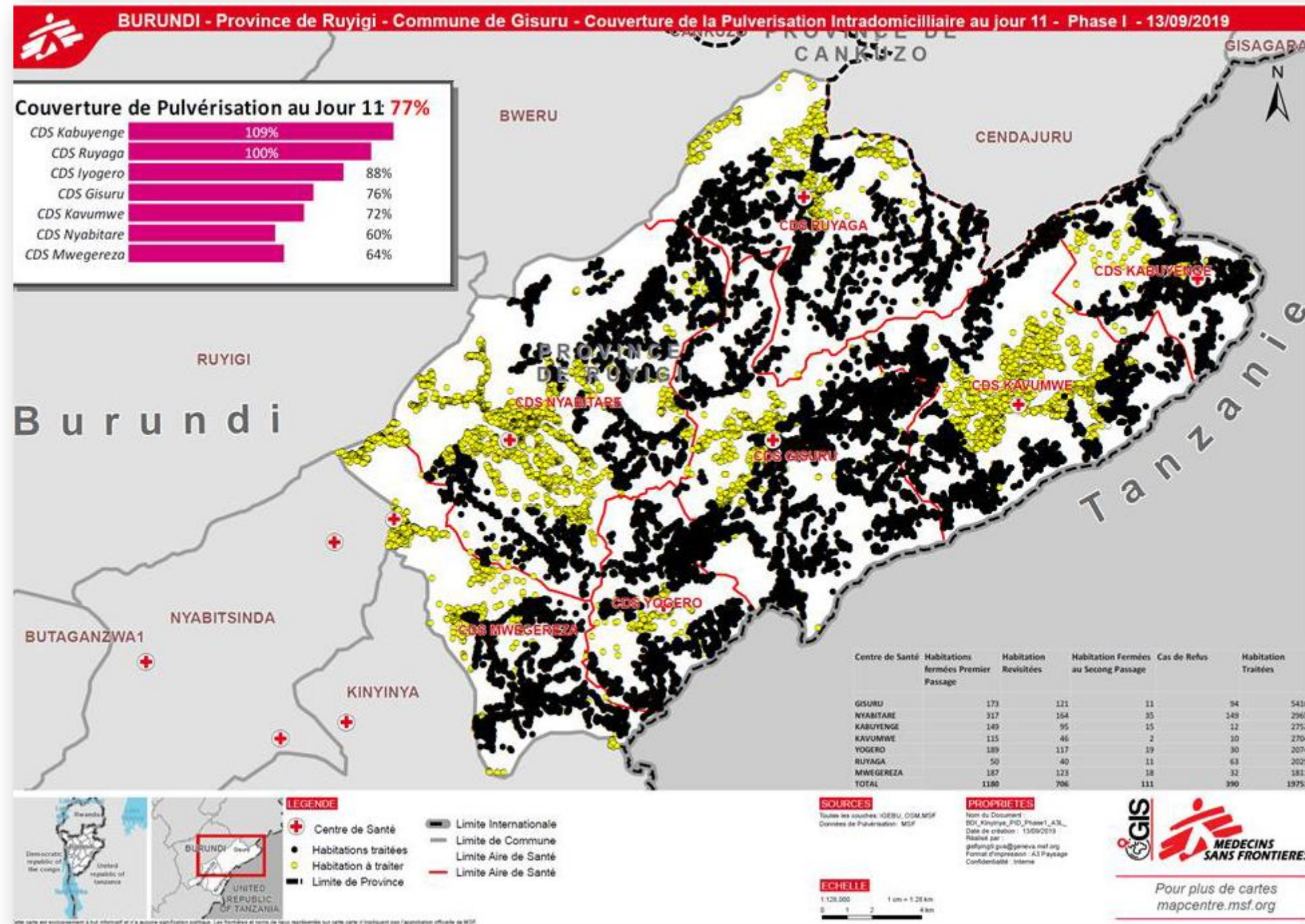
Acknowledgement

This project was implemented with the extensive collaboration of many people:

- **Environmental Health Specialists:**
  Coordinating the IRS campaign with the GIS specialist

- **OCB ICT department:**
  Setting-up of the NUC server and Mobile Aggregation Kits

- **Burundi Coordination & Kininya project Coordination:**
  Taking care of the Logistical support of the campaign (Admin, Budget & Logistics constraints, HR, Supply, Collaboration with MOH, …)

- **GIS Unit & OCB-HQ:**
  Setting-up the Missing Maps activation

- **12 supervisors & 64 team leaders & 432 sprayers:**
  In charge of the implementation of the IRS campaign

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SCIENTIFIC DAYS

THANK YOU VERY MUCH

Jean-Pierre Weza – GIS flying
Aude Matthey-Doret – GIS specialist

Médecins Sans Frontières (MSF), Geneva, Switzerland