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IE 482 – HUMANITARIAN LOGISTICS
BROCCOLI CASE STUDY

Persistent Access to Food Security Through the Use
of Biometrics, Low-Cost Computing and Logistics

DEADLINE: April 2nd, 2024

THE BROCCOLI PROJECT

- The Broccoli Project [<https://broccoliproject.co.za>] is “a rewards program for the poor” that provides rewards in the form of vouchers to its participants.
- It is often because basic needs are not met such as food, shelter and clothing that the poor might resort to petty crime – this can lead to a reinforcement of such behavior which results in a life of crime, poverty that perpetuates the poverty cycle.
- The Broccoli Project aims to break this cycle by providing a framework that provides an alternative to crime giving in effect a safety net that will provide essentials, such as food, shelter and clothing.

- The participants will receive vouchers that can be exchanged for food, clothing and other basic needs, in return of socially beneficial actions:
 - taking an HIV/AIDS test,
 - cleaning up communities,
 - collecting certain types of plastics
 - attending skills development programs,
 - keeping children in school,
 - attending preventative healthcare workshops
 - ...



Vouchers

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Vouchers

CONDITIONAL AID

*condition

**aid

Attend a week
of school



\$8 per child in food /
grocery voucher.

Go for regular
Health checks

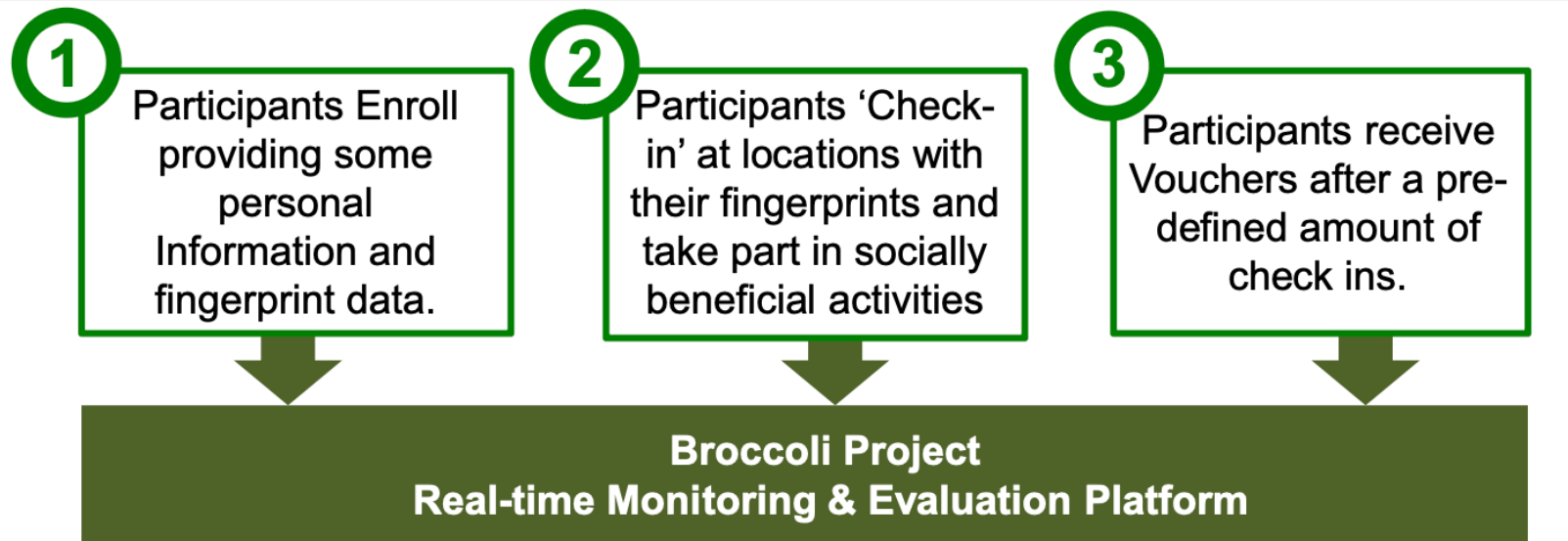


\$15 in food /
grocery voucher

Grow a sustainable
food patch.

\$15 in food /
grocery voucher

CONDITIONAL AID



WHY VOUCHERS?

- Multiple parties can co-sponsor & leverage the value
- Can limit usage to product groups (Food & Groceries)
- Vouchers can be traced and tracked
- Deferred / externalized logistics

Sources of Income

Donor /
Grant
Funding
(Trust)

| | |
|-------------------------|---|
| Web Fundraising | ■ |
| Traditional Fundraising | ■ |
| Project Sponsors | ■ |

+

Revenue
Generating
Activities
(BPT)

| | |
|---------------------------------------|---|
| On Voucher Advertising / Co-Branding | ■ |
| Per Record Billing (SaaS model) | ■ |
| Maintenance Contracts | ■ |
| Hardware Sales | ■ |
| Interest on Breakage & Capital Amount | ■ |
| Device Licensing Fees | |

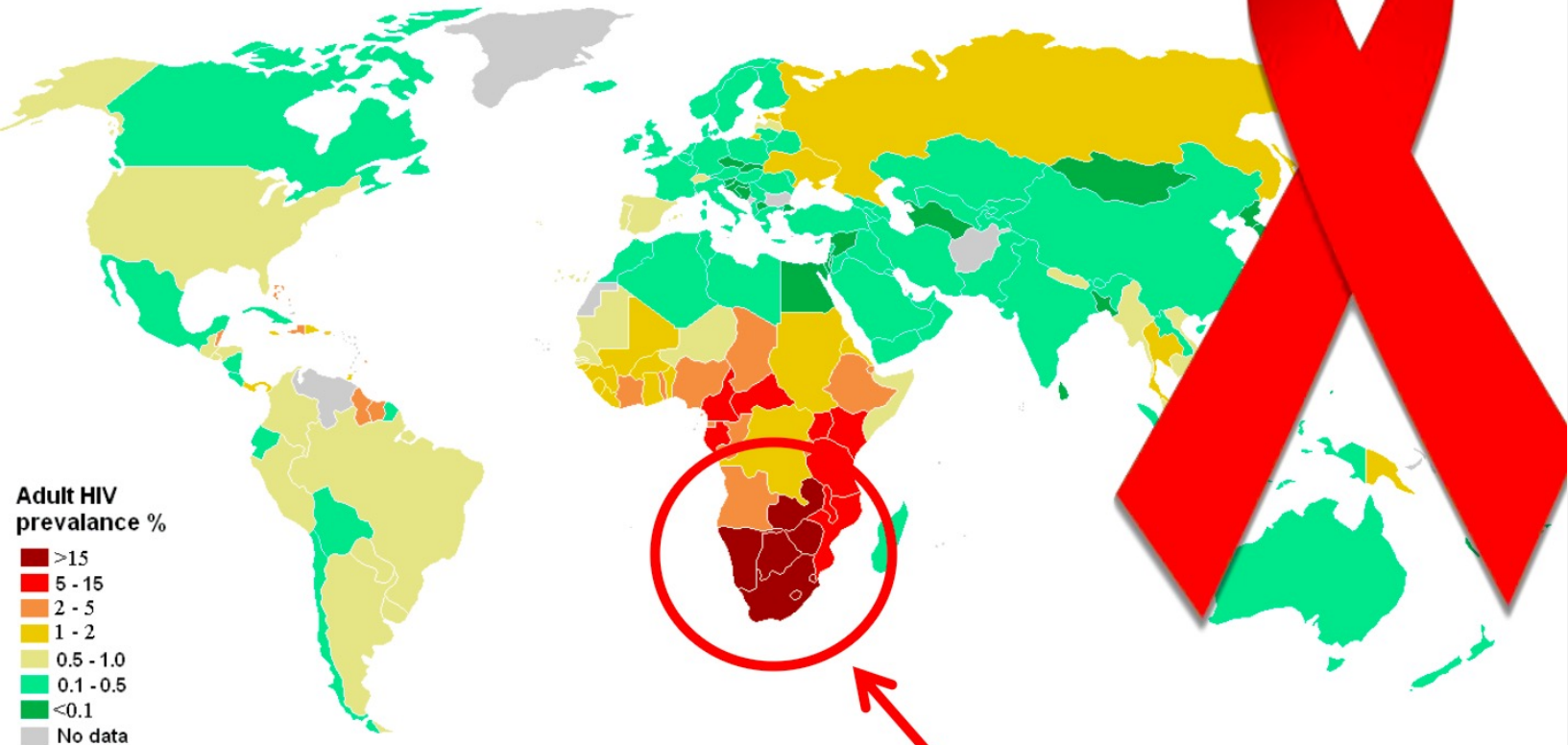
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Vouchers

HIV IN SOUTH AFRICA

34 million cases



22 million here!!



HIV IN SOUTH AFRICA



THE BROCCOLI PROJECT

- We will create a system ensure accessibility of HIV testing facilities and voucher facilities for South African people



Broccoli Project



Broccoli Points



South African People

BROCCOLI POINTS

- To gain traction in rural areas, we will require the development of an outdoor, rugged system (called a Broccoli Point)
- address the maximum amount of people for the lowest number of devices deployed.

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A Broccoli Point

BROCCOLI POINTS

- Can be activated by biometric sign-in (fingerprint scan)
- Available 7/24
- The underlying technology is expensive. Cannot be installed every district.
- They need to be “close” to districts since public transportation is not widely-used and people cannot afford it.

THE BROCCOLI PROJECT

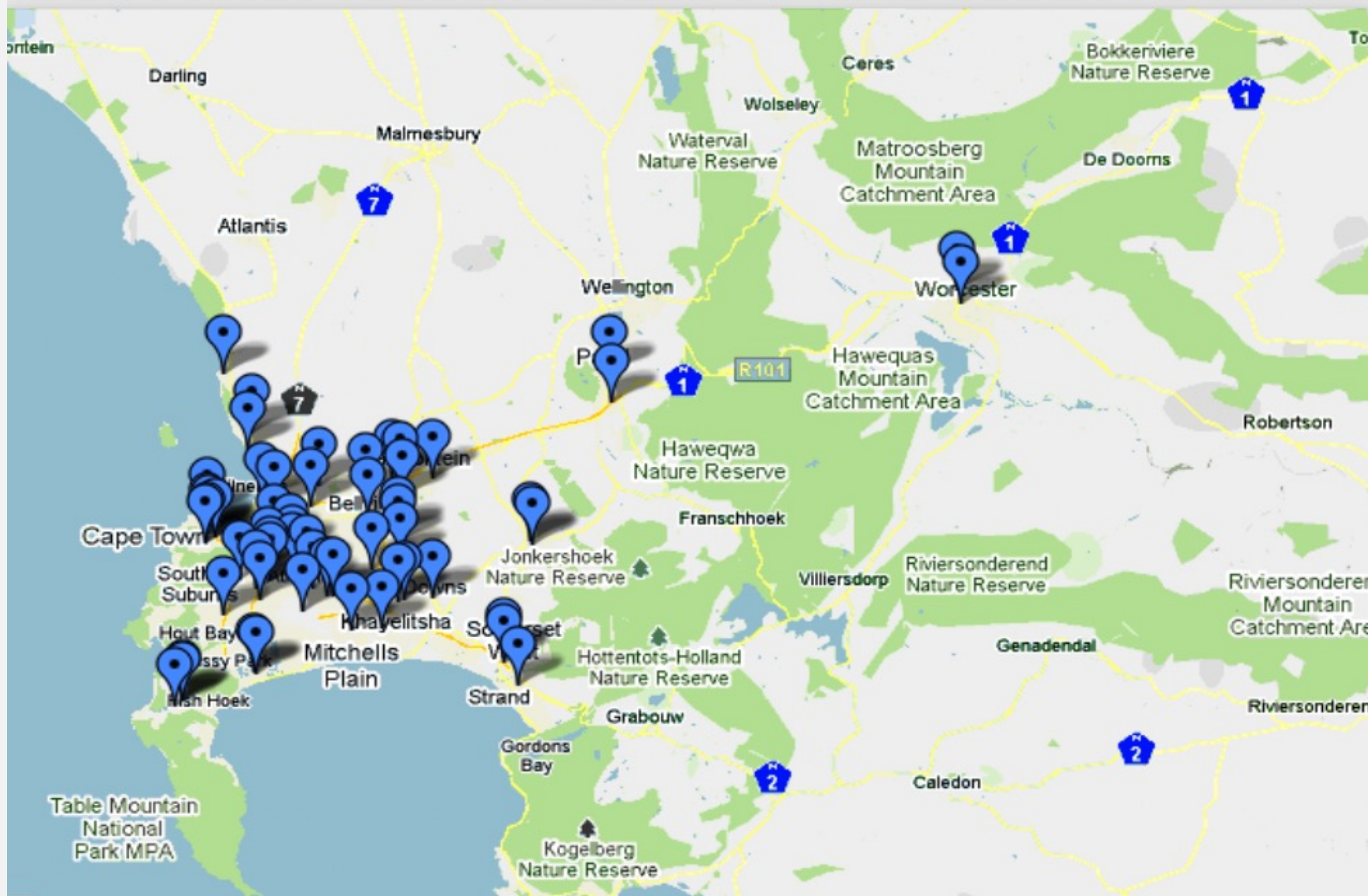
- Your Objective;



Optimum Placement
of
Broccoli Points

THE BROCCOLI PROJECT

- Broccoli Points should be;
 - **“near” to peoples houses**, so that people can reach those points,
 - **“near” to clinics** so that people can go and take a test in case they do not have any points gathered when they need a food voucher,
 - **“near” to redemption points** so that people can go and redeem the printed food vouchers.



Points under consideration

THE BROCCOLI PROJECT

- There are
 - 15 districts
 - 12 clinics
 - 33 redemption points

THE BROCCOLI PROJECT

You will be given:

- # of people living in each district
- distance matrices

Criteria (will be considered for all parts):

- 1) You don't want people to walk too much.
- 2) You don't want to install too many Broccoli Points

THE BROCCOLI PROJECT

- **A)** Try to cover all districts while minimizing the number of broccoli points required to do so.

THE BROCCOLI PROJECT

- **A)** Try to cover all districts while minimizing the number of broccoli points required to do so.
- **B)** The decision-makers want to see how coverage changes based on the number of installed Broccoli points. Make a systematic sensitivity analysis to demonstrate how many people can be covered with fewer Broccoli points than the number you found in part A.

THE BROCCOLI PROJECT

- **C)** Try to minimize the maximum distance between the districts & the Broccoli points while covering all districts.