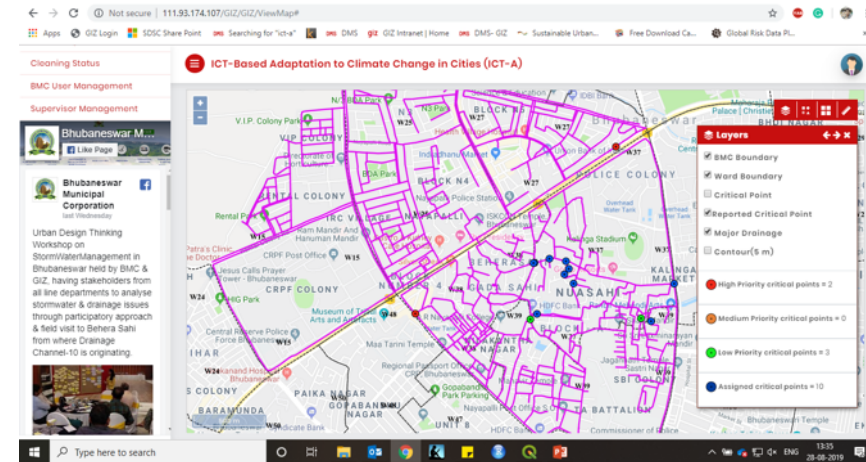
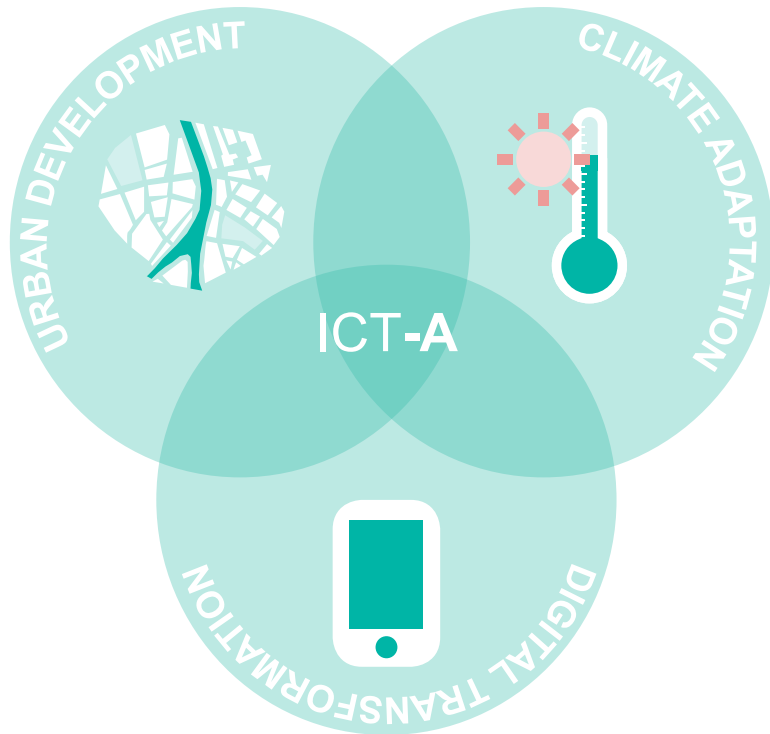


ICT-based Adaptation to Climate Change in Cities

06 April 2020, 9:30 – 10:30 CEST



Transformation - Urban Opportunities - Climate Change (TUrbOCliC)

Cross-sectoral group of the TUEWAS and SNGA network of GIZ

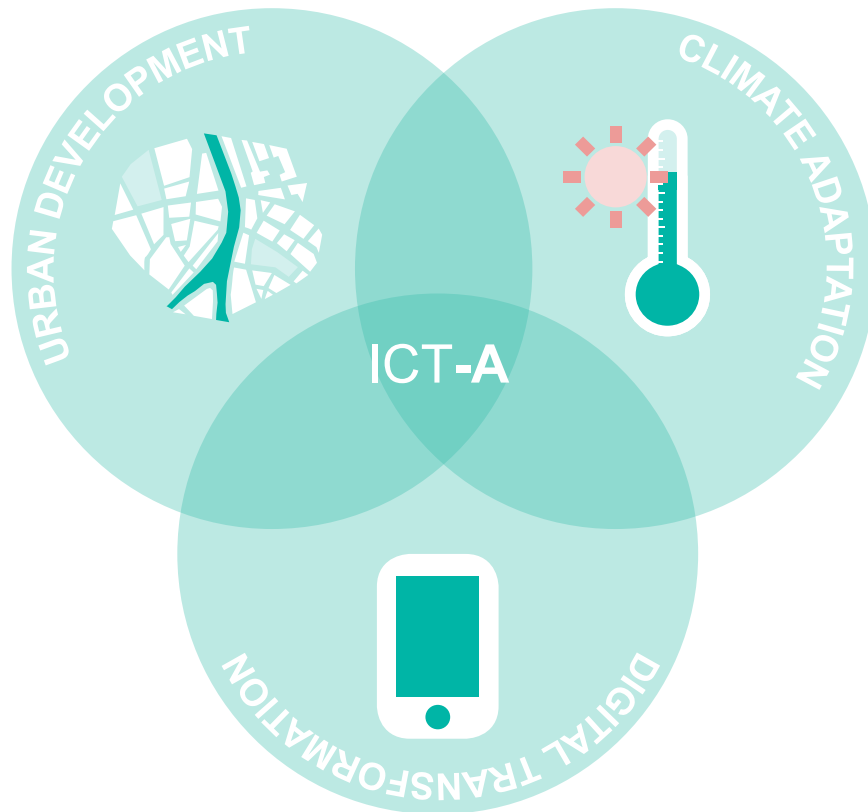
Programme

- **Welcome and Moderation:** Ms. Vaishali Nandan - Project Head CSC & ICT-A (India) and Joint Speaker of TUrbOCliC
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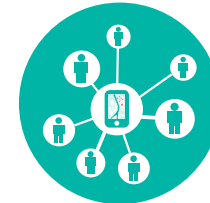
Global Programme: ICT-based Adaptation to Climate Change in Cities (ICT-A)



Knowledge



Pilot Projects



International Exchange

On behalf of:



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety



In cooperation with:



Federal Ministry
of the Interior, Building
and Community

IPCC Special Report „Global Warming of 1.5°C“

Summary for Urban Policymakers

Transformational Adaptation: Deep, systemic change that requires reconfiguration of social and ecological systems



**More ambition!
Leave no one behind!**

German Advisory Council on Global Change: Our common digital future (2019)



- Without digitization, the SDGs are not achievable
- In order to put the digital transformation at the service of the transformation towards sustainability, the potential and risks of digital technologies and solutions must be understood and aligned with the SDGs worldwide

Digital done right: Principles for Digital Development

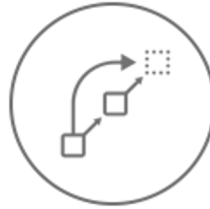


www.digitalprinciples.org

ICT-A – Strategic Principles



Foster **citizen participation** and open innovation



Plan and implement for **sustainability**



Address local **climate challenges**



Make a **responsible use of data**



Contribute to existing **urban planning** processes



Facilitate **transferability** and **scaling-up** of the digital solution and the process



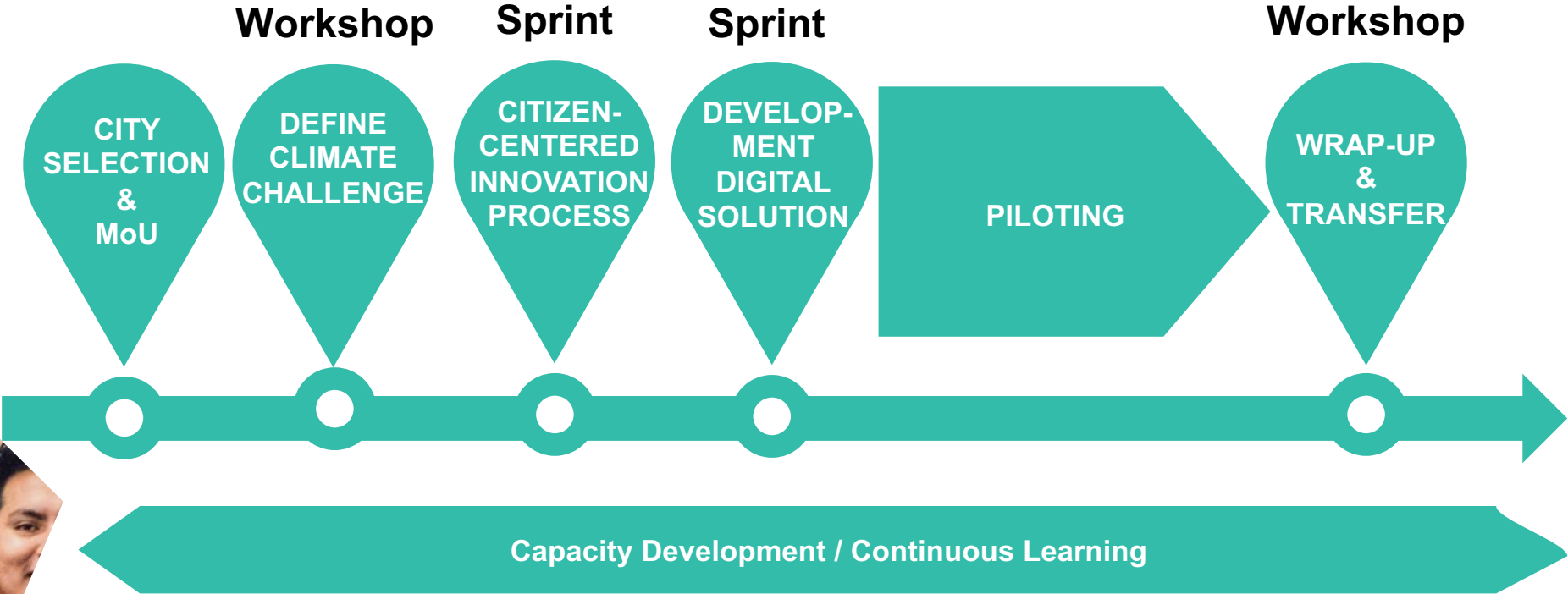
Promote local **co-creation**



Prioritize **open source**

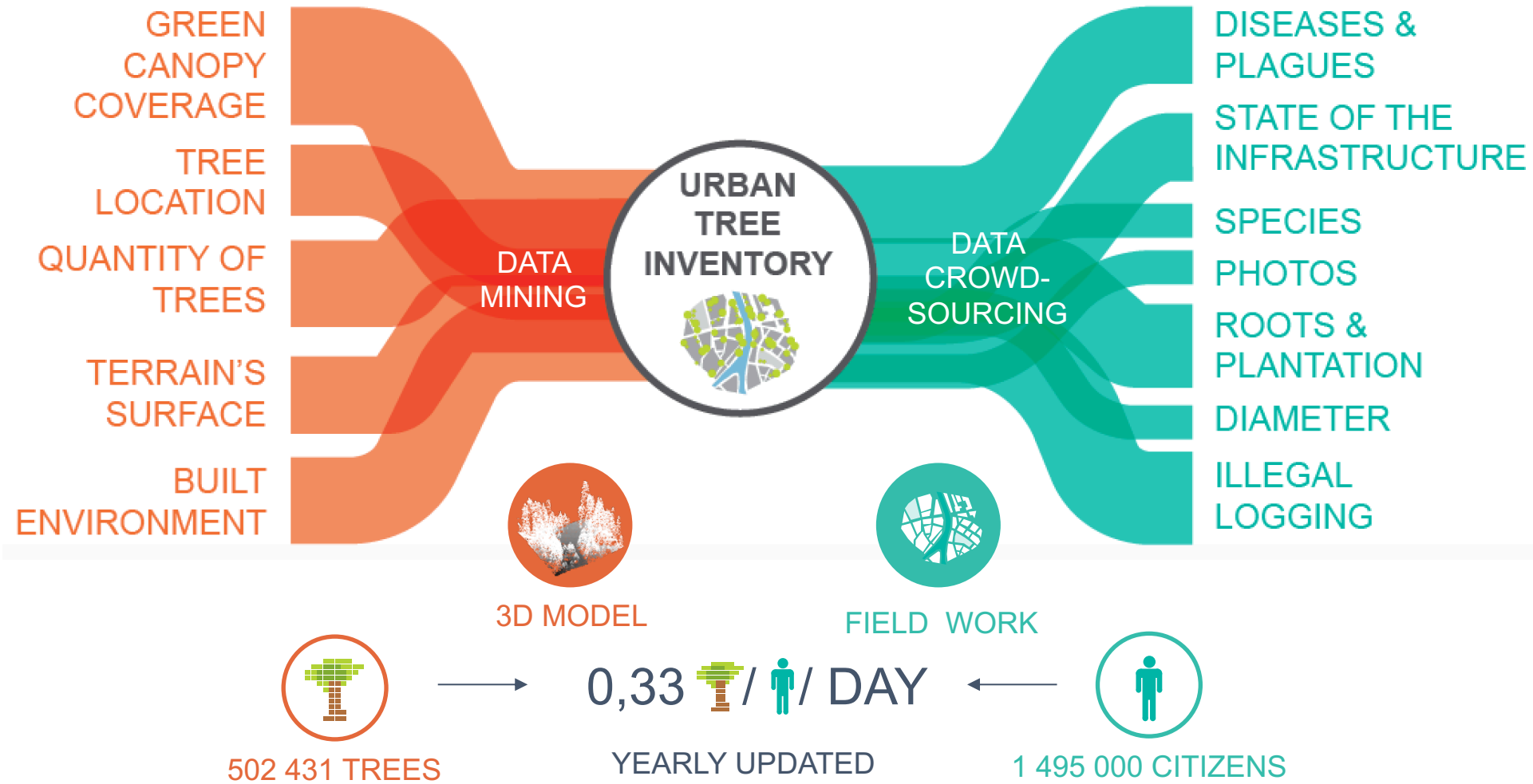


Citizen-Centered Innovation Process



Mexiko

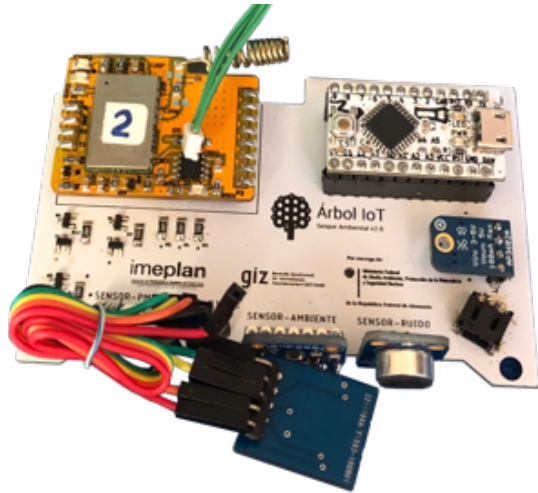
How is the problem being addressed?



Mexiko

What is the solution?

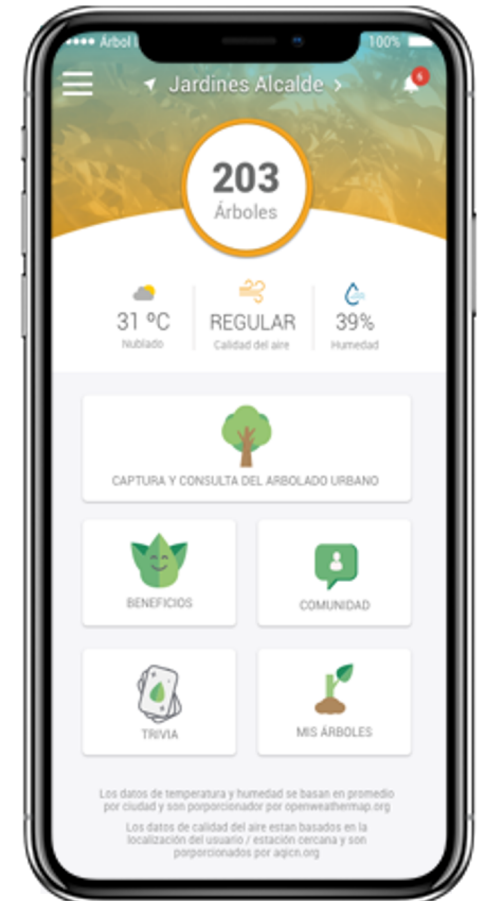
ENVIRONMENTAL SENSOR



WEB APP & BACK-END PLATFORM



MOBILE APP



Peru

How is the problem being addressed?

Before

FIELD WORK



3 MONTHS

DATA NOT RELIABLE

ALL STAFF



After

CROWDSOURCING



REAL TIME.

DATA RELIABLE.

ALL CITIZENS

CITIZEN

ENGAGEMENT FOR

TRANSFORMATIONAL

ADAPTATION TO

CLIMATE CHANGE.

Peru

What is the solution?

Digital Solution Peru: Components



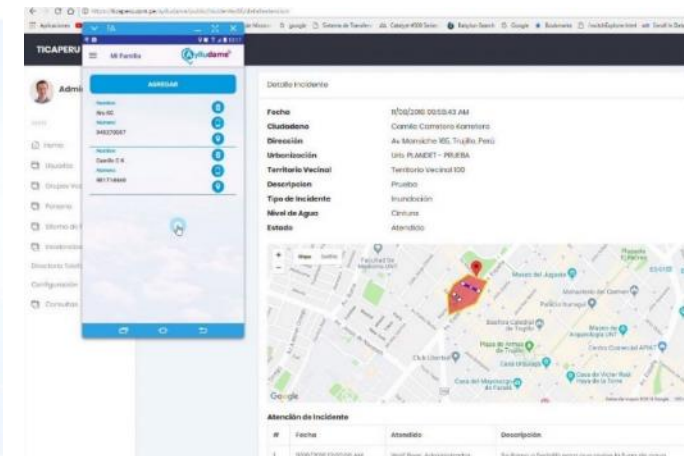
Meteorological Sensors



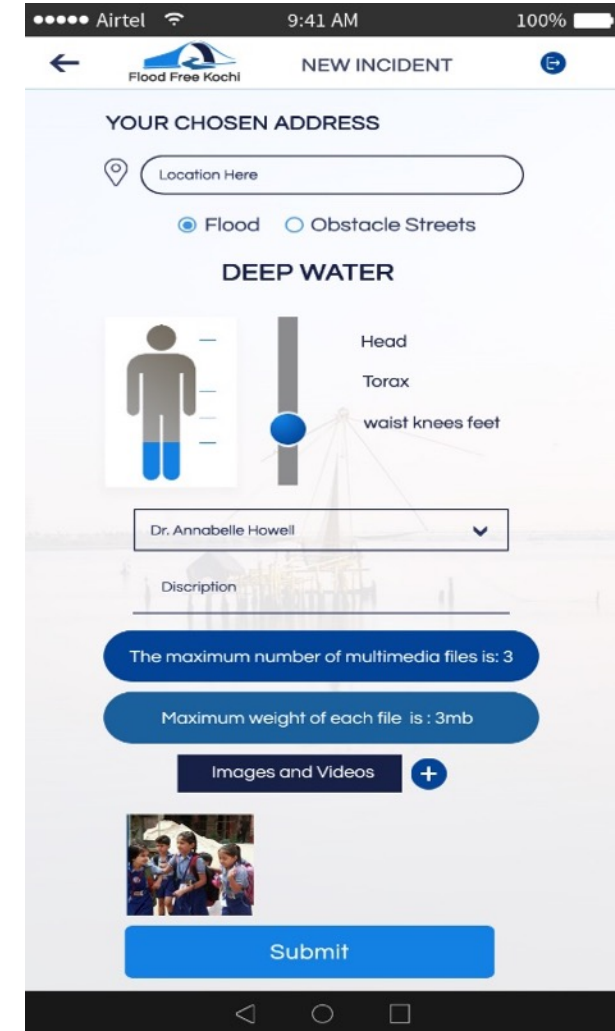
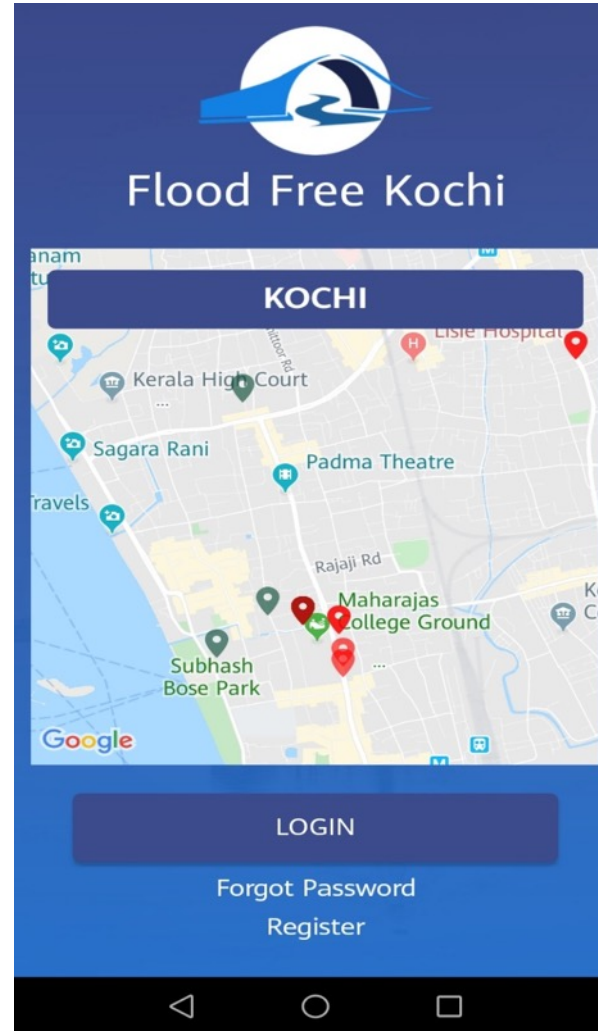
App for Android Mobile Phones



Dashboard for Municipality Officials



Peru - India International transfer



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Global Programme: ICT-based Adaptation to Climate Change in Cities

Ms. Vaishali Nandan, Teresa Kerber, Mr. Shabaz Khan | 06.04.2020





Co-created Digital solution for urban flooding – “Mu City Savior”



Bhubaneswar - What Problem are We Trying to Solve?

Hour-long heavy rain causes waterlogging in Bhubaneswar

Hemanta Pradhan | TNN | Jun 30, 2018, 22:34 IST

✉ 🖨 A- A+



BHUBANESWAR: An hour-long heavy rain caused waterlogging in different parts of the city throwing life out of gear on Saturday afternoon. National Highway 16 in front of Iskcon temple was looking like a pond due to waterlogging.

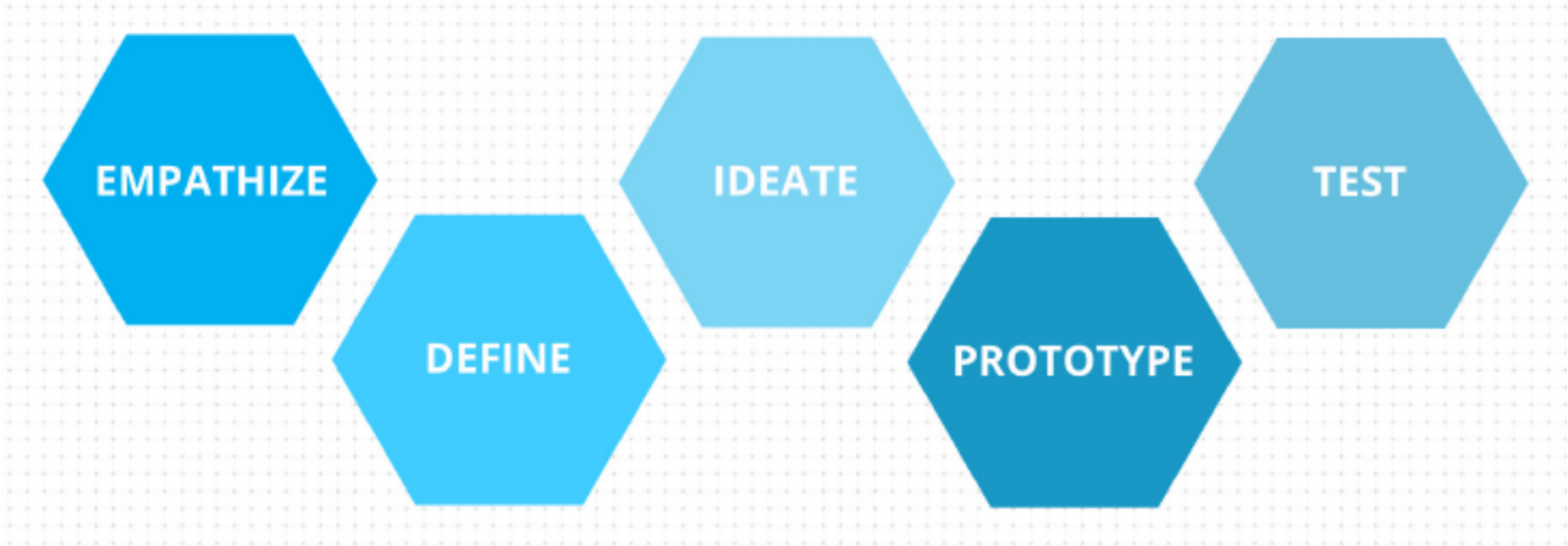
Cars and auto-rickshaws were stuck in the flood water in front

of the temple. [A car was seen](#)



Methodology

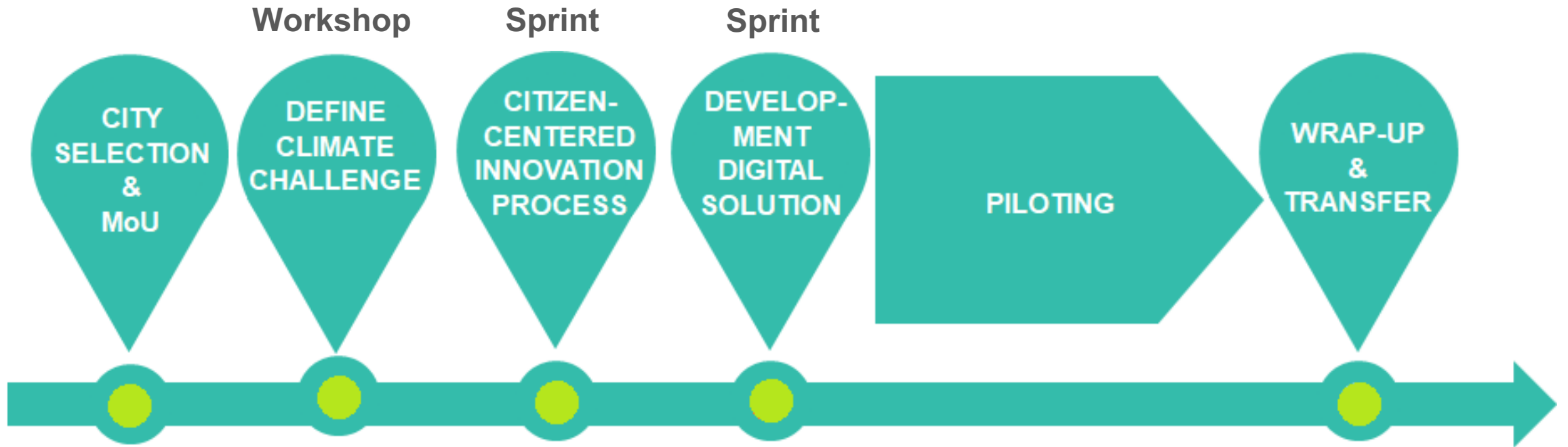
Design Thinking



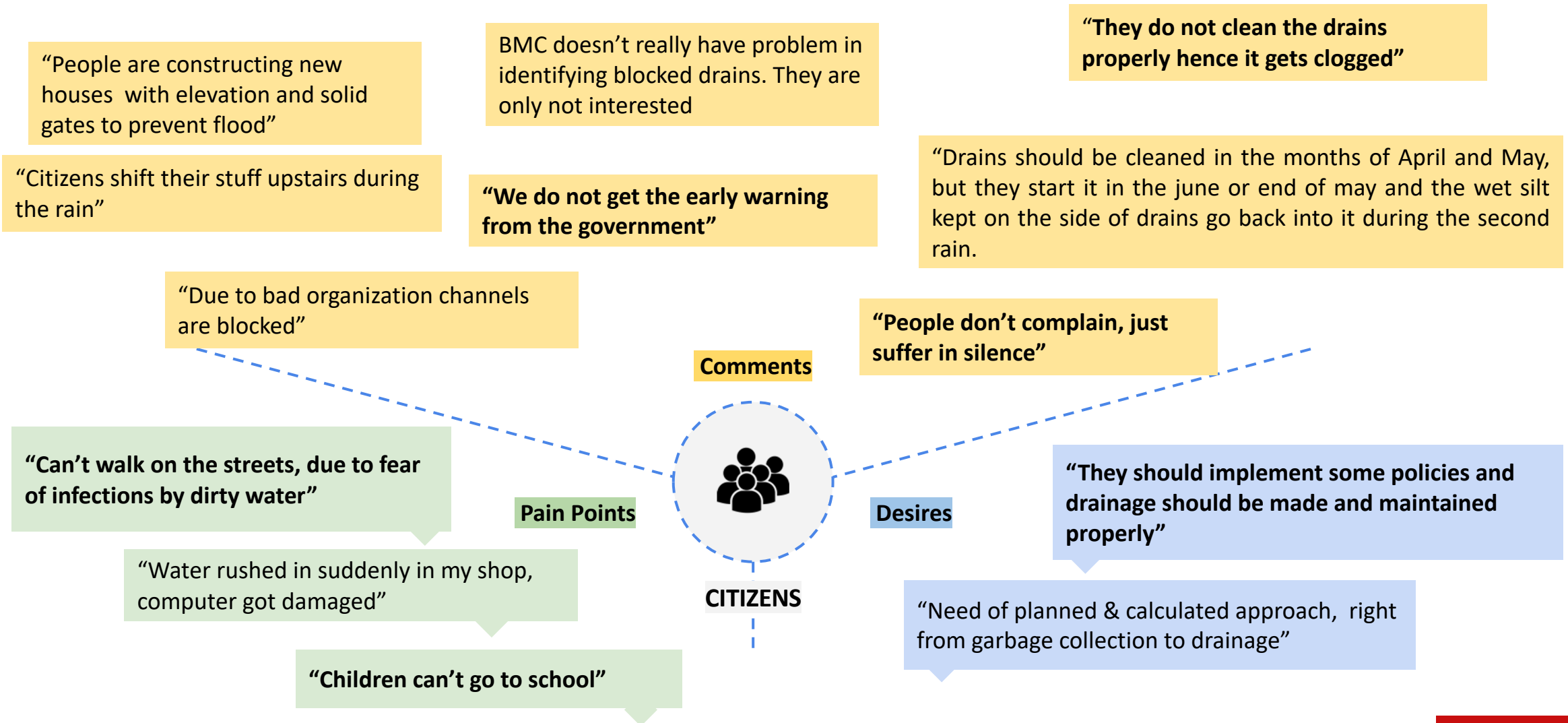
Co-Creation



Process



Empathy Research: Citizens



Empathy Research: BMC Officials

“90% flood occurs due to blockage in drains”

“Drain capacity is low as compared to the speed of development.”

“NH flyover is acting as a barrier to upstream area of IRC village”

“Have only 4 pumps, 15 rented out and other from fire department”

“Varied drain ownership, some owned by PWD some by NHAI.”

“The flooding tolerance in urban areas is defined upto 1 hour”

Comments

“Need computerized information system to get complete details about the drainage”

“National Highway (NH) flyover is acting as a barrier to upstream area of IRC village.”

Pain Points



Desires

BMC OFFICIALS

“ If we were to know where and how much a drain is blocked , we can prioritize cleaning ”

Empathy Research: Drain Cleaning Agency

“We are contracted to clean only the arterial drains and not the main 10 natural drains”

“No problem to locate and clean open drains. All culverts where entry is not possible can't be cleaned and have blockages”



Culvert runs perpendicular to the road & is not possible to clean due to absence of manholes & entry through side.

“Ramki Engineering, Jagruti Welfare organization and PMR consulting are agencies hired by BMC to clean and desilt the arterial drains. All work is manually done.”

“Need to do frequent desilting, during rain season”

“Hotel waste, construction debris, tyres etc found in drains”



Manual Drain Cleaning by removing cement slab covers on arterial drain

Comments

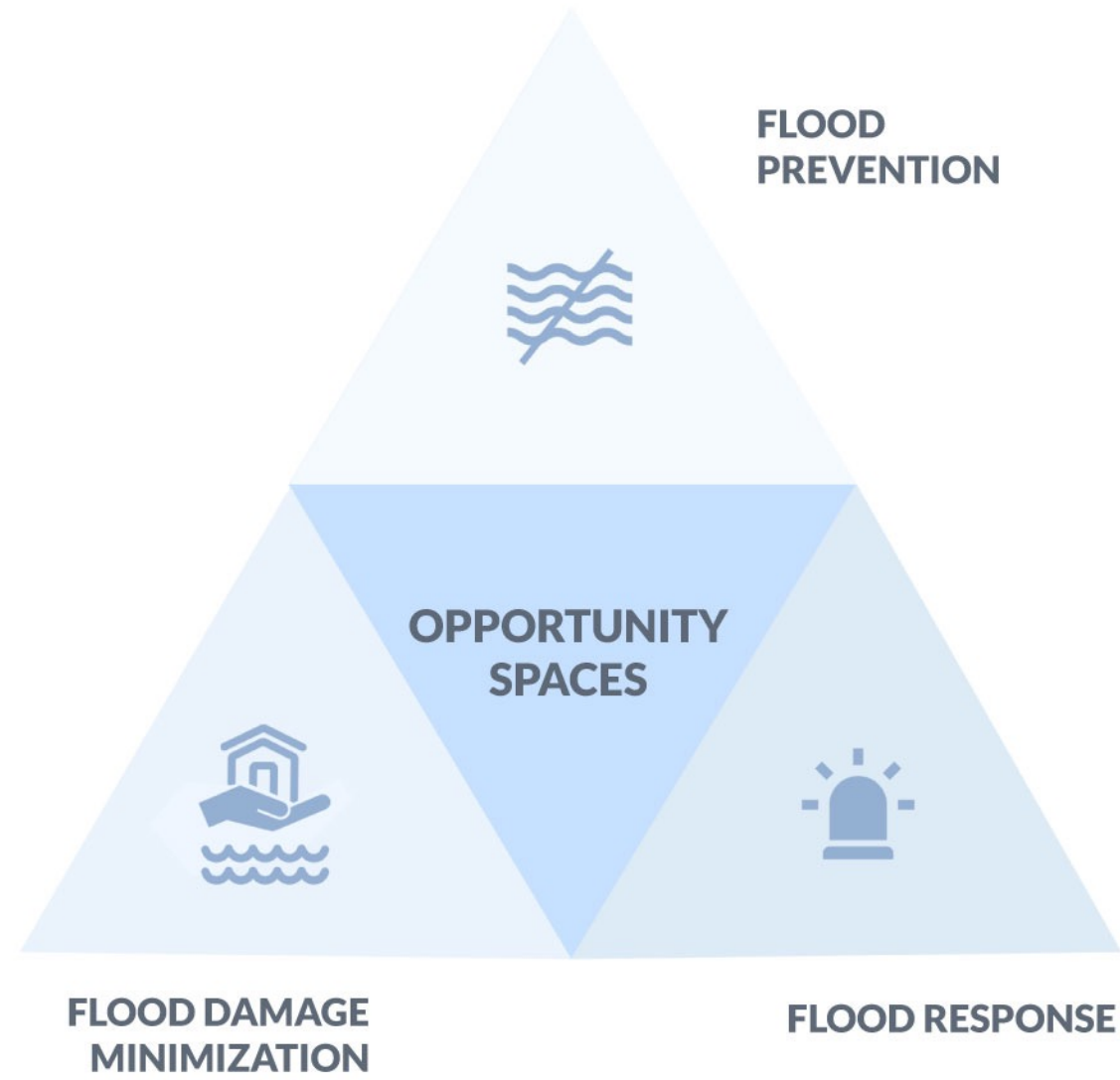


Pain Points

Desires

DRAIN CLEANING AGENCY

Opportunity Space in Bhubaneswar



Defined challenge



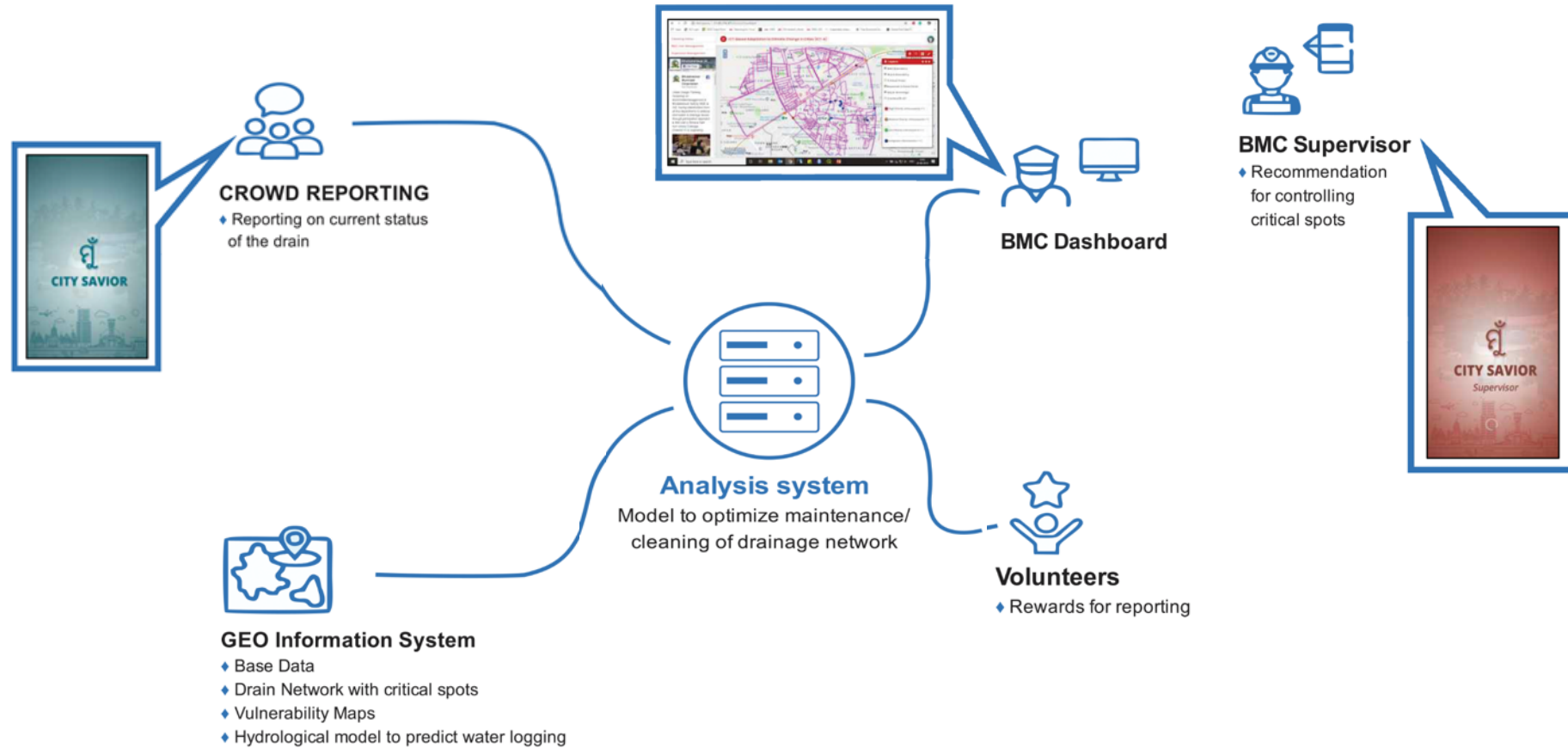
How might we

help the BMC officials know the drain status in Nayapalli and Satabdinagar as live and as dynamic as possible so that they can optimize their resources deployment to prevent floods.



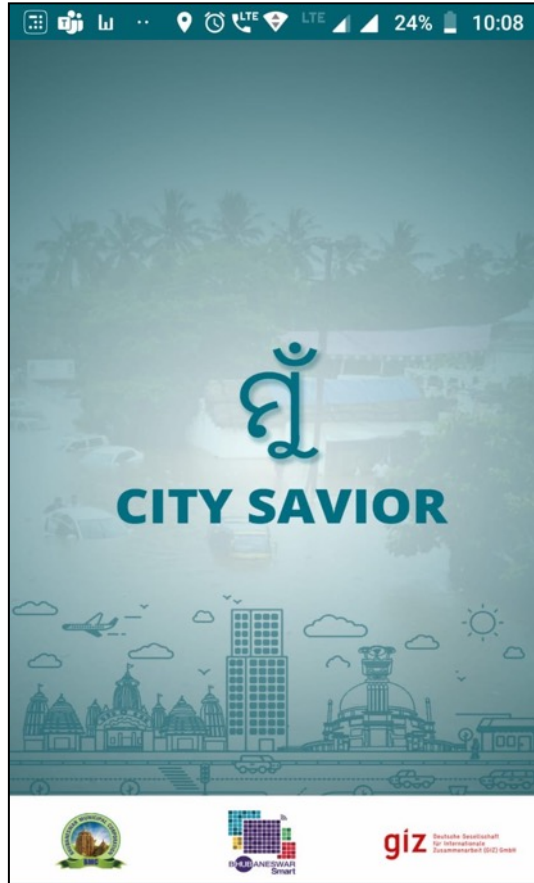
**Some Glimpse of the Citizen Centred Innovation Process
: Sprint 1 and Sprint 2**

System overview

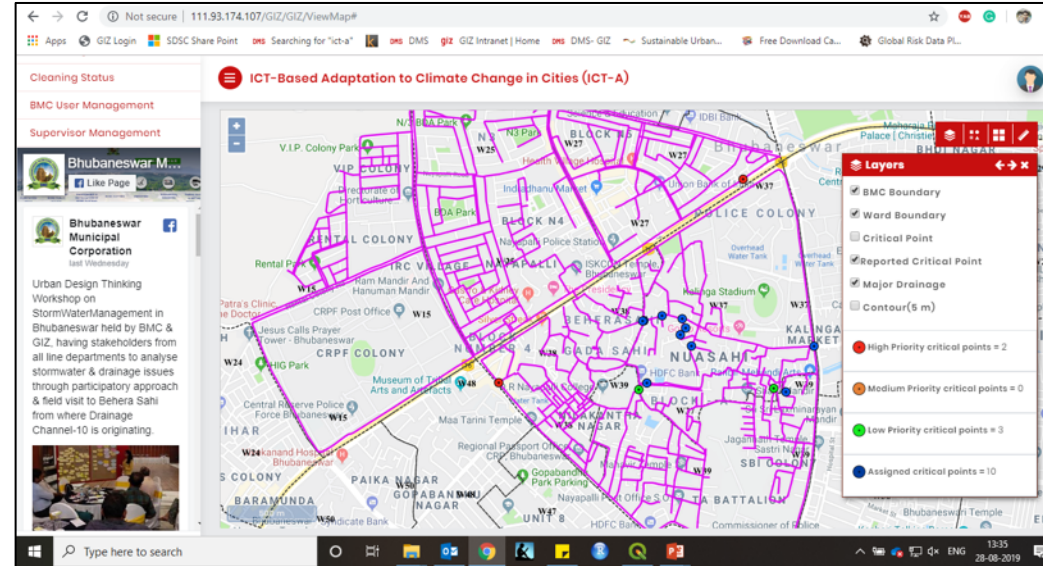


Digital Solution India: Components

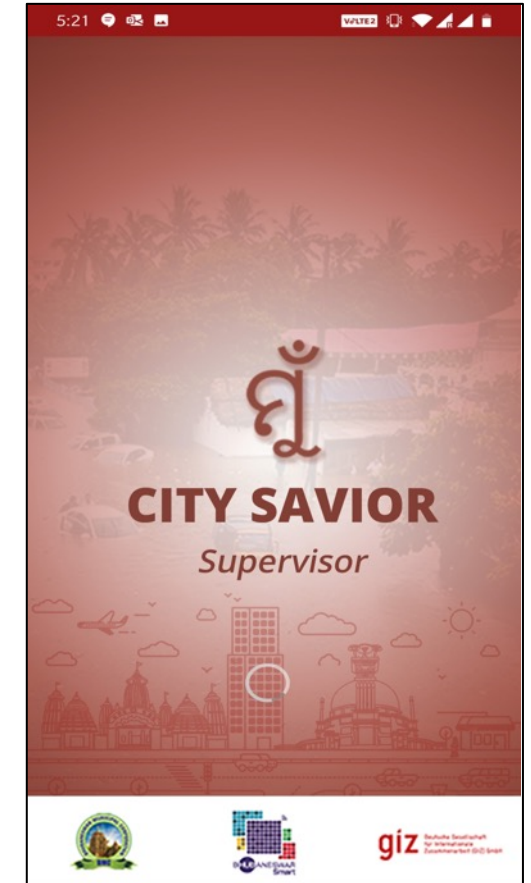
Volunteer App



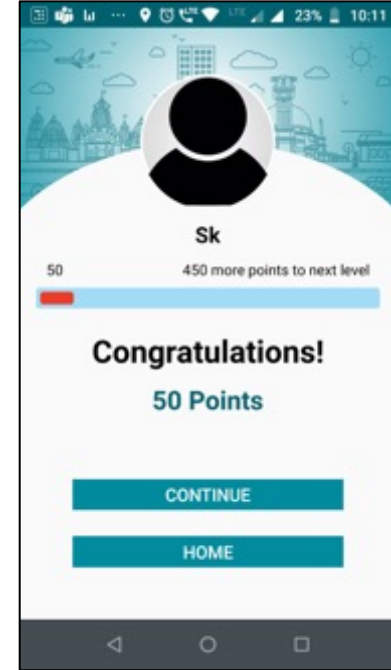
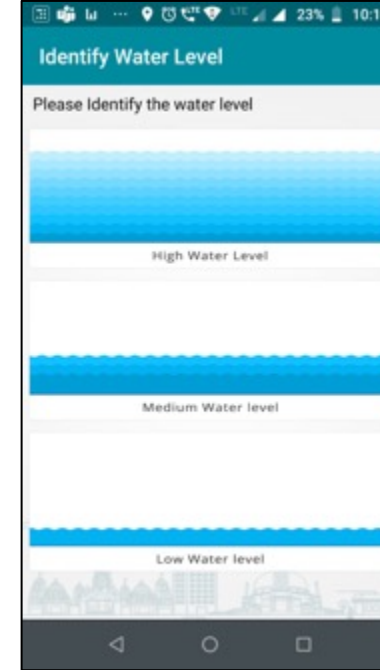
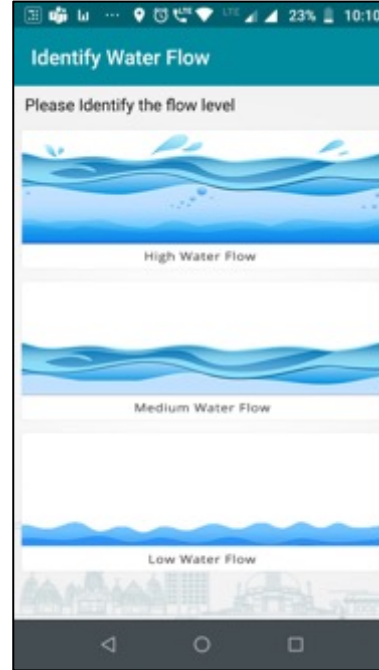
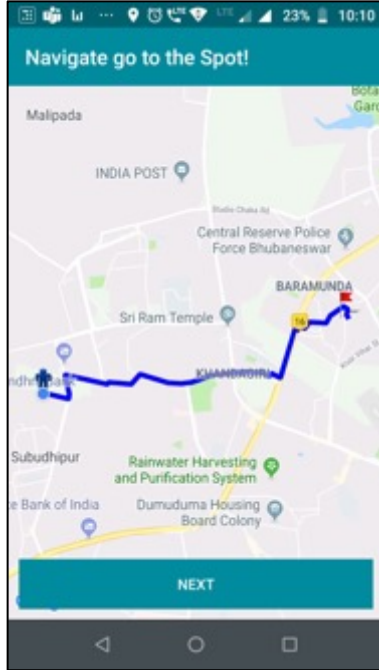
Dashboard with Suggestions for City Officials



Supervisor's App



Digital Solution India: Volunteer App



Digital Solution India: Dashboard for city officials

ICT-Based Adaptation to Climate Change in Cities (ICT-A)

Reported Critical Point Details

- Critical point No: 224
- Land Mark: CRP chaka
- Flow Status: High
- Water level Status: High
- Flow level Status: Medium
- Garbage level Status: High
- Assigned To: Kamesh K

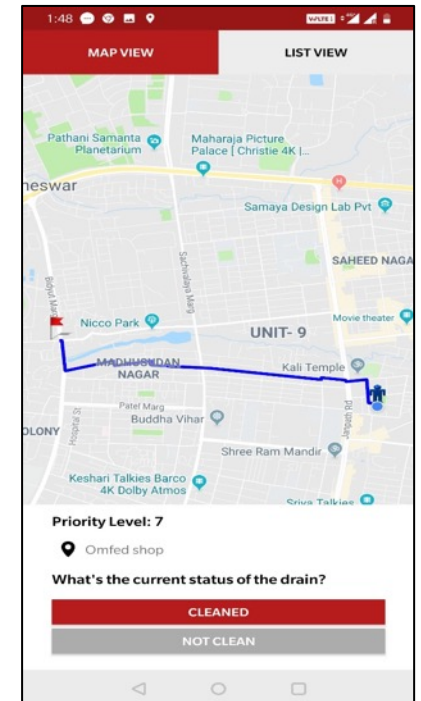
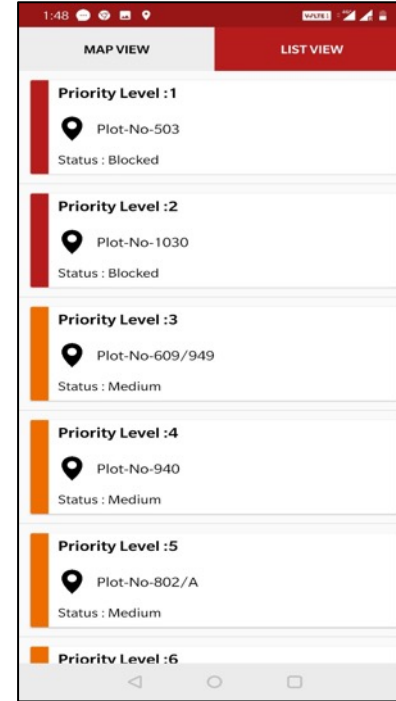
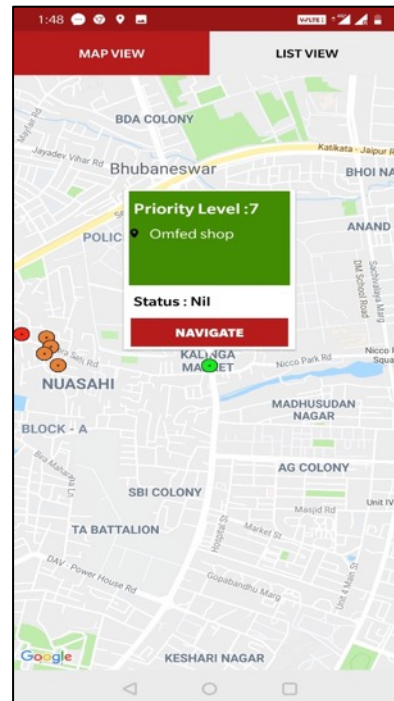
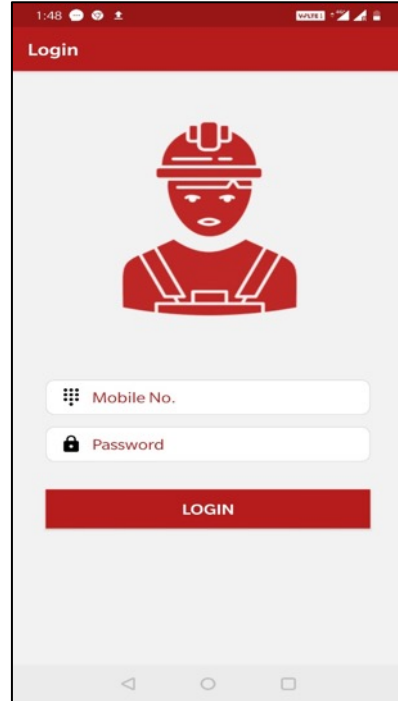
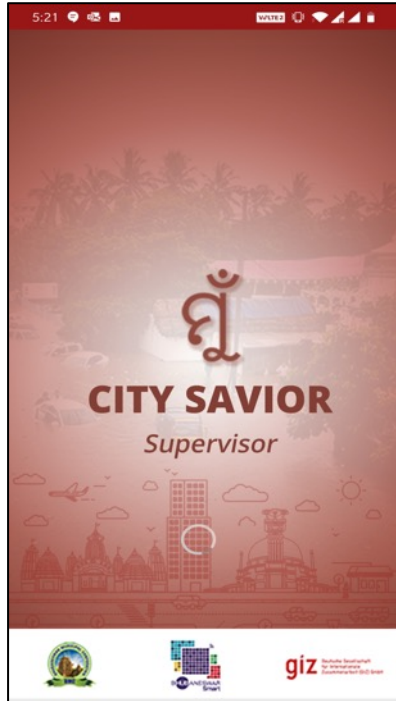
Layers

- BMC Boundary
- Ward Boundary
- Critical Point
- Reported Critical Point
- Major Drainage
- Contour(5 m)
- High Priority critical points = 2
- Medium Priority critical points = 0
- Low Priority critical points = 3
- Assigned critical points = 10

ICT-Based Adaptation to Climate Change in Cities (ICT-A)

CP NO.	LAND MARK	SUPERVISOR NAME	SUPERVISOR NO.	ASSIGNED DATE	CLEANING STATUS
1	Rilanco Smart	Liju	1234567895	16-07-2019	Assigned
5	Plot-No-530	Liju	1234567895	18-07-2019	Assigned
11	Damayanti Apartment	Chandan Nanda	1234567897	16-07-2019	Assigned
12	Damayanti Apartment	Liju	1234567895	18-07-2019	Assigned
20	Plot-No-1160	Shabaz Khan	9867633628	18-07-2019	Completed
21	Satyam Homo(302a)	Shabaz Khan	9867633628	18-07-2019	Completed
21	Satyam Homo(302a)	Shabaz Khan	9867633628	18-07-2019	Completed
22	Omfed shop	Shabaz Khan	9867633628	26-07-2019	Assigned
23	Plot-No-503	Shabaz Khan	9867633628	18-07-2019	Assigned
24	Plot-No-612	Shabaz Khan	9867633628	26-07-2019	Assigned

Digital Solution India: Supervisor's Application



Algorithm for Ranking Critical Points

(i) Prioritization Score_n = (Vulnerability Score_n + Hydrological Score_n)^{Flow Status_n}

*(ii) Vulnerability Score
= (w₁)Landuse + (w₂) Buildings + (w₃)Population
+ (w₄) Critical Infrastructure*

*(iii) Hydrological Score (HS) =
(w₁) Stream Resultant Score + (w₂)Distance to main outlet + (w₃)
Drain construction type*

(iv) Flow Status → Reported by App (possible score: 1,2,3)

Digital Solution India: Advantages

- ✓ Crowdsourcing. Citizen support BMC in monitoring the drains and collecting data for climate resilient urban development
- ✓ Algorithm prioritize clogged drains to be clean according to criteria of city officials
- ✓ Citizens sensitised about importance of keeping drains clean; raising awareness and behavioural change



Achievement

Best Climate Smart Cities Award under Smart City- Empowering India Awards 2019 - by Smart Cities Mission, Ministry of Housing and Urban Affairs, Govt. of India.



Community Outreach

10 community events in 10 different locations by 30 volunteers over a week. A joint launching event with BMC, BSCL, BDA at project area.



Integration in Bhubaneswar Command and Control System and Bhubaneswar.me platform for informed decision making

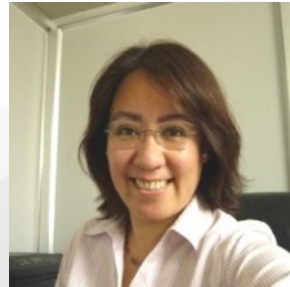


Ms. Vaishali Nandan

Project Head CSC & ICT-A, India

vaishali.nandan@giz.de

-



Dr. Teresa Kerber

Head of the ICT-A Program, Germany

teresa.kerber@giz.de



Mr. Shabaz Khan

Technical Expert ICT-A, Bhubaneswar-India

shabaz.khan@giz.de



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<https://www.facebook.com/gizprofile/>

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