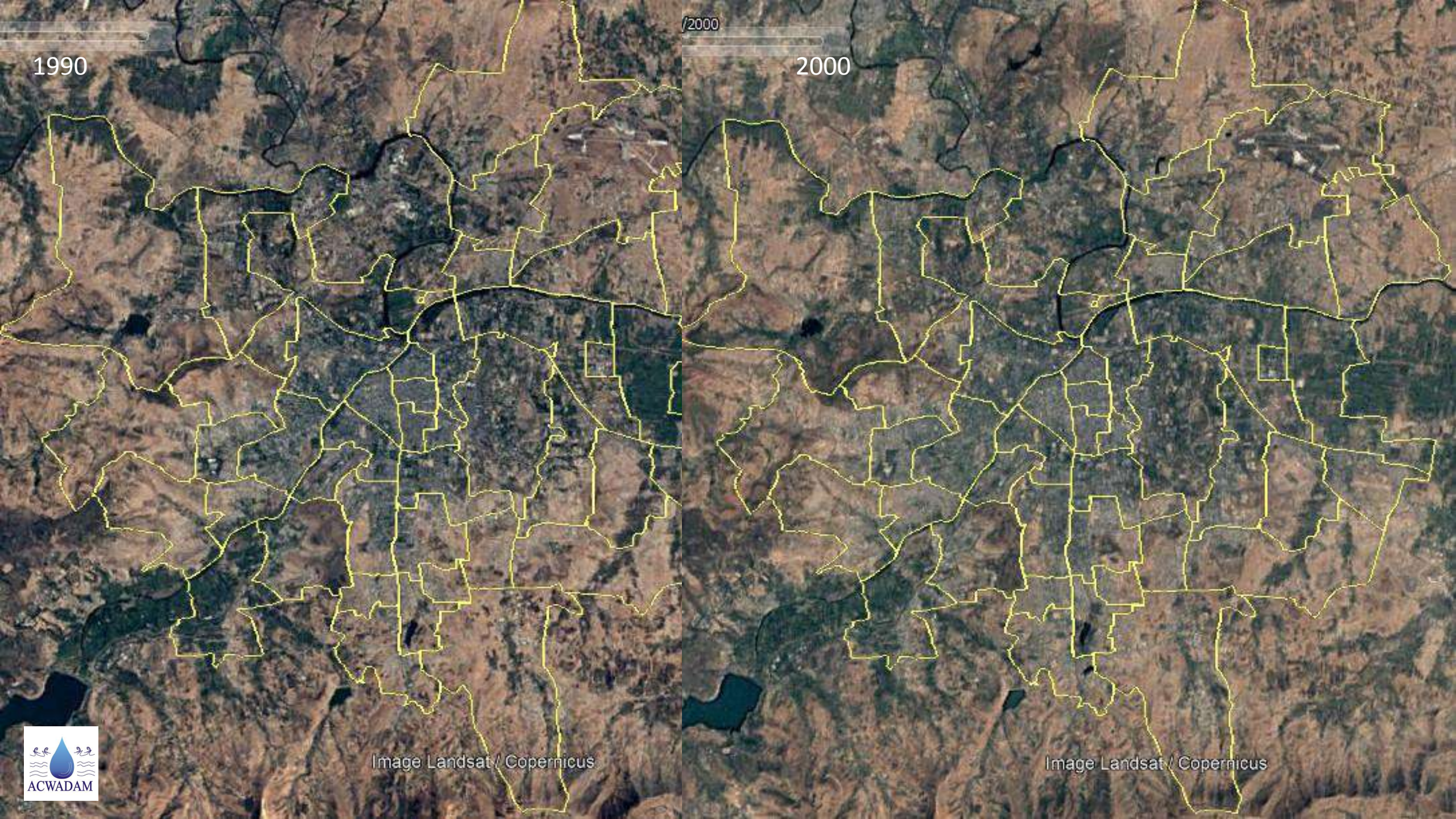
PUNE: Urban Hydrogeology – recent experiences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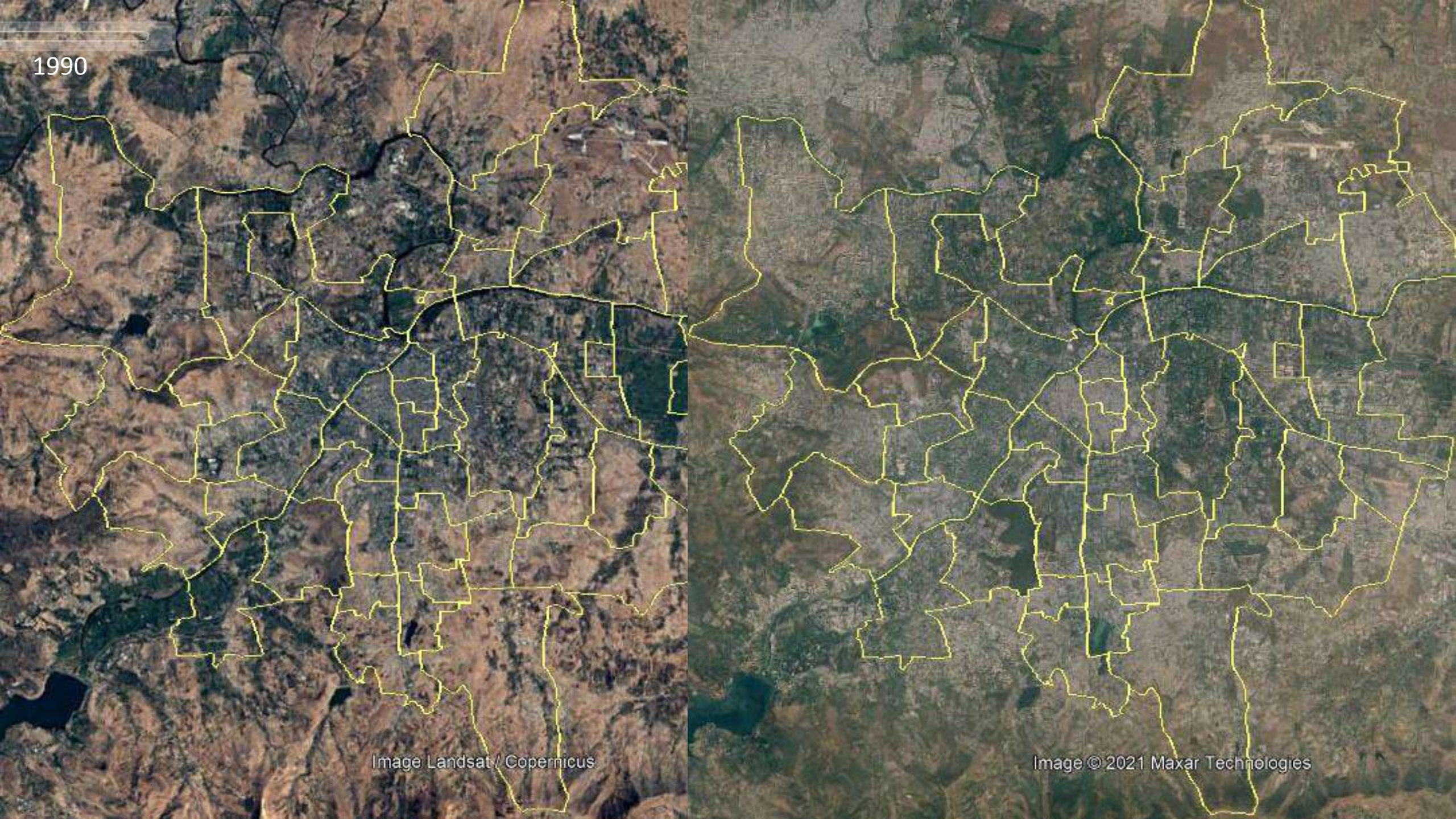
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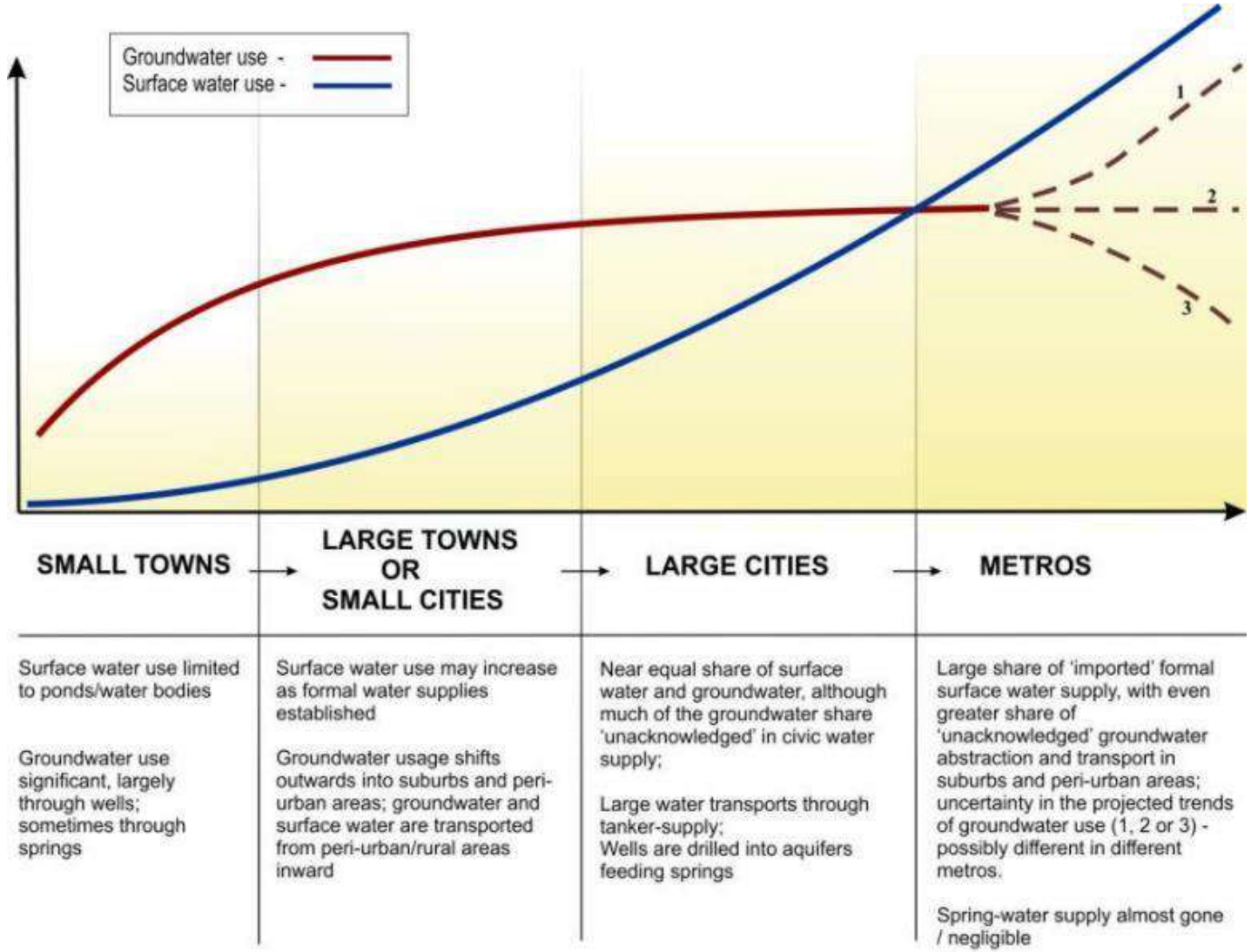
TRENDS IN SURFACE AND GROUNDWATER USE ACROSS VARIOUSLY SIZED URBAN SETTLEMENTS IN INDIA (after:Shah and Kulkarni, 2015)



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Factors that accelerate challenges in urban groundwater surveys

- Personal interests and agenda
- People cannot spare enough time for social and ecological issues around groundwater
- Preconceived notions and limited sensitivity to groundwater (and aquifers)
- Lack of political will

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What are these structures ???

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	Kumbhare & Tithee Shah	1099 2) 859-899-900-998 3) 672-749 4) 815-847-924-935-952-974		2) 18.514926 73.858705 3) 18.513431 73.857801 4) 18.516666 73.861188
	Kunal Kale & Kumbhar	1) 1496-1636 2) 423-498 3) 502-536-564-707	Light Green	1) 18.513513 73.858946 2) 18.517739 73.859768 3) 18.512043 73.862517
	nath var & Shardool Kokare	1) 721-734-795-814-975-983 2) 398-420-506-525 3) 357-383-541-580 4) 700-719-984-1087 5) 604-685-699-1088-1092-1100-1129 6) 537-562-708-775-49A-D-86A-87	Light Blue	1) 18.516335 73.860405 2) 18.516459 73.859628 3) 18.514969 73.859736 4) 18.515546 73.861001 5) 18.514791 73.861000 6) 18.512048 73.863722
9		1) 330-356-581-632-663-680-683-1130-1187 2) 350-500-582-583 3) 1-33-550-552-590-595-328-337-323 4) 286-348-694-697-700-704-714-728	Dark Green	1) 18.513852 73.860610 2) 18.517793 73.862317 3) 18.518359 73.864528 4) 18.516601 73.863861
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Shaniwar peth – Sadashiv peth
Kasba peth – Somwar peth
Rasta peth – Raviwar peth

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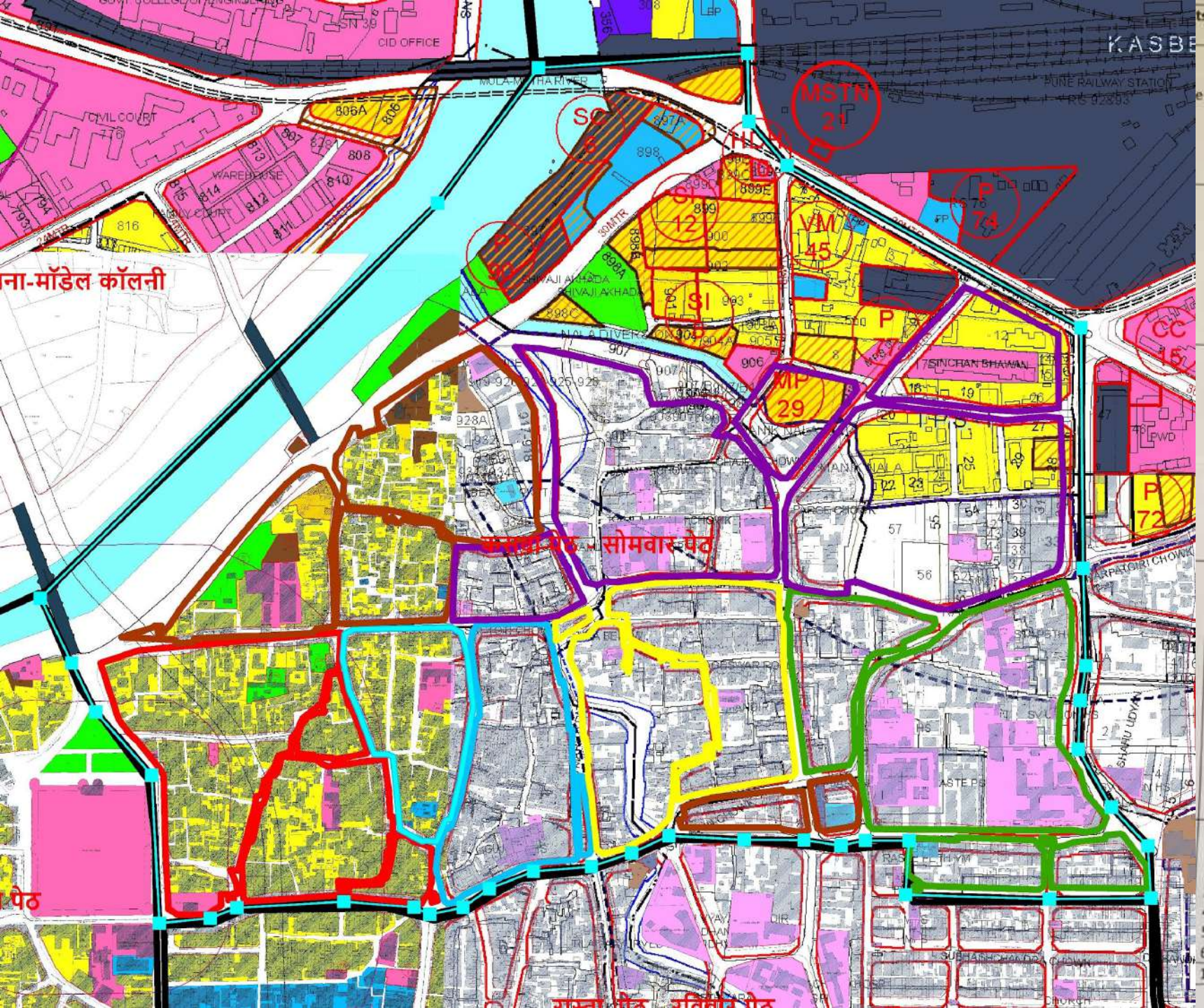

Survey No	Colour Code	Lat-Long
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1) 494-660 2) 601-635 3) 58-82-642-646 4) 83-93-161-184 5) 185-205-263-289 6) 208-226-248-262 7) 227-247	Purple	1) 18.516144 73.868344 2) 18.516983 73.867234 3) 18.517382 73.867098 4) 18.517954 73.867704 5) 18.518605 73.867660 6) 18.518611 73.866442 7) 18.518627 73.865361
1) 110-144 2) 94-108-145-160 3) 34-57-598-600 4) 574-613 5) 563-627 6) 528-550 7) 271-345 8) 205-213-262-270 9) 80-144 10) 735-746-793-794 11) 553-578-581-587-588-589	Orange	1) 18.517941 73.865380 2) 18.517950 73.866495 3) 18.517302 73.865407 4) 18.516159 73.865451 5) 18.516116 73.866740 6) 18.516063 73.867637 7) 18.515137 73.867677 8) 18.514489 73.867686 9) 18.513485 73.865080 10) 18.517278 73.860347 11) 18.518898 73.863447
1) 1098-1208 2) 279-291-320-330 3) 292-319 4) 231-251 5) 214-230-252-261 6) 1217-1250-1256-1275 7) 147B-718-719-583-594 8) 720-732-735 9) 736-747 10) 564-582 11) 525-560-761-742-762 12) 753-766 13) 848-862-911-923-936-951	Dark Blue	1) 18.513471 73.867494 2) 18.515109 73.866697 3) 18.515105 73.865599 4) 18.514448 73.865691 5) 18.514461 73.866682 6) 18.512644 73.865634 7) 18.518351 73.856877 8) 18.518529 73.857993 9) 18.518553 73.858821 10) 18.518022 73.856864 11) 18.518137 73.858178 12) 18.518252 73.859220 13) 18.517675 73.861199
1) 426-524-715-712-751-752-767-782-785-788-796 2) 257-261-267-847-850 3) 312-379 4) 289-311-380-382-839-846 5) 384-424-796-838 6) 747-790	Yellow	1) 18.517372 73.857614 2) 18.516332 73.856522 3) 18.516541 73.857443 4) 18.515991 73.857387 5) 18.516418 73.858 6) 18.518412 73.860
1) 242-252-306-277-282-851-857-999-		1) 18.514961 73.857

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Concepts and reality

- The fine line dividing concepts and misconceptions may lead surveyors on the wrong path
- Surveys, questionnaires have to be sharp and strategic so as to capture the real situation on the ground

Groundwater discharge in the basement of many buildings….

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Observations at the micro-level reveal many surprises and surprising realities…

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Maintained and unmaintained sources

- Availability of alternate source
- Quality of water

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YES, WE HAVE A BOREWELL !!!

- A matter of pride – we have our ‘own’ independent source…
- We need it – since public water supply falls short, especially in summer
- It is a perpetual necessity – we pump it every day

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Digging for development with scant regard for aquifers - ”what is that?”

Development, Sustainability, Environment, Ecosystem ???

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The ubiquitous dugwell: it is everywhere - from a city farm to the crematorium

- Wells in farms
- Wells in public places – parks, crematoriums
- Wells in basements
- Wells in backyards
- Wells on the street

Making the invisible visible: challenges

- Survey wise ward map and information not available
- Difficulty in access to the source
- Gathering information on ground from right person
- Limitations in communication
- Hesitancy in sharing the water draft and source information
- No separate metering for source
- Private sources maintained
- No conservation or protection to public sources
- No water quality testing on private sources
- Used for domestic purposes
- Ownership issues
- No proper information or documentation on old Katraj to Shaniwarwada aqueducts – *we suspect there are wells tapping this system too*
- Basement flooding issues in many parts of the city
- Spring discharge connected to storm water drains in many places
- Many seepages and springs along Mula – Mutha river channel, but not protected and conserved through a concerted effort

Our unstinting effort on ‘groundwater literacy’

- Entire effort is based on partnership and collaboration
- Sensitization and awareness – various stakeholders
- Protection of natural recharge areas through policy
- Incentivization for groundwater recharge in recharge zones
- Ward-wise citizen group for groundwater monitoring
- Centralized system to update and maintain data
- Conjunctive use of groundwater with formal municipal water supply
- Decision support system to ensure the safe and secure groundwater for future use
- Interdepartmental and inter-organizational effective, efficient and timely communication
- Incorporation of findings and recommendations to upcoming developmental projects and plans
- Public systems of Managed Aquifer Recharge as a priority

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MISSION GROUNDWATER
भूजल अभियान

CEE

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