Creating Future-Proof Spaces for Megacities by an Impact-Oriented Participative Approach – Case Study Experiences from India

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1 ABSTRACT

A lot is discussed how climate change puts threats on future urban and rural spaces. Indeed, this is highly relevant and needs to be reflected in the creation of these spaces in the frame of impact analyses. In addition, it seems even more relevant to integrate the human component into the processes of driving future real estate in order to shape spatial transformation in rural and urban spaces jointly and sustainably in a "better way".

URBAN MENUS (urbanmenus.com) is a novel platform for participative spatial development processes combining data understanding, data crunching, modelling, visualisation, and critical impact analysis, operationalised in an easy-to-use, high-end interactive real-time app with 3D visuals. URBAN MENUS quickly displays images of the future, allows a walkthrough, and evaluates effects in terms of resources and ecology (with the carbon footprint as one recent lead indicator), society and urbanity, and profitability – as an overall profile of resilience. This allows structured and fact-based, multi-perspective considerations on a project, steering holistic, future-proof space optimisation and investment security.

The paper describes the experiences with impact-oriented participative spatial development processes in Pune, India. India has a very long democratic tradition as a good basis for participative processes and we observed a higher average appreciation of Women's inputs compared to Europe. Yet, according to our experience, the caste system still strongly influences the mindset and hinders equal treatment of concerns across population segments. Furthermore, the relationship with decision makers, which play a crucial role in development projects, is widely characterised by widespread mistrust, counteracting consensus-finding at all levels.

To this end, our conclusion is focused on the need of an onboarding phase, making all participants familiar with impact-thinking and creating awareness on the benefits of cooperation and the joint targets of happiness on a resilient basis. Furthermore, the young generation and their decision makers should be involved more to advance future spaces, combined with established classic stakeholders. Together they can yield best results, especially if orientation is provided for instance by archetypical examples deducted from previous processes. For India we have elaborated the following "archetypes" with high needs and potentials: a) smart rural development based on the circular economy, b) re-definition of development around historic heritage, c) city concepts based on new green production and mobility, and d) multi-sectoral and inclusive city enlargements.

Keywords: Inter-Sectoral Development, Impact Analysis in Spatial Development, Holistic Decision Making, Future Planning, Community Interaction

2 IMPACT-ORIENTED, MULTI-SECTORAL AREA DEVELOPMENT AND URBAN MENUS

Profound knowledge about an area in question and stakeholder involvement are central for multi-sectoral resilient system planning: To think about the future of space, the history and the present cannot be neglected. Therefore, it is important to identify framework data to understand the case, current and possible future problems, and potentials. To elaborate a joint vision, stakeholders with a driving influence, not only for commercial or positioning reasons, need to be identified, motivated and integrated.

Our method URBAN MENUS assists such a multi-sectoral, agile, proactive urban and regional development. It offers a digital participation technology to gather input from all stakeholders about the area's status quo. Future visions thereof can then be elaborated along three main interests: (1) ecology & sustainability, (2) urbanity & society, (3) density & (economic) efficiency. 3D visualisation allows to walk through, adapt and choose the best future for all in an interactive process. Integral impact assessment in line with the EU Green Deal, UN SDGs, diversity, and gender aspects shows the impact of scenarios on happiness, safety, innovation, profitability and circularity values – this supports resilience and benefit optimisation in line with (changing) interests of all stakeholders, framework conditions and sustainability strategies.

Users benefit from precise identification of areas for improvement, intelligent fact assessment and transparent presentation of development alternatives, objective dialogue about future dreams with all relevant stakeholders, accurate representations for communication, support in building the right alliances and access to inspiring contemporary demo projects.
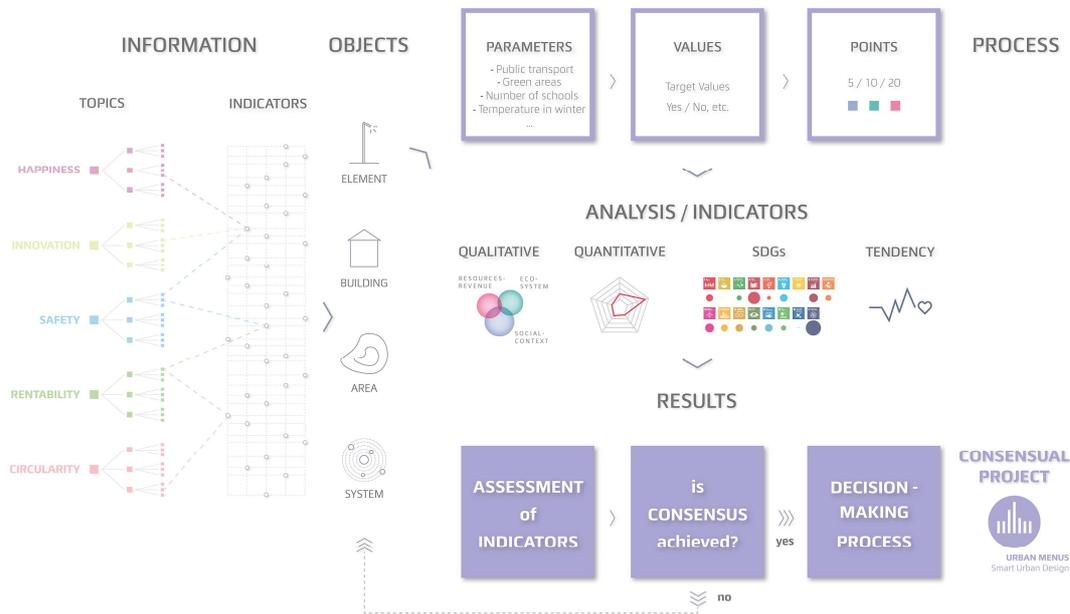

Fig. 1: URBAN MENUS Smart Development Methodology.

3 AREA DEVELOPMENT IN INDIA, FOCUS ON PUNE REGION

The chapter presents current characteristics of the planning and development scene in India, economic and other influencing factors, stemming from our and project-related experiences with stakeholders.

3.1 General framework conditions

Focus on acute problems and moderate ambitions: Indian megacity regions, in contrast to classic European ones, are primarily focused on acute challenges such as water scarcity, water and air pollution, traffic chaos and noise[1], which therefore dominate in the visioning process. Looking into the future beyond these dimensions is less important to most of the stakeholders. Development as a goal, connected with the need to change (and curiosity towards the new), is clearly common sense different from Europe. However, the ambition of "making the best" and leveraging utmost potential is overarched by "achieving a moderate good". Certain circumstances are accepted without any discussion, improvements seem "out of any reach".

Stakeholder communication – caste and other influences: To gather stakeholder commitment for effective multi-sectoral processes requires great efforts within the Indian society, due to hierarchical and orderly thinking especially influenced by caste – caste plays a role at every stage of an Indian's economic life" (cf. MUNSHI 2019, p. 781) as well as religion, but maybe also British Empire and Commonwealth history. We experienced personal acquaintance as a kind of precondition for top-level cooperation and a cautious attitude towards digital and low-threshold-meetings. According to another experience report on the topic of participatory urban development in India, "urban land politics is entrenched in overlapping class, caste, religion and ethnic moorings". (Salamah 2021, p. 139) For a researcher observing Indian's fascination with colonial heritage and the hegemonic discourse, an "[…] emphasis on order […], seems to be "at the centre of powerful discourses at the level of both, the state and citizens." (Perera, 2018). This obedience to authority may contribute to all the difficulties with introducing development ideas bottom-up.

Stakeholder engagement and digital participation are in the initial phase

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[1] Participants in the status quo assessment of cases (see chapter 3.1.2) focused on the following problems: safety issues impeding open structures, lack of environmental efforts, water and food related infrastructure challenges. In addition, villagers tend to face connection issues.

Stakeholders are increasingly involved (e.g., Mumbai First; mumbaifirst.org). In the recent past, methodologies were tested to assess key sustainability values for spatial development, such as the analytic hierarchy process (AHP) technique combined with stakeholder identification (cf. Kwarta et al. 2021). However, public participation is still highly administrative, largely conducted without digital technology.

Often, consultations are even conducted pro forma about draft plans for which the decision has basically already been made. (cf. Samah 2021, p. 137) "Although the concept of stakeholder engagement is gaining increased acceptance and significance […], there are yet no established normative frameworks and practices […] by courtesy of the varying social, economic and political conditions across settings." (Tyagi 2019, p. 813) The complementary use of technologies such as VR and AR and also drone and satellite data is just emerging.

Shift in traditional role models: Due to female empowerment in India, women reach high positions in the labour market and in the local village life. This also influences development processes and mindsets. The change in the social fabric comes with new space design needs, concerning Women's safety at campuses and workplaces for example, but also their children's security in new environments. Also, new equality-oriented social gathering spaces are needed apart from traditional ones. The National Policy for the Empowerment of Women expresses efforts in this direction: "Women's perspectives will be included in […] planning of housing […] both in rural and urban areas. Special attention will be given to providing adequate and safe housing […]." (Government of India 2001) Although there are already government housing schemes for women in place, reservation principles are providing discounted access to infrastructure, and services for disadvantaged influence the housing market, further development is needed regarding affordability, optimum integration of respective housing units into surrounding infrastructure and proximity to workplaces. (cf. Saxena 2020)

3.2 Density

Redevelopment, extension and gentrification

Pune, an inner-city, wants to boost its image, given the high outward migration in the last 10–20 years: It is characterised by densification and high-rise tendencies pushed by new development control rules from 2017 (Pune municipsl corporstian 2017), slum redevelopment, heritage palace refurbishment and large-scale mobility projects such as Maharashtra Metro Rail Corporation Limited (Maha-Mryto) are all entailing gentrification more or less. However, due to the tenancy law, the Maharashtra Rent Control Act from 1999 (Government of Maharashtra 2016), protecting old rents is tempting landlords not to invest in maintenance or improvement. The suburbs are characterised by a lot of new infrastructures and residential development, due to the settlement of tech companies in the last 20 years, among others, throughout India.

3.3 Ecology

Increased awareness for ecological and social aspects

A comprehensive ESG legislation comparable to the European market (Paulesich et al. 2023), such as for example the Corporate Sustainability Reporting Directive (European Commission 2021) which is intended to replace the current guidelines on sustainability reporting with new requirements for sustainable action even for SMEs in 2023. or the EU Taxonomy Regulation (European Commission 2020), exerting pressure to invest sustainably in all economic sectors, is not in place in India, but aspects are already in focus. Since 2003 water retention reservoirs are mandatory for every new building (IELRC 2003) in Pune and NGOs and foundations managed significant river clean-up. The 2016 Compensatory Afforestation Fund Act establishes afforestation as compensation for certain building project-induced deforestation. (Government of India 2016) Also, citizens are active, organised via social media but also at the university level: A forest-threatening ring road project around Pune was halted by activists in autumn of 2021 for example, and trees are planted on their own initiative. Generally, action under the term Smart City became more respectable. There is also a model for sustainable metro station development, "Transit Oriented Development" TOD (Government of India 2017), dedicated to creating compact, pedestrian-oriented, mixed-use communities around high-quality train systems. Politics currently focus on infrastructure image projects like overall street layout, public spaces and modal split, especially bicycle and pedestrian infrastructure.

3.4 Urbanity

Conflict between community spirit-driven willingness to open structures (boundary-free / fence-less design) and security concerns

In Indian cities, public spaces are rare due to density. 'Katta's', small corners off the street, are their only places for informal meetings. Longing for more "public urban life" is ascertainable – especially among returnees, but there are concerns about how to guarantee safety in such spaces.

4   CASE STUDY EXPERIENCES

Between March 2021 and September 2022, over 100 Indian and international participants were involved in exploring impact-oriented, multi-sectoral area development approaches.

4.1 Case study overview

In order to show the potential of impact-oriented multi-sectoral development processes in different areas of application in a structured way, e.g., with regard to target groups, geographical conditions, focus topics, administrative frameworks, cases were defined in close cooperation with Prof. Asmita Joshi and her team from Dr. Bhanuben Nanavati College of Architecture for Women (BNCA), Pune. The cases, all situated in Pune metropolitan region, represent focus challenges of Indian area development:

- Case study 1 – Cummins College Road and surrounding area → interaction campus-city
- Case study 2 – Village Ranmala → multi-sectoral, circular, inclusive rural development
- Case study 3 – Mandai Road / Laxmi Road → development around historic heritage
- Case study 4 – Baner Balewadi → residential suburbia city extension

Each case was assigned a local and an Austrian group as case coordinators and one or more local experts matching the case challenges. A list of further stakeholders was prepared to involve those with an essential case relation.

4.2 Case study workflows & experiences

Case studies involved more than 30 stakeholders from public and private institutiond of planning and development, academia, politics, and others, around 30 planning and development related students, around 40 interested locals, a 10-person Indian team and the 13-person URBAN MENUS R&D team in Austria.

The basic phases of case study processing:

(1) Start meeting to lay the groundwork and create a basic understanding of expectations and opportunities, provide an outline of the case study process, and build teams

(2) Analysis and impact-assessment work of the teams in India and Austria including online meetings and think tanks with different stakeholders to identify the challenges and potentials of each case.

(3) Testimonial workshops with around 20 international testimonials of successful development projects with strong motivation to create synergies

(4) Development of possible futures, utopian realities based on collective dreams to trigger fantasies of a better world in order to build a consensus.

4.2.1   Status Quo analysis survey

The status quo was assessed by personal interviews, group discussions and a survey along the five main URBAN MENUS values. Within the introductory general weighing, safety, innovation, happiness and circularity came out more or less equally important, profitability was ranked lower. Happiness tended to be most important. The final ranking was: 1 Happiness, 2 Safety, 3 Circularity, 4 Profitability, 5 Innovation.

The personal perception of the significance of these values at the case sites delivered broad ranges – nearly on the whole scale from 0 to 100 each. This variety can be explained, a) by different perceptions as such, b) by calibration varieties based on the personal predisposition and different concept definition understandings respectively. Additionally, status-quo and potential analysis were mixed in the explanations, showing that it was difficult for respondents to clearly focus on the status quo and neglect the perceived potentials. Therefore, already in the status quo assessment, cases with higher future potential obtained higher scores.

The status quo analysis results of Case Study 1 are described in 4.2.3.

4.2.2 Testimonial workshops

In additional workshops, all participants had the chance to exchange with those responsible for innovative process approaches from all over the world. They were: Kibbutzism from Israel, collective open approaches from Mexico and Columbia, sponge city and open WU Vienna campus from Austria, perception-based reconstruction and landscape law from Chile, neighbourhood-based approaches from Washington, social housing from Catalonia.

A workshop on foresight language and methods was added in March and April 2022, held by internationally active futurologist Karla Paniagua from Mexico. The goal was to develop skills for the detection of signals of change and trends, the visualisation of alternative futures for a given system, the synthesis of a long-term vision and the appropriate methods of participatory intervention to realise the desired future (strategy).

4.2.3 Example Case Study 1: Cummins College Road (Local Authorities / Public)

Case study 1 was the most comprehensive one and is described here in more detail. The other cases, so far, could only be accompanied by status quo and first draft scenarios.

(A) Process

Stakeholder involvement and stakeholder needs

A series of interviews were conducted with stakeholders of various spheres, however, a joint think tank meeting could not be achieved, with the resulting drawback, that everybody tends to shift the problem-solving competencies to other parties that were not yet present in the same meeting. Nevertheless, different perspectives on stakeholder needs could be collected by the project team, There is a strong desire for more public spaces and informal gathering places, as these do not exist today. However, traffic safety, security concerns about underage girls, as well as necessary flood protection during the monsoon seem to be obstacles. The approach of combining the campus and productive city elements closer with each other was seen as difficult due to sectoral barriers.

Impact assessment of the status quo

Dealing with scarce data was one of the biggest challenges. This ranged from inaccuracy of marked locations in Google Maps to lack of GIS data as Open Data in the administration and official plans are only available in heavily pixelated raster format. Yet, enough material could be combined for analyses. The Status Quo Impact Assessment of 15 participants, scoring each of the 5 URBAN MENUS values between 0 and 100 widely reflected the qualitative results of interviews and discussions:

Happiness: Highly frequented by young people, the area is very lively. Green areas and a river are part of the campus but are not being used. A community feeling and leisure activities seem to be missing. Status Quo Survey Median: 55 (room for improvement!).

Safety: Constant traffic and areas with no proper sidewalks endanger pedestrians. No streets except the main street are adequately lit, creating safety issues at night, especially for women. Safety being one of the biggest concerns is also well reflected by the status quo survey median of only 30.

Innovation: The campus offers R&D programmes and is an example of sustainable energy use (solar). However, the potential for innovative synergies with the surrounding area needs to be exploited. A survey median of 32 (from 100) underlines that. Although this is a university area, the perceived degree of innovation is rather low.

Profitability: The area is mainly university-focused, with a proliferation of small businesses especially promoted by the young. This value achieved the highest status quo median of 60, which can also be explained by the fact, that the private college does not face too many economic problems (also for all those attending the college economic problems are not prevailing).

Circularity: Solar energy and the material flow inside the campus and water storage outside determine a certain level of circularity. Yet, the car-oriented, energy-intensive area and polluted river demand more – the status quo median is accordingly low at 40.

Fig. 2: URBAN MENUS classify today's prevailing collective objectives into five main topics

(B) Results

Four future scenarios were developed and discussed with experts and case coordinators. All scenarios focused on how the university cohabits with the city:

- Catalyst – Pockets of Curiosity:

The campus is an innovation hub where start-ups, sustainable space use concepts such as densification pockets, adaptive re-use, technologies such as photovoltaics and the diversity of the local population meet in a recreational landscape, walkable and easily reachable by public transport.
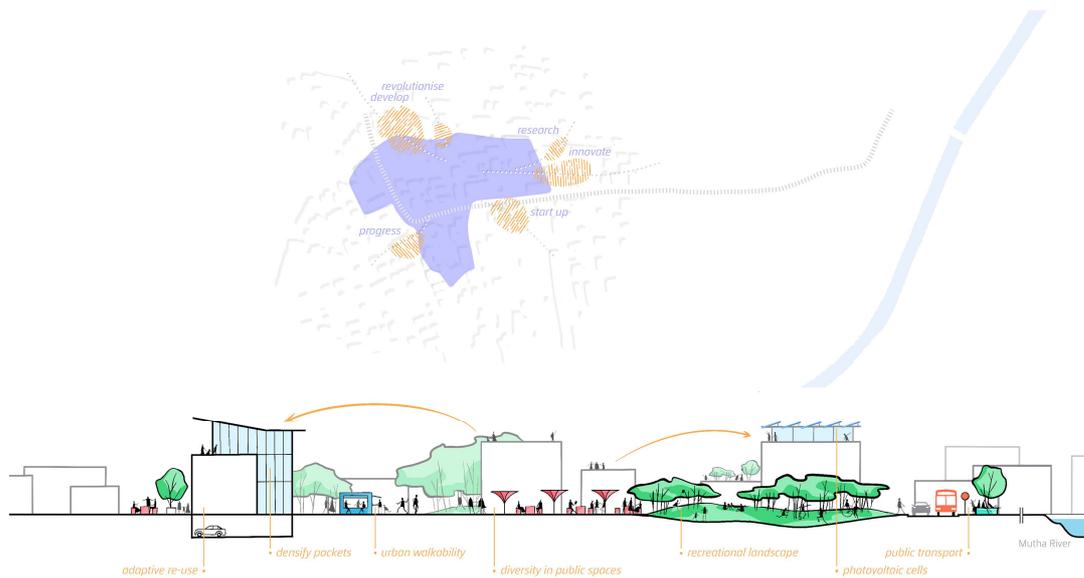

Fig. 3: URBAN MENUS Cummins Case Vision 1 | Catalyst – Pockets of Curiosity.

- EcoSystem – Biocenosis of Life:

Fig. 4: URBAN MENUS Cummins Case Vision 2 | EcoSystem – Biocenosis of Life.

Biodiversity and sustainability as goals lead to rethinking processes in terms of circularity and promoting engagement, They encompasssed water retention, sponge city, aquaculture, new mobility, bike sharing, renewable energy, smart spaces, river clean-up, waste management and urban gardening. A focus is also on structures for pedestrians like experimental under- and overpass solutions.

- Acropolis – Archipel of discovery:

Learning and socialising in connection with nature as a strong signpost are materialised by a resource-wise autonomous university. Rooftop gardens, that contribute to the concept, can also be used as event spaces.
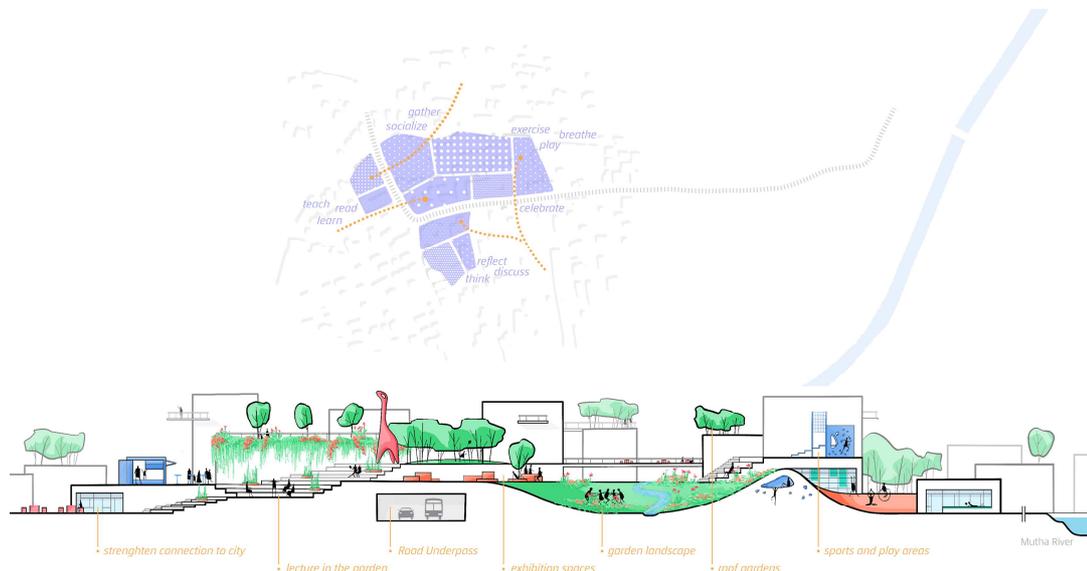

Fig. 5: URBAN MENUS Cummins Case Vision 3 | Acropolis – Archipel of discovery.

- Agora – EduSpace of pleasure:

Education has a strong focus on culture / creation and community / connection. Neighbourliness and peer exchange are encouraged by a cultural centre.

Fig. 6: URBAN MENUS Cummins Case Vision 4 | Agora – EduSpace of pleasure.

In a feedback session with the case expert and case coordinator, the concepts were well received, however always underlined by critical safety concerns.
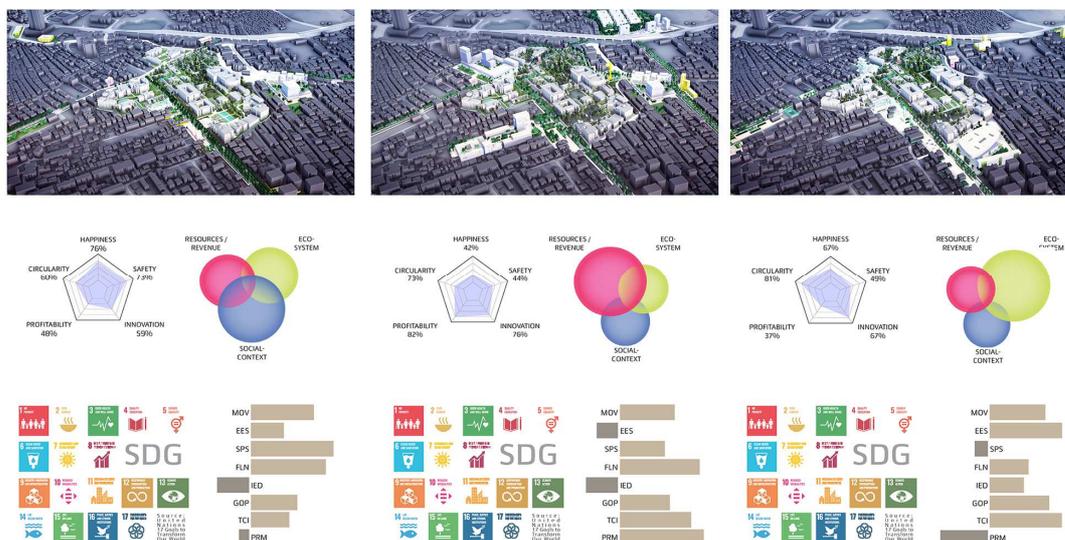
Fig. 7: URBAN MENUS Cummins Case Analysis.

Fig. 8: URBAN MENUS Cummins Case Analysis.

5 DISCUSSION AND CONCLUSION

From the mainly case-based approach we can summarise our learnings on how impact-oriented multi-stakeholder area development can be successfully implemented in India or in similar settings as follows:

5.1 Status quo analysis

This phase worked well in a hybrid approach by which we made up for data gaps due to the low level of local data availability, detail and digitisation. We had little access to local/specific data – sources were on the one hand Google Maps data, which does not always deliver an accurate picture, on the other hand, materials from stakeholders – pictures, development plans, channel plans, but much of it was pixelated and not in vector format, partly unorganised and not comprehensive. However, this material was of great help and compensated for the fact, that we couldn't be there in person (due to the pandemic project period).

More than half of all statutory towns and more than three-quarters of all census towns have no master plans to control spatial development and investments, and the ones who have a plan are often lacking a proper strategy. There is also a lack of personnel, which further complicates accessibility. Of the only about 4,000 sanctioned positions nationwide, more than 40 per cent are vacant. (Government of India 2021, p. 58) Work is in progress since 2009 to integrate mapping technologies and data science into a model curriculum to train the workforce, and since 2020 with a stronger focus on participation (Government of India 2021, 71-72), the development is only slowly gaining momentum.

Regarding impact analysis of the status quo we learned that, in order to establish a uniform understanding of the impact criteria and the resilience goal, it would be wise to hold context-related definition workshops for calibration purposes before moving to case analysis. Also, it needs to be underlined that the status quo analysis and the potential assessment should be evaluated strictly separately from each other, which is often not easy for participants.

For the presentation of the results, we feel confirmed in the multimedia approach. Visualisation alone cannot always represent the depth of the analyses. For example, it is not always easy to understand from a picture alone that a district has higher innovation values because an IT hub is located there. Relationships between elements are complex and additional explanations are valuable.

5.2 Stakeholder involvement

It was difficult to get through to high-level stakeholders to conduct detailed analysis and work together to develop visions and find contractors for implementation. Our hypotheses on the reasons for barriers to reaching decision-makers include, among others, the top-down hierarchy shaped by caste thinking and history, the strong economic interest behind the implementation of project ideas, and a lack of comprehensive sustainability/impact-oriented legislation to generate more drivers towards resilience.

Indian experts already agree on the importance of multi-stakeholder partnerships (Metchant 2021) and a A Multi-Sectoral Development Programme (Government of India 2011) was already applied earlier in minority management, however, economic motives often prevent integrative and multifunctional planning. "The rhetoric of urban areas being engines of economic growth runs the risk of overriding other functions of the urban space" (Salamah 2021, p. 137)/ Universities are often seen as the economic engine of the surroundings by local stakeholders, which is one reason why changes are treated so cautiously.

"[E]xploring an efficient method to balance the power of different participants in the participation process" (XUE et al. 2020, p. 1.), one of the biggest challenges in multi-sector partnerships internationally, is also a barrier in India.

5.3 Positive drivers from the stakeholders' perspective

By the end of all case processes, we asked stakeholders about their learnings from the process: "Why do you think investors, developers and local authorities should opt for impact-oriented participative area development?" They underlined that they have experienced the process as very suitable to steer prospective and strategic thinking and collective action. Detailed aspects they raised lead to the following "local recommendations":

- Tangible (visual) impressions count. If the goal is to change an entire system, it is even more important to make this visually concrete. The discussion of feasibility and resilience aspects, based on 3D interactive illustrations, beforehand is very valuable.

- For building trust, involving known institutions is helpful. Good care to avoid open conflict is important, as there is a strong tendency to avoid losing face. Female empowerment is central.

- Local authorities tend to use public interest projects for generating votes. In this context they are often fascinated by dashboards showing numbers (30% to 50% green for example), which brings them an argument to like impact analysis results.

- Real estate investors are in place, but mainly look for monetary benefits and favor profitability calculations that clearly point out economic perspectives.

- City planners seek opportunities to work on big projects for recognition as well as monetary benefits.

- If stakeholders are convinced by an innovative idea, they will proudly strive for implementation as a first mover.

5.4 Overall conclusions

Our conclusion regarding stakeholder involvement is focused on the need to involve the young generation and their decision makers more intensely to advance future spatial development, together with classical established stakeholders. Especially private sector and non-profit partner involvement is necessary to advance smart city agendas, as for example the Smart Cities Mission (Government of India 2022).

Worldwide just 16% of cities are able to self-fund required infrastructure projects and need support (Deloitte 2018). India also faces financial challenges (Government of India2021). Archetypical examples deducted from previous processes, can steer and inspire such stakeholder involvement and the process as a whole.

For India we have elaborated the following "archetypes" with high needs and potentials:

- Smart rural development based on circular economy
- Re-definition of development around historic heritage
- City concepts based on new production
- Multi-sectoral and inclusive city enlargements

On a meta-level we experienced, that applying our methodology in the new setting in India, also significantly helped to critically review it internally. Consequently, we are planning to extend the process, especially at the beginning: We want to include an onboarding phase with a strong personal and "value calibration" element, which can at the same time, involve individuals more tightly in the process, create awareness on the benefits of co-operation, teach them on impact and resilience analyses and make them feel more relevant, confident and therefore also more active throughout further discussions.

In this sense, many insights gained from the Indian case studies can therefore be incorporated into our general methodology for participative and future-proof area deeloped and afterwards transferred to other (similar) regions.

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