The Incremental City as a Participation Strategy for Co-Produced Neighbourhoods: An Alternative Urban Development Model for Rapidly Urbanizing Regions

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ABSTRACT

In order to create resilient and sustainable cities in Africa, it is necessary to accept that replicating traditional urban design and urban development patterns of the global north is not suitable to adequately incorporate the differing framework conditions prevailing in this diverse context. Rapidly urbanizing regions in combination with socio-economic challenges need novel approaches to sustainable cities with the potential to create long-lasting positive impact regarding resource consumption and social development. Various experts are demanding to accept the informal sector as the predominant form of future urban space production, anticipate the development of self-built settlements, and incorporate them into formal planning processes. (Werthmann, 2014) The concept of co-produced neighbourhoods takes up the above-mentioned approach of anticipation and develops it further into the ´Incremental City´ strategy, a hybrid urban development model that brings together aspects of top-down planning and bottom-up self-organisation as well as giving ample space for informal self-building. (Turner, 1977; Caminos, Goethert, 1978; Aravena, Iacobelli 2016). This paper outlines the key aspects regarding the implementation process of the Incremental City planning strategy for co-produced neighbourhoods based on a dissertation published in 2021. (Giralt) The focus lies on a first approach for good governance, stakeholder engagement and policy innovation for inclusive development. It summarizes the prerequisites for successful co-produced cities, describes the urban coding approach, which combines the urban plan with a code of conduct and set of responsibilities for the different stakeholders involved, and demonstrates how to adapt formal framework conditions to informal practice in order to pave the way for successful co-produced neighbourhoods.

Key words: Urban Design, Informal Urbanisation, Incremental Housing and Urbanism, Coproduced Neighbourhoods, Participation Implementation Strategies

1. INTRODUCTION

Context of study and objective

According to UN projections, the number of inhabitants of informal settlements in the global south is expected to increase significantly by 2050 due to continuous population growth and urbanisation. (United Nations, 2019) This is especially true for Sub-Sahara Africa where the population will double in the next three decades.

The prognosis of two billion additional city dwellers globally until the end of this century will lead to an enormous consumption of space and resources, with correspondingly far-reaching, global consequences for the environment, economy and society. A key difference to previous periods of urban growth is the fact that this growth in the coming years will not take place in industrialized countries, but in regions that will have significantly fewer resources available. This wealth and income inequality, combined with a multitude of push

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and pull factors, has a strong influence on future migration movements. In addition to other important aspects related to population growth, the question of the conditions under which the new city dwellers will live and work is of central social importance. Demographics and urban growth are predictable and sufficiently accurate to allow anticipating the extension of self-built settlements. Starting point is the assumption that we have to accept the informal sector as the predominant form of urban space production in the future. (Gouverneur, 2015)

In the context of rapidly growing cities in the global south, this paper deliberately excludes the question of effective transformation strategies for existing informal settlements. Instead it focusses on one specific approach for the co-produced city as greenfield development often described as site-and-service or incremental housing strategy. The objective is to develop a modular and scalable planning approach using a combination of robust infrastructure (Angel, 2011, p. 57) and flexible self-built infill. (Gouverneur, 2015, XXIV) As a low-cost, low-tech approach, this results in a multitude of advantages, like reduction in land and material usage, increase in building density, small-scale plot and building structures, diverse mix of uses, improved walkability and a reduction in resources for technical infrastructure and mobility. In addition, it can be argued that site-and-service and incremental housing strategies are more efficient in terms of resource consumption and speed of delivery than conventional social mass housing programmes. (Davis, 2007)

In co-production and self-construction, the focus lies not on physical execution by the users, but on their decision-making authority. If the people affected are at the centre of the planning process, it is possible to create housing that is tailored to their needs and possibilities. (Turner, 1972) While the urban plan and structural design guidelines of the Incremental City strategy are discussed in more detail in another publication (Giralt, 2023) and a dissertation (Giralt, 2021), this paper focuses on participation and implementation strategies: How could a planning strategy for the informal self-build look like and how could it be implemented?

> „Expansion of Cities is important as long as they are well planned. Well planned doesn´t mean making an instant, perfect city. It means providing the infrastructure of a messy and incremental city." (Ricky Burdett, The Quito Papers: Towards an Open City. LSE Cities, 2016, Min 10:30)

Hypothesis

A hybrid urban development model can combine the strengths of supportive formal planning (top-down) with the flexibility and efficiency of informal urban production (bottom-up) in future co-produced cities. Through urban coding, a combination of a structural concept and urban planning metrics (urban plan), as well as appropriate planning requirements, design guidlines, and a code of conduct (urban code), dynamic urban growth can be managed.

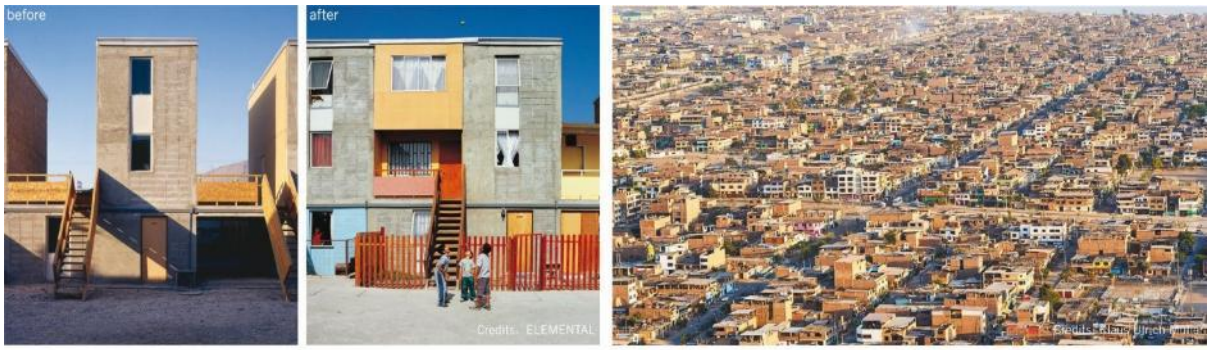

Figure 1: From Incremental Housing to Incremental City

Research Gap

When evaluating the available literature, one finds that there are already several publications on the topic of co-produced neighbourhoods. Many of these publications date back to the 1970s/80s, when these concepts were implemented in relatively large numbers. It is therefore worth re-evaluating these successful built examples from today's perspective and analysing the strategies for their suitability for rapidly growing cities in the present and future.

For the successful realisation of this alternative planning approach, it is essential to consider the role of the stakeholders and the process. The aspects of self-construction and participation in particular mean that settlers and future city dwellers play a much more central role than in conventional urban planning projects.

In co-production, participation processes have an outstanding significance, as the future settlers actually become the driving force and central actors in the future co-produced neighbourhood through their active participation, self-building on the plot and often also through the collective expansion of the supporting technical infrastructure. In this context, it is particularly decisive how the interface between the formal and the informal level is designed and how the power of decision and responsibility are allocated, to enable the successful coproduction of future urban extensions. The main sections in this paper will therefore examine which factors are decisive for successful implementation.

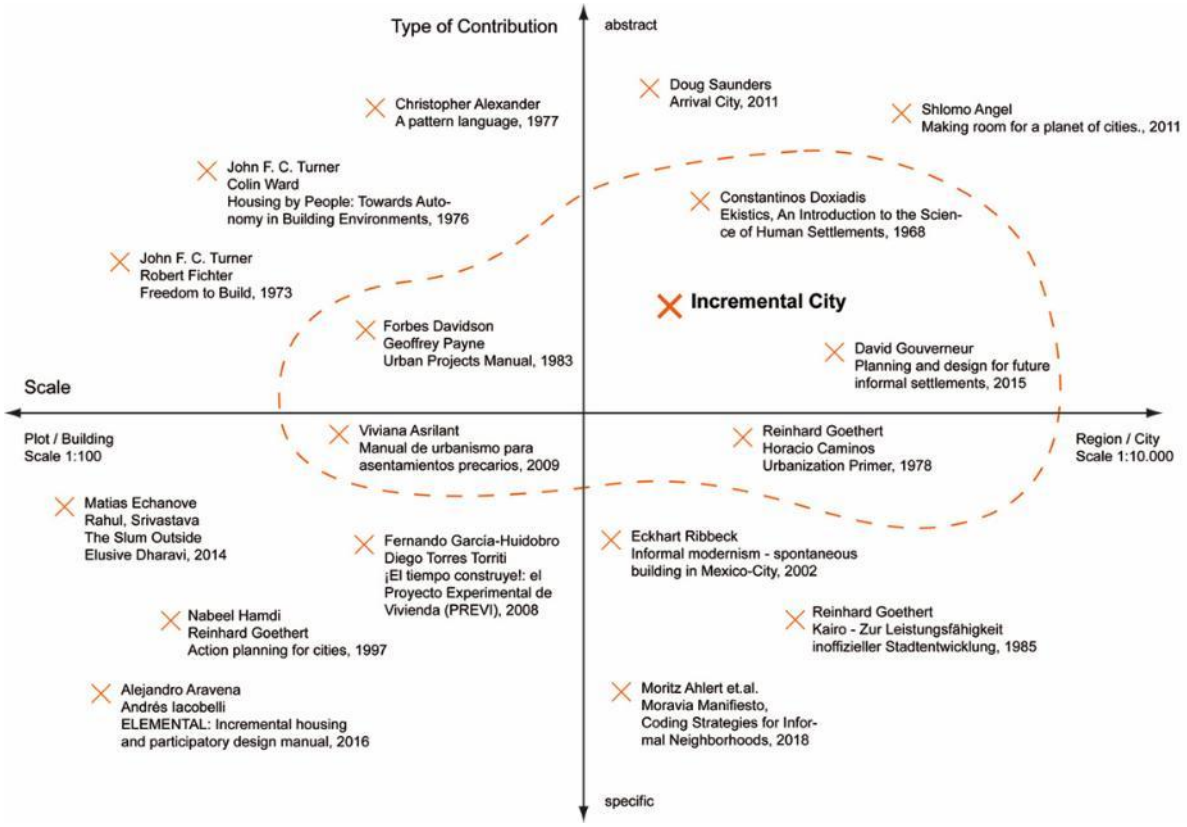

Figure 2: Thematically related authors and publications (selection)

Methodology

To answer the research questions, this work draws on various sources of knowledge between theory and practice. It draws on a foundation of personal experience and first-hand observation on the ground in various regions of Asia, Africa and Latin America, combined with a professional background in architecture, urban planning and strategic land development.

The research methodology consists of four parts. The first part includes the work with literature sources in the thematic field of informal settlement development and self-building. The second part represents the analyses of case studies, which cover both the structural characteristics and urban development indicators as well as the historical and social framework conditions. The third part represents the coding process, i.e., the development of a planning tool for the co-produced neighbourhoods. The development of such a tool has a significant design component and therefore can be methodologically referred to as research by design. Finally, a series of test planning projects were carried out in a workshop and urban planning master studio at KIT Karlsruhe Institute of Technology to test these design guidelines for applicability, the results of which are shown at the end of section 2.1

The preliminary results concerning the participation and implementation strategies presented in this paper are a result of case study analysis combined with research in literature. They are meant to summarise the findings during the process but do not claim to be complete. Rather, they form the starting point for further discussion and exchange of experience with experts.

When considering implementation, it is important to clarify that there can be no standardised blueprint for the realization of a co-produced city that covers all actor constellations. The appropriate

implementation strategy is much more dependent on the local context than the physical urban structure. Although a good structural concept is a necessary condition for successful development, it is not a sufficient condition and therefore also requires a customised implementation strategy as a mandatory prerequisite. The aim of this paper is therefore to identify the central aspects in the implementation process of a co-produced city, without, however, attempting to draw up a universally valid scheme.

The remainder of the paper is structured as follows. Section 2.1 illustrates the key elements of the urban planning concept as a robust infrastructural framework combined with flexible self-building on individual plots as well as showing exemplary results in the form of test planning studies. Section 2.2 outlines the prerequisites for successful co-produced cities, like availability of land, solutions for financing, good governance, capacity building and innovative government frameworks that create ample space for participation, collaborative processes and self-governance. Section 2.3 presents the main components of the hybrid urban development model and explains how these combine top-down and bottom-up in an urban coding concept. It outlines the urban coding approach, a combination of urban plan, urban code and site specific planning processes. Section 2.4 describes the areas of responsibility for different entities like politics, administration and planning (top-down) as well as settlers and future city dwellers (bottom-up). These are presented as a proposal of guidelines in the form of a code of conduct reduced to the essential rules and describes the interfaces between the areas of responsibility of the two spheres.

2.1 DESIGN GUIDELINES FOR THE CO-PRODUCED CITY

The following description of the structural concept and urban design guidelines of the Incremental City strategy is an extract from a dissertation (Giralt, 2021) and a summary in the paper ´Incremental City: An Urban Coding Strategy to Create Livable Future Co-Produced Neighbourhoods´. (2023)

DE-CODING: Analysing the Self-Built City

To analyse and compare the urban qualities of planned self-constructed neighbourhoods the following six case studies have been selected: Nezahualcóyotl in Mexico City, Mexico; Solanda in Quito, Ecuador; Villa El Salvador in Lima, Peru; Carrières Centrales in Casablanca, Morrocco; Ard el-Lewa in Cairo, Egypt and Aranya in Indore, India.

Figure 3: Scale comparison of neighbourhood modules in case studies.

Each of the six projects has a unique history of development and structure of stakeholders. In some analysed aspects of urban planning, we find similarities, in others, there are substantial differences. The following paragraph summarizes the five key findings:

Structure and Hierarchy: All projects follow a modular-hierarchical structure that ranges from rigid orthogonal grids like in Villa El Salvador or Nezahualcóyotl to complex spatial frameworks like in Solanda or Aranya.

Networks of Streets and Paths: Usually there are three to four levels of access hierarchy. In all projects, at least parts of the street network double up as multifunctional public spaces, mainly close to individual homes.

Open space and Social Infrastructure: Most projects use public open spaces as an integral part of their urban layout. Especially Solanda with its archipelago of differentiated public green spaces and the interconnected green network of Aranya show successful solutions for liveable neighbourhoods. Furthermore, all projects combine social infrastructure with public spaces to use the scarce resource of space in the most effective manner.

Plot and Block Structure: The chosen size and proportion of plots have a direct influence on the achievable long-term density and height of the buildings. The study shows that families stop extending their homes at a certain moment, which causes stagnation of density. This brings us to the conclusion that the optimization of net building land and providing large individual plots are misleading. Small plots and additional public space create more attractive neighbourhoods while achieving similar average densities over time.

Adaptation to local context: The analyzed examples show a wide array of adaptations to the local context regarding social, cultural and climatic aspects. One example to point out is the strict hierarchical layout of Villa El Salvador, where the urban grid is a direct representation of the local system of self-organization on block and neighbourhood levels. Also to mention is the adaptation to topography

and climate, e.g. optimizing cooling wind directions and solar protection in the Aranya project.

Figure 4: Comparison of urban structure in four exemplary case studies

These findings and best practice examples from the analysed case studies have been extracted as conclusions and form the basis for the proposed design guidelines described in the Incremental City strategy.

CODING: Design Guidelines of the Incremental City

The design guidelines for co-produced neighbourhoods are the result of a research process in literature as well as the findings derived from case studies combined with the professional experience as an architect and urban planner. The design toolbox for the Incremental City consists of six spatial components which are outlined in the following description.

> „In essence, coding generates urban order by the generic specification of allowable and necessary components and relationships." (Marshall, 2011, p. 6)

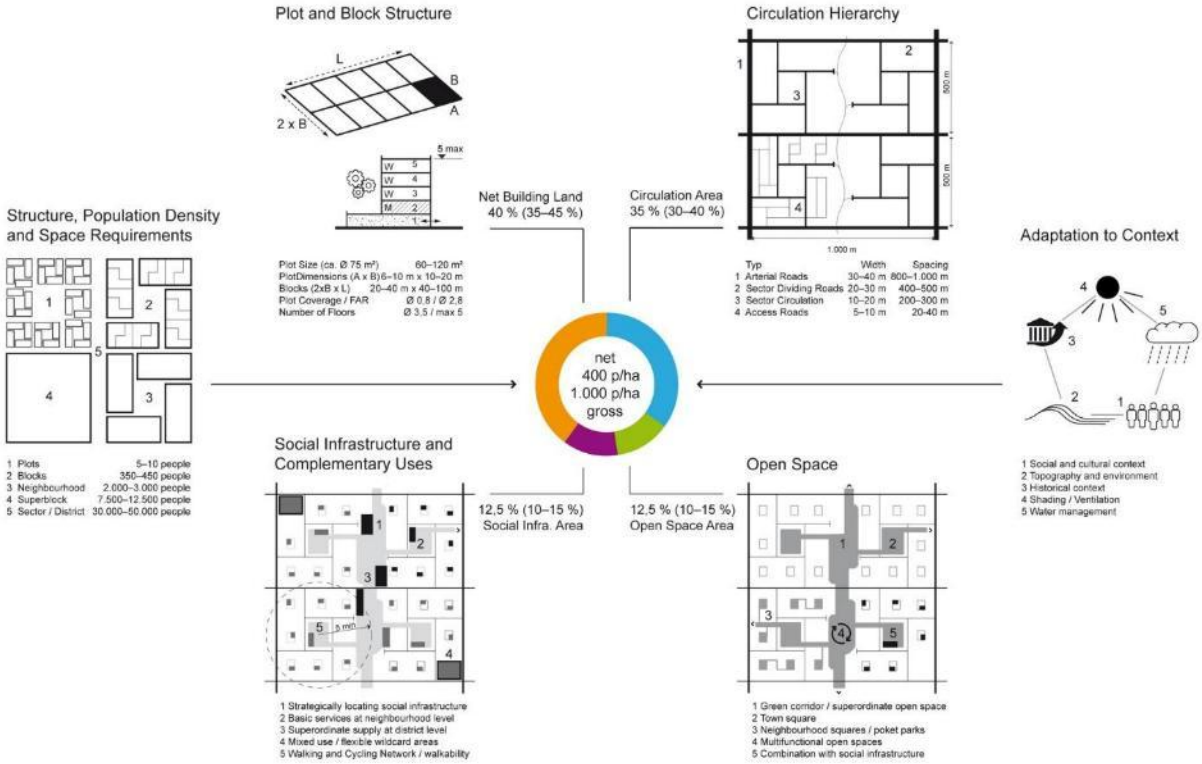

Figure 5: Urban Design Toolbox of the Incremental City

1) A hierarchical structure forms the basis for any modular and scalable urban system. (Alexander et al., 1977) An urban hierarchy of streets, public spaces, social infrastructure and distribution of functions provides orientation and identity.

2) The network of streets and paths. It provides a structure, which can be repeated and extended to a grid or layered spatial framework. Combined with access to public transport, optimized network lengths and increased walkability it forms the basis of the infrastructure grid.

3) A framework of public spaces works as a powerful tool to structure neighbourhoods. These public spaces are multifunctional and cater for a wide range of users. Multiple uses in the same space are staggered in the course of the day to maximize the use of rare public space resources.

4) Social infrastructures serve as gravitational centres in the urban system. Strategically located infrastructure guides incremental growth into desired directions and works as a protector of public or ecologically important spaces. Certain institutions may be used to create destinations of city-wide importance within new neighbourhoods and thus contribute to a more equal city.

5) The plots and block structure in which the principles of informal modernism serve as a blueprint of the urban design. (Ribbeck, Padilla and Dahman, 2002, p. 14-15) Moderate height and full use of the plot create the basis for a low-rise and high-density urban development model. The gradual expansion and incremental growth of the neighbourhood and on individual plots are some of the most visible characteristics of the Incremental City.

6) The adaptation to the local context. All of the spatial components need to be adapted to topography, climate and natural environment and for example include solutions for shading, ventilation and precipitation. Finally yet importantly, the urban framework not only needs to be adapted to the social, cultural and historical context. Preferably, it should use the

specific context as a source of inspiration to create a unique neighbourhood with a strong identity.

Based on this toolbox, test planning projects were conducted as part of an urban planning master studio at KIT. The following selection of results shows the variety of possible solutions within this seemingly restrictively defined planning framework.

Figure 6: KIT Urban Design Master Studio; Sebeta, Ethiopia; By Lukas Benz, Xiang-Ru Zhu

Figure 7: KIT Urban Design Master Studio; Athi River, Kenya; By Julia Henschel, Johanna Olfen

Figure 8: KIT Urban Design Master Studio, Kigali, Rwanda; By Felix Mielich, Adrian-Petru Tanasescu

2.2 PREREQUISITES FOR SUCCESSFUL CO-PRODUCED CITIES

When defining the framework conditions for successful co-produced cities, there is a broad consensus across various authors on the necessary basic requirements. For example, Gouverneur (2015, p. 124), Wainer et al. (2016, p. 19) as well as Davidson and Payne (1983, p. 84) describe almost identical framework conditions that differ only in details which is summarised in the following diagram.

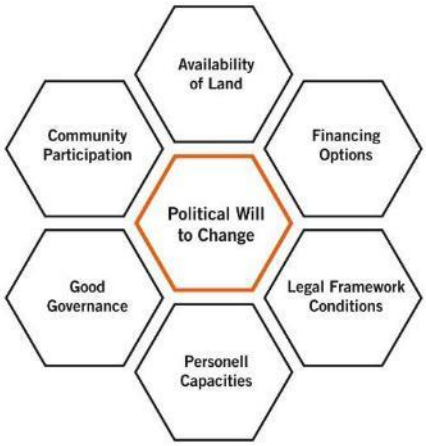

Figure 9: Prerequisites for successful co-produced cities

The authors mentioned above emphasise that the fundamental prerequisite for the success of all further steps is **political will**. Only with the will to change the status quo, with the will to take into account the actual concerns of the lower-income sections of the population and with the will to adapt existing regulations to informal realities will it be possible to realise a co-produced city. The planning results are therefore to be understood as an expression of the political and social preconditions, in this respect planning can be understood as a political act.

It should not be forgotten to point out that, in addition to a lack of political will, there are issues regarding the imbalance of power, including issues of corruption, often also involving international organizations as well as strong forces of inertia that have a vested interest in ensuring that conditions do not change. UN-Habitat identifies the large profits in the informal transport sector or in the area of informal water supply as specific examples for this phenomenon. (UN-Habitat 2014, p. 37)

> „However, this explanation is insufficient. In cities across the region it is often vested interests that are to blame for public inaction. […] In other words, informality and inadequate infrastructures allow powerful groups to benefit from the status quo.“ (UN-Habitat 2014, p. 37)

In addition to the political will, sufficient resources are required. On the one hand, this includes the **availability of land** in the public and private sectors. On the other hand, the **financing** of land purchases and development measures must be secured, and a flexible combination of savings, subsidies and loans is necessary for the financing strategy of the settlers' needs. (Wainer et al. 2016, p. 19)

However, before the financing requirements are determined, it is necessary to fully exploit the potential for cost optimisation in the design. Early cooperation between politicians, authorities and planners will create the **legal**

framework conditions that enable unregulated self-build on the plot and guarantee secure land ownership (security of tenure). In addition, sufficient **personnel capacities** in authorities and planning are crucial in order to get such a project off the ground. The authors agree that a commitment to **good governance** is another key success factor. Gouverneur particularly emphasises the importance of the settlers and their ability to organise themselves. (2015, p. 124) However, it is at least as important as **participation and support** for the first steps to maintain a long-term commitment to the community and to be able to offer the settlers advisory support in various areas.

Only once these foundations of the project have been secured can specific planning take place, taking into account the specific framework conditions of policy, actual available space, funding and human resources. In order to be able to better categorise the described prerequisites for co-produced cities, they are thematically structured and explained in more detail on the following pages.

According to Davidson and Payne, planning for the co-produced city should be effective, efficient and respectful. Effective, because plans are practically useless if they disregard the political, legal and technical framework conditions without any chance of being realised in reality; efficient, because they must be cost-effective in order to meet the framework conditions of limited land availability and scarce financial resources of the co-produced city; and respectful, because the housing issue concerns one of the central needs of the people and their planning must therefore be treated with due respect for the reality of the settlers' lives. (Davidson and Payne 1983, p. 84)

> „The symbiosis between caring management and good design is the best formula for giving new settlers a sense of security. “ (Gouverneur 2015, p. 174)

2.3 A HYBRID URBAN DEVELOPMENT MODEL FOR CO-PRODUCED CITIES

Urban coding as a combination of urban plan, urban code and process

The structure of the hybrid urban development model is based on the concept of urban coding. The two central pillars of urban coding for future co-produced cities are the urban plan as a spatial structural framework with the associated urban planning parameters and the urban code, as a collective term for planning and design guidelines, and a kind of set of rules or code of conduct for the actors involved.

> „To design these forms that compose a city-aggregate, two main languages are used: URBAN PLANS and URBAN CODES. While plans articulate the layout of the city in a blue print, urban codes can be seen as the ´hidden language of place making´.”
> (Ben-Joseph 2005, in Ahlert et al. 2018, p. 73)

As can be seen in the following diagram, both the Urban Plan and the Urban Code are incorporated into the implementation process. Together, these aspects form the Urban Coding strategy for the development and implementation of a co-produced city.

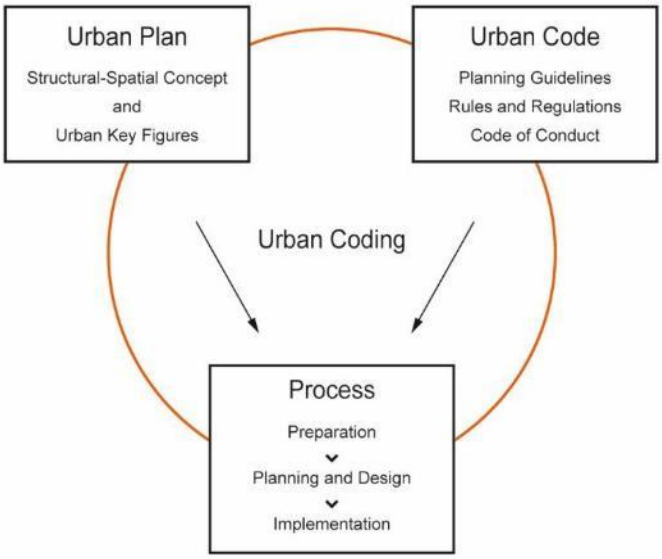

Figure 10: Urban coding as a combination of urban plan, urban code and process

From the structural concept in section 2.1 ´Design Guidelines for the Co-Produced City´, it has become clear that the concept of the incremental city is based on a combination of top-down planning of an infrastructure framework and bottom-up self-organisation and self-construction, and in this respect represents a hybrid approach. Formal and informal urban production already exist in parallel in many cities in the Global South. They coexist, but at the same time they are characterised by a major imbalance. On the one hand, the formal and informal spheres are closely intertwined via diverse material and production cycles as well as employment relationships, while on the other, a structural-spatial segregation is often clearly evident. One of the main shortcomings is the imbalance in the quality of public services and supply facilities. This concerns technical infrastructure and accessibility as well as access to educational and health facilities, culture, public open spaces and employment opportunities.

Therefore, the aim is to address this shortcoming by gradually equalising the quality of public infrastructure provision. In order to achieve this goal, a hybrid city model is being developed in a process of approximation and adaptation that combines aspects of formal planning and informal self-building.

A combination of aspects from both spheres is necessary, as both purely formal and purely informal urban production are not able to deliver the desired results for low-income sections of the population. The formal processes and structures are usually too costly due to complex urban development measures and are too slow to implement. They inhibit self-building on the plot due to a multitude of regulations. In informal settlements, development is usually centred on the plot, but public space for circulation, open spaces and infrastructure provision is often ignored, which in turn leads to other negative results. (Gouverneur 2015, p. 182) The aim is to combine the positive aspects and strengths of each sphere in a hybrid concept.

The Incremental City toolkit consists of a combination of design guidelines and codes of conduct. The formal components primarily relate to the planning of an infrastructural framework. For this purpose, a development grid, open space system and the allocation of social infrastructure provision are developed in a design process on the basis of previously defined target population densities and a suitable urban structure in various hierarchical levels. Within this infrastructure framework, individual self-build solutions can be

implemented on the individual plot, in the block and in the neighbourhood, while adhering to a minimal set of rules.

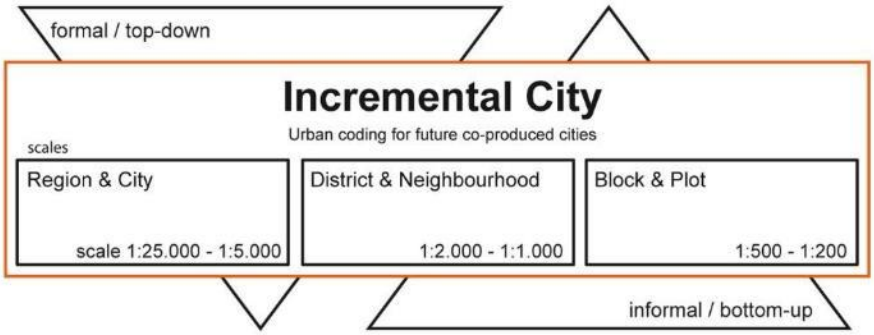

Figure 11: Schematic diagram of the hybrid city model of the Incremental City

The schematic diagram above shows the hybrid urban development model of the Incremental City It shows that the formal and informal contributions are not equally distributed across all scales, but are combined in different proportions depending on scale and specific planning task.

Adapting formal framework conditions to informal practice

In order to apply the hybrid urban development model described in the previous section as a combination of formal planning and informal self-construction, adjustments to the formal framework conditions are necessary. The previous section 2.2 summarised the prerequisites for a successful co-produced city. Once the availability of land, funding, legal framework, personnel capacities, good governance and opportunities for participation by future settlers have been secured, the next step is to design the spatial structure of the future neighbourhood.

Section 2.1 summarises the design guidelines in six thematic categories that can serve as a starting point for the structural concept. The aim is to achieve a design balance between the formulated requirements for urban organisation, such as population density, circulation, open space, social infrastructure, plots and block structure, and ultimately the local context. The individual structural concept of a co-produced city is created by blending different requirements and interests into a balanced design. The planning system consisting of modular planning and infrastructure components creates a basic framework for the flexible expansion of the plot, block and neighbourhood.

In order to create the necessary conditions for the co-produced city, to apply the design guidelines and to accept a minimal set of rules for self-build, the existing official restrictions must first be dismantled. It is important to identify the forces of inertia that are currently preventing a change in policy, administration and planning culture in the individual context. Knowledge of the prevailing power hierarchies and actor constellations is the key to changing the planning culture. One of the fundamental prerequisites is the political will to change the status quo in terms of dealing with the lowest-income sections of the population which leads to the responsibility of politics and authorities.

> „An urbanism based on co-production stimulates mutual learning effects and local identification, moreover it benefits all stakeholders involved in making the city.“
> (Ahlert et al. 2018, p. 155)

Historically, planning was a government responsibility for a long time. However, this clear categorisation began to dissolve in the 1960s at the latest with the Right to the City movement (Le droit à la ville, Lefebvre 2015). The development continues to this day, also against the backdrop of better availability of information and new opportunities for networking among citizens, new forms of citizen participation are becoming increasingly important in urban planning. What initially began as an unconventional approach is now referred to as a bottom-up contribution to planning and involves a range of different public and private players such as (neighbourhood) associations, citizens' initiatives and residents. Very different interests and levels of information, commitment and expectations come together and manifest themselves in a variety of hybrid forms of planning.

> „In contemporary planning theory, bottom-up planning splits into a variety of hybrid forms including participation, collaboration und co-production.“ (Ahlert 2018, p. 75)

According to Ahlert et al., the boundary between top-down and bottom-up is becoming increasingly blurred by the urban coding process. Formalising specific informal practices - such as self-build mechanisms - in an urban code can help communities to protect their rights and assert their needs, especially when it comes to potentially conflictual issues. (Ahlert 2018, p. 75)

> „The meaning of land, and the legitimacy of who governs it, is very often socially determined. To make matters more complex, none of these systems have remained static. Alive to the demands of rapid urbanisation, systems have adapted over time and continue to do so today. Such systems co-exist as they adapt, often resulting in hybrids that are neither exclusively Western or African, neither legal nor illegal, neither formal nor informal, neither private nor customary, neither local nor official.“ (Napier 2013, p. 50)

Innovative forms of governance (innovative government frameworks), transparency and a strong culture of communication in the decision-making processes are needed in order to adapt the existing formal framework conditions to the informal realities. Section 2.2 on the prerequisites for the co-produced city has identified the key issues.

This concerns access to land and the land market, financing options, legal framework conditions such as building and planning law, but also the registration of secure land tenure, organisational forms of administration and planning, planning methods and guiding principles, to participation, involvement and shared responsibility of the settlers. What all these topics have in common is that there is an urgent need to adapt the formal regulations to the informal realities and that the actual needs of the low-income population groups must be taken into account.

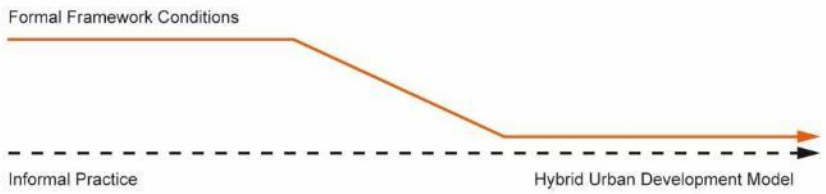

Figure 12: Adapting formal framework conditions to informal practice

This process is explicitly not about a merely temporary legitimisation of the informal within the existing formal system, but about a long-term, effective, gradual adaptation of formal regulations to informal practice. In this context, the hybrid urban development model and the set of rules are to be understood as a dynamic and adaptable planning tool that does not produce homogeneous standard solutions, but rather enables adaptation to the local context and a reaction to changing needs over time.

> „Standards - in both planning and architecture - should be perceived as a dynamic regulation tool, responsive to needs and uses that emerge“ (Wainer et al. 2016, p. 34)

In the development process, complexity, imperfection and ongoing transformation are accepted as an integral part of the Incremental City. Continuous planning and technical assistance will support the self-build development. Through simple yet effective solutions, the attitude or mind-set of the society towards self-build is gradually improved. (Governor 2015, p. 268)

> "Furthermore, incrementalism is - in its essence - a trade-off option for achieving low income housing in a good location, and implies a mind-set change in terms of building standards and the speed of progress to 'polished' neighbourhoods." (Wainer et al. 2016, p. 34)

The respective requirements for the planning regulations must be clarified in each specific project and the right degree of control and the necessary room for manoeuvre determined. An all-round acceptance of the division of labour between planning and self-construction can also persuade the settlers to accept a small set of rules in exchange for the greatest possible freedom in construction. It is therefore important to find an agreement on a minimum repertoire of rules in a cooperative process between settlers and administration during the coding process. In the end, this minimum regulatory repertoire can be assigned to the respective areas of responsibility of politics, administration and planning as well as the settlers which is described in the following section.

2.4 RESPONSIBILITIES AND CODE OF CONDUCT

Structure of the urban code and its interfaces

In this study, a distinction is made between the spheres of formal top-down planning and informal bottom-up self-construction. The top-down category includes the areas of politics, administration and planning. On the other hand, the bottom-up category combines the actual self-construction as well as various forms of self-organisation, self-administration and collective self-help in the form of cooperatives or grassroots movements.

The distinction between the areas of responsibility described below and the respective Code of Conduct also runs along these lines. This allocation is a rough simplification so that the concerns of the different spheres can be presented in a clear form. Many challenges in connection with co-produced neighbourhoods represent complex problems that cannot be solved by individual disciplines separately, but only through interdisciplinary and multidisciplinary approaches. (Schönwandt 2013, p. 22) A close cooperation between the actors involved in the top-down sphere is therefore essential and must be guided by common goals. In this respect, the boundaries between the professional disciplines are becoming increasingly fluid and thus enable a joint approach. On the other hand, there is the bottom-up sphere, in which the concerns of citizens, settlers, residents and users of the city as well as the actions of self-construction, self-

organisation and self-administration are combined.

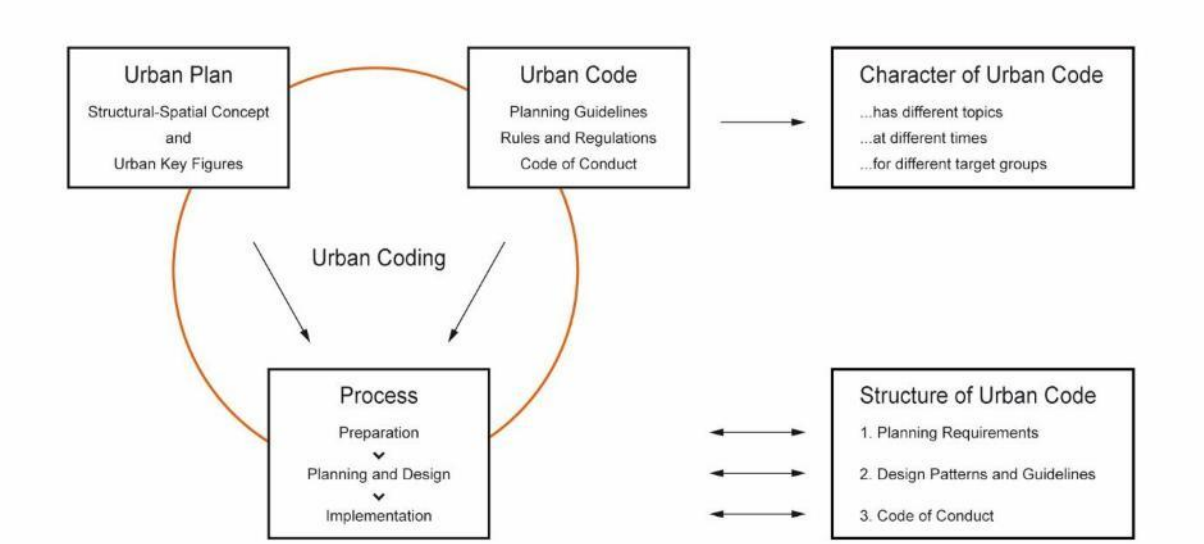

Figure 13: Character and structure of the urban coding process

As the diagram above (figure 8) shows, the urban coding strategy consists of various components that are closely interrelated. One key characteristic is the hybrid nature of the underlying city model. This means that the formal and informal spheres are closely linked at the level of the structural concept (Urban Plan) and at the level of guidelines or the code of conduct (Urban Code), as well as in the implementation process. Depending on the project, however, the responsibilities and opportunities for participation of the respective spheres are distributed differently. The Code of Conduct therefore has different content for different addressees at different times.

The following diagram (figure 9) shows that the responsibility in the planning preparation phase lies mainly with policy-makers, administration, and planning. Only in the design process and in the area of finding specific solutions does it seem sensible to involve the sphere of informal urban space production. However, in the realisation phase, self-construction, self-organisation and collective self-help ultimately become the driving force for further development on the long road towards a consolidated part of the city.

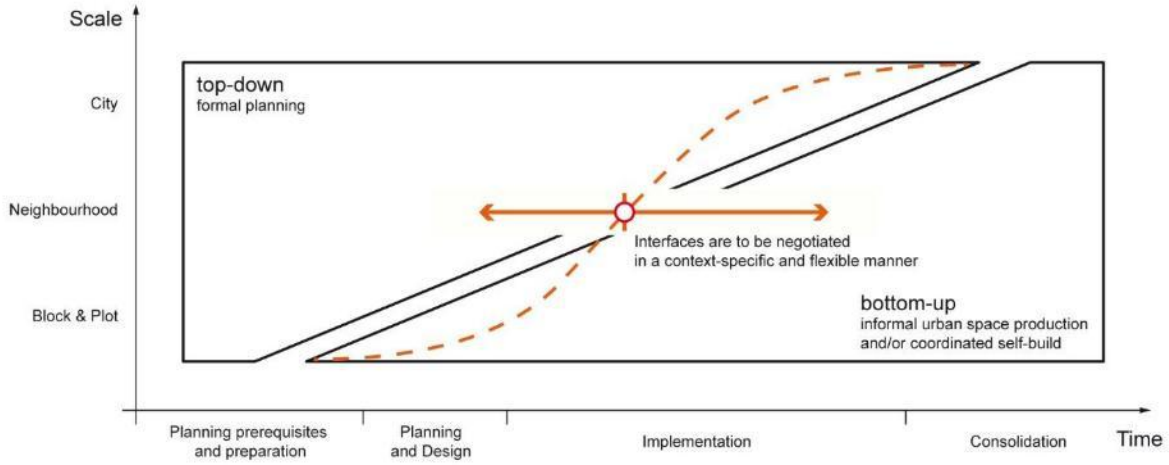

Figure 14: Dynamic adaptation between the formal and informal spheres depending on scale and time

It can be stated: The larger the scale, the greater the proportion of formal planning, and the smaller the scale, the greater the scope for informal urban production will be. Analogous to this statement, the earlier on the time axis, the greater the proportion of formal planning, and the later in the process, the greater the proportion of informal urban production becomes.

The areas of influence of the formal and informal spheres can therefore be assigned to different planning phases and scales. The two spheres are not in competition with each other, but work towards a common goal in the sense of co-production. It is not possible to precisely define a universally valid interface between these spheres, but it seems sensible to locate the interface at the neighbourhood level. Based on the proposed structural-spatial pattern of the Incremental City presented in section 2.1, a neighbourhood corresponds to an area of around half a dozen hectares and assuming a population density of around 2,500 inhabitants for such a neighbourhood in the final stage of development. However, it can be assumed that this figure will be significantly lower at the beginning of the settlement and that self-organisation and forms of participation will therefore be easier to implement.

In a specific project, the perimeter and location of the settlement area could be determined by top-down planning, while the flexible infill, i.e. the block and plot structure, is developed together with the settlers. As the settlers are directly responsible for the construction of the houses, the dialogue process should start with the plot and the following questions should be clarified: What local forms of housing typologies are suitable? What household sizes are expected? What plot sizes are required? What financial scope is there for the city and settlers? What local building materials and techniques are available? Are there already certain social groups within the settler group that would like to live in close proximity? How large are these groups? How many plots form a block or a courtyard? Which open spaces and functions are actually needed? What areas are required for this and how are these organised and allocated in the urban layout?

Area of responsibility for policy, administration and planning

Even if the interfaces between the formal and informal spheres can only be roughly outlined, the following paragraphs summarize the essential rules or a code of conduct for both areas. Firstly, the formal sphere (top-down) and in particular the repertoire of urban

planning and related disciplines will be described. This is followed by the informal sphere (bottom-up), with a particular focus on informal urban production and the repertoire for self-building on the plot.

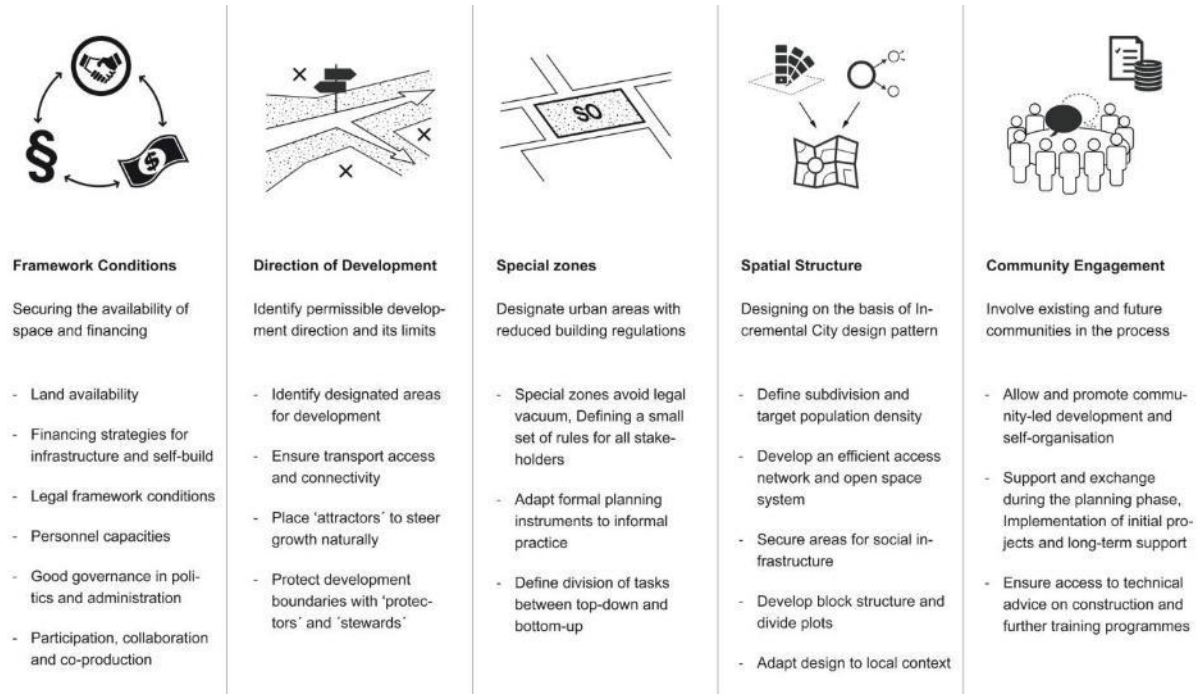

Figure 15: Code of conduct for administration, politics and planning

1) Politics, administration and planning are primarily responsible for creating the framework conditions. First and foremost we need the political will for change and to overcome the forces of inertia that have an interest in maintaining the status quo. It is then necessary to ensure the availability of space, financing, legal framework conditions, personnel capacities, good governance of politics and administration as well as the participation opportunities of future settlers.

2) The development of the city can be steered by clarifying regional and spatial planning issues. The aim is to obtain clear statements on the spatial direction of development. Existing and future development axes are identified as attractors in development corridors and suitable areas for future co-produced urban expansions are identified. At the same time, boundaries are defined to protect ecologically or agriculturally valuable areas, the edges of which are protected from unwanted settlement by protectors in the form of temporary or permanent open space utilisation or social facilities.

3) In the next step, the identified development areas are categorised into construction phases and initial measures are derived. Special zones can be designated for areas intended for co-production or self-build. These urban areas with special building and planning rights enable the formalisation of informal self-build practices and thus create the basis for legal and investment security and pave the way for the long-term consolidation of the district. To this end, the formal planning instruments are adapted to the requirements of self-build and the expected division of labour between municipal administration and settlers is defined.

4) Once these framework conditions have been determined, the actual planning for a structural-spatial plan can be carried out on the basis of the design guidelines presented in

Chapter 2.1. These patterns for structural hierarchy, road network, open space, social infrastructure, block and plots as well as local adaptation, organised according to six subject areas, provide design suggestions for various planning scales from the plot to the district. Specifically, the street grid, open space system and block structure are to be developed, which offer an optimal basis for incremental self-build on the plot.

5) In the context of the co-produced city, continuous dialogue with the community and moderation of the process are essential for long-term success. The interface with administration and planning is therefore of central importance. Authorities, administration and planning should be represented to the settlers by a small circle of people, thus providing the settler community with long-term contacts and advisors from the administration and planning side. They have the task of conveying information, jointly developing solutions or sharing knowledge through suitable media or in the form of information events, workshops or seminars. The aim is to give the communities themselves the opportunity to help shape future development; to achieve this, self-organisation, participation and shared responsibility must be allowed and encouraged.

Area of responsibility for settlers and future city dwellers

As part of the co-produced city concept, settlers and future city dwellers are primarily responsible for building on their own plot of land. To ensure the smooth development, a manageable set of rules must be imposed on the settlers. By adhering to this Code of Conduct, undesired developments can be significantly reduced and costly construction errors and the structural risks of the load-bearing elements can be avoided. These regulations increase the likelihood that such an approach can be accepted by the responsible authorities in special development zones described above. For the concept of the co-produced city, it is not decisive what standard of provision is achieved at the time of handover. Much more important is the question of what standard of development can be achieved in the long term. The statements in the Code of Conduct do therefore not refer to the standard of infrastructure or buildings at the beginning, but primarily define the further expansion of the buildings.

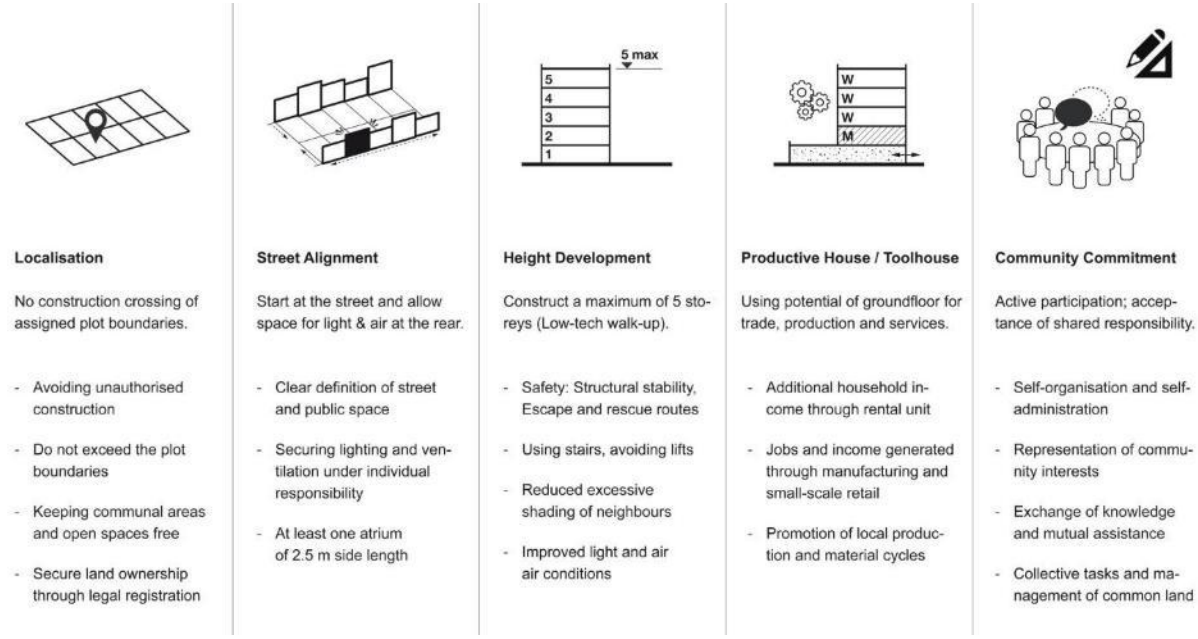

Figure 16: Code of conduct for settlers and future city dwellers

1) The first rule of the code relates to localisation. According to this, all building activity must be restricted to the allocated and registered plot. This prevents unauthorised building without secure land ownership. Exceeding the plot boundaries is generally not permitted. In this way, neighbouring properties, communal areas and open spaces are protected from unwanted construction.

2) The second rule concerns adherence to the street alignment. Ideally, the building should start at the street and thus support the definition of the public space at an early stage. In addition, sufficient space for lighting and ventilation should be ensured at the rear. If the plot is completely built over, a light atrium and adequate ventilation shafts must be provided. In practice, however, it is very difficult to check compliance with the lighting and ventilation requirements. The implementation of the lighting and ventilation requirements is therefore the responsibility of the building owner.

3) The height development is limited to twice the width of the street or a maximum of 5 storeys. The development thus follows the guiding principle of a low-rise/high-density structure and thus limits excessive mutual shading, improves the lighting and ventilation conditions, avoids cost-intensive technical installations such as lifts and air-conditioning technology in the sense of a low-tech/low-cost approach to acquisition and maintenance. In addition, there is increased safety thanks to simple structural design with foreseeable maximum load-bearing capacities in the final extension and relatively short escape and rescue routes.

4) The productive house or toolhouse theme is not to be understood as a requirement, but rather as a suggestion to realise the greatest possible mix of uses on the plot. By utilising the potential of the ground floor for trade, production and services, additional employment opportunities and further income are created. In This way, local production and material cycles are promoted and local value creation is supported. A wide range of local amenities will improve walkability and reduce mobility requirements. In addition, additional household income can be generated by renting out residential or commercial space.

5) Another point of the code of conduct is community commitment. This refers to the call for active participation in the settler community and involvement in various sub-projects as well as the acceptance of shared responsibility for the long-term successful development of the co-produced city. This includes, for example, the exchange of knowledge and mutual assistance, the implementation of collective tasks to improve the living environment and self-organisation and self-administration, as well as joint and thus more effective representation of interests towards policy makers, administration and planning.

Since, for organisational reasons, not all those affected can enter into dialogue individually, delegates should be elected, for example one representative per block or defined neighbourhood. These delegates have several tasks and duties to fulfil. Not only do they have to represent the interests of their respective neighbours, they also have to take the information and decisions they receive back to the community. They must ensure that the rules of conduct are adhered to in the interests of the community, as respecting the code of conduct is a basic prerequisite for a functioning system of co-production.

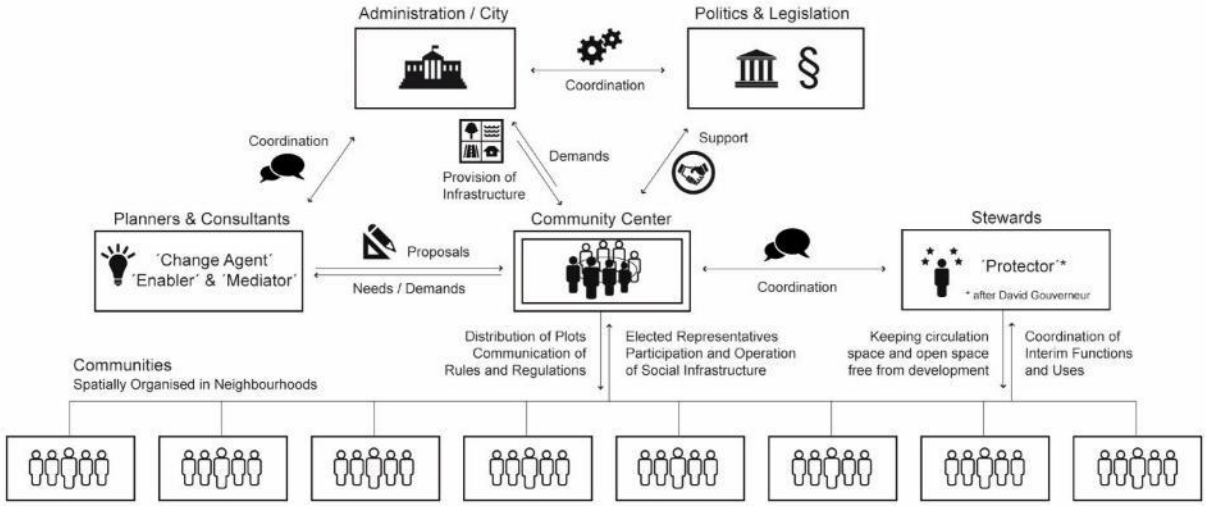

Figure 17: Organisation chart: Actors, tasks and interfaces

3. CONCLUSION

While the questions regarding a suitable structural plan for future co-produced cities can be clarified more specifically by means of design or planning guidelines with underlying urban development indicators, the answers with regard to the urban code and the implementation strategy necessarily remain somewhat more general due to the very different starting conditions. Nevertheless, some results can be noted for the questions formulated at the beginning. These findings can be condensed into a generally formulated plan for action, from which specific starting points for individual implementation strategies can be derived. What are the key points of the process design and the role of the actors involved?

As the concepts in this paper show, there is a broad consensus among experts that the essential condition for a change in the status quo with regard to informal self-construction is political will. However, this requirement is often countered by strong forces of inertia that make rapid change difficult. In addition to this fundamental aspect, six areas were identified that must be ensured as prerequisites. Specifically, these are availability of space,

financing, legal framework conditions, personnel capacities, good governance and community participation. These points can be seen as premises for the implementation of the urban structure outlined in section 2 in order to pave the way for the development of the co-produced city.

In terms of planning and realisation, the implementation strategy follows the concept of a hybrid urban development model as a combination of top-down in the area of responsibility of politics, administration and planning and bottom-up in the area of responsibility of settlers and future city residents. Both spheres form a number of interfaces and are closely intertwined. Depending on the time and scale of the development, the areas of responsibility of both spheres are weighted differently. It can be stated that the most effective stage for negotiation and participatory design decisions seems to be at the scale of neighbourhoods and during the planning stage before actual construction has started.

In order to define these areas of responsibility in more detail, the essential rules were summarised in a code of conduct, which must be negotiated between both spheres on a case-by-case basis. For a successful strategy, it is necessary to adapt the formal framework conditions to the informal practice - an adaptation in the opposite direction does not appear to deliver promising results. This approach is definitely not about abolishing all legal framework conditions for building and planning in the cities and regions concerned. Instead, it is proposed to implement these new regulations within new special urban development zones. In these zones with clear spatial boundaries, self-construction could be implemented with simplified regulations without having a negative impact on the rest of the city.

In this process, concessions must be made by all stakeholders. However, if there is a willingness in both spheres to break new ground and to comply with a minimum of regulations, the probability of an orderly development increases considerably and therefore this strategy might be the starting point for successful future co-produced neighbourhoods.

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