

## CRITICAL SUCCESS FACTORS OF A BOTTOM UP URBAN DESIGN PROCESS TO DELIVER SUSTAINABLE URBAN DESIGNS

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**Abstract.** A sustainable urban environment caters for peoples' need. When the needs of the people are addressed, it increases the property values and attracts investors. The current urban design process is top-down, i.e., Designers and planners play the key role and the community has less engagement. There are serious criticisms of this process as it may not touch the "ground" level requirements, and therefore, these projects will fail to create sustainable environments. Accordingly, to overcome the drawbacks of the current top-down process, researches have discussed implementing a bottom-up process in order to deliver sustainable urban designs. Based on this argument this paper discusses what are the positive and negative implications of a bottom up urban design process and what are the critical success factors which can be derived from a bottom-up urban design process in order to deliver sustainable urban environments.

**Keywords:** bottom-up, urban design process, sustainable urban design, critical success factors, community engagement.

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### Introduction

As Wall and Waterman (2010) state, today, urban design functions are at the crossroads of architecture, landscape architecture and city planning. It has become a collaborative discipline that combines with others to create three-dimensional forms and spaces that function effectively for people. Therefore, as they have stated, urban design seeks to enhance the life of the city and its inhabitants in socio-economic and environmental terms. While urban design seeks to enhance the life of a city and its inhabitants in socio-economic and environmental terms (Wall & Waterman, 2010), the concept of sustainability has become integrated with urban design. As Ritchie and Thomas (2013) describe, sustainable urban design should share the values of social, economic and environmental sustainability. The work of Farr (2007) also emphasises the need for integrating social, economic and environmental aspects of urban design to provide sustainable design solutions.

The property market and the property values are linked with the economic sustainability aspect of urban design. Rowley (1998) argues that a better understanding of the relationship between urban design, the development process and the property industry is a prerequisite to achieving

lasting improvements in the quality of the urban environment. According to Rowley (1998) a well-designed urban environment is an asset where the investors, developers and the occupiers can demand. Adding to this Adair et al. (2003) describe that over the long-term, returns for urban regeneration property exceed national and local benchmarks. Nase, Berry, and Adair (2015) describe that a product of quality design offered to the market by the developer can be differentiated from other products by the higher utility derived from the combination of its characteristics relative to average products present in the market. This indicates the impact of various aspects of quality design on real estate value. From a developer's point of view, this is evaluated as higher returns associated with investing in delivering quality. Ferreira (2016) points out that effective and efficient planning and development of residential environments will increase the neighbourhood satisfaction and the neighbourhood satisfaction has a high impact on residential valuations. Accordingly, based on this discussion it can be noted that a well-designed urban environment is an asset to the property market and it supports to the economic sustainability of urban environments.

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As the Egan (2004) report has argued, the process used in urban design plays a vital role in delivering sustainable places and communities. Accordingly, Fraser, Dougill, Mabee, Reed, and McAlpine (2006) state, that the current design process is top-down and employing a top-down process may alienate local community members and fail to capture locally significant factors. Therefore, as they have discovered, a proper bottom-up process, where the community can engage actively and effectively in the development process is required. Furthermore, they specify that a proper bottom-up process will help to achieve better performance in attaining sustainability indicators.

As argued above, the outcomes of urban design needs to achieve sustainability in its triple bottom line (socio, economic, environmental) but the current top-down urban design process has its own limitations hindering the achievement of it. Therefore, a bottom-up urban design process is required. As will be shown in the section 1.2 bottom-up processes also have negative features which may adversely affect for the creation of sustainable urban designs. However, a proper bottom-up process has not been evaluated in an urban design project context in order to see its positive and negative implications in urban design.

The integrated collaborative approach of the regenerative design process (The Regenis Group, 2011), discusses implementing a proper bottom-up process in the development and they have given specific consideration on understanding the whole system of the urban environment through its community and its stakeholders. Accordingly, adopting the features of regenerative design process is considered a good starting point to develop a bottom-up urban design process.

Based on the above argument, this paper discusses the analysis and findings which evaluated the regenerative design process in a live urban design project process in the neighbourhood context of United Kingdom. The findings of the evaluation revealed the positive and negative features of the regenerative design process in the urban design project process context and how those negative and positive features have assisted the researchers to derive the critical success factors (CSF) for the development of a new bottom-up urban design process framework.

## 1. The urban design process

As described by Roberts and Greed (2001), the current urban design process occurs in four sequential stages. They have explained the behaviour of project team members in these four stages. As they discovered, during the first stage “defining the problem” the planning or design team appraises the study area by conducting surveys associated with the urban form by undertaking an activity analysis. Thereafter, based on the analysis, the team develops a rationale with a summary of development opportunities and constraints. In the latter stage, area strategies and urban design options are evaluated by team members who then finalise an urban design strategy for the area. This indi-

cates that, in practice, the current urban design process is stiff and directly indicates that it is a totally top-down process. Lawson (2005) describes the current process of urban design, which follows a sequence of activities, as unconvincing. He argues that many designers learn about the design problems largely by trying to solve them. As he has explained, the current process does not allow a clear platform for in depth analysis of urban problems and the process is led by designers. Greed and Roberts (2014) have also discussed the urban design process stating that currently, there are ongoing debates on the question of “who are the real designers, the community or the professionals?” Accordingly, they conclude that the current urban design process is a mainly inflexible and top-down process. Roy and Ganguly (2009) have stated that a classic top-down process provides early, high level planning which may not deal with the real issues at ground level. As they have explained, a top-down process has no significant understanding of the specific issues, or their cause, at ground level. Carmona, Tiesdell, Heath, and Oc (2003) maintain that the danger of the top down process is the prior formation of the agenda which may lead to the manipulation of local opinion rather than addressing genuine community needs that emerge through effective participation. Supporting the argument of Carmona et al. (2003), and adding to that argument, the Commission for Architecture and the Built Environment (2000) has stated that local stakeholders often have particular insight into specific urban design issues affecting a given context and, therefore, urban design solutions developed through a top-down process may not be accepted by the majority of stakeholders.

Based on these arguments it can be noted that the current urban design process is top-down and it has many negative implications for the creation of sustainable urban designs as the top-down urban design process does not specifically identify or address the ground level issues and problem causes. Therefore, there are discussions and arguments among researchers to implement a bottom-up urban design process. Section 1.1 describes a literature synthesis on the need of a bottom-up urban design process.

### 1.1. Bottom-up urban design process against the top-down urban design process

Roy and Ganguly (2009) support the development of a bottom up urban design process and have argued that a bottom-up process to designing makes more sense because a community intuitively understands their needs and aspirations better than professional actors. Therefore, the involvement of a community from the beginning to the end of a project will help to deliver more sustainable solutions. Fraser et al. (2006) state that a proper bottom-up approach where the community can engage actively in the development process will capture locally significant factors and will help to achieve better results in relation to sustainability indicators. These authors (Fraser et al., 2006) have provided many logical reasons as to why we should

move to a proper bottom-up approach. Some of the key points that they make are as follows:

- A bottom-up approach provides a comprehensive assessment of local social, environmental and economic issues which help to diagnose the local context in a detailed manner rather than relying only on quantitative facts and figures.
- A bottom-up approach fills the gap between the problems identified by the planners and the actual problems that exist in an area. It also promotes increased sensitivity to local issues.
- Solutions generated through a bottom-up approach are grounded in the locality, and therefore, addresses local issues and provides sustainable solutions.
- A bottom-up approach increases a community's capacity to manage their environment, and therefore, the community is empowered.

Supporting to the fundamental theory and the argument made by Fraser et al. (2006), Boyko, Cooper, Davey, and Wootton (2006) states that sustainability issues should be addressed early in the urban design process, and therefore, people who live, work and socialise in urban environments have a fundamental role to play in urban design. Accordingly, Boyko et al. (2006) suggest the constantly changing social, functional, aesthetic and emotional needs should be addressed in the urban design process by providing community engagement opportunities throughout the urban design process. Batty (2008) states that cities have been treated as systems, and in the last two decades the focus of city treatment has been changed more towards systems whose structure emerges from the bottom up. Consequently, the author stated, in a bottom up process cities are treated as emergent phenomenon generated through a combination of hierarchical levels of decision, driven in a decentralised fashion. Adding to the above,

All the above literature suggests that the key characteristic of a bottom-up urban design process is community consultation and involvement from the beginning to the end of the project. This indicates the importance of consulting with the community at the urban analysis stage, as early involvement of the community helps to properly diagnose the area. Likewise, as indicated in the above literature synthesis, consultation with the community should continue through all the stages from the urban analysis stage through to strategy generation and up to designs finalisation and the professional actor's role needs to focus on helping the community recognise the problems and the potential of their area. This literature analysis indicates that there is still a need for a proper bottom-up urban design process which actually identifies community needs and aspirations and delivers sustainable solutions.

### 1.2. Bottom-up process, is it a solid solution?

As evidenced in section 1.1, the key characteristics of a bottom-up process is community engagement throughout the urban design process. And, furthermore, the section indicated that a bottom-up process is more decentralised

and operates in a more liberated manner. However, as will be shown, there are criticisms concerning a bottom-up urban approach to a design process.

Cliff (2014) states the powerful role play by the non-designers in the urban design process is welcome and appreciated. He further states that in order to understand the local context the role of non-designers is crucial; but the author argues against a design process which is fully grounded without the iterative mix of urban design philosophies and language. Similarly, Cooksey and Kikula (2005) state that a bottom-up process is ideal in order to understand the local context but a bottom-up process may reduce planner and designers control which will result in reducing the efficiency of the UD process. On the other hand they speculate that donor agencies may not be particularly interested in projects which employ a bottom-up process as they are cautious that budgets and targets may not pre-established. Larice and Macdonald (2007) have also stated bottom-up processes may be time consuming and ineffective if they are not controlled by professionals but operate in a more decentralised manner. Pissourios (2014) argues bottom-up communicative planning lacks the crucial components of a typical planning theory. This emphasises the importance of avoiding a full bottom up process in the urban design process.

Accordingly, based on the above literature synthesis, it can be noted that a bottom-up process for urban design has also been criticised by many researchers and authors.

## 2. The need for evaluate a potential bottom-up process in an urban design project process context

Even though, a bottom up process has been proposed by many researchers and already been criticised by many researchers, there is no adequate attempt which has tried to evaluate a bottom up process in an urban design context. Therefore, within this research the bottom-up process have been evaluated in an urban design context in order to identify its positive and negative features and also to derive Critical Success Factors (CSFs) potentially to develop a new urban design process framework. Accordingly, the researchers have evaluated the features of integrative collaborative approach of regenerative design in an urban design project process in North-West England in the scale of neighbourhood urban design. Section 2.1 introduces the integrative regenerative design in the arena of sustainable development with the features of regenerative design and the section 2.2 summarises the rational of using the features of regenerative design process to evaluate a bottom-up urban design process.

### 2.1. Integrative regenerative design for sustainable development

The integrative approach of regenerative design is a design approach which tries to create sustainability in a manner of looking at the built and natural environment, together

with its inhabitants, as a whole. Reed (2007) argues that sustainability is not deliverable as the concept in its current form of understanding. Sustainability is not a “thing”. Sustainability is not simply about efficient technologies and techniques; it is about life – a process by which living things, such as, forests, neighbourhoods, people, businesses, mushrooms and polar bears ensure their viability over a long period of time. According to the integrative approach for regenerative design, it is important to understand the life of places, which includes the social and economic life, combined with the natural setting. In the integrative regenerative approach the environment is referred to as the ‘place’ incorporating a combination of socio-economic and natural environment. As Reed (2007) states an environmentally sustainable place is 100% improved place but it is not the best place; the best place is somewhere which integrates humans as participants of nature. The Regenis Group (2012) state that this concept is linked with the concept of sustainability today. The Regenis Group states that sustainability requires more than merely adding green components and techniques. Sustainable integration of nature and people into a living system is essential. Furthermore, this whole system approach does not leave out green technologies but integrates them in a more meaningful context.

Regenerative design process consists of three distinct but overlapping streams of work in order to understand the whole system of the place:

- Integral Assessment: understanding the place.
- The story of place: making that understanding comprehensible and transferrable.
- Stakeholder engagement: inspiring the community.

These three key features of regenerative design has been explained in the Figure 1.

**2.2. Why regenerative design to evaluate a bottom-up urban design process**

As described in section 1.1 and 1.2, authors and researchers have argued for a bottom-up urban design process which is based on community engagement and empowerment. As explained in the section 1.1 the bottom-up process is aimed at the community, and therefore, community needs are addressed in the urban design solutions. Furthermore, as discovered in the same section, the bottom up process helps to acknowledge unique features of the locality and utilise them for the betterment of the society. On the other hand as explained in the section 1.1 the key idea of having a community embedded urban design process is to achieve sustainability in urban design which is referred as the socio-economic and environmental sustainability

Features of regenerative design employed in the UD process for case study 2	
Features of regenerative design	Stages covered in the UD process and parties engaged
<p><b>Phase 1</b> Integral assessment: Understanding place</p> <ul style="list-style-type: none"> <li>– Collect data about the place, history, economic reports, previous reports about the place etc.</li> <li>– Collect data and information from stakeholders, ex-community leaders, commuters etc.</li> </ul> <p><i>A strong understanding of the place is expected, linking the past and present, also this identifies the potential and drawbacks of the area</i></p>	<p>Represents the preparation and problem identification stages in the UD process</p> <p>The urban environment is understood by use of secondary data sources, ideas from professionals, ideas from community members such as community leaders etc.</p>
<p><b>Phase 2</b> The story of place: Make it understandable, comprehensible and transferable</p> <ul style="list-style-type: none"> <li>– Develop a story of the place based on the information gathered in the first phase</li> <li>– Produce it at stakeholder workshops</li> </ul> <p><i>The stakeholders are provided with a full detailed history of the place; anyone who is unfamiliar with the place, such as, development team members has an opportunity to learn more. Stakeholders also have the opportunity to check for missing data the story of the place</i></p>	<p>Represents the urban analysis stage</p> <p>The story of the place is delivered in order to strengthen the findings of the previous stage. The wider community is consulted at this stage. The community has constructed a story of the place inviting comment or alteration</p>
<p><b>Phase 3</b> Stakeholder engagement: Inspiring the community</p> <p><i>An open community consultation workshop, which provides a platform for introducing the story of the place, developing strategies and solving the problems and issues identified</i></p>	<p>Represents the vision, mission and strategy generation, and design development stage</p> <p>The story of the place is integrated here to build up the strategies to the place, wider community is consulted</p>

Figure 1. Key stages of urban design process under the specific features of regenerative design process

in the current scope of urban design. Accordingly, when examine the features of regenerative design process the integrative approach to regenerative design employs a truly bottom-up process which starts with community engagement, continues and ends with the community engagement; employing the community in each and every step of the process. The ultimate aim of this concept is to create sustainable environments on all three counts, i.e. social, economic and environmental sustainability. Therefore, this bottom-up process seems to provide the basis of a good solution in order to assess the features of a bottom-up urban design process. Figure 1 describes how the specific features of regenerative design process has been used in the standard stages of the urban design project process.

### 3. Methodology

This is a qualitative research study where a multi-methodology was adopted which was reinforced by case study research and grounded theory. The data collection methods were semi structured interview, document review, focus group discussion and online discussion forum. The researchers interviewed 35 community members in 20 semi semi-structured interviews. In addition to that the researchers conducted 3 focus group discussions with 12 community leaders each focus group consisted 4 community leaders. Further, semi-structured interviews were conducted with the president of the community forum, project officer of previous urban development project. The online participation of community members was relatively low but, representing the youth around 10 community members have responded via the online forum. Accordingly, around 35% of the families' in the neighbourhood were represented. In addition to all above data collection methods, 20 published documents on previous and current development were reviewed.

As described in the previous section the researchers investigated the integrative regenerative design process in the context of urban design project process in a neighbourhood context. Accordingly, it is worthwhile to briefly introduce what is meant by the neighbourhood context and the specific reasons to narrow down the study to the neighbourhood context of UK. The concept of neighbourhood can be defined from geographical perspective as well as from social perspective. According to Bowden (1972) neighbourhood can be identified as the state or value of living near one another, a region, territory with regards to some common characteristics. Chaskin (1997) states that neighbourhood is a geographical or spatial unit and community is a social unit. Accordingly, it can be understood that neighbourhood is not merely a particular geographical entity but also a spatially defined residential area with some common social characteristics. The main reason for scoping the study to neighbourhood urban design is the complex nature of the subject. As justified in section 2, the researchers intend to evaluate a bottom up urban design process, therefore, if the researchers scope the study to a region, city or at town level, the number of stakeholders in the project would be

much higher than at neighbourhood level and the researchers would not be able to critically evaluate the features of a bottom-up process within the limited time framework which was available. Supporting to this, as explored by Wilson (2009), neighbourhoods create and form communities and community involvement become meaningful when it is applied in a neighbourhood context.

The data collection techniques were used within the context of integrative regenerative design process. As per the integrative regenerative design process it was necessary that an integral assessment was undertaken which aimed to identify the whole environment as a system; in order to do that it was necessary to interview community leaders and professionals who have a direct influence on development in the area. Accordingly, the semi structured interview technique was used to interview; the president of the community forum for the area and also the project officer involved in previous regeneration work. Thereafter, as per the stages of the integrative regenerative design process the community should be actively engaged in the design process, accordingly, the researchers used the semi structured interview method for wider community engagement at two points referred as the 'story of the place' and 'stakeholder engagement' in the integrative regenerative design process. At these two particular community engagement points, the researchers used a small booklet which provided the community with the opportunity to comment on design issues; this booklet followed the basic parameters of the semi structured interviews. The researchers used the document review data collection technique in the "integral assessment" stage of the regenerative design process. As detailed in section 2.2 integral assessment seeks to understand the whole system of the environment through different data sources. The other important data collection technique was focus group discussion, similar to other data collection focus group discussion was also conducted within in the context of regenerative design process. Accordingly, the researchers used focus group discussion at the "integral assessment" stage in order interview the community leaders. The members of the focus group were community leaders from the community forum in the study area. There were 12 community leaders in the forum and the researchers divided them into three groups which ensured the effective participation of four members in each focus group. The final data collection method used in the study was online-discussion forum. Accordingly, as per the principles of regenerative design the wider community should be engaged in the urban design project process. In addition to wider community engagement through focus group discussion and individual semi structured interviews, the researchers intended to obtain more community participation through an online forum. The researchers provided the online forum link to the community who participated in the community workshops asking them to provide online forum link to the other community members who did not participated in the event. However, this attempt was not that successful as the responses through the online forum were low.

For the purpose of analysing the data gathered during the data collection stage of this research, two data analysis techniques were used. These are thematic analysis and mind mapping. The purpose of the thematic analysis was to analyse the data to develop and organise the main themes (concepts) related to the phenomenon being investigated. Mind mapping was used to illustrate and to further clarify the related issues, using the relationship between the concepts identified. NVIVO software version 10 was used for thematic analysis and the version 9.2 of the Inspiration software was used for mind mapping.

#### 4. Analysis, findings and discussions

As mentioned earlier, in this case study the researchers employed the features of regenerative design in the UD process conducted by the researchers. By employing the features of regenerative design the researchers intended to inductively obtain the CSFs which would lead to the construction of components for the UD process framework. The inductively obtained CSFs have informed the viability of the features of regenerative design and how those viable features should be merged to establish components for the UD process framework. Furthermore, CSFs emerged that have shown the non-viable features of regenerative design which should not be considered for a potential UD process framework. Sections 4.1 to 4.8 describe how each and every CSF was established and what are the positive and negative features which guided to derive each CSFs.

##### 4.1. Assessment of previous work successes or failures

This is the first CSF derived from the analysis. Under the integral assessment feature for regenerative design the researchers needed to conduct a full system analysis in order to construct a story of the place. As described in regenerative design at the integral assessment stage it is necessary to meet community leaders, community based organisations etc. According to the information revealed from the community leaders the researchers could identify that people were not satisfied with the previous regeneration work, especially in regard to the district centre development which was a part of the previous development project. This information was derived at an early stage by the researchers due to the incorporation of the integral assessment feature from the regenerative design process. Had the researchers conducted a standard problem identification and urban analysis (in the current urban design process), a full system analysis would not have been conducted and specific analysis of the previous development work would not have been undertaken. Therefore, in an urban design process if previous regeneration work is not assessed at an early stage the professional actors will not know whether the previous work was acceptable to the community. This indicates that in a UD process the project team should have a thorough understanding of previous development work. Therefore, at this point, the

CSF 'deep assessment of previous work' was initially established but it was still necessary to investigate the following two questions:

- Is it extremely important to assess previous work in the UD process?
- If so, how can it be done?

Accordingly, the researchers interviewed community about the previous development work and it was revealed that community is not satisfied on the previous development. The special feature was that the community had a unique perception on the previous development work. At this point the researchers clearly identified that conducting a deep assessment of previous work is extremely important as it allows a clear look back on past work. As happened in this case study the results obtained from assessment of previous work may not always be uniform, but in a sustainable UD process it provides indications about the outcomes from previous development work from the people who actually use it. Based on the above findings the following facts were established regarding the importance of conducting an in-depth work assessment:

- In-depth assessments of previous work lead the current project team to understanding how the previous spatial changes have been adopted by the community.
- To see which strategies have failed and the reasons why.
- To discover what needs to be addressed within the development based on the failures of the previous development work.

The analysis of data further revealed that the previous regeneration work has created additional issues to the area. Accordingly, previous work assessment became furthermore important CSF because a regeneration project should solve problems not create more problems, and any regeneration project that causes additional problems could be deemed to be a failure: therefore, assessing previous work allows the professional actors not to repeat the same mistakes. In relation to the whole system assessment of regenerative design at the integral assessment stage the researchers studied previous published documents regarding the area under consideration and was conversant with many details about previous plans that had been proposed and implemented in the area. The document review helped to reevaluate the aims and objectives of previous plans from the community's view on the implemented work provided the researchers a strong perspective of the failures and success of previous development work. In addition to that the interview with the project officer with the previous development also assisted the researchers to build a strong picture of the previous development work and its failures and successes. Previous work assessment allowed for a comparison, using evidence from different parties, of the successes and failures of previous work and provided a comprehensive picture for the new project team which was extremely helpful. As a whole it was identified that having a strong picture of the previous development work is really important so that professionals can learn from the mistakes that happened in the previous work and en-

sure these not repeated in the new UD project. Based on all these discussions it can be concluded that an in-depth assessment of previous work is an extremely important CSF factor.

After establishing the CSF and its importance it was necessary to identify the steps for conducting an in-depth assessment of previous work. Actually, this CSF was derived by employing features from the regenerative design process, and therefore, the way in which the researchers obtained the information to establish the CSF stood as an effective step to conducting an in-depth assessment of previous work. Accordingly, at the integral assessment stage the researchers consulted community leaders regarding previous work and also interviewed key professionals who were involved in the previous development work along with undertaking a comprehensive review of previously published documents including the previous plans. Thereafter, the findings from the integral assessment were further shaped by engaging the wider community. The findings from the previous study were the basis to further analyse the previous work by engaging wider community. In this way the researchers established the CSF and its importance and no difficulties were encountered with the assessment of the previous work due to the manner employed by the researchers. Therefore, the researchers suggest that in-depth assessment of previous regeneration work should be conducted in a similar way. Figure 2 summarises the ways and means to do a deep assessment of previous work in a sustainable UD process.

### 4.2. Non linearity vs linearity

One of the specific features that emerged from this study is the non-linear nature of the UD process. This has been deeply evident at the problem identification and urban analysis stages. Based on this non liner nature, three CSFs have evolved. The three CSFs convey three inter-related, but different analyses, which should be carried out at the urban analysis stage of the UD process framework. As extracted from the CSFs established, the exact meaning of ‘non linearity’ refers to analysis of the urban environment based on different sources rather than relying on a single data source. These three CSFs and their components were derived by employing specific features from the regenerative design process. The specific features from the regenerative design process reveal that the community plays an influential role and also should be considered to be a prominent source of data collection. In addition to the community’s role secondary data sources and opinions from professional actors, who have relevant experience of development work in the urban entity, are also important data sources. Accordingly, as earlier described, the establishment of these CSFs are outcomes from the employment of specific features from the regenerative design process, and therefore, each CSF illustrates how well the features from the regenerative design process worked in the UD process environment and how those features have been modified according to the nature of UD process.

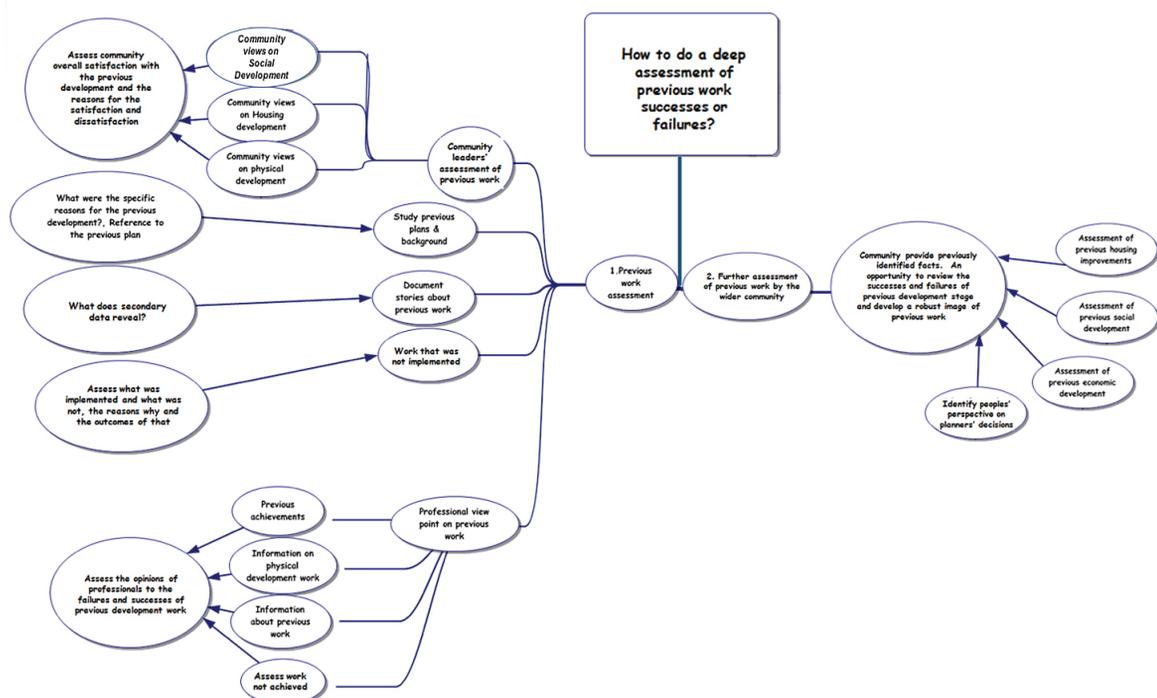


Figure 2. How to conduct an in-depth deep assessment of previous work

#### 4.2.1. Non linearity in current situation analysis

'Non-linear assessment of the current situation' was the first CSF to emerge from the three CSF established related to maintaining non linearity. In simple terms this CSF illustrates the need and importance for a comprehensive understanding of the exact situation of the urban entity and the reasons for the current situation.

Based on the perceptions of community leaders in the focus groups and also from the interview conducted with the President of the Community Forum the researchers were able to understand that through the engagement of the wider community positive facts were revealed in the assessment of the current urban environment. As indicated by the statements analysed in the study community leaders were able to reveal exactly the crucial issues of the area and the reasons why they were important. The researchers neither found any difficulty working with community leaders nor extracting information; in fact they were very keen to be engaged in the process and appreciated the researchers for consulting them at this stage regarding the situation analysis of the urban environment.

Based on the evidences found at this stage, it was clearly demonstrated that community leaders are extremely useful in diagnosing the urban environment and they are capable of assessing the exact urban conditions and specific reasons for local conditions. Accordingly, at this stage, the researchers were able to establish part of the CSF which is; "it is necessary to examine deeply the current urban conditions with the exact reasons for the current conditions". However, the researchers wanted to further examine how and why a deep examination of the current urban condition could be executed. Accordingly, as per the full system assessment nature of regenerative design, the researchers interviewed key project officers who had worked on the previous development activities. By conducting this interview the researchers was able to see the urban environment from a different perspective. The project officer outlines what had been done to the area, what had not been done, and what needs to be done in the urban entity.

Accordingly, this further established the idea of the "need for a deep assessment of the current urban condition with the specific reasons for the current situation" which was initially derived by engaging the community leaders. Whilst the community leaders stated their viewpoint of the exact situation, the project officer was also able to report the exact status of the urban entity from his perspective. Based on this the initial CSF derived, which was "deep assessment of current situation with its reasons", was further shaped by adding "nonlinear" to the "deep assessment of the current situation with its reasons". However, as per the regenerative design process an urban diagnosis should be undertaken by also referring to secondary data sources and also obtaining information from the wider community. Accordingly, it was still necessary to examine whether the CSF was viable or not in the UD process. The information derived from documentary sources also informed the researchers that secondary sources are

also good source for undertaking a deep assessment of the current urban situation, but the most important thing in doing this is that the documents referred to should be new and up-to-date in order to compare and contrast the exact urban condition.

Thereafter, as per the regenerative process, it is necessary to engage the wider community in the urban analysis, and therefore, the researchers wanted to ascertain whether the wider community were able to clearly state the exact condition of the urban environment. Findings from the wider community are directly linked to the findings of community leaders and also to the socio-economic profile and the comments from professional actors. This indicates that even the wider community can describe exactly the current urban condition. Based on all this evidence the researchers established the CSF "non-linear deep urban analysis of the current situation". This CSF establishes the need for a comprehensive analysis to identify the exact urban conditions rather than relying on only one particular data source. According to the established CSF the community is the most important data source in identification of the exact urban condition, and therefore, this CSF encourages the employment of the community at this point in the UD process.

Similar to the previous CSF the researchers were able to establish this CSF and obtain successful results by employing the features of regenerative design. Therefore, the researchers suggest the adoption of the characteristics of regenerative design in order to undertake a "non-linear deep urban analysis of the current situation". Figure 3 is the mind map developed for this CSF and it illustrates the way to conduct "a non-linear current urban environment assessment".

#### 4.2.2. Non linearity in need analysis

This CSF is linked with the CSF non-linear current situation analysis. It was revealed that the current needs analysis can be conducted parallel to the current situation analysis. The analysis indicated the features of the regenerative design process can be adopted for the CSF similar to the previous CSF.

#### 4.2.3. Non linearity in area specific condition analysis

'Non-linear assessment of other area specific conditions' was another specific CSF that emerged from this case study. According to the regenerative design nature, to fully understand the urban entity the researchers initially conducted the integral assessment and then constructed a 'story' about the place which was later shaped by involvement with the wider community. Within this deep urban analysis by using different data sources the researchers were able to extract several important, specific features which should be assessed in a complete urban analysis. From the analysis the research could reveal information on the history of the place, the image of the place, the relationship of the place with the other adjoining cities and the locational condition of the place.

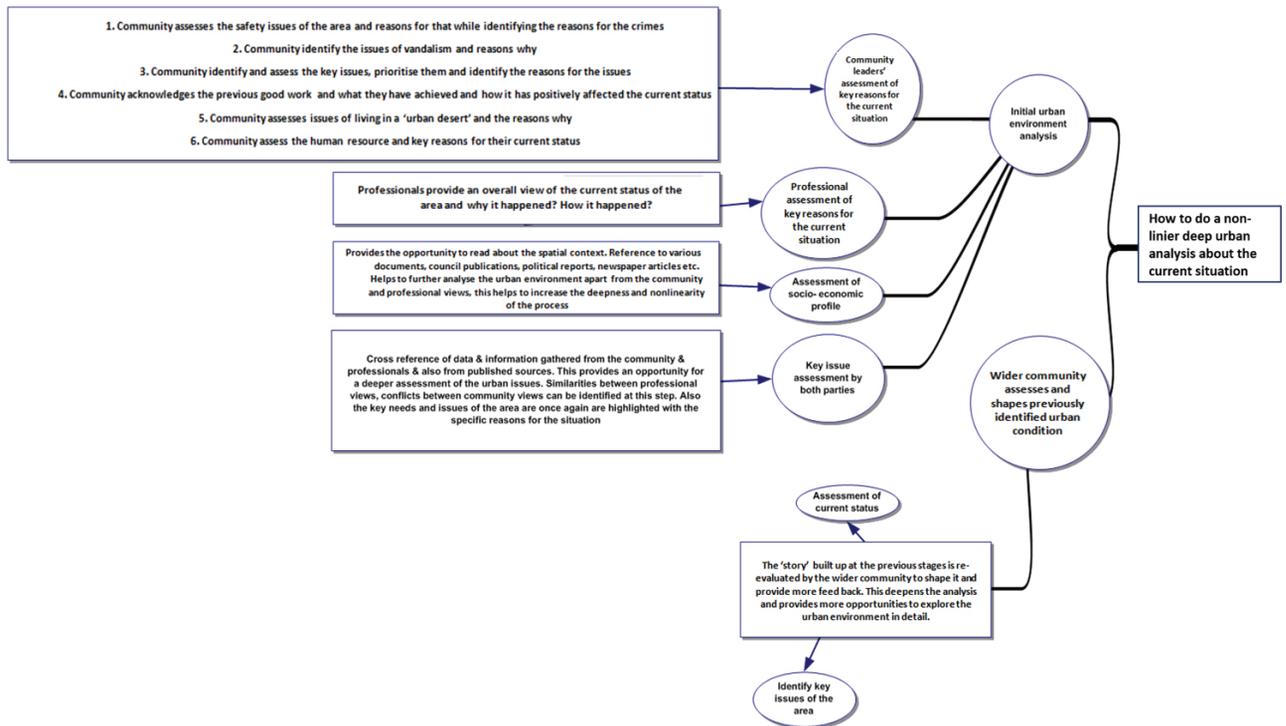


Figure 3. Ways in which to do a non-linear deep urban analysis of the current situation

Based on the analysis, the researchers can conclude that these extremely specific conditions within the area could only be assessed because the researchers employed features from the regenerative design process. In a standard urban analysis, the community are not usually engaged at this stage, and therefore, there is no possible way to extract specific information about the urban environment. Therefore, the researchers further support the notion that features from the regenerative design process should be incorporated into the potential UD process framework at the urban analysis stage; understanding specific features such as those noted above, is extremely important in order to conduct a comprehensive urban analysis.

### 4.3. Comprehensive area potential identification

This CSF is associated with the previous three CSFs, which were focused on the deep non-linear analysis of the urban environment. This CSF simply means that in the urban analysis it is necessary to have a complete understanding about the potentials of the area. The previous three CSFs identified the exact condition of the urban entity, the needs of the community and other area specific conditions. Accordingly, under the CSFs 'non-linear deep urban analysis of the current situation' and 'non-linear assessment of other area specific conditions' the area potentials have already been discussed. Therefore, this CSF can be identified as a repetitive CSF. However, because the researchers could clearly find evidence which supported the establishment of this CSF, the researchers decided this CSF should be presented separately. This area potential identification has assisted the researchers to identify the potentials of the com-

munity which can be integrated for the urban development and the specific potentials of the area which are positive asserts for the development of the particular area.

The deep system analysis nature of regenerative design allowed the researchers to obtain specific information about the area's potential. Identifying the area's specific potential is extremely important in order to create design solutions which are locally relevant and sustainable. Design solutions based on the area's potential prevent the application of alien solutions in the area and are widely accepted by the community. Therefore, employing features from the regenerative design processes assisted the researchers in establishing this CSF and confirmed once again the positive outcomes derived by employing the regenerative design process.

### 4.4. Collaborative central leadership

The establishment of this CSF was quite different to that of CSFs. Previously CSFs were mainly established by engaging specific features from the regenerative design process but this particular CSF was established by assessing the researchers' own behaviour in employing the regenerative design features in this case study project. As the researchers employed the regenerative design features in the UD process for this project, therefore, the researchers inevitably became the leader of this UD project.

The comments made by community members regarding previous development work provided insights for the researchers to think about the leadership style which should be employed in a UD project. As per the nature of regenerative design the researchers worked more

collaboratively with the community, and accordingly, the researchers could gather a great deal of data and information about the urban entity and its features. The information and data derived helped the researchers to clearly identify the urban entity and helped to diagnose exactly what is required by the community. Therefore, based on the data analysis and on through researchers' experience of this project the researchers were able to establish the sub node "Ability to see the gap between community needs and professionals' ideas". This informs a collaborative leadership allows the leader to see the gap between community needs and professionals' ideas.

Thereafter, the analysis revealed that the urban design project leader should have the ability to identify and overcome the inequities which creates in the urban design process and it was further identified that the leader should have strong authority to do that. Based on this a sub node called 'maintain equity' was established.

Also, in the urban design process community engagement the researcher received conflicting opinions from the community. Accordingly, the researcher acknowledged any conflicting opinions and the finalised urban analysis and strategies were based on the view points of the majority of the community members. The key feature derived is that there should be a central leader who has the power to initiate and execute the UD process rather than delegating power to different parties. Because the researcher centrally controlled the UD process conflicting opinions could managed without disrupting the smooth flow of the UD process;

however, if the researchers worked in a group where leadership powers were equally distributed then it would have been difficult to manage the flow of the UD process. Because of this problem the researchers established a sub node "Managing conflicting ideas" to be the responsibility of the project leader but this would mean that the leader would need to be sole charge of all decisions making.

In addition to that the analysis revealed, that in the UD process a proper communication plan should be delivered to the community and this should be the sole responsibility of the project leader. Based on this the researchers established the sub node "Development of proper communication".

Accordingly, under this CSF four sub nodes were established and the four sub nodes assisted for the creation CSF collaborative central leadership. This indicates that the project leader should work with the community but should have central leadership powers in order to initiate, execute and complete the UD process. Figure 4 describes the mind map developed for this CSF.

#### 4.5. Democracy and leadership

Democracy is the next CSF established in this case study, however, this CSF is directly linked to the sub sections of the previous CSF "Centralised collaborative leadership". However this CSF informed two important sub nodes which are "the community need to see the final product" in the UD process and "project leader should get the common community consent".

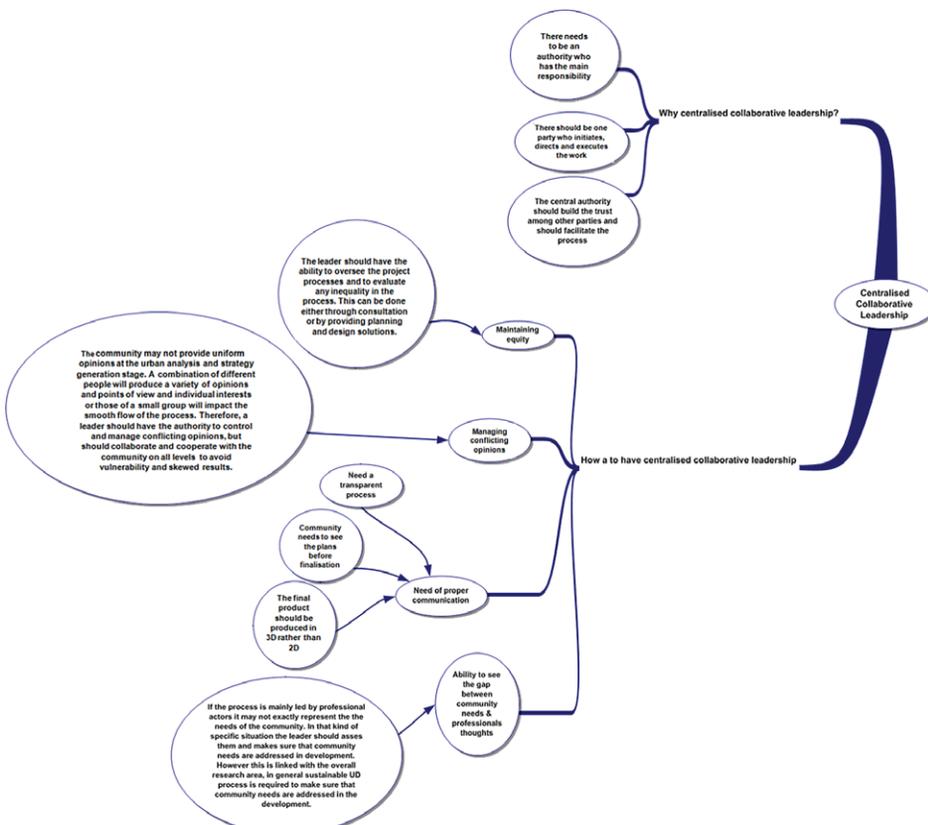


Figure 4. Mind map for the CSF 'Centralised collaborative leadership'

#### 4.6. Identification of limits and boundaries of development

Identification of the limits and boundaries of the development is another specific CSF that emerged from this case study. The engagement of regenerative design features provided the insights to develop up this CSF. Under this CSF the researchers established two sub nodes as follows. Based on the analysis findings the researchers were able to establish the need for properly informing the community about the scope of the UD project to effectively engage the community in order to avoid the community raising concerns not relevant at that particular stage of the UD project. On this basis the sub node “Notifying to community about the limits and boundaries of the development” was developed. Further, the analysis proved that community members are capable and keen to mention areas which should not be developed and they specify the limits of the intended development by being part of it. For an example the community accepted the public realm development but they wanted to speak about locations which should not be touched by the development. This enlightened the researchers about community awareness of areas they felt should be outside the limits of the development and thus the sub node “Community view points on limits and boundaries”. These two sub nodes assisted for the development of this CSF.

#### 4.7. Community based strategy generation

Community based strategy generation is one of the most crucial CSF derived from this case study by employing the features from the regenerative design process. The analysis revealed that the community members have integrated urban issues with strategy generation; they have created strategies to address the problems and issues that have been identified. This confirms that the community can be effectively engaged in developing strategies for identified solutions. In addition to that findings indicated that the community was capable and ready to accept the challenge to develop solutions for their own area; they then identified problems and developed solutions for the problem, they then used their knowledge of the locality to establish which areas should remain unchanged as part of the solutions. The analysis further indicated that the community has gone beyond the stage of developing strategies for identified problems and issues and have been confident enough to address other problem areas in their strategy generation. On the whole, during the strategy generation stage with the community, the researchers did not experience any serious issues, such as, community members being reluctant to engage or community members who were totally out of focus with development strategies. In fact the willingness and the ability of the community in strategy generation was highlighted in the data analysis. There were few conflicting opinions but these did not deflect the community from engaging in strategy development; what is required is a strong leader who can manage conflict. As informed by above discussions the experience

of the community in strategy generation was extremely positive and it indicates the regenerative nature of community engagement and can, therefore, be adopted in a new UD process framework. Accordingly, based on these findings, the researchers established the CSF ‘Community based strategy generation’.

#### 4.8. Selective community based design development

This CSF was derived by analysing contrasting data and has become one of the most important CSF because it ignored the features of regenerative design. According to the regenerative design process the community plays an influential role at all stages. This fact matched perfectly with the UD process until the strategy generation stage in the main UD process. However, the finding for design development differed and the CSF ‘Selective community based design development’ was established.

Many community members mentioned specifically that they can only provide solutions for the identified issue but were unable take part in design development. Furthermore, they stated there is no need for them to be involved as the community will accept the professionals’ designs providing they have integrated community defined strategies into the design solutions. Based on these finding the researchers initially established the idea of “not involving community members at the detailed design stage”. On the whole there was more evidence to say that community members should not be engaged in detailed designing. However, some community members were able to create with potential design solutions and some were able to do this with the assistance of the researchers, therefore, the researchers could not totally withdraw the idea of not engaging the community in detailed designing. Accordingly, based on all the evidence the researchers established the CSF “Selective community based design development” which means that professional actors should be selective in deciding whether to engage community members in detailed designing or not in a UD process. Based on the community’s actions throughout the previous stages, their level of education and collaborative nature, professional actors need to decide whether to engage the wider community in the detailed designing stage rather than generally engaging the wider community in the detailed designing in any UD process. Figure 5 explains the mind map for this CSF.

### Conclusions

As described earlier the researchers employed the features of regenerative design in the UD project process which was analysed in this case study. In a nutshell, the regenerative design concept enhances the deep understanding about the urban environment, and therefore, it provides a prominent role for the community. According to the regenerative design process, the community is the key role player. Accordingly, the researchers followed the key steps described in the regenerative design in the UD pro-

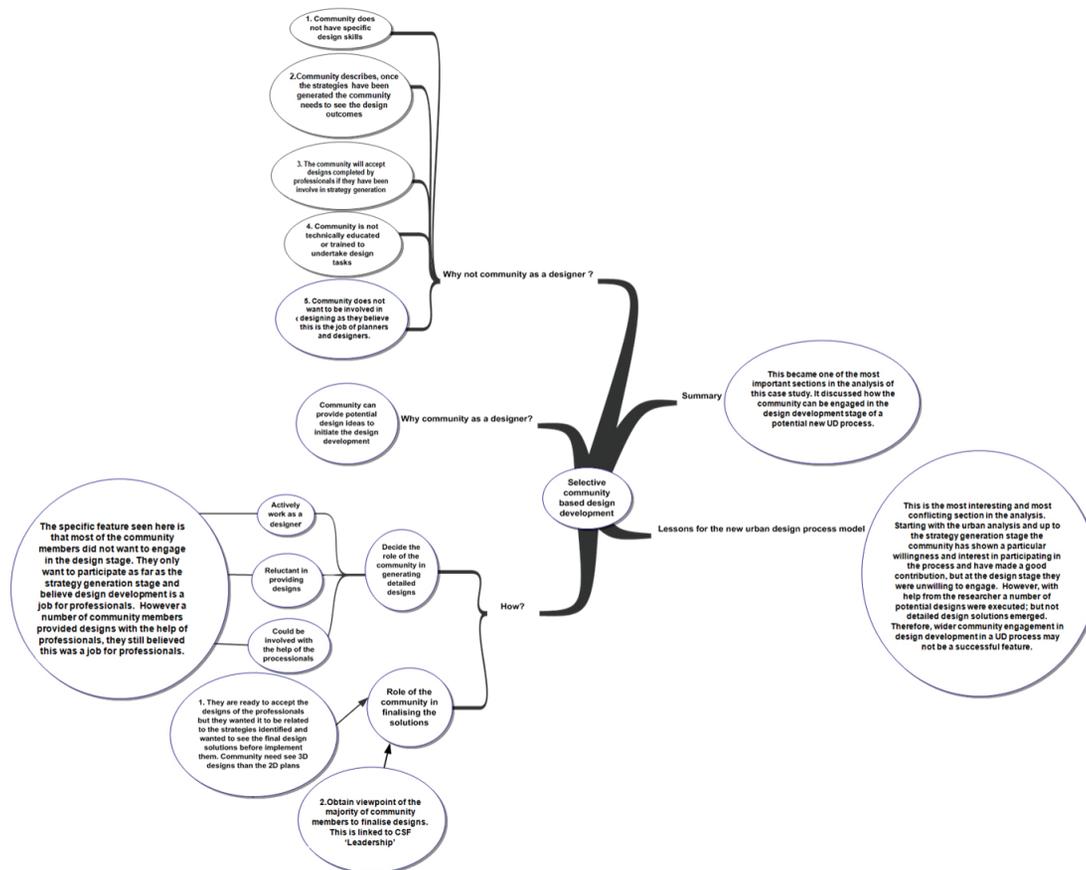


Figure 5. Mind map for the CSF 'Selective community based design development'

ject process. After full employment of regenerative design features in the UD process the researchers established 10 critical success factors which supported the construction of components for a potential UD process framework. Some of the CSFs focused on urban analysis and some on strategy generation and design development. In conclusion to this paper the researchers can confirm that the features of regenerative design can be positively adopted for the UD process at a number of points in the UD process as the researchers have been able to establish many CSFs from the positive results which emerged by employing the features of regenerative design. However, employing the features of regenerative design is not always applicable in a potential UD process framework as wider community engagement is not always advisable and possible in the UD process specifically in the design development stage of the UD process. This is one of the key alterations necessary if the regenerative process is to be adopted into the new potential UD process framework. Accordingly, altering the regenerative design process as it suits to neighbourhood context of the urban design context will help to create sustainable urban environments in its triple bottom line (social, economic and environment) which will increase the quality of life and increase the property value in the property market.

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