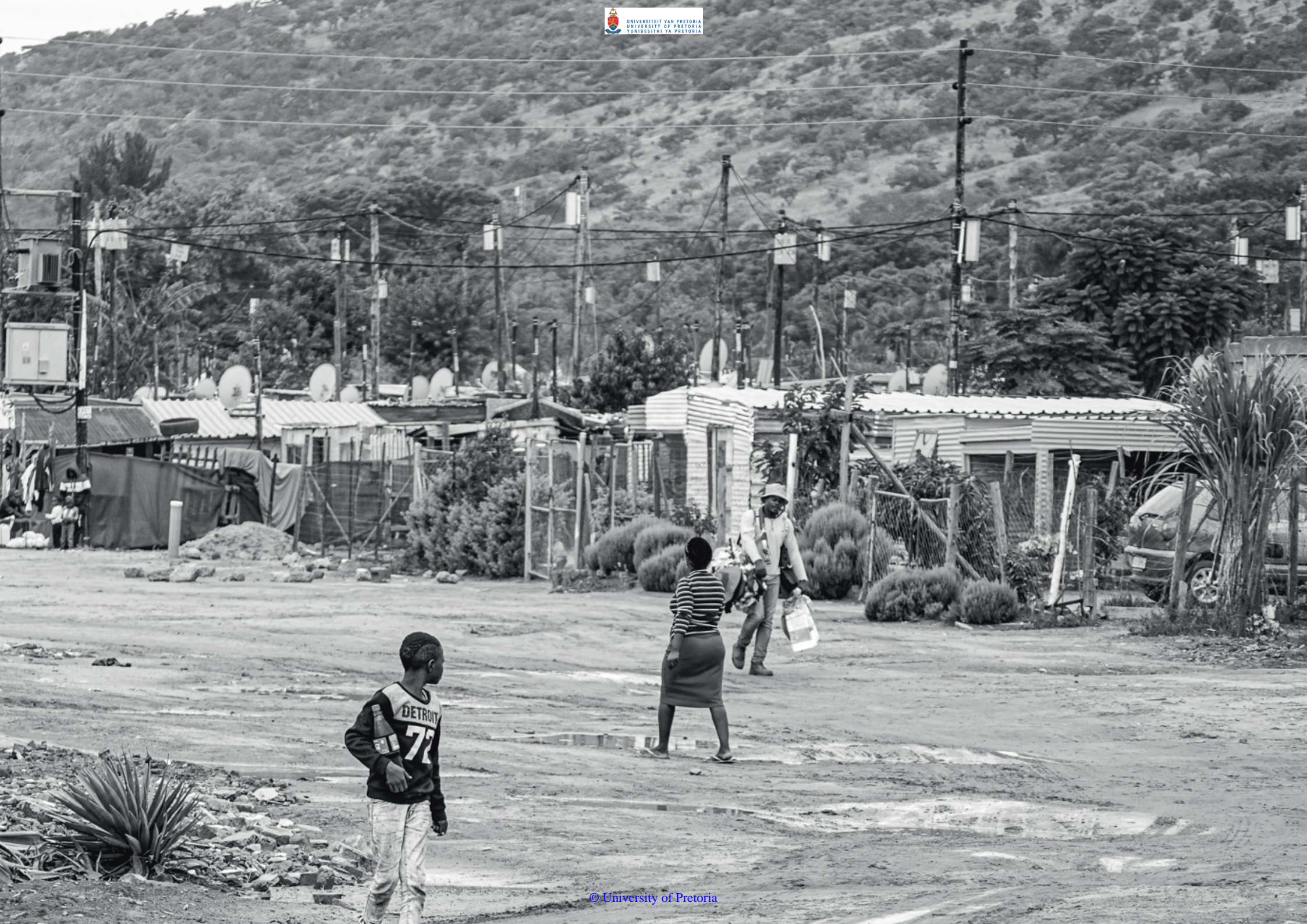


ESSAY 01

POSITION AND SITUATION

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1.1 Introduction

1.1.1 Background

In recent years, the impending climate crisis and rapid yet irreversible global trend of urbanisation have motivated the increased promotion of sustainability, with a growing momentum for a transition toward regenerative practices. In the built environment, the advancement of sustainability produced the green building movement actualised in the application of sustainable practices like the use of renewable energy, locally sourced materials, and rainwater harvesting. Reed (2007: 675), however, argues that such approaches are fragmented, and rather suggests a transformation in how sustainability is conceptualised and practiced through the process of Whole Systems and Living System Thinking. This entails a shift from sustainability – which focusses on minimizing environmental harm through efficiency – to regenerative thinking which focusses on reversing the degeneration of ecological systems through co-evolution of socio-cultural systems as interrelated parts of a whole system (figure 1.1) (ibid.). According to Mang et al. (2016:36) second basic premise of regenerative development, “[c]o-evolution among humans and natural systems can only be undertaken in specific places, using approaches that are precisely fitted to them...”. The adoption of sustainable practices – increasingly accepted as best practices – as universal standards that are replicable in all places is therefore problematic (Mang et al. 2016:34). Regenerative approaches, by contrast, advocate for place-based solutions that are “indigenous rather than generic” (ibid.:36).

In South Africa, a significant challenge engendered by the rapid urbanisation is the emergence and increase of informal settlements in urban areas (Ziblim 2013:10). Informal settlements house a high and growing percentage of the urban population and are areas where the consequences of the climate crisis are dire and strategies for resilience and regeneration critical. However, Venter, Marais, and Morgan (2019:2) writing from a South African

perspective, point out that “despite technical and conceptual progress in regenerative development, practitioners and governments have not applied it to informal settlement upgrading.” In 2004, following a review of the South African housing policy, the Breaking New Ground: A Comprehensive Plan for Development of Sustainable Human Settlement (BNG) was launched. This not only saw the integration of informal settlement upgrading into South African housing policy, but a shift in focus from housing supply to sustainable human settlements (DHS 2004). However, whilst the term ‘sustainability’ was embedded in the policy, it “is under-utilised in practice and the policy makes virtually no reference to regenerative development practices...” (Venter et al. 2019:2). Regenerative thinking concerning the informal settlements is therefore important and calls to attention the need for place-based solutions.

1.1.2 Problem Statement

Research shows that informal settlements have either been neglected concerning sustainability, with approaches focusing mainly on the formal city; or marginalised by the introduction of contextually inappropriate sustainable practices (Simon 2016:80). The shift from sustainability to regenerative design brings into focus the concept of ‘place’ and the development of solutions indigenous to a context. It therefore demands responses tailored to the informal city. Place, according to Mang et al. (2016:37) “encompasses local economies and food systems, vernacular architecture, wildlife, and native plant communities, it also includes subjective experience.” Notably, literature on informal settlements advocates for solutions that draw lessons from the vernacular architecture of informal settlements (Osman and Karusseit 2008). However, whilst vernacular architecture has been studied largely in relation to traditional vernacular, there is a relative paucity of research on the contemporary urban vernacular design of informal settlements. For this study, it is of interest to investigate the potential contribution of the vernacular design of informal settlements to the discipline of architecture and to the development of place-based strategies for regeneration.

1.1.3 General, urban, and architectural issues

The urban issue explored in this dissertation is informality which is framed in light of regenerative design – the general issue. The architectural issues explored are the scaling of vernacular innovation and principles. Also investigated is the architect’s role in building a community’s capabilities demonstrated in the vernacular design towards place-based regenerative design strategies.

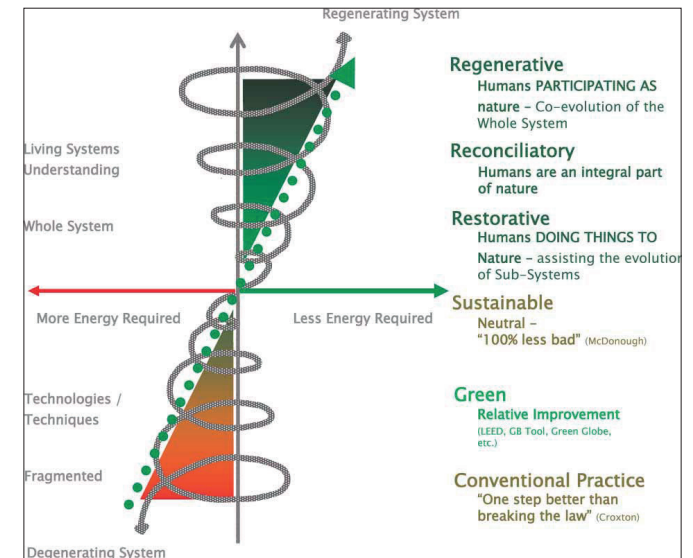


Figure 1.1: Trajectory of Environmentally Responsible Design (Reed 2016:676).



Figure 1.2: Flooding in Melusi, which will be exacerbated by climate change (Author 2021).



Figure 1.3: Collage of Melusi Issues (Author 2021)

1.1.4 Research Question

The main research question is: “How can the engagement of the vernacular design principles inherent in informal settlements facilitate the building of capabilities towards regenerative architecture?”

Three sub-questions provide guidance to disentangling the over-arching question, these are:

1. What lessons can be drawn from the vernacular design of Melusi informal settlement?
2. What social and ecological issues are currently unresolved in the Melusi informal settlement pertaining to the vernacular? This is to consider possible points of design intervention.
3. How does the application of the lessons facilitate the building of capabilities towards regenerative architecture?

1.1.5 Theoretical Framework

The concepts investigated in this research are vernacular design and regenerative design as they relate to informal settlements. The hypothesis is that architectural interventions that engage lessons from the vernacular design found in informal settlements can enable community participation in co-evolution through strategies that are unique to ‘place’ and build existing capabilities. To test this hypothesis, constructs pertinent to the research and highlighted from a literature review were used to establish a theoretical framework. These are, ‘place’ and ‘building capabilities.’

The first construct, ‘place’ is concerned with ‘respect for place’, one of the core aspects of regenerative design (Cole, Oliver, and Robinson 2013). The underpinning for this being that co-evolution – a central notion of regenerative design – stems from a distinctiveness of place; requiring place-based approaches engaging a partnership between socio-cultural and ecological systems (Mang et al. 2016). In that regard, a building is not regenerative as in the self-healing and self-organising attributes in nature, rather, it effectuates regeneration in the socio-cultural and ecological systems in which it is embedded through catalysing positive change unique to the ‘place’ where it is situated (Cole et al. 2013:238). Regenerative approaches, therefore, imply that a building’s design facilitates adaptation capacity to respond to change in a place (ibid.). The vernacular design of informal settlement speaks

to the socio-cultural context and has implications for the ecological context in which a settlement is situated. As such, it renders an opportunity for understanding 'place' and responding to it uniquely.

The second construct is, building capabilities of communities to co-evolve. According to Mang et al. (2016:20) "regenerative projects seek to transform human communities into living systems enablers." In doing so, the regenerative approach, unlike sustainable design, shifts from a focus on doing less damage to enabling communities to participate in co-evolution towards healthier environments. In that regard regenerative approaches also call for community engagement towards co-creating regenerative environments which in turn demands for the building of the regenerative capacity of communities. Vernacular design is born out of the capabilities of the dwellers and as such has lessons for architectural interventions in that regard.

Central to this study is, an exploration into building capabilities demonstrated in form of the vernacular design towards community participation in coevolution. A study aim is, therefore, to align with the Capability Approach (CA) theoretical framework to understand the purpose and approach to intervention. The CA theoretical framework resists the notion of increased assets as a measure of well-being (Architecture Sans Frontières International 2012). Rather, it advocates the establishment of interventions that build existing capabilities of people and communities to improve their own wellbeing.

1.2 Context

1.2.1 Situation

Melusi, the case study informal settlement, is located West of Pretoria (figure 1.4). It is bordered by the middle-income suburbs of Booyens and Claremont; lies partially in Kirkney; and is bordered by the Witwatersberg ridge to its South (figure 1.5).

Melusi was established in 2008. Its history and reasons for situation are unclear and under-documented. Information garnered from the discussions with community stakeholders suggests that the availability of vacant land was a primary driver for its establishment. Prior to its inhabitation, the Melusi site was mined for clay (figure 1.6), which according to an interview participant, was used in the construction of the Daspoort tunnel which opened in 1972. Currently, three disused quarries exist in Melusi as water bodies (figure 1.6).

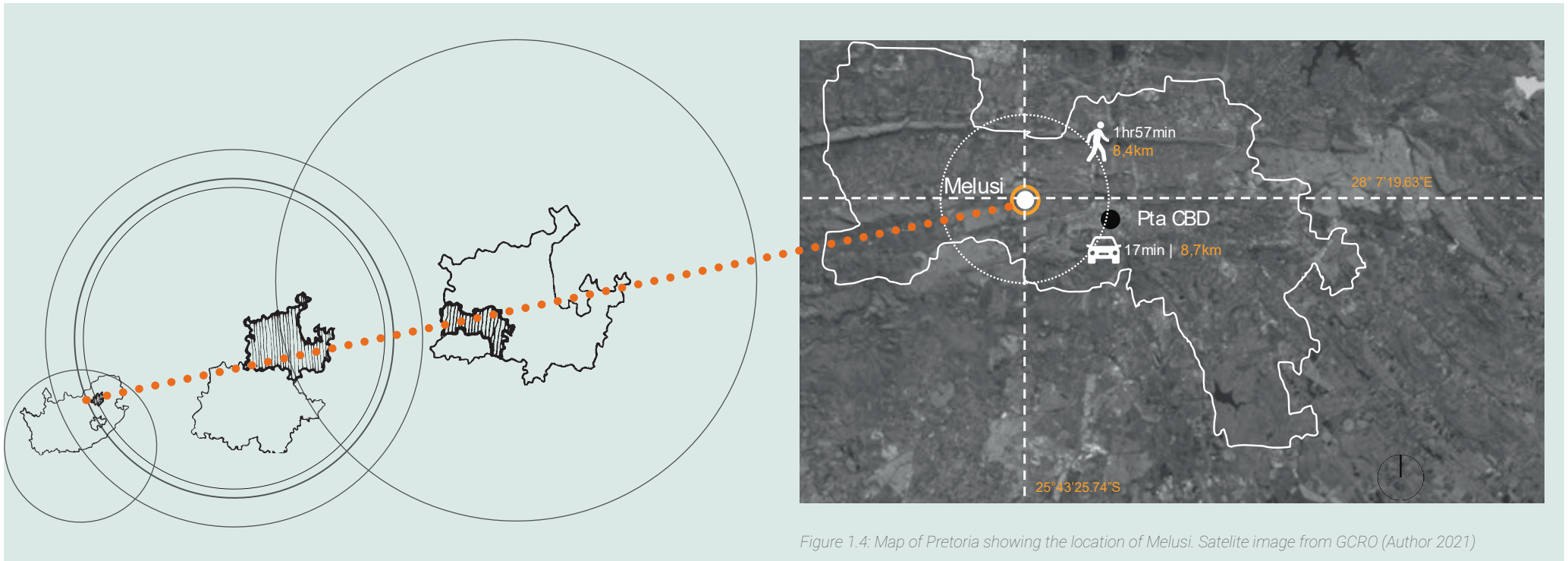


Figure 1.4: Map of Pretoria showing the location of Melusi. Satellite image from GCRO (Author 2021)

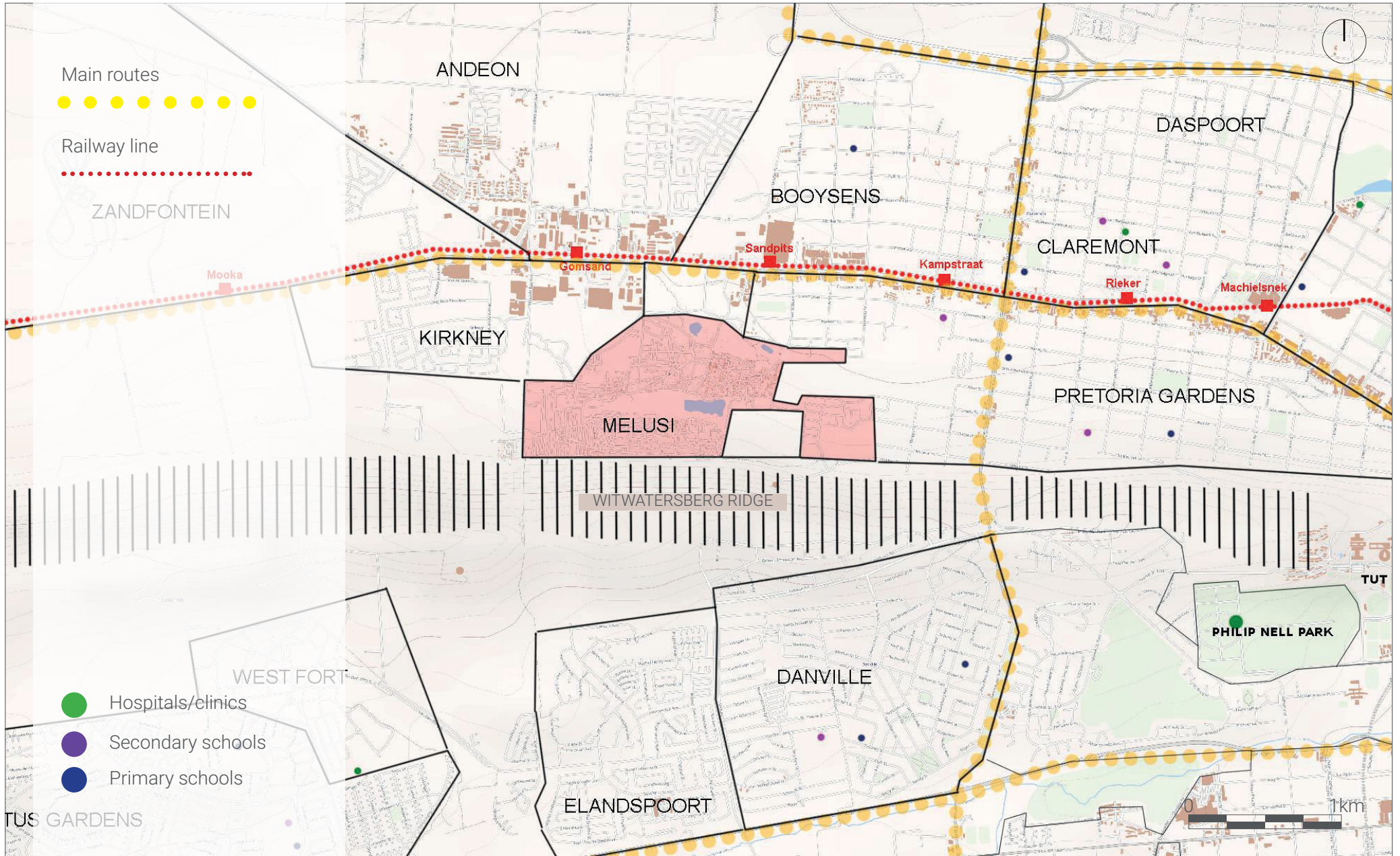


Figure 1.5: Map showing the surrounding context of Melusi (Climate Adaptation Studio Group 2 2020; Edited by Author 2021)

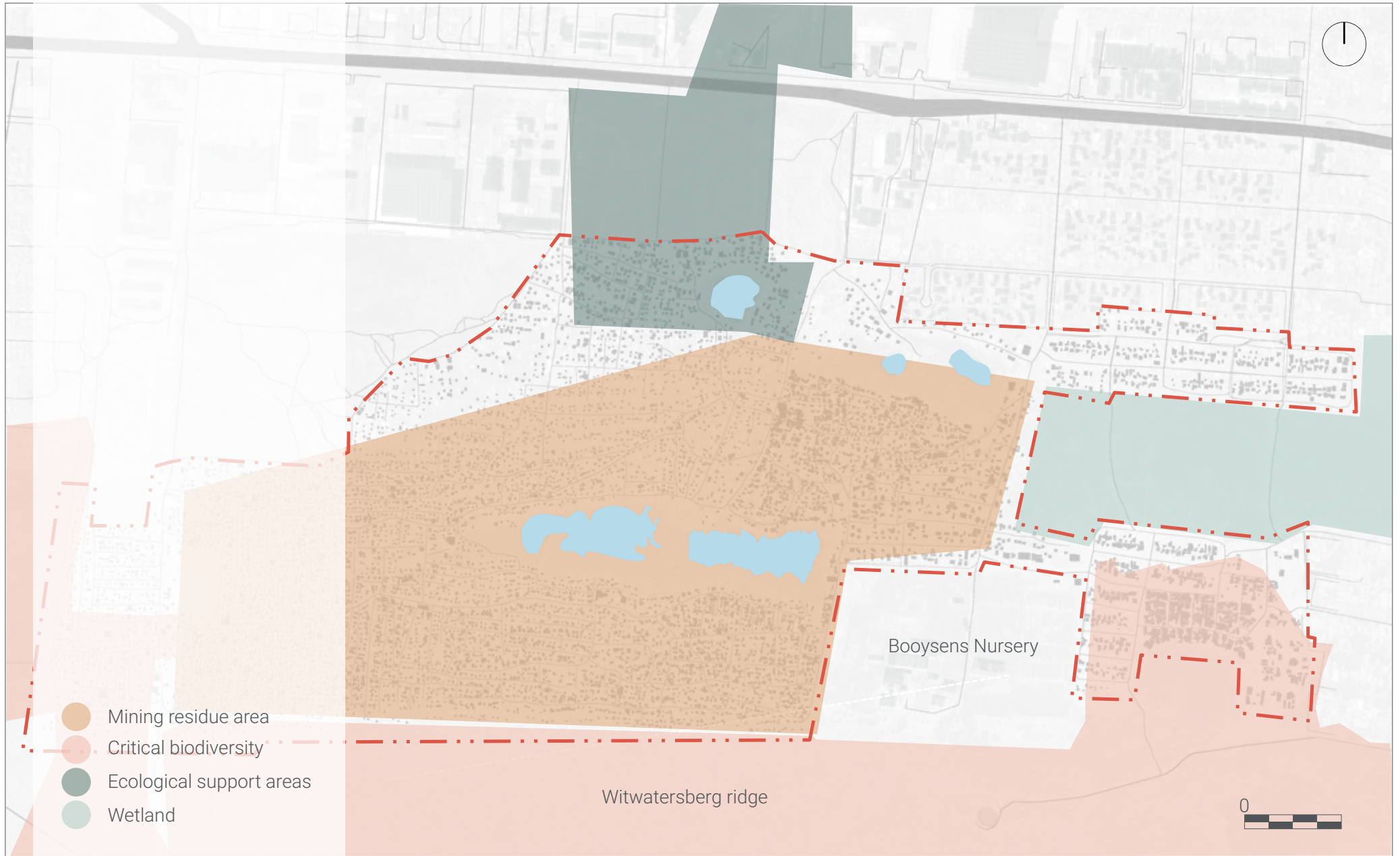


Figure 1.6: Map of Melusi showing the zoning. Satellite image from GCRO (Edited by Author 2021)

1.2.2 Evolution

Melusi has experienced exponential growth (figure 1.7) with a population growth of more than 524% between 2011 and 2021 (Placemaking and Placekeeping Studio 2021) into three regions, Melusi 1, Melusi 2 and Melusi 3 (figure 1.9). The distinctions among the three regions can be observed in their densities, degrees of formalisation, and accessibility to service provision from the municipality. Melusi 2 is the most formalised, has the highest service provision (with access to electricity), and portions of it have the highest housing density (Placemaking and Placekeeping Studio 2021). Melusi 3, where the project site is located, is un-serviced and has the lowest degree of formalisation (ibid.). The growth of the settlement, however, has had negative implications for the environment as illustrated in consequential removal of vegetation for residential development (figure 1.10).

Also revealed from the interviews was that the site was previously considered for a golf course project. The project was abandoned following an EIA report that identified an endangered African bull-frog species on the site. Presently, however, the bull-frog species is non-existent on the site. Though fishing is conducted in the

Figure 1.7: Maps of Melusi showing its growth from 2009 to 2021. Satellite images from Google Earth (Author 2021)



2009 (Only Melusi 1)



2013 (Melusi 1 and 2)

largest quarry pond, the banks of water features are generally used as dumping sites. Essentially, human activity within Melusi has had negative implications for the natural environment. The natural environment also engenders vulnerabilities for the residents, particularly erosion and flooding given the location of the settlement at the foot of a ridge and partially within a wetland. As such, the relationship between the human and natural systems is concerning, but also presents an opportunity for co-evolution.

A common typology of the Melusi vernacular is characterised by single floor dwelling, two-room dimension in width, built from humanscale with rudimentary tools by hand (figure 1.8). Corrugated iron sheets, timber, and bricks are the most used material (Climate Adaptation Studio 2020). They are applied in diverse ways, and mostly recycled or re-used. Whilst the materials and technology used have the advantage of ease of assembly and affordability, they increase the vulnerability to extreme weather events and fire. Other existing vulnerabilities in Melusi highlighted in its mapping by the 2020 Honours Climate Adaptation Studio and 2021 Honours Placemaking and Placekeeping studio include food security, water and sanitation, access to healthcare, and employment.



Figure 1.8: Melusi vernacular (Placemaking and Placekeeping Studio 2021)



2015 (Melusi 1, 2 and 3)



2021

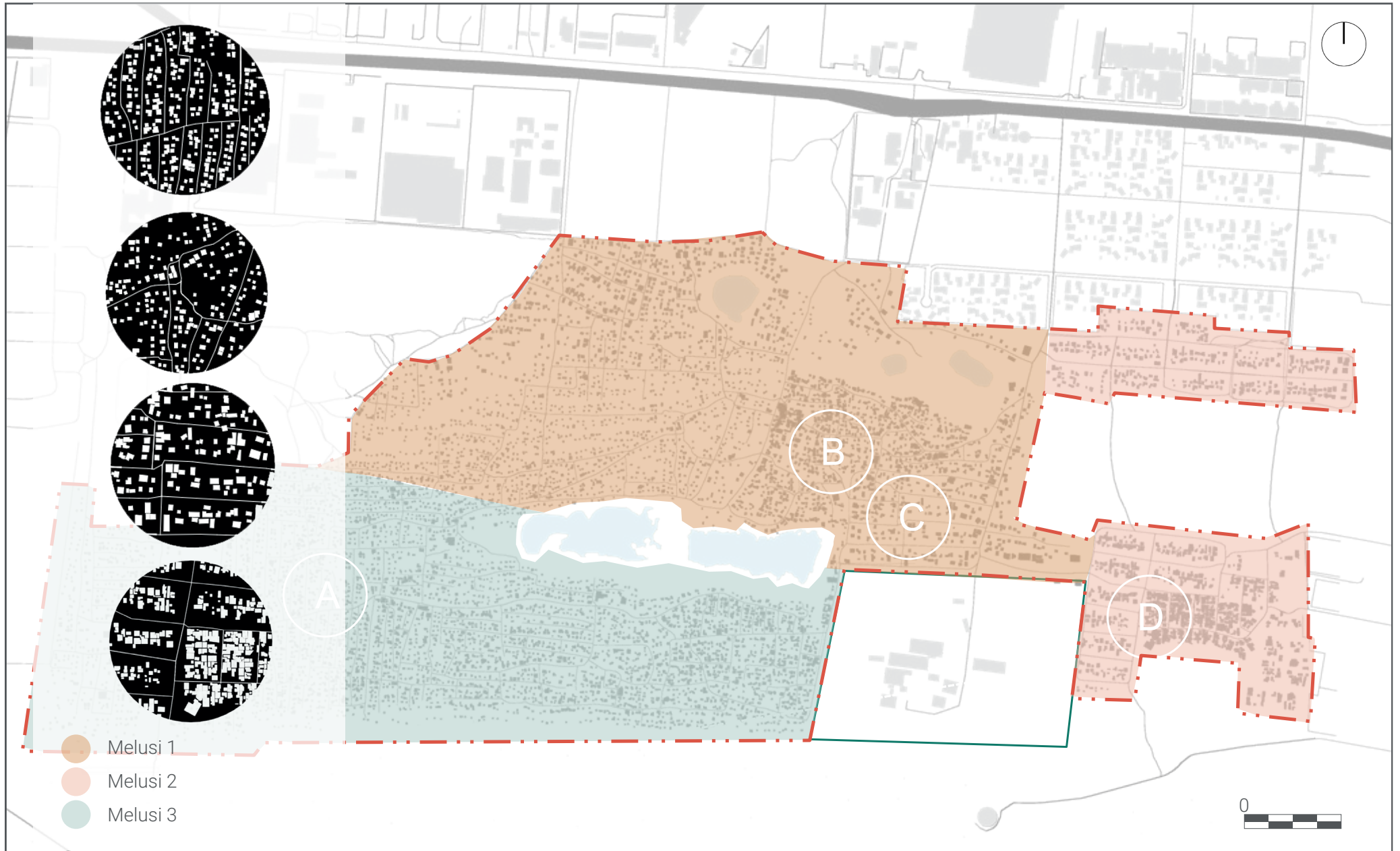


Figure 1.9: Map of showing its three regions and their distinctions in density (Placemaking and Placekeeping Studio Group 2 2021; edited by Author 2021)

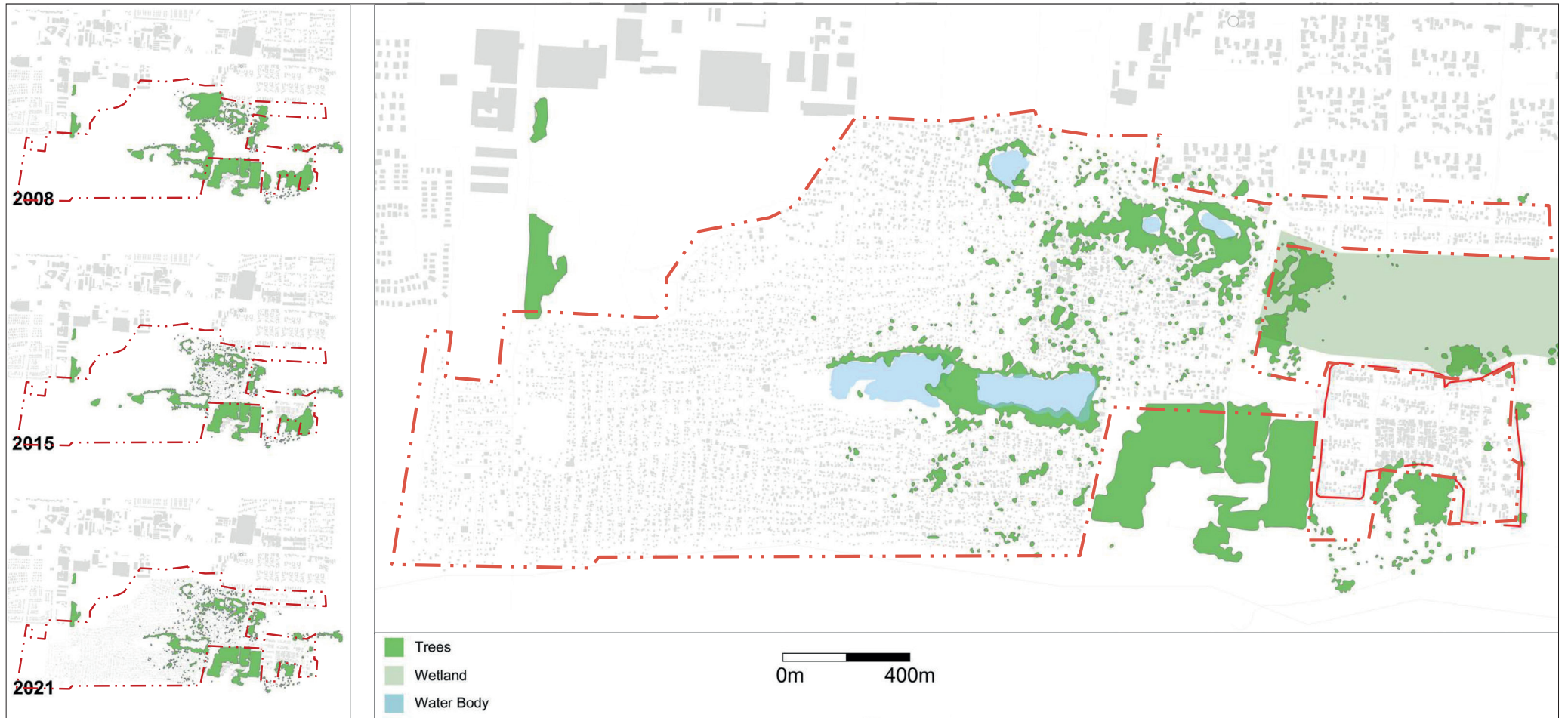


Figure 1.10: Map of Melusi showing the death of plant life as the settlement grows (Placemaking and Placekeeping Studio Group 2 2021; edited by Author 2021)

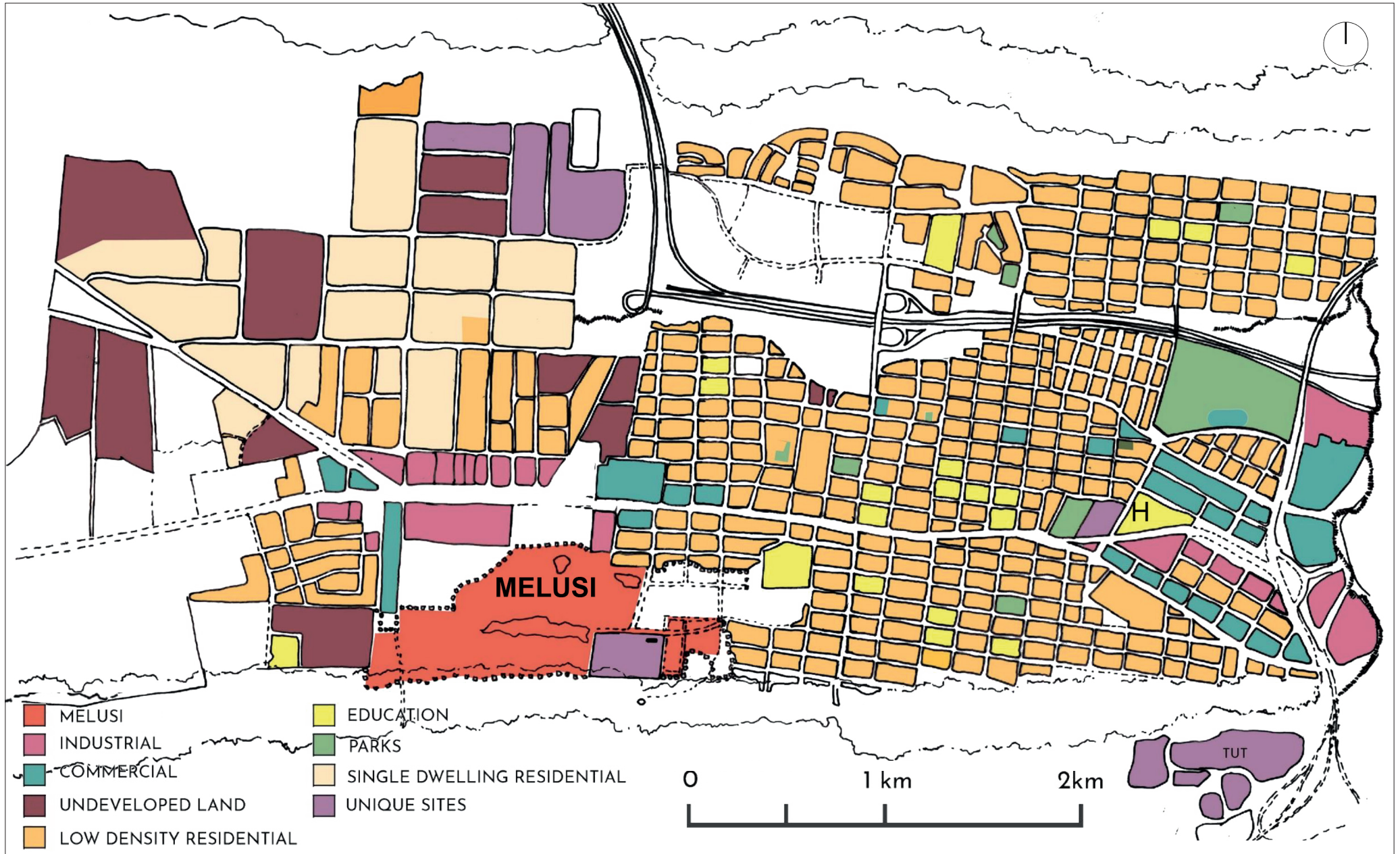


Figure 1.11: Map of Melusi showing Land Use (Climate Adaptation Studio Group 2 2020).

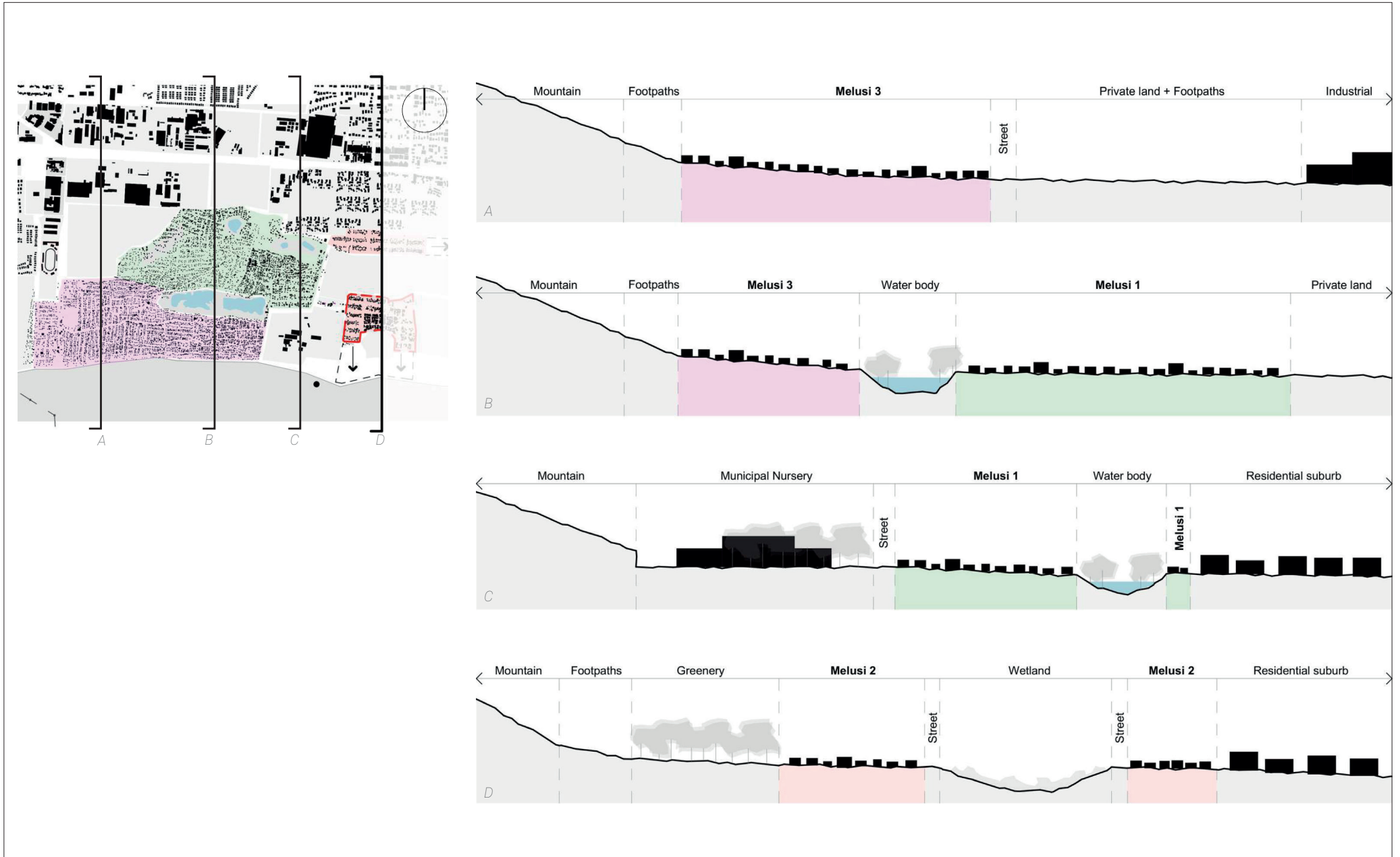


Figure 1.12: Map of and Site Section through Melusi showing the Edge Conditions (Placemaking and Placekeeping Studio Group 2 2021)



Figure 1.13: Map of Melusi showing the Development Trends (Placemaking and Placekeeping Studio Group 2 2021)

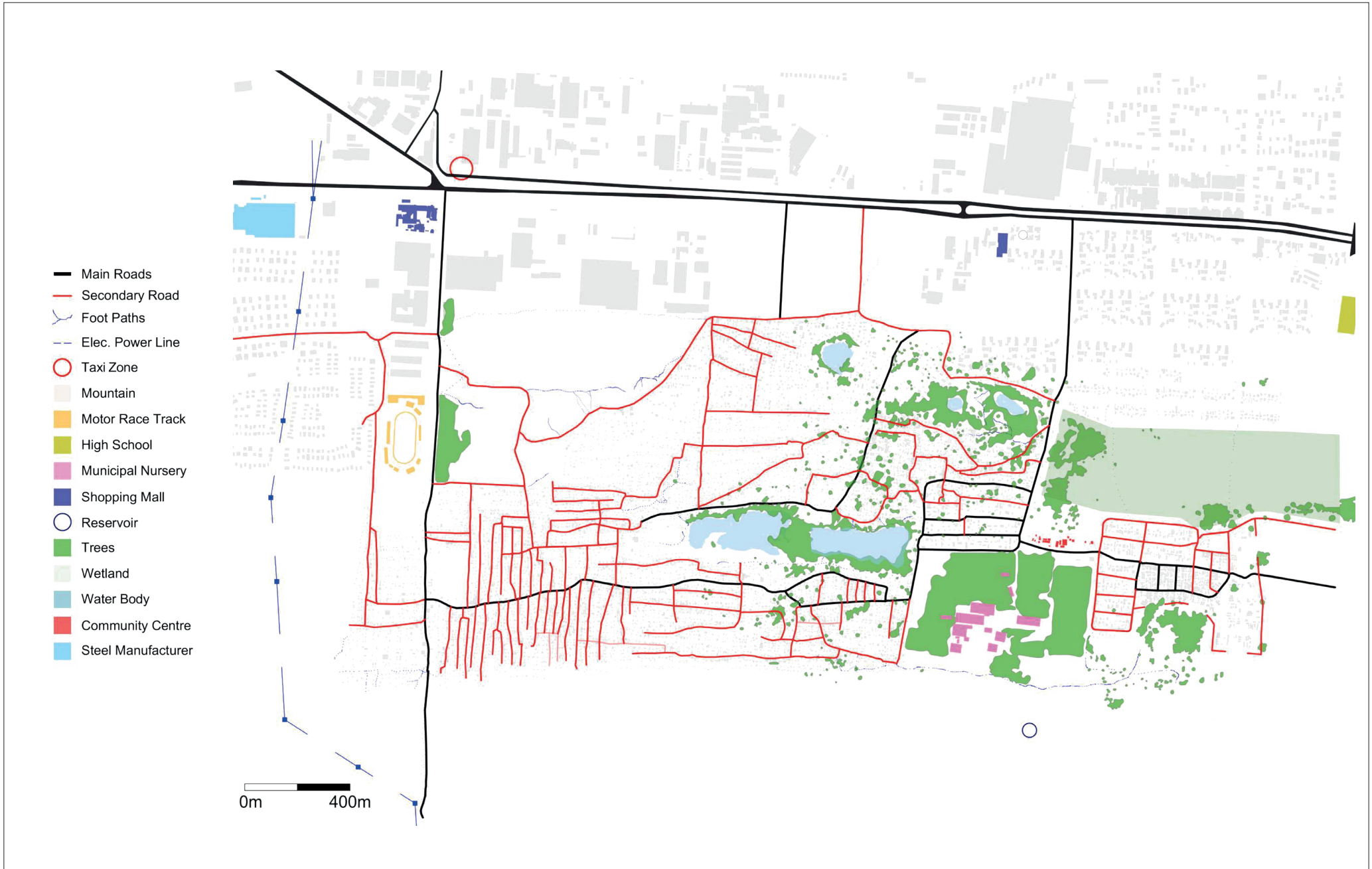


Figure 1.14: Map of Melusi showing the features (Placemaking and Placekeeping Studio Group 2 2021)

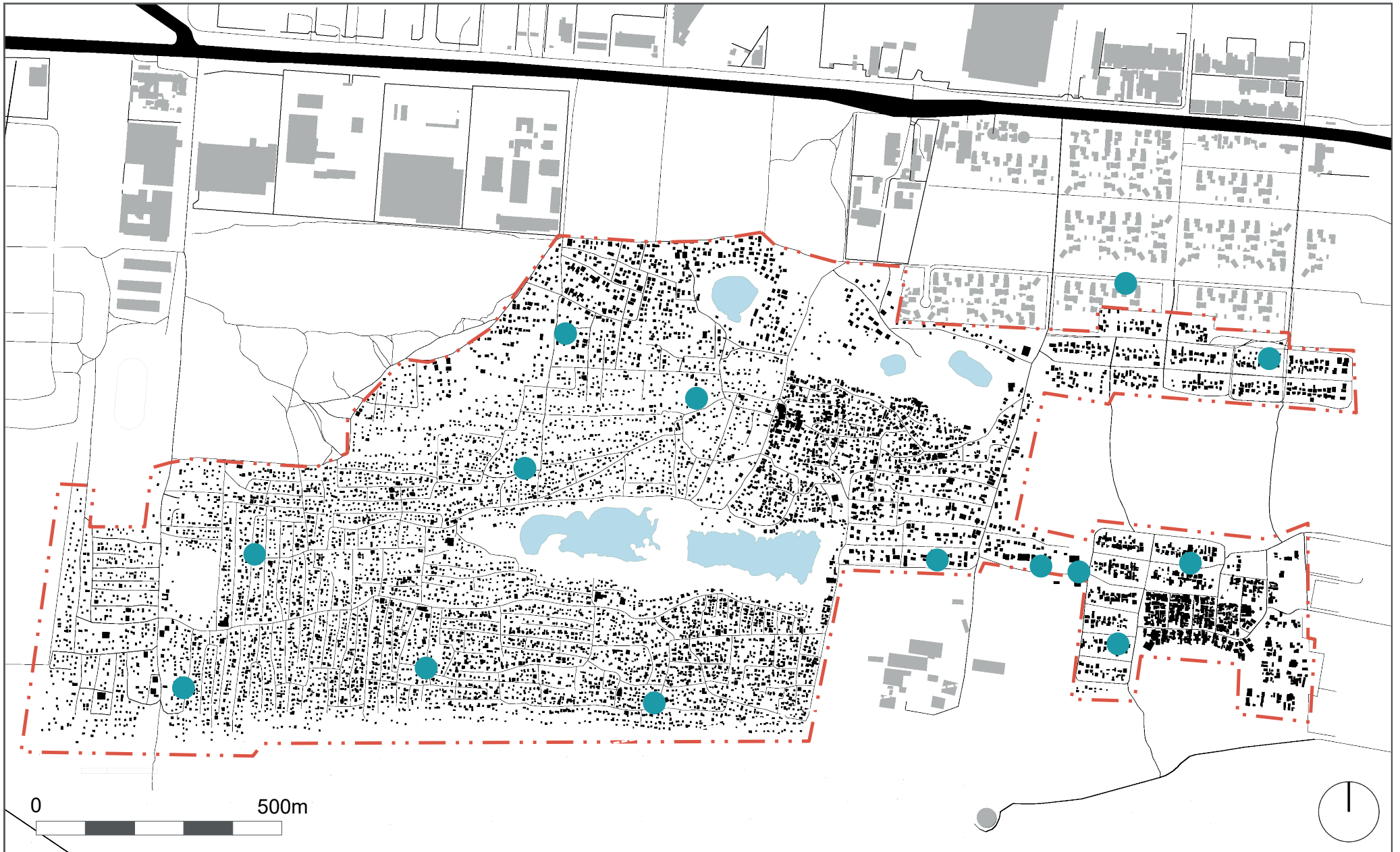


Figure 1.15: Map of Melusi showing the location of ECD's within Melusi. (Author 2021)



Figure 1.16: Map of Melusi showing location of water tanks. (Author 2021)

1.2.2 Site selection

The project site is situated on the banks of the largest quarry pond, in Melusi 3. The site is one of the few vacant lots within Melusi (figure 1.17). The others being the North-Western corner of the Booyens nursery, the wetland East of the settlement, and the slopes of the Witwatersburg ridge, both zoned as protected areas (Tshwane GIS). The site selection was motivated partly by the availability of land – not privately owned or zoned as a protected area – to avoid the marginalisation of certain households through displacement due to the project’s establishment. Displacement is opposed by the National Housing Code which suggests relocation only “as a last resort, in exceptional circumstances” to sites in proximity of previous location (DHS 2009:9). Additionally, the location of the site on the banks of a fractured landscape (disused quarry pond) presents an opportunity for its regeneration through the establishment of a liminal space where exchange can happen between the built-environment and the bio-physical context to enable a co-evolutionary partnership.



Figure 1.17: Vacant sites. Satellite image from Google Earth (Edited by Author 2021)

1.3 Research methodology

This research project is situated in an interpretivist paradigm which according to Blanche and Durrheim (1999:6) “aims to explain the subjective reasons and meanings that lie behind social action.” The motivation for this was to understand the social and material relations within the context. This facilitated the exploration of the vernacular design, the study’s key constructs, ‘place’ and ‘building capabilities.’ It also facilitates an understanding of the quality of the relationships between the various community stakeholders and their perspectives on issues pertinent to the research. A qualitative methodological approach was employed and considered a combination of ethnographic methods; transect walks (figure 1.19), semi-structured interviews, participatory research (figure 1.20), and observation. Data from the above was supplemented with mapping and structured observations conducted by students in the Climate Adaptation Studio (2020), Placemaking and Placekeeping Studio (2021), and the Malusi RFS Studio (2021).

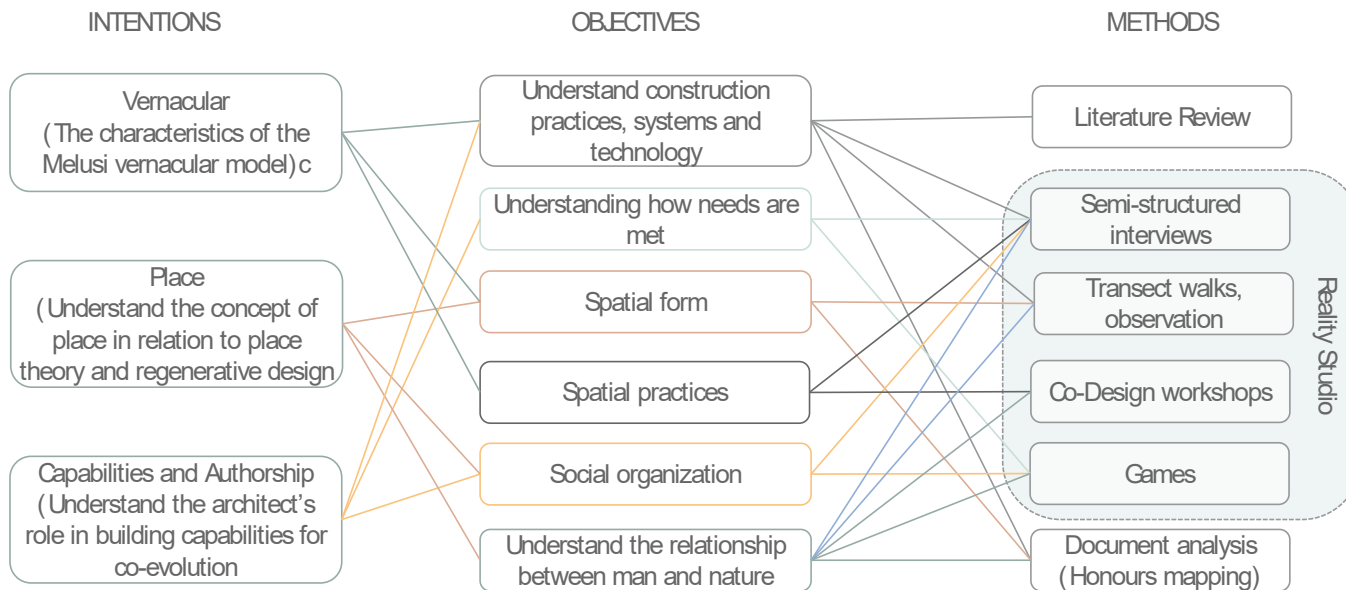


Figure 1.18: Research approach (Author 2021)

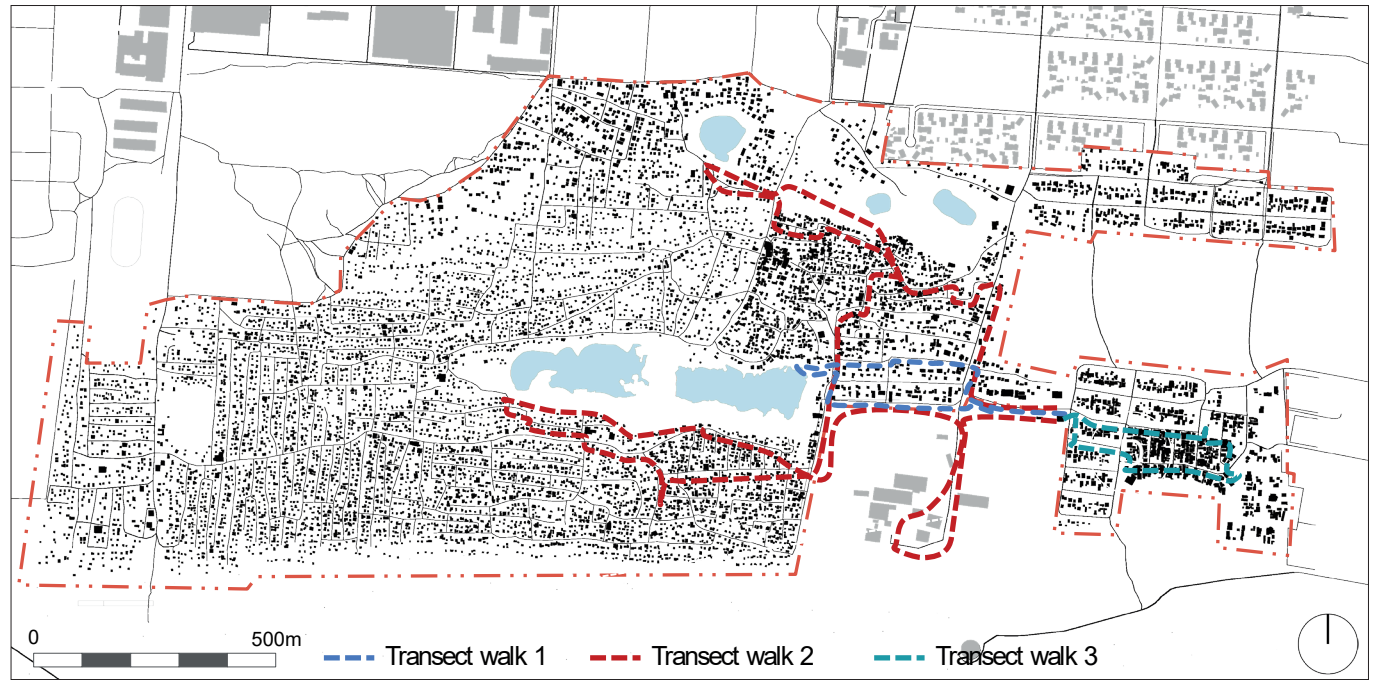


Figure 1.19: Transect walk routes taken (Author 2021)



Figure 1.20: Children taking part in participatory games (Zorn 2021)

1.3.1 Ethical considerations

Prior to and as a prerequisite for participation, the contributors were requested to sign informed consent forms which detailed the research particulars that had also been explained to them. For the children, consent for their participation was sought from their parents. Participation was voluntary and the participants maintained the right to withdraw their participation at any point in time.

1.3.2 Limitations

Language barrier limited the interactions with children especially those at the youngest participants at the ECD. To counter that interpreters were engaged, however, there was still a disconnect in that regard.

1.3.3 Normative Position

Turner & Fichter (1972:245) note that a lot done in the name of human well-being has been at the expense of it, by undermining ones “opportunity to do for oneself what one is quite able to do.” Similarly, Wekesa, Steyn & Otieno (2011) writing on informal settlement upgrading in South Africa, argue that undermining self-determination in interventions engenders a crippling effect in communities. Essentially, interventions that preclude the self-determination and capabilities exhibited by communities in providing for themselves come at the expense of human wellbeing.

In *Architecture Without Architects*, Rudolfsky (1964:25) explores non-Western vernacular architecture noting that “[t]here is much to learn from architecture before it became an expert’s art” (ibid.25). He demonstrates that architecture created by untutored builders through communal design processes not only exhibited artistic qualities but was also purposeful and responsive to climate. Intrinsically, communities demonstrate high-level capabilities in the form of vernacular architecture. The normative position taken in this study is that architecture ought to support and build the existing capabilities of communities for co-evolution through engaging the vernacular design. It is important to question where an architect positions oneself in terms of authorship when intervening in communities that already demonstrate design autonomy in creating for themselves. Architects can analyse the vernacular condition of places through a regenerative lens and make informed decisions on where design intervention can contribute to enabling capacity for co-evolution.

1.4 Conclusion

This research addresses the topic of regeneration and in particular the concept of 'place' within the South African context and with a focus on developing pro-poor place-specific strategies for informal settlements. Regenerative development is concerned with effecting improved social, economic and ecological wellbeing through supporting and building of local capacity. Whilst informal settlements are often cast in a negative light, in this dissertation, the researcher considers them as a stage in the lifecycle of emergence and explores the latent social and ecological potential for regeneration in the communities and vernacular design. The research into this latent potential has been classified as social and material aspects. The social dimension considers the richness of relationships, that is, between community stakeholders, the natural and built environments. The material dimension considers the spatial qualities of the informal settlements, that is, learning from the vernacular. Whilst the vernacular is the focus of the study, it is intricately tied to the social aspects.



Figure 1-21: Melusi dwelling (Zorn 2021)