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# The Value of Community Capitals in Sustainable Urban Development: A Qualitative Exploration of Urban Informal Workers

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**Abstract:** Urban informality, often viewed negatively, is not solely the product of the urban poor but also reflects the failure of formal systems to adapt. Informal workers, who make up about 61% of the global workforce, operate outside formal labor laws and significantly contribute to urban development. Understanding and harnessing community capitals are vital for sustainable urban development. This qualitative study explored the community capitals framework (CCF) in an urban context, addressing the limitations of quantitative data on CCF, which often overlooks critical social factors. This study team conducted in-depth interviews with 36 informal service providers from the education, healthcare, water, sanitation, and solid waste management sectors. Additionally, four local leaders from two urban informal settlements in Nairobi, Kenya, were interviewed. The data from the transcripts were analyzed using thematic framework analysis, guided by the community capitals framework. We identified seven forms of community capital that benefit informal workers: natural, cultural, human, social, political, financial, and built. Human capital, which focuses on skills and qualities, was the most frequently utilized, followed by social capital, which centers on connections and relationships. Next in importance were financial and political capital. Although cultural capital was the least implemented, it was described as important for reflecting community knowledge and traditions. Examples of these capitals in action included solid waste workers, manual pit emptiers, education providers, health workers, and water service providers, who all contributed to urban development and well-being through waste management, sanitation, education, healthcare, and access to clean water. In conclusion, service providers use community capitals as a planning tool to understand dynamics, refine strategies, and build trust for urban development. Each capital functions like a community bank account, containing strengths and opportunities. Although cultural capital was ranked last, it warrants further research to explore its drivers. Additional research is needed to fully grasp the relationships among the various capitals and their impact on service delivery.

**Keywords:** urbanization; capital; community capital; informal settlements



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## 1. Introduction

Urban informality is commonly seen as a “threat” to progress, ascribed to the urban poor who live and work in informal settlements [1,2]. However, what is really failing residents in informal settlements is an underlying multiplicity of “formal” workers, actors, institutions, legal frameworks, and markets that are not able to respond, absorb, or adjust to this reality [3,4]. Informal workers who are mostly in informal settlements account for about 61% of the global workforce, working as waste collectors, landscapers, day laborers, taxi drivers, cooks, and in other roles that often fall outside labor legislation, taxation, benefits, and social protection [2]. In low- and middle-income countries, the informal sector is larger than the formal sector [1]. In the Global South, informal workers account for 50% to 80% of urban employment and generate 25% to 50% of gross domestic product (GDP) [5,6]. The growth of this sector can be linked to liberalization and privatization

policies that led to reduced job opportunities in the formal public sector [7]. The formal private sector could not absorb the increasing number of job seekers [2,7]. Therefore, the informal industry emerged as an alternative source of employment to a growing number of individuals transitioning from educational institutions [1,6]. Thus, the informal sector should be supported due to its role in the Kenyan economy [2]. The increasing size of the informal sector has become a concern among many governments in both developed and developing countries, including Kenya [6], and as such, it is important to understand existing capital that flourishes in the informal sector.

The world we live in is shaped by our history [8]. To understand it right, we cannot see it as a bunch of separate moments where people act like machines [9]. Instead, we need to think about the idea of capital—the resources and wealth that build up over time [10,11]. The accumulation of capital has a big impact on society and how it works [9]. Community capital is one sourced from a broad cross section of the community and invested in the community, and it is more than a legal and financial strategy [12]. At its core, community capital is about equity, inclusivity, empowerment, and shared prosperity. The capital is a result of accumulated labor, either in physical objects or in the skills and knowledge of people [13]. When individuals or groups own community capital, they can control and use the labor of others in society [9,12]. Community capital is both a force embedded in structures and a guiding principle for how society operates [12]. The capital takes time to gather, whether it is in physical objects or in skills and knowledge, and has the potential to make profits, grow over time, and persist in its being [13]. The structure of the distribution of different types and subtypes of community capital at a given moment in time represents the immanent structure of the sundry world [14]. It is impossible to account for the structure and functioning of a dynamic and diverse world unless one reintroduces capital in all its forms and not solely in the one form recognized by economic theory in the form of capitalism/economic capital [9]. Capital implicitly ensures transubstantiation—and different types can present themselves in the immaterial form of cultural capital and social capital, among others [12].

Community capital comes in many forms with many sources and a common need uniting a wide range of actors (including businesses, nonprofits, city governments, and consumers) who are seeking to grow and develop [10,15]. The community capitals framework reveals the interactions between different parts of a community [16]. Communities where capitals are embedded are systems that have inflows and outflows, ups and downs, progression and regression [14,16]. For example, when money is invested in a new school in the community, the system is affected either positively or negatively; more jobs, increased populations, new housing developments, and increased crime rates are just a few of the new issues to be dealt with [14]. From an economic development perspective, bringing a new school to town seems like a great solution, but it must be understood that the school will affect other facets of the community [16]. While the capitals are separated into seven separate categories, each has a connection with the others, for example, if a community wants to build a new school, it must be able to invest in several of the community capitals such as social networks to reach that goal [15,16]. Our study explored community capitals, targeting informal workers in diverse service delivery in an urban setup. This study responds to the need of investigating the community capitals framework (CCF) in avenues that go beyond rural setups [17], as this study was conducted in an urban setup. This study is targeted at informal workers in diverse service delivery roles, who are often invisible, as they are rarely documented [18,19]. Quantitative data on CCF often ignore critical social and cultural factors [17,19]. Excluding the social aspects of the CCF in site selection risks economic and environmental sustainability [20,21], and as such, our study was qualitative in nature.

### *Conceptual Framework*

The community capitals framework (CCF) is a widely proposed tool to comprehensively identify community assets [9,10]. By assessing what communities have, and

highlighting interactions and synergies between tangible and intangible assets, the CCF aims at a positive spiraling effect that allows for the generation of additional capitals [10]. To enable a comprehensive identification of tangible and intangible assets, the CCF groups them into seven thematic groups. These are natural, cultural, human, social, political, financial, and built capitals (see Figure 1).



**Figure 1.** Community capitals framework.

Natural capital includes assets that are connected with the environment of a specific location, for instance, weather, geographical position, natural resources, landscapes, and aesthetics [10]. Cultural capital refers to the way people know the world and includes traditions and language [21,22]. Human capital comprises demographic aspects as well as people's skills, knowledge and competences [23]. Social capital is understood in terms of connections, networks, and interpersonal relationships among people and organizations that allow them to reach collective objectives [4]. Political capital relates to power, representation and engagement, resources allocation, and organization [10]. Financial capital indicates economic resources, including loans, investments, and aids [24]. Built (or infrastructural) capital reflects the equipment and facilities that support human activities [24].

There are four principles of community capital [10,13,17,25] applicable to our study:

- Community capital is inclusive: Community capital practices provide opportunities for people of all levels of wealth and all demographics to fully participate in the economy as investors. Widening the investor pool creates more opportunities for diverse stakeholders to receive investment from their neighbors and build enduring wealth.
- Community capital is fair and equitable: Community capital practices redress financial inequity by establishing wealth-building opportunities for all. Unlike historic practices, which provided opportunities and incentives only to the wealthiest, community capital provides opportunities for meaningful returns on investments for everyone.
- Community capital empowers and serves all stakeholders: Community capital works to incorporate the perspectives and interests of a diverse set of stakeholders in their design and management. The capital intentionally balances the needs of many stakeholders fairly and equitably and ensures that none are harmed.
- Community capital facilitates shared prosperity: Community capital strives to grow wealth and wellbeing for local individuals and communities. When investors are also customers, financial beneficiaries, and partners, both the venture and the community prosper.

## 2. Methodology

We present our study findings according to the set of standardized Consolidated Criteria for Reporting Qualitative Research (COREQ) [26]. COREQ is a 32-item checklist designed to ensure the transparency and quality of qualitative research reports. It covers three main domains: research team, study design, and data analysis. COREQ includes items such as information about the research team's experiences, methodological approach, participant selection and recruitment, data collection methods, and data analysis techniques. By adhering to COREQ, researchers can enhance the credibility and reproducibility of their qualitative studies, making it easier for others to understand, evaluate, and build upon their findings [26].

### 2.1. Study Design

This was a case study design using a qualitative approach. We designed this study guided by the community capitals framework. As such, questions in the study tools probed the community capitals framework: natural, cultural, human, social, financial, political, and built capitals. Community capital formed the basis for our objectives, research questions, data collection, analysis, and interpretation of findings.

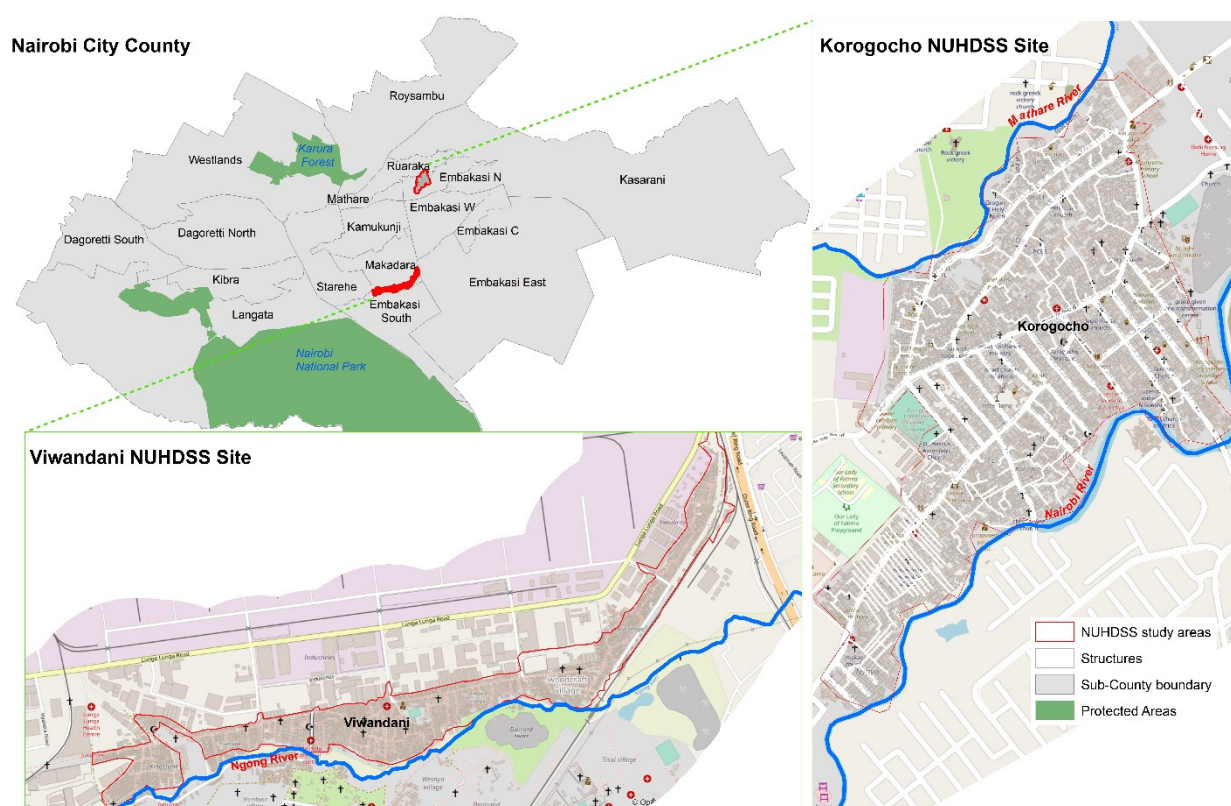
### 2.2. Study Setting

From a population of 350,000 in the 1962 census to 4,397,073 in the 2019 census, Nairobi typifies the rapid urbanization and population explosion in sub-Saharan Africa [27]. We conducted this study in Nairobi, which is the capital and largest city of Kenya. Informal settlements in Nairobi are characterized by unmet needs in access to basic amenities of healthcare, sanitation, water, hygiene, solid waste management and education [28] by the marginalized and vulnerable groups like persons with a disability, older persons, and children [28]. The consequence of the rapid and uncontrolled population explosion is the proliferation of informal settlements in Nairobi, with upwards of 60 percent of Nairobi residents estimated to be living in slums and contributing to increasing urbanization and the need for employment opportunities. Our study covered two informal settlements: Korogocho and Viwandani informal settlements in Nairobi, in the regions covered by Nairobi Urban Health and Demographic Surveillance System (NUHDSS) initiated in 2002 by the African Population and Health Research Center (APHRC) (Figure 2). The Korogocho informal settlement has a more steady population, and multigenerational inhabitants have resided in the region for several years [29]. On the other hand, Viwandani is situated near an industrial zone, with frequent migration among residents and more educated occupants who labor or look out for better jobs within and outside the informal settlements [29]. The choice of this case study in informal settlements in Nairobi was motivated by the pressing need to understand the dynamics of community capitals in these often marginalized areas. By exploring the interplay between different forms of community capital in this context, this study will contribute to a better understanding of community capitals and their potential to improve sustainable urban development and quality of life in informal settlements.

### 2.3. Target Population, Sampling, and Sample Size

The populations of interest were service providers in five sectors that were identified and described in the governance diaries as priority basic needs [28]. The sectors included education, healthcare, water, sanitation, and solid waste management. Through a stakeholder mapping exercise, we developed a stakeholder database that depicts actors/service providers [30]. The stakeholder mapping exercise was a critical step in our study, designed to identify and categorize key actors and service providers involved in community development within the study area. This process involved conducting a literature review, consulting with community leaders, and discussing with local experts to identify potential stakeholders. Information about each stakeholder, including their name, organization, role, and areas of interest, was gathered through interviews and secondary data sources. Once the initial stakeholder database was created, it was refined and validated through inter-

views with study participants during the governance diaries data collection process [28] with marginalized and vulnerable groups and during community advisory consultations with community leaders [31]. This ensured that the stakeholder database accurately represented the key actors and their roles within the community. From the service providers in the validated database, we purposively selected providers who had operated longer than the rest (on average 8 years). Longer time in service delivery meant more depth in knowledge on the subject matter. As such, we selected 4 education providers, 2 health-care providers, 4 water providers, 4 sanitation providers, and 4 solid waste management providers as study participants in each of the study sites. Two sub-County officials in each study site were also selected purposively as study participants if they had vast experience in the study sites, portrayed by their longer stay in serving the studied communities. After collecting data from 40 participants who had worked in their respective fields for over eight years, we found that no additional significant information emerged, indicating that saturation had been reached. This enabled us to understand community capital.



**Figure 2.** Study sites (source: authors, 2022).

#### 2.4. Data Collection Process

We collected data from March to May 2022 using in-depth interview guides. We selected Research Assistants with support from community advisory committees [31], that is, if they were endorsed by community in the study sites and if they had some experience in qualitative research. We opted for Research Assistants from the community who are insiders. Insider researchers are native to the setting and are sometimes perceived to be too close and thereby do not attain the distance and objectivity necessary for valid research [32]. Notably, we challenged the limitations of using insider Research Assistants in this study. Insider knowledge in whatever research tradition is not only valid and useful but also provides important knowledge, which approaches used by outsiders may not be able to uncover [33]. In our view, insider research is not problematic in itself and is respectable research in whatever paradigm it is undertaken.

Given the often marginalized and vulnerable status of residents in these communities, it was essential to establish trust and build rapport. We engaged community leaders and gatekeepers to gain access and facilitate introductions to the community and to the study participants. We were flexible and adaptable to accommodate rapidly changing circumstances in informal settlements, including change in operational hours due to fire-outbreaks, overwhelmed service providers, and closure of service provision. Data were collected through in-depth interviews (IDIs) [26], using an IDI guide which had questions on community capital in the workplace, including the seven capitals. We conducted face-to-face interviews in English or in Swahili as needed at quiet location convenient to the participants, which were mainly at their workplaces, and for the convenience of the study participants. Research Assistants recorded the interviews using a digital recorder and backed them up with handwritten records. These interviews lasted for approximately 1 h.

### *2.5. Data Quality Control*

Project researchers reviewed all audio files in real time to ensure the completeness and depth of the interviews and provided feedback to the Research Assistants, who were trained for 5 days on study aims, data collection procedures, study tools, and study ethics. The training also enlightened the Research Assistants on objectivity in data collection despite their insider perspectives. Researchers and Research Assistants held debriefing sessions every day to determine the key emerging themes, probing techniques, and general progress.

### *2.6. Data Management and Analysis*

Recorded audio files from IDIs were translated and transcribed from Swahili to English and saved as individual Microsoft 365 Word documents. Outputs were assigned number codes to prepare for analysis and to ensure confidentiality. Thereafter, transcripts were imported into NVivo version 12 software (QSR International, Chadstone, Australia) for coding and analysis. Each transcript had a unique identifier comprising participant category, study site, and sex to enhance anonymity and facilitate informed analysis.

We used a framework analysis [34] informed by the community capital [26,35] (Figure 1). Framework analysis is adopted for research that has specific questions, a pre-designed sample, and priority issues [34]. The first step of our framework analysis was listening to the recordings to familiarize the researchers with the information related to community capital. To ensure reliability, two researchers (an experienced qualitative researcher and an anthropologist) and five co-researchers, who collected the data participated in the development of a coding framework by reading the outputs imported in NVivo 12 software independently to establish an intercoder agreement. Once the initial coding framework was completed, the team met to discuss the themes generated and reach an agreement on themes. Two researchers proceeded with coding, charting, mapping, and interpretation of transcripts.

### *2.7. Ethical Considerations*

AMREF Health Africa's Ethics and Scientific Review Committee (ESRC), REF: AMREF-ESRC P747/2020, approved this study. We obtained a research permit from the National Commission for Science, Technology and Innovation (NACOSTI), REF: NACOSTI/P/20/7726. Approval was also sought from the Liverpool School of Tropical Medicine (LSTM) and the African Population and Health Research Centre (APHRC) internal ethical review committees as part of the larger Accountability and Responsiveness in Informal Settlements for Equity (ARISE) Hub funded by UK Research and Innovation (UKRI). Before participating in an interview, all participants provided informed written consent. The interviews were conducted in quiet spaces for privacy and confidentiality and for the quality of the audio files.

### 3. Results

We present findings on community capital. Study participants included employers or service providers in the two study sites. Specifically, four education providers, two healthcare providers, four water providers, four sanitation providers, four solid waste management providers, and two community/local leaders in each of the study sites took part in our study (Table 1).

**Table 1.** Summary of the study's sample coverage.

Study Participants	Korogocho	Viwandani
Education service providers	4	4
Health service providers	2	2
Water service providers	4	4
Sanitation service providers	4	4
Solid waste management service providers	4	4
Community/local leaders	2	2
<b>Subtotal</b>	<b>20</b>	<b>20</b>
<b>Total</b>	<b>40</b>	

#### 3.1. Forms of Community Capitals

The CCF included seven forms of community capital—natural capital, cultural capital, human capital, social capital, political capital, financial capital, and built capital. Specific examples of each form of capital summarized from the literature can be seen in Figure 1. For all cases studied, human capital were most frequently implemented and valued, followed by social capital, financial capital, and political capital. In particular, human capital deals with retaining skilled workforces and for finding the necessary financial resources to support efforts to meet community needs. The second most frequently valued type of capital employed was social capital. Clearly, to get things done in their communities, the study participants drew heavily on their networks of like-minded service providers and individuals and had to raise funds and obtain some sort of political support for their efforts in order to achieve their goals. Cultural and built capitals were the least implemented (Figure 3). The low implementation of cultural capital could be the reason some forms of development and service delivery were stagnating in the informal settlements. Although this interpretation is quite simplistic, it does give us a sense of the interrelatedness of the community capitals.

Type of Capital	Frequency
Human capital	22
Social capital	19
Financial capital	17
Political capital	16
Natural capital	14
Built capital	13
Cultural capital	10

**Figure 3.** Type and frequency of capitals reflected in service delivery.

#### 3.2. Human Capital

Human capital refers to skills, competencies and qualities possessed by individuals that can be leveraged to enhance resources within and beyond the community. This includes their capacity to earn income, foster community cohesion, and contribute to community organizations, their families, and personal development [13,36]. These attributes encompass educational and technical skills, maintaining a healthy lifestyle, and personal traits such as honesty, leadership, and a strong work ethic [10,36].

This was the most valued capital among the study participants (Figure 3). Solid waste workers demonstrated human capital by efficiently managing waste disposal and recycling, contributing to environmental cleanliness and public health. Manual pit emptiers exhibited human capital by reducing health hazards through the manual emptying of pit latrines, thereby promoting sanitation within the community. Education service providers contributed to human capital by imparting knowledge and skills, empowering community members with education and training opportunities. Health providers showcased human capital by offering medical services, improving the overall healthcare of residents, and reducing the burden of disease. Water service providers contributed to human capital by ensuring access to clean and safe water, promoting hygiene, and preventing waterborne diseases in the community.

*“Various community workers, such as solid waste handlers, manual pit emptiers, education providers, health workers, and water service providers, demonstrate human capital through their respective roles, contributing to environmental cleanliness, sanitation, education, healthcare, and access to clean water, thus improving overall community wellbeing.”* (KII, local leader).

### 3.3. Social Capital

Social capital refers to the connections and relationships among community members and organizations that enable them to come together and effect change [37]. It can be understood in terms of norms of reciprocity and mutual trust [4,36]. Building social capital involves encouraging community adaptability, responsibility, and initiative, as well as fostering interactions that strengthen members' commitment to their group's values and goals [36].

This was the second most valued capital among the study participants (Figure 3). Solid waste workers contributed to social capital by collaborating with residents and community organizations to manage waste effectively, fostering cooperation and trust within the community. Manual pit emptiers built social capital by engaging with residents to address sanitation issues, promoting shared responsibility and collective action for improving public health. Education service providers enhanced social capital through their interactions with learners, families, and community groups, fostering a sense of trust and cooperation in the pursuit of educational goals. Healthcare providers contributed to social capital by establishing rapport with community members, promoting health-seeking behaviors, and encouraging collective efforts to address healthcare challenges. Water service providers strengthened social capital by engaging with residents to ensure access to clean water, fostering a sense of community ownership and responsibility for water resource management.

*“We work in groups while desludging a toilet, we also need to liaise with residents here to know the facilities that need emptying. . . And it is not only us, solid waste handlers, education providers, health workers, and water service providers also work in groups. Often times workers in this place fosters cooperation, trust, and shared responsibility among residents and community organizations, thereby promoting collective action and improving urban development and overall community wellbeing.”* (IDI, sanitation service provider).

Further discussions with manual emptiers who put more emphasis on social capital described how they could not operate at any one time without a group. From their illustration, when a pit latrine was full, the latrine owner would inform an emptier, who would in turn contact other manual emptiers through informal means and existing peer contacts. There appeared to be no formal advertising procedures. Study participants described that the size of a team was a minimum of two people for a household pit, but could be up to five people for a public latrine. A team could include both men and women, although they did not carry out the same tasks and were not equally rewarded.



*“We, the emptiers, know ourselves. We are usually friends from the same tribe. When one of us gets information about emptying he informs two or more other friends to assist in the emptying.” (IDI, sanitation service provider).*

*“One of us gets into the pit through an inserted ladder to dig and/or collect the fecal matter and other non-fecal stuff into a bucket which is then pulled by one or two persons. In a team of two persons, there is exchange of roles between the two. When exhausted, a digger inside the pit will come up to replace the collector on the top of the pit who then descends into the pit to replace the first digger. . . until the job is completed.” (IDI, sanitation service provider).*

### 3.4. Financial Capital

Financial capital refers to the resources available for investing in community capacity building, creating new businesses, accumulating wealth for future development, and promoting entrepreneurship [10,17]. While financial capital is often associated with money, it encompasses more than just currency, including resources that can be converted into monetary instruments, making them highly liquid and easily transferable into other forms of capital [9,25].

This was the third most valued capital among the study participants (Figure 3). Solid waste workers contributed to financial capital by generating income through waste management services, which could be reinvested in community projects or personal development. Manual pit emptiers accumulated financial capital through their sanitation services, potentially reinvesting earnings into improving their equipment or expanding their operations. Education service providers played a role in financial capital by attracting funding for educational programs and initiatives that enhanced human capital within the community. Healthcare providers contributed to financial capital by securing funding for healthcare services and facilities, which in turn improved community health and well-being. Water service providers invested in infrastructure and technologies to ensure access to clean water, thus contributing to community development and wellbeing.

*“I think everyone is operating to create income, like me, I work for money and to improve our water collection. In this community, various community workers, including solid waste collectors, manual pit emptiers, education providers, health workers, and water service providers, contribute to financial capital by generating income, attracting funding, and investing in services and infrastructure that benefit the community’s development and well-being.” (IDI, solid waste worker).*

### 3.5. Political Capital

Political capital includes community members’ abilities to engage in community betterment and to make their voices heard regarding community issues [9]. It reflects how power is distributed and the access that community members have to organizations, shared resources, and power brokers [9]. It also entails the ability of community members to engage in improving their community and influencing decision-making processes regarding community issues [10].

Solid waste workers contributed to political capital by participating in community meetings and advocating for improved waste management policies, thereby influencing decisions that could affect their work and the community. Manual pit emptiers built political capital by organizing with other community members to address sanitation issues, advocating for better infrastructure and services from local authorities. Education service providers enhanced political capital by empowering students and parents to advocate for educational resources and improvements in school facilities through community engagement and activism. Health providers contributed to political capital by advocating for healthcare access and resources, participating in policy discussions, and mobilizing community members to influence health-related decisions. Water service providers strengthened political capital by working with residents to advocate for improved water infrastruc-

ture, regulations, and access to clean water, ensuring that community voices are heard in decision-making processes.

*“In Nairobi’s informal settlements solid waste handlers, manual pit emptiers, education providers, health workers, and water service providers, contribute to political capital by actively participating in community engagement, advocacy efforts, and policy discussions to address issues such as waste management, sanitation, education, healthcare, and water access, thereby influencing decisions that impact the community’s wellbeing.”* (IDI, education service provider).

### 3.6. Natural Capital

Natural capital consists of assets that are tied to specific locations and include geographic location, natural resources, climate, amenities, and natural beauty. Existing definitions of natural capital can be broken down into four categories: (1) a stock of resources used to produce market goods and services [38], (2) those that add ecosystem services to the resources or goods production [24], (3) those that identify the spiritual and aesthetic aspects of the natural environment [39], and (4) those that recognize the role natural capital plays in supporting life and survival [40]. For this study, we derived our definition from researchers who described it as assets tied to specific locations, encompassing geographic location, natural resources, climate, amenities, and natural beauty [38].

Informal solid waste workers, water providers, education providers, and sanitation workers all related to this concept. For instance, informal solid waste workers relied on the natural capital of waste streams, which they would collect and recycle or dispose of. Water providers depended on the natural capital of water bodies to supply clean water to communities. Education providers benefited from the natural capital of green spaces and outdoor environments, which enhanced learning experiences. Sanitation workers utilized the natural capital of ecosystems to manage waste and maintain public health.

Solid waste workers collected recyclable materials from the environment, such as plastic bottles and scrap metal, which were then sold for income and served as a resource, which could be repurposed or recycled. These then contributed to the local economy while also managing waste generated by the community.

*“Informal solid waste workers rely on the natural waste streams. . . We collect the waste, and recycle or dispose of. In this area waste management is a crucial issue, and informal waste workers play a vital role in utilizing the natural capital of waste resources to maintain cleanliness and hygiene.”* (IDI, solid waste worker).

Water providers in Nairobi faced challenges in supplying clean water to informal settlements due to limited infrastructure and resources. They often depended on natural water bodies such as rivers and boreholes. However, these water sources were polluted due to inadequate sanitation and waste management practices within the settlements. In some cases, water providers implemented filtration and purification systems to make the water safe for consumption.

*“Water providers in Nairobi face challenges in supplying clean water to informal settlements due to limited infrastructure and resources. They often depend on the natural capital of water bodies such as rivers.”* (IDI, water service provider).

Education providers in the study sites benefited from the natural green spaces and outdoor environments to enhance learning experiences. Despite the challenges of limited space and resources, some schools incorporated outdoor learning activities into their curriculum. For example, teachers took learners on nature walks and organized gardening projects to teach them about environmental sustainability and biodiversity. Additionally, green spaces within the settlements provided opportunities for learners on recreational activities, contributing to social cohesion and well-being.

*“For example, educators {Teachers} took learners on nature walks and organized gardening projects to teach them about environmental sustainability and biodiversity. Ad-*

*ditionally, green spaces within the settlements provided opportunities for learners on recreational activities, contributing to social cohesion and well-being.” (IDI, education service provider).*

Sanitation workers in Nairobi’s informal settlements utilized the natural capital of ecosystems to manage fecal waste and maintain public health. Ecosystems were often under threat from pollution and encroachment. Organizations worked to rehabilitate and protect these natural assets while also engaging communities in waste management initiatives, such as clean-up campaigns and recycling programs.

*“Sanitation workers in Nairobi’s informal settlements utilize the natural capital of ecosystems to manage fecal waste and maintain public health. Ecosystems were often under threat from pollution and encroachment.” (IDI, sanitation service provider).*

### 3.7. Built Capital

Built capital consists of built infrastructure that supports all capitals and related activities [10]. Built infrastructure supports the various capitals described earlier [9]. This includes buildings for housing and businesses, roads for transportation of goods and people, and power plants for energy production [17].

Solid waste workers relied on built capital such as waste management facilities and transport infrastructure to carry out their duties effectively. Manual pit emptiers required proper sanitation infrastructure, including safe disposal sites to carry out their work safely and efficiently. Education service providers utilized built capital like classrooms to deliver educational services to the community. Health providers depended on healthcare facilities to offer medical services and support community health. Water service providers relied on built infrastructure like water treatment plants, water kiosks and distribution networks to ensure access to clean water for the community.

*“What I can say is that solid waste workers, manual pit emptiers, teachers, health providers, and water service providers all rely on infrastructure such as waste management facilities, sanitation systems, schools, clinics, hospitals, water treatment plants, and distribution networks in service delivery and to support the well-being of the community.” (KIL, local leader).*

### 3.8. Cultural Capital

Cultural capital shapes what is considered knowledge, how knowledge is obtained, and how it is validated within a community’s power structure [21]. It encompasses values, language, traditions, and worldviews of community members, and influence perception and interpretation of surroundings based on cultural identities [21,41].

Cultural capital was evident in the practices of solid waste workers, who relied on community knowledge and traditions to navigate waste management. They used local knowledge and expertise passed down through generations to sort, recycle, and dispose of waste effectively, contributing to the cleanliness and health of their neighborhoods. Manual pit emptiers also drew on cultural capital when performing sanitation duties, as they employed traditional techniques and knowledge to safely empty pit latrines while respecting community norms and beliefs. Education service providers leveraged on cultural capital to foster learning. For example, educators used storytelling and drama as teaching tools, drawing on the rich traditions of the community. Healthcare providers relied on cultural capital to deliver effective healthcare by understanding cultural beliefs and practices of the community, which influenced healthcare-seeking behavior and treatment acceptance. For instance, traditional healers in the community used traditional healing methods alongside modern medicine to address health issues. Water service providers used cultural capital to build trust and cooperation within communities. They respected local customs and beliefs when implementing water supply projects, working closely with community leaders to ensure alignment with cultural practices and values.

*“Water, sanitation, education, solid waste and healthcare providers use cultural capital to build trust and cooperation within communities. They respect local customs when offering services, working closely with community leaders and elders to ensure alignment with cultural practices. These fosters acceptance and sustainability of services.”* (IDI, education service provider).

#### 4. Discussion

This study examined community capital through the lens of various service providers in two urban sites, Korogocho and Viwandani. A study conducted in a community in the state of Georgia, United States, described how the CCF provides a holistic model for understanding and facilitating community development, depicting a need to conduct this study in a different context [24]. We identified seven forms of community capital, natural, cultural, human, social, political, financial, and built capitals, evident in practices like waste management, sanitation, education, healthcare, and water supply in Nairobi’s informal settlements. Our findings presented demonstrate the multifaceted nature of community capital.

We interrogated the seven community capitals that had been identified in other studies as important in health and wellbeing [13,14]. This study supports the idea that service providers acknowledged community capitals in making positive changes, as work is important not only as a source of income but also as a source of personal development, social participation, and recognition [4]. Our results showed that the community capitals appeared to be organized in clusters and were not spiraling, hence contrasting with the “spiraling up” analogy that had been used previously to describe the relationship among the capital categories [9]. Our study described the relationships in capitals as “leveraging”, where using one capital helped to apply another capital more effectively. Findings from studies in developed countries like those in the states of Georgia, South Dakota, and five other states in the United States highlighted the multifaceted nature of community assets and their potential to contribute to multiple forms of capital [13,14,24]. For example, in Georgia, “churches” were identified as valuable resources within natural, built, social, and cultural capital. By providing green spaces, supporting community activities, fostering social connections, and promoting cultural diversity, “churches” demonstrated their capacity to contribute to various aspects of community development [13]. This example demonstrates how community assets can be interconnected and significantly contribute to sustainable urban development and overall wellbeing of a community. To gain a deeper understanding of this phenomenon in informal settlements, our qualitative study with diverse service providers involved is beneficial.

Human capital, social capital, and financial capital emerged as the most frequently implemented forms, while cultural and built capitals were utilized less frequently. These findings align with existing research on community development. For instance, other researchers [4,10] emphasized the role of human capital in fostering community development through enhanced competencies of labour force. Human capital was ranked highly, as success in communities depended on using every available asset to its fullest potential, including the development of skills, knowledge, and abilities that service providers or communities possessed. Human capital had one of the strongest ties to each of the other capitals because it represents who got things done [13]. Social capital was illustrated as key in building trust and cooperation [4,13]. Cooperatives and associations of informal workers have the potential to play crucial roles in poverty alleviation and disaster preparedness efforts in urban informal settlements, leveraging their collective power to overcome marginalization and extend worker rights [15]. These studies collectively suggest that communities equipped with skilled individuals, strong social networks, and adequate financial resources are better positioned to address local challenges and achieve desired outcomes. Cultural capitals was ranked the lowest. In an attempt to modernize, some service providers did not take culture into consideration in their operations, suggesting a potential neglect of cultural considerations in their operations. This contrasts with studies emphasizing the growing

importance of cultural policy in broader development agendas [14]. We argue that to value and implement cultural capital, policy actors and service providers ought to understand the meaning and aspirations behind cultural capital. Decision makers frequently refer to notions such as cultural value without being specific about how it is conceived or how it relates to economic value [42]. A well-defined concept of cultural capital, with a clear delineation of its value, could assist in sharpening the policy articulation process, especially in the heritage and overall development of other aspects of community capital [21,22].

This structure of relationships is similar to that posited by Gutierrez-Montes, Emery, and Fernandez-Baca, which placed the community capitals into many categories: human (including social, human, political, and cultural capitals) and material (including natural, financial, and built capitals) [14]. For now, it would appear that there is some underlying linkage within the seven capitals in the framework that tend to be frequently deployed in a pattern of combinations. This portrays that by leveraging on existing community capital, service providers in informal settlements can build a more resilient, inclusive, sustainable, and equitable communities. Lessons can be drawn from community based organizations (CBOs) in Nairobi's informal settlements, who have brought forth numerous initiatives leveraging community capital to enhance resilience and inclusive sustainable development. Four community-based organizations in Nairobi initiated community adaptation strategies, and demonstrated the impact of community capital in creating awareness and developing absorptive, adaptive and transformative capacity of communities for climate resilience [43].

#### *Strengths and Limitations of the Study*

Overall, one of the greatest strengths of the CCF is in its flexibility and compatibility because the framework includes a wide variety of domains. The primary limitation of this study lies in its reliance on a qualitative study making it challenging to quantify and generate inferences from the observed phenomena. However, as noted in the study's introduction, there was a need to address the gap in quantitative research, which often overlooks intangible capital like cultural and social capital.

#### **5. Conclusions**

Informal settlements are often viewed as sources of problems, but this study highlights their wealth of resources. Community capital, encompassing human, social, financial, cultural, and built capitals, offers a powerful tool for positive change. This study highlights the interconnectedness of community capitals and their potential to drive positive change. By understanding these interconnected assets, policymakers, practitioners, and communities can work together to implement effective interventions that support development and improve quality of life. When utilizing the community capitals framework, it is essential to consider not only the assets themselves but also the stories and experiences that accompany them. These narratives provide valuable insights into the diverse perspectives and values within the community, and creates a more inclusive and representative understanding of community capital.

The study offer valuable insights into the potential of community capital to enhance service delivery. By understanding the interconnectedness of community capitals, community, policymakers and service providers can develop strategies to leverage these resources more effectively. This may involve providing capacity-development opportunities to enhance human capital, fostering social cohesion and trust, supporting community-led initiatives, preserving cultural heritage, and investing in infrastructure development. By working collaboratively with local communities and harnessing the power of community capital, it is possible to improve the effectiveness and sustainability of service delivery, ultimately leading to better outcomes for residents in informal settlements.

This study demonstrates the utility of community capital as a strategic tool for service providers. By understanding the dynamics of the seven forms of capital within their communities, service providers can refine their strategies, build trust with stakeholders, and identify areas for collaboration. The concept of community capital can be likened to

a “community bank,” where each form of capital represents a valuable resource that can be invested, spent, or squandered. By recognizing the importance of these resources and utilizing them effectively, service providers can implement more impactful and sustainable initiatives, empowering communities and enhancing service delivery. CCF offers a systemic approach to evaluation, going beyond project-specific goals to assess the overall well-being of the community and its systems.

The relevance of cultural capital, ranked last by study participants, provides a useful area for further study to explore its drivers. Further research is also needed to fully grasp the relationships among the capitals and their impact on service delivery.

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## References

1. Douglas, M. Tapping into Informality: The Suitability of MajiVoice as a Tool to Improve Water Service Delivery and Governance in Nairobi’s Informal Settlements. 2015, pp. 1–48. Available online: <http://hdl.handle.net/11283/593377> (accessed on 1 January 2020).
2. Muchiri, K.B. *An Analysis of the Effect of the Growth of the Informal Sector on Tax Revenue Performance in Kenya*; University of Nairobi: Nairobi, Kenya, 2014.
3. Ogunkan, D.V. Urban Governance Achieving sustainable environmental governance in Nigeria: A review for policy consideration. *Urban Gov.* **2022**, *2*, 212–220. [CrossRef]
4. Chumo, I.; Mberu, B.; Wainaina, C.; Murigi, W.; Sumba, L.; Kabaria, C. Sanitation services for the urban poor: A social capital approach to sanitation challenges in informal settlements. *PLoS Water* **2023**, *2*, e0000086. [CrossRef]
5. Yerochewski, C. *Informal Workers and Collective Action: A Global Perspective*; Eaton, A.E., Schurman, S.J., Chen, M.A., Eds.; ILR Press/Cornell University Press: Ithaca, NY, USA, 2017; Volume 74, p. 412.
6. Murunga, J.; Muriithi, M.K.; Wawire, N.W. Estimating the size of the informal sector in Kenya. *Cogent Econ. Financ.* **2021**, *9*, 20. [CrossRef]
7. Lorato, T.; Tadesse, T.; Abebe Mamo, Y.; Getinet, B. The urban informal sector as a means of livelihood improvement among youth: Evidence from Hawassa city, Ethiopia. *Cogent Econ. Financ.* **2023**, *11*, 21. [CrossRef]
8. Hobsbawm, E.J. Obituary. *Int. Rev. Soc. Hist.* **2013**, *58*, 1–8.
9. Flora, C.; Emery, M.; Fey, S.; Bregendahl, C. *Community Capitals: A Tool for Evaluating Strategic Interventions and Projects*; North Central Regional Center for Rural Development, Iowa State University: Ames, IA, USA, 2006.
10. Bisung, E.; Elliott, S.J. Toward a social capital based framework for understanding the water-health nexus. *Soc. Sci. Med.* **2014**, *108*, 194–200. [CrossRef]
11. Emery, M.; Flora, C. Spiraling-Up: Mapping Community Transformation with Community Capitals Framework. *Community Dev.* **2006**, *37*, 19–35. [CrossRef]

12. Crowe, J.; Smith, J. The influence of community capital toward a community's capacity to respond to food insecurity. *Community Dev.* **2012**, *43*, 169–186. [CrossRef]
13. Jacobs, C. Community Capitals: Human Capital. *SDSU Ext. Extra Arch.* **2011**, *1*, 1–2.
14. Pigg, K.; Gasteyer, S.P.; Martin, K.E.; Keating, K.; Apaliyah, G.P. The Community Capitals Framework: An empirical examination of internal relationships. *Community Dev.* **2013**, *44*, 492–502. [CrossRef]
15. Theodos, B.; Hangen, E.; Hedman, C.; Meixell, B. Measuring Community Needs, Capital Flows, and Capital Gaps. 2018, Volume 85. Available online: [https://www.urban.org/sites/default/files/publication/99313/measuring\\_community\\_needs\\_capital\\_flows\\_and\\_capital\\_gaps\\_3.pdf](https://www.urban.org/sites/default/files/publication/99313/measuring_community_needs_capital_flows_and_capital_gaps_3.pdf) (accessed on 16 September 2024).
16. Cheryl, J. Measuring Success in Communities: Understanding the Community Capitals Framework. *Ext. Extra* **2007**, 1–16.
17. Mueller, D.; Hoard, S.; Roemer, K.; Sanders, C.; Rijkhoff, S.A.M. Quantifying the community capitals framework: Strategic application of the community assets and attributes model. *Community Dev.* **2020**, *51*, 535–555. [CrossRef]
18. Lee, B.H.; Swider, S.; Tilly, C. Informality in action: A relational look at informal work. *Int. J. Comp. Sociol.* **2020**, *61*, 91–100. [CrossRef]
19. Tigges, L.M.; Noble, M. Getting to Yes or Bailing on No: The Site Selection Process of Ethanol Plants in Wisconsin. *Rural Sociol.* **2012**, *77*, 547–568. [CrossRef]
20. Ballet, J.; Sirven, N.; Requier-Desjardins, M. Social capital and natural resource management: A critical perspective. *J. Environ. Dev.* **2007**, *16*, 355–374. [CrossRef]
21. Boglioli, M.; Mueller, D.W.; Strauss, S.; Hoard, S.; Beeton, T.A.; Budowle, R. Searching for Culture in “Cultural Capital”: The Case for a Mixed Methods Approach to Production Facility Siting. *Front. Energy Res.* **2022**, *9*, 772316. [CrossRef]
22. Edgerton, J.D.; Roberts, L.W. Cultural capital or habitus? Bourdieu and beyond in the explanation of enduring educational inequality. *Theory Res. Educ.* **2014**, *12*, 193–220. [CrossRef]
23. Bartel, A.P.; Beaulieu, N.D.; Phibbs, C.S.; Stone, P.W. Human capital and productivity in a team environment: Evidence from the healthcare sector. *Am. Econ. J. Appl. Econ.* **2014**, *6*, 231–259. [CrossRef]
24. Anglin, A. Facilitating community change: The Community Capitals Framework, its relevance to community psychology practice, and its application in a Georgia community. *Glob. J. Community Psychol. Pract.* **2015**, *6*, 1–15. [CrossRef]
25. Pigg, K.; Gasteyer, S.P.; Martin, K.E.; Keating, K.; Apaliyah, G.P. The Community Capitals Framework: An empirical examination of internal relationships. In *50 Years of Community Development*; Routledge: London, UK, 2020; pp. 117–127.
26. Tong, A.; Sainsbury, P.; Craig, J. Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *Int. J. Qual. Health Care* **2007**, *19*, 349–357. [CrossRef]
27. Kenya National Bureau of Statistics. *2019 Kenya Population and Housing Census: Population by County and Sub-County*, 1st ed.; KNBS, Ed.; Kenya National Bureau of Statistics: Nairobi, Kenya, 2019; Volume I, pp. 1–49. Available online: <https://www.knbs.or.ke/?wpdmpromo=2019-kenya-population-and-housing-census-volume-i-population-by-county-and-sub-county> (accessed on 16 September 2024).
28. Chumo, I.; Kabaria, C.; Shankland, A.; Mberu, B. Unmet Needs and Resilience: The Case of Vulnerable and Marginalized Populations in Nairobi's Informal Settlements. *Sustainability* **2023**, *15*, 37. [CrossRef]
29. Chumo, I.; Kabaria, C.; Phillips-Howard, P.A.; Gitau, H.; Elsey, H.; Mberu, B. Beyond a facility: Water, sanitation and hygiene service levels and informal social accountability in childcare centres in informal settlements. *J. Water Sanit. Hyg. Dev.* **2024**, *14*, 313–324. [CrossRef]
30. Chumo, I.; Mberu, B.; Kabaria, C. Stakeholder Mapping in Informal Settlements. 2023; Volume 1, p. 2.
31. Chumo, I.; Kabaria, C.; Oduor, C.; Amondi, C.; Njeri, A.; Mberu, B. Community advisory committee as a facilitator of health and wellbeing: A qualitative study in informal settlements in Nairobi, Kenya. *Front. Public Health* **2022**, *10*, 1047133. [CrossRef] [PubMed]
32. Milligan, L. Insider-outsider-inbetweener? Researcher positioning, participative methods and cross-cultural educational research. *Int. Educ.* **2016**, *46*, 235–250. [CrossRef]
33. Liu, X.; Burnett, D. Insider-outsider: Methodological reflections on collaborative intercultural research. *Humanit. Soc. Sci. Commun.* **2022**, *9*, 3–14. [CrossRef]
34. Gale, N.K.; Heath, G.; Cameron, E.; Rashid, S.; Redwood, S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med. Res. Methodol.* **2013**, *13*, 117. [CrossRef]
35. Lakey, B. Social support: Theory, Measurement and Intervention Social Support Theory and Measurement. In *Social Support Measures*; 2020; pp. 28–52.
36. Coleman, J. Social Capital in the Creation of Human Capital. *Am. J. Sociol.* **1988**, *94*, 95–120. [CrossRef]
37. Evans, P. Collective capabilities, culture, and Amartya Sen's Development as Freedom. *Stud. Comp. Int. Dev.* **2002**, *37*, 54–60. [CrossRef]
38. Seliverstova, N.S.; Iakovleva, E.L.; Grigoryeva, O.V.; Vorontsova, L.V. Dimensions of social capital. *Actual Probl. Econ. Law* **2018**, *12*, 2000–2003.
39. Ruggeri, J. Government investment in natural capital. *Ecol. Econ.* **2009**, *68*, 1723–1739. [CrossRef]
40. Cooper, N.; Brady, E.; Steen, H.; Bryce, R. Aesthetic and spiritual values of ecosystems: Recognising the ontological and axiological plurality of cultural ecosystem 'services'. *Ecosyst. Serv.* **2016**, *21*, 218–229. [CrossRef]

41. Guerry, A.D.; Polasky, S.; Lubchenco, J.; Chaplin-Kramer, R.; Daily, G.C.; Griffin, R.; Ruckelshaus, M.; Bateman, I.J.; Duraiappah, A.; Elmqvist, T.; et al. Natural capital and ecosystem services informing decisions: From promise to practice. *Proc. Natl. Acad. Sci. USA* **2015**, *112*, 7348–7355. [[CrossRef](#)] [[PubMed](#)]
42. Oude Groeniger, J.; de Koster, W.; van der Waal, J.; Mackenbach, J.P.; Kamphuis, C.B.M.; van Lenthe, F.J. How does cultural capital keep you thin? Exploring unique aspects of cultural class that link social advantage to lower body mass index. *Sociol Health Illn.* **2020**, *42*, 1497–1515. [[CrossRef](#)] [[PubMed](#)]
43. Kais, S.M.; Islam, M.S. Community capitals as community resilience to climate change: Conceptual connections. *Int. J. Environ. Res. Public Health* **2016**, *13*, 1211. [[CrossRef](#)]

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