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Article

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The interrelationships of sustainable livelihood capital assets deprivations and asset based social policy interventions: The case of Addis Ababa informal settlement areas, Ethiopia

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ABSTRACT

The purpose of the research is to analyze the pattern of interrelationships in deprivations of sustainable livelihood capital assets, sub-groups deprivation variations in light of the theoretical and empirical frameworks, and suggest recommendations for Asset Based Social policy (ABS). The research reviews the approaches of informal settlement interventions vis-a-vis livelihood capital assets, how livelihood capital assets deprivations affect each other, the relationships of assets and functioning of capability, and the institution role on access and control of assets by vulnerable sub-groups. The case study area was from two informal settlements of Addis Ketema sub-city Wereda 07 (the inner-city slum) and kolfe keranyo sub-city Wereda 03 (*peri-urban*). The research applied an explanatory mixed-method sequential design consisting of quantitative research based on a house-to-house random sampling survey, followed by the qualitative method of individual case study and key-informants interview. The research refined strategic issues/ indicators that require ABS interventions from the many aspects of deprivations relationships and argued in line with the theoretical and empirical frameworks. The research implicated strengthening institutions to make livelihood capital assets closer to vulnerable sub-groups, especially in *peri-urban*, empowering community associations bargain for poor rights, reinforce capability functioning for livelihood capital asset accumulation. ABS is crucial for addressing the strategic issue of livelihood capital assets deprivations, tackling institutional and legal constraints, effective functioning of assets and capability, address risk, safety, and vulnerability in informal settlements. The ABS policy improves the wellbeing of poor and vulnerable sub-groups through asset accession, asset valorization, and asset consolidation.

1. Introduction

The framework of the urban planning theories paradigm has influenced the reduction of informal settlement problems and socio-spatial exclusion/deprivation from sustainable intervention perspectives (Lewis, 1966; Abram, 1966; Turner, 1982; De Soto, 2001; Payne, Rakodi, Durand-Lasserve, 2009; Arroyo, 2013; Fontana, 2016). The theory on culture of poverty argued on the vicious circle of poverty and

the means for poverty alleviation is leveraging human capital through raising the class-consciousness of the poor (Lewis, 1966). Abram opposed Lewis (1966) by arguing about empowerment to self-help incrementally focusing on enhancing social capital through the involvement of the community in planning, design, and self-construction (Abrams, 1966; Arroyo, 2013). Turner's modernization theory argued the synergized effect of social and physical capital for self-help incremental building of the poor through government intervention

Abbreviations: ABS, Asset-Based Social Policy; HHS, Households; IHDP, Integrated Housing Development Program; UNDP, United Nations Development Program; SDG, Sustainable Development Goal; UN-Habitat, United Nations Human Settlement Programme; AA, Addis Ababa; FHHS, Female Headed Households; MHHS, Male Headed Households; CBD, Central Business District; CBO, Community Based Organization; SPSS, Statistical Package for Social Science; OWAUV, One Way Anova for Unequal Variance; PPMC, Pearson Product Moment Co-relation; SRC, Spearman Rank Co-relation; GIS, Geographic Information System; UPSNP, Urban Productive Safety Net Program; MSSE, Micro and Small Scale Enterprise.

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by providing tenure security, site, and services for curbing informal settlement problems and poverty (Turner, 1982). According to De Soto, accessing physical capital for the poor through property rights and land titling would allow the poor to enter the formal market and escape poverty (De Soto, 2001; Fontana, 2016). Land titling is the crucial livelihood strategy for asset accession of the poor (Dani & Moser, 2008). Direct regularization (not incremental) and property improvement exacerbate poverty for renters and market-based eviction of owners; due to sudden property prices and rental value hikes (Payne, Rakodi, & Durand-Lasserve, 2009). The limited understanding of informal settlement problems leads to deal with the different aspects of deprivations separately (ECE, 2008), therefore; many of the previous urban policies do not explore the range of livelihood capitals.

The inclusive, integrated and resilient approach requires designing strategies and policies for informal settlement reduction and housing interventions considering the access of livelihood capitals assets and rights of the poor (Soma, Sukhwani, & Shaw, 2020; UN-Habitat, 2020a; Wang, Lan, & Wang, 2021b). The current Caribbean informal settlement upgrading followed a comprehensive, integrated and resilient approach including the new urban agenda of leaving no one behind (informal + formal) and the integrated achievement of SDG 11 and SDG 1 (UN-Habitat, 2020b). The current research found a certain linkage between livelihood assets and housing conditions in an urban slum of Dhaka, Bangladesh (Soma et al., 2020). Rural Land Consolidation in China improved initial livelihood capital endowment, reduced vulnerability, and enhanced livelihood capital accumulations (Wang et al., 2021b).

Since most poor in informal settlements do not depend on salaried employment, the livelihood and well-being rather depends on access and accumulate assets, decent return from these assets, and use the asset base to manage risks (Moser & Dani, 2008). Assets mobilization are the key to reduce risk and vulnerabilities (Vatsa, 2004). Yet, informal settlement interventions are not tailored to leverage the poor's access and control over sustainable livelihood capital assets in Ethiopia that lead to policy limitations (Lakisha, 2012; Ministry of Federal Affairs, 2005; Ministry of Urban Development and Housing, 2003; UN-Habitat, 2011; Kloosterboer, 2019). The urban development policy of Ethiopia stipulates the construction of housing estate for low-income groups of society through long-term loans (Ministry of Federal Affairs, 2005). Nevertheless, 70% of the occupiers of the constructed 175,000 condominium units in Addis Ababa (AA), based on IHDP (Integrated Housing Development Program) interventions, rent out the property, and live in informal settlements (Lakisha, 2012).

The above situation implicates the inadequate consideration of the economic opportunities and financial capitals of the poor before implementing massive IHDP. The urban development policy also underscored the promulgation of the legal system on urban renewal through the demolition of houses constructed legally or illegally before the issuance of this policy (Ministry of Federal Affairs, 2005). The policy implementation of urban renewal in AA dismantled social bondage and economic opportunities (UN-Habitat, 2011). Between 2009 and 2016, at least 28,584 HHS (households) of AA were displaced due to inner-city renewal (Kloosterboer, 2019). In 2007, the government drafted a strategy on urban development package focused on job creation, housing, and infrastructure, and a good governance package focused on governance (UN-Habitat, 2014). The above strategy showed the astounding result in job creation and IHDP homeownership but it was not responsive to the livelihood of the chronically poor (Kassahun & Tiwari, 2012). The land management policy enforces timeline systematic regularizations for cities in Ethiopia while preventing the development of future illegal settlements through coercive bulldozing (Ministry of Urban Development and Housing, 2003). Accordingly, the legal enforcement agency still demolished newly formed illegal houses stripping homeownership (physical capital) for the poor in the peri-urban settlements of AA, while squatter settlement proliferation persists currently (T. Getu, personal communication, October 29, 2021). The employment policy of Ethiopia recognized the creation of employment

through sectors (public and private), self, and entrepreneurship (Ministry of Labor and Social Affairs, 2009) though there are significant unemployed population. Nonetheless, currently, the 10-years development plan (2021–2030) recognized the utilization of livelihood capital assets for prosperity and growth (Planning and Development Commission of Ethiopia, 2020).

Currently, sustainable urbanization is one of the major transformative drivers of the 21st century (UNDP, 2012). Yet, the major challenges for sustainable urbanization are the complexities of informal settlement growth and the greater level of spatial, economic, and social exclusion (Jones, 2017). The livelihood capitals possessed by HHS determine comprehensive strategies on livelihood objectives such as income, shelter, security, and general welfare (Ding, Jimoh, Hou, Hou, & Zhang, 2018). A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living (Serrat, 2017). The livelihood capitals consist of financial, human, physical, social, and natural¹ (Sheilah, Tamsin, Julian., 2001; Farrington, Ramasut, Walker, 2002; UNDP, 2017).

The literature argued the interrelationship between the livelihood capital assets and their pertinence to livelihood strategies of poverty alleviation and sustainable urbanization (Sheilah, Tamsin, & Julian, 2001; Farrington, Ramasut, & Walker, 2002; Baud, Sridharan, & Karin, 2008; UNDP, 2017; SDG Tracker, 2019; Wang, Li, Jin, Yao, & Ji, 2021a). For instance, financial capital in terms of earning and access to employment is strongly dependent on adequate human capital. Physical capital is a key determinant of human and social capital through the link of quality of housing and health as well as mutual support network through social capital (Farrington et al., 2002). Social capital improves the efficacy of economic relationships and equal access to resources and public goods (UNDP, 2017). Poor housing, lack of drinking water and sanitation lead to poor health, preventing people from working effectively and reducing their ability to earn income (Baud et al., 2008). The opportunity cost associated with sub-standard infrastructure impedes education, medical assistance, and income generation (UNDP, 2017). Financial capital is the significant asset to develop and cumulate other assets and support livelihood activities (Wang et al., 2021a). The SDG-11 argued about the link of SDG poverty goal-1 with goal 11 of access to land, slum, and inadequate housing (SDG Tracker, 2019).

The livelihood capital assets interrelationships implicated the crucial role of asset accumulation, which is pragmatic through the functioning of capability. The capability approach focuses on what people are able to be and do with the resources and goods (Robeyns & Morten, 2021). Poverty is viewed as the deprivations of basic capabilities (well-nourished, clothed, married, educated, and healthy) as well as taking part in the life of a community (Sen, 1995). The creation of capabilities strongly depends on the set of capital assets available. The greater the erosion of people's assets, the greater the vulnerability and insecurity (Lienert & Burger, 2015). Individuals and communities are crucial in the expansion of capabilities (Graciela, 2018). Accordingly, the Asset-Based Social policy (ABS) shifted from income/consumption to the critical role played by asset and capability in improving wellbeing (Moser, 2008). The first generation of ABS provides individuals and HHS to further accumulate livelihood capital on their own and move out of poverty. The second generation focuses on asset consolidation and preventing erosion (Caroline & Moser, 2006). The ABS accumulate assets through stages of asset accession, valorization, and transformation (Dani & Moser, 2008; Moser, 2008). Asset accession focuses on increasing the capability of the

¹ Financial capital includes income from the sale of labor, saving, and credit. Human capital is the skill, knowledge, access to training/education, ability to labor, and good health. Physical capital includes housing people use, own, and rent as well as, infrastructure and services access. Social capital is a set of shared values that allows individuals to work together in a group to effectively achieve a common purpose. Natural capital is significant in cities in cases of river pollution and people eviction due to urban agriculture.

poor to strengthen the asset base. Asset valorization focuses on public investment to increase the return or value of assets and asset transformation focuses on transformational public policy and secure livelihood overcoming constraints (Dani & Moser, 2008). The contemporarily social policy is transformational adheres to the principle of universalization, integration of policy, inclusiveness, and alignment with global/social regional policy (United Nations, 2021). UPSNP (Urban Productive Safety Net Program) was implemented in 2016 in Ethiopia to enhance asset accumulation through offering protection of the urban community, providing income and employment opportunities in public works (Gebreselassie, 2019; Abiy, 2020). Despite no country wide evaluation on UPSNP, the evaluative research on Mekele city revealed UPSNP improved beneficiaries' income, protected livelihood risks, and enhanced food security (Gebresilassie, 2019).

MSSE (Micro and Small Scale Enterprises) is an institutional asset for poverty alleviation and employment generation through the functioning of capability. Yet, the problems of revolving fund recovery for traditional collateral based lending stunted MSSE's. Accordingly, asset-based lending and special funding for MSSE (Micro and Small Scale Enterprises) shall be the alternative options to ensure the success of MSSE (Nega & Edris, 2016) and expansion of capital asset accumulation.

The sub-groups (gender, age, household types, employment status) varied by access to resources, right, goods, and services in line with social-exclusion theory (Levitas, 2006). Jayamohan and Amenu (2014) research argued the feminization of poverty is a weak argument in urban Ethiopia based on the sole assessment of income. Half of the unemployed of AA in 2014 were youths completing secondary and post-secondary education (Federal Democratic Republic of Ethiopia, 2018). Aboderin, Kano, and Owil (2017) underscored the vulnerability of the old slum dwellers sub-groups, which needs old age slum mainstreaming initiatives. People's capability also varied in what they are able to do and be with those resources (Robeyns & Morten, 2021) with implications for sub-group variations. Institutions affect the range of livelihood capitals by controlling and influencing how, when, and by whom they are used (Messer & Townsley, 2003). In other words, an institution can leverage the control and access of livelihood capitals by sub-groups. The institution includes the organization of formal, informal, political, economic, and socio-cultural (Carloni & Crowley, 2005). Institution structure, policy, legislation, and process transformed livelihood strategies similar to access to livelihood capitals (Carloni & Crowley, 2005; Serrat, 2017). Accordingly, pro-poor public policies need to focus on creating institutional conditions to allow poor and vulnerable people to build and obtain a return on assets (Dani & Moser, 2008). Local institutions strengthened Social capital (UNDP 2017) and social capital facilitate access to livelihood capitals for vulnerable sub-groups. The insight from South Asian research indicated inaccessibility of enabling institutional support for building assets exacerbated poverty (Shahbaz, Vinod, Geiser, Sadaf, Schäfer, Müller-Böcker, 2010). Limited organizational capacity might reduce the social network to access credit and labor (Bebbington, n.d) that especially affect vulnerable sub-groups.

The research selected two case study areas from inner-city slum and *peri-urban* of AA based on two slum model dichotomies of an informal settlement in line with authors (Eckstein, 1990; Stoke, 1962). Stoke (1962) argued inner-city slum (slum of despair) and *peri-urban* or squatter settlement (slum of hope), while Eckstein (1990) reasoned out the reverse of the slum model of Stoke (1962). Despite the slum theoretical model being debatable in a different context, the consensus is the dichotomous nature of slum settlement for selecting the two case study areas. Accordingly, the Addis Ababa (AA) case study area was Addis-Ketema sub-city Wereda-07 inner-city slum ('inner-city slum') and Kolfe-Keranyo sub-city Wereda-03 *peri-urban* squatter settlement ('*peri-urban*').

In line with Walker and Baxter (2019), the research followed an explanatory sequential design that quantitative analysis provides general comprehension while qualitative data of individual case studies and interviews refine and explain the statistical result. Accordingly, the

three research questions are the following. 1) Is there a pattern of the interrelationships among deprivations of sustainable livelihood capital assets, based on the findings and/or in light of theoretical and empirical frameworks? 2) Are there variations in deprivation of sustainable livelihood capital assets by sub-groups based on findings and/or in light of theoretical and empirical frameworks?

3) What are the recommended asset-based social policy interventions? The sub-groups for this research were disaggregated HHS by income status, gender, tenure status, unemployment, and education status.

2. Background information

The world population living in cities was 54% in 2015 and projected to be 70% in 2050 (UNDP, 2012; World Bank, 2015a). Empirical analysis showed that a 1 % increase in population growth increases the incidence of a slum in Africa by 2.3 % (UN-Habitat, 2020a) indicating urbanization of poverty. Yet, according to authors (Mitilini & Satterthwaite, 2004; UN-Habitat 2003; World Bank, 2015b), urban poverty is underestimated relative to rural poverty due to failure to make adjustments for rising costs of living and poor definition of access to infrastructure or services.

Ethiopia has a low level of urbanization, which is 21.2% in 2019 (Mezgebo, 2021). Nonetheless, the country's urban growth is at a high rate of 3.8% per annum, which would lead to the tripling of its urban population by 2037 should this growth rate remain constant in the meantime (World Bank, 2015a). Ethiopia's urban population had more than doubled from 4.87 to 11.6 million between 1984 and 2007. The AA unemployment rate was 28.6% for 15–64 age groups (CSA [Central Statistics Agency of Ethiopia], 2015). AA has 10 sub-cities and the selected case study areas were from Addis-Ketema and Kolfe-Keranyo sub-cities. The old inner-city slum in Addis Ababa covers 11% of the total area of 54,000 ha, which includes the sub-cities of Lideta, Kirkos, Addis Ketema, Arada, and some parts of Kolfe-Keranyo, Gulele, and Yeka sub-cities (Elias, 2008). The inner-city slum in Addis Ababa is the legacy of houses constructed informally before the 1974 revolution (Solomon & Mcleod, 2004).

Addis-Ketema sub-city has 10 weredas. According to Zafu and Peter (2014), Addis-Ketema sub-city inner-city slum is aged, centrally located, dilapidated, overcrowded, formalized tenure dominated by tenant houses, low-income people, subject to flooding, and endowed with poor services. Kolfe Keranyo had 15 Weredas. kolfe Keranyo *peri-urban* is the dwelling site for migrants arriving from different parts of the country (M.G/Egziabhere, personal communication, June 12, 2018). The Kolfe Keranyo *peri-urban* settlement lies at the edge of Addis Ababa. Some of the tenures of *peri-urban* were regularized using 1994 E.C (Ethiopian Calendar) aerial photograph and 1997 E.C satellite image. The *peri-urban* squatter settlements evolved in the 1990 s (Kassahun, 2010) and increased since 1994 (Minwuyelet, 2005). The *peri-urban* proliferation of informal settlements has become rampant after the regularization (World Bank, 2016). The first study area was from Addis-Ketema Wereda 07(inner-city slum), and the second study area was from Kolfe-Keranyo wereda 03 *peri-urban* settlement (*peri-urban*).

The inner-city slum: it is in the Addis-Ketema sub-city consisted of four Kebele administrations (kebeles 29, 30, 32, and 34). The estimated population size was 32,646 and the growth rate was 3% in 2018 (CSA, 2013a, 2013b). The total surveyed population and HHS of the inner-city slum were 2435 and 404 in 2018, respectively. The mean HHS was 4.8 people (CSA, 2007). The area and population densities were 49.88 ha and 654 people/hectare in 2018. 59.4% of the total HHS were FHHS (Female-Headed Households). The mean household size was "6". The overcrowdedness was 4.01. About 25.3% of HHS had a mezzanine floor ('kot' in Amharic) for renting/living. About 61.3% of HHS had lived in their dwelling unit for >30 years. The largest ethnic group was the Amhara (38.4% HHS). The majority (74.3%) of the dwellers followed the Ethiopian Orthodox Christian. The Married and Widowed HHS

constituted 44.3% and 27.5 %, respectively. About 20.5% of HHS were learning Read and Write. 65.5% were migrants. About 97.52% of HHS had de jure tenure right (Permit Right, Kebele house renter, Municipal house renter). Based on additional questions on previously surveyed HHS for Kebele 32 and 34 of Wereda 07, 39.3% of HHS rented beds for temporary and recent migrants. The above findings depicted Alonso's model regarding how the poor outbid the rich and survive in a CBD (Central Business District) through overcrowding, renting, and exploiting the reduced transport cost opportunity (UN-Habitat, 2003). About 90.3% were involved in CBO (Community Based Organization) such as 'Edir' and 'Ekub'. Election participation for 20 % of HHS was low and very low. About 43.6% of HHS earned incomes below the absolute poverty line of Ethiopia (< 599 birrs per month per Adult Equivalent in 2016). The average mobility from work to home was 13 min for inner-city slums due to near old CBD. The unemployment rate for the 18–64 and 18–29 age groups was 33.71 % and 24.33 %, respectively.

Peri-urban: Kolfe-Keranyo Wereda-03 *peri-urban* is a settlement mainly formed through informal land transactions. The *peri-urban* population was scanty and spontaneous during the 2007 Ethiopian census period; therefore, there was no officially recorded figure per geographic jurisdiction. Yet, based on information from the Wereda-03 building permit office and residents, there were 2500 HHS in 2018. Considering 4.35 HHS for the kolfe keranyo sub-city (CSA, 2007), the estimated population was 10,875. The area and population densities for 2018 were 45.96 ha and 237 persons/hectare, respectively. The total surveyed population was 1212 (HHS = 252) for 2018. The MHHS (Male Headed Households) constituted 78.57%. The mean household size was "4.8". The overcrowdedness was 2.67 people per room. 100% of *peri-urban* HHS had no mezzanine floor. 75% of the *peri-urban* HHS had lived in their dwelling units for less than ten years. From the total HHS, the Gurage ethnic groups and Muslim religion followers were 50.4 % and 58.7 %, respectively. The Widowed HHS constituted 3.6%. HHS attended 5–8 grade was 48.4 %. Migrants constituted 90.5% of the HHS. 81.7% of HHS had no recognized tenure (unauthorized dwellers/renters). About 76.6% were involved in CBO. Election participation for 24.6 % of HHS was low and very low. About 22.6% of HHS earned incomes below the absolute poverty line of Ethiopia. The average mobility from work to home was 42 min. The unemployment rate for the 18–64 and 18–29 age groups was 20.4 % and 15.63%, respectively.

3. Methodology

Based on the recognized two slum dichotomies, the researchers selected case study areas from an inner-city slum and *peri-urban*/squatter settlement. Slum of hope is a new, self-built structure, usually illegal (squatters) that are in or have recently been through a process of development, consolidation, and improvement. Slum of despair is 'declining' neighborhoods, in which environmental conditions and domestic services are undergoing a process of degeneration (inner-city slum) (Stoke, 1962; UN-Habitat, 2003). Eckstein (1990) reasoned out the reverse of the slum model: Squatter settlement as the slum of despair and inner-city slum as the slum of hope.

The research followed an explanatory sequential design based on Walker and Baxter (2019), collecting quantitative data through HHS face-to-face interviews, physical validation and GIS analysis. Then, the quantitative data is further enriched and validated with qualitative data collected through an individual case study and key informant interviews. The theoretical and conceptual lens of multiple aspects of livelihood capital assets deprivations, in addition to regulatory framework reviews, provides bases for defining variables or questions for quantitative research. The individuals' case study enabled finding in-depth and real-life situations of vulnerable participants following Rebolj (2013). The targeted participants for the individual case study were nine purposively selected persons (chronically poor women, poor women renter, two tenure right dispossessed men, women vulnerable to poor sanitation, CBO member widowed women, CBO member men, and

two women vulnerable to poor infrastructure). The researcher made an in-depth key-informant interview with sub-city and Wereda local administrations on livelihood aspects of an institution, capability, risks, safety, and other issues. Key informant interviews were executed for twelve(12) government staff from *peri-urban* and the inner-city slum, respectively.

The key-informant interview and individual case study enriched the external validity of the research using open-ended questionnaires. The quantitative questionnaires consisted of sections of area and location identification (6 questions), HHS basic characteristics for HHS (26 questions) & housing (14 questions), service and infrastructure (9–10 questions), regulatory and perception related (18). The question for service and infrastructure is 9 for the inner-city slum and 10 for *peri-urban*. For quantitative research, systematic random sampling was conducted on the two areas based on Yamane (1967) formula for the finite population as follows:

$$n = \frac{N}{1 + N(e)^2}$$
 Where, N = Number of Household in the population, e = level of significance varies based on research conditions.

For quantitative research, the data collectors were four (4) for the inner-city slum and two (2) for the *peri-urban*. The data collectors (minimum bachelor degree) took orientation on questionnaires, and the questionnaires were tested and updated on the pilot area before full scale-up. The data collectors filled the questionnaires by face-to-face interview with each household (HH) and performing physical validation. The SPSS analysis filtered the vulnerable sub-groups from the collected quantitative data. The researcher validated data collectors during the field survey through sample field checks and revisiting some areas for bridging the gaps on unfilled questionnaires. The research analyzed the variables using statistical tools of Chi-square test (χ^2), One Way Anova for Unequal Variance (OWAUV), Pearson Product Moment Coorelationship (PPMC), Spearman Rank Coorelationship (SRC). The GIS software analyzed spatial data(service, infrastructure, and topography) and integrated it with the database of the questionnaires in SPSS. The specific approaches for Inner-city slum and *peri-urban* are described below.

Inner-city slum: Addis ketema sub-city was selected purposively from AA, due to its location near the old CBD, the main transport hub, and large market. Then, the researchers selected the Wereda-07 inner-city slum from the ten weredas purposively by consulting with Addis-Ketema sub-city officials, supported with preliminary field verification. Accordingly, wereda 07 inner-city slum houses were aged, dilapidated, overcrowded, degenerated services, near the old CBD, and intact settlements (not affected by renewal). The projected population and HHS size for Addis Ketema Wereda 07 in 2018 were 32,646 and 6801, respectively. The projection considered the base population of the wereda according to CSA, 2007 and the 3 % annual growth rate of AA in 2017 (CSA, 2013a). The envisaged sample survey was 378 HHS, from the overall HHS size of 6810 HHS for wereda 07, at 0.05 level of significance. Yet, the actual data entry was 404 HHS tagged with GPS coordinates, suffices survey considering the relative heterogeneity and dense nature of the area. Accordingly, each member of the 6th HHS was questioned and surveyed. Hence, the external validity of the research was ensured by triangulating the collected survey information with a base map and rental house information of the Addis Ketema Wereda 07 office as well as an individual case study and key-informant interview

Peri-urban: to filter consolidated squatter settlements, the regularized building structure of AA (based on a satellite image of 2005) overlaid on a recent google image of 2018. Accordingly, Kolfe-Keranyo and Bole sub-city were the main squatter settlement expansion areas. Yet, the trends of expansions were relatively increasing for Kolfe-Keranyo, based on the filtered spontaneous settlements and the further verification of the previous research of Minwuyelet (2005). According to Kolfe keranyo Sub-city Transitional Land Administration Project office, Wereda 03 portion of areas was one of the weredas' with consolidated squatter settlement (G.Gebreegziabhere, personal communication, June 12,

2018). Then, based on the building permit office of wereda 03 information, the squatter area of wereda 03 was delineated; and the total HHS in the delineated area was 2500. Accordingly, the targeted HHS for the sample survey was 250 at a 0.06 level of significance. Yet, the performed data entry was 252 HHS, which was a sufficient sample considering the relative homogeneity of the area. Accordingly, every 10th HHS was questioned and surveyed by data collectors.

The soft wares used for Analysis are IBM SPSS Statistics 20 and ArcGIS 10.4.1. The test used in the research was the Chi-square test, OWAUV, PPMC and SRC. In chi-square test, not significant associations were not included ($p > 0.05$). The income per Adult Equivalent (AE) considers the different calorie requirements of adults and children. According to authors (Shinns & Lyne, 2002), $AE = (No.Adult + 0.5 \times No.Children)^{0.9}$. The absolute poverty line of Ethiopia for 2015/16 is less than birr 7184 per year per AE (<599 Birr/Month (M)/AE) (National Planning Commission of Ethiopia, 2017).

Result

Financial capital interrelationship with other livelihood capitals

The OWAUV revealed a significant difference in the percentage of expenditure for food, water, energy, and transport. Inner-city slum and *peri-urban* HHS on average spent 61.36 % and 55.8 % on food, respectively. On the other hand, the inner-city slums and *peri-urban* spent < 5 % and 9 % on transport, energy/light, and water, respectively. The food expenditure % versus income per AE PPMC was -0.33 and -0.284 for the inner-city slums and *peri-urban*, respectively. The above result indicated the poorer the HHS, the more reliance on cash-economy for food security. The income per AE versus energy/light % expenditure PPMC was -0.33 and -0.32 for inner-city slums and *peri-urban*, respectively. Similarly, the lower the income per AE, the higher % of investment in energy and light. A woman in a *peri-urban* area expressed the poverty and survival mechanism for the high-energy cost of charcoal as follows:

I am the only person supporting my children and husband by selling candles in front of the Kidane Mihret church. My husband suffers from a mental illness. I have been compelled to sell my household's furniture to treat him. In order to cover the high cost of charcoal, I use charcoal residuals provided freely by charcoal sellers mixed with the soil which sustains long for cooking (Case study -1, 2018, Kolfe Keranyo Wereda 03 *peri-urban*).

There was significant association between Sanitation Vulnerability² and HHS income per AE for inner-city slum ($\chi^2 = 36.635$, $df = 12$, $\alpha = 0.001$) and for *peri-urban* ($\chi^2 = 51.411$, $df = 12$, $\alpha = 0.001$). The fact was explained by the % of non-vulnerable to sanitation was 5.68% and 41.48% for HHS with income < 599 birr/M/AE and ≥ 3000 birr/M/AE, respectively. For *peri-urban*, the percentage of non-vulnerable to sanitation was 1.75 % and 16.67% for HHS with income < 599 birr/M/AE and ≥ 3000 birr/M/AE, respectively (Table 1).

The OWAUV indicated significant differences in rental value per tenure status for the inner-city slum ($\alpha < 0.001$). The average rental value was birr 16.3, 175.72, 591.8, 1420.41, 2942.86 for Kebele House

Rent, Municipal House Rent, Rented from Unauthorized Dwellers, Sub-Rent from Kebele house Rent and Rented from Owner Permit Right, respectively. The renters from owners of a Permit right and sub-rented from a renter of Kebele House (government rented house) renter were paying an exorbitantly high rent price. A female HHS, who rented a dwelling unit from the owner with permit right, expressed the exorbitant rent affecting her livelihood as follows

My livelihood depends on selling "Areke" (traditional alcoholic drink) renting a 12 m² house paying 1,000 Ethiopian birr per month. I paid the rent until now by saving through the local saving organization (Ekub). Yet, currently, the previous owner sold the house to another person, and the new proprietor asked me to pay 10,000 Birr per month; if not, he will rent it to a tenant who intends to use the structure as a bookstore. The Wereda office responded that they did not involve in matters of the legally transacted house. Now I am really in deep grief since my livelihood depends on selling "Areke" otherwise I will be on the street (Case study -2, 2018, Addis Ketema Wereda 07 inner-city slum).

There was a significant association between income per AE with Water source for *Peri-urban* ($\chi^2 = 29.417$, $\alpha = 0.001$). The association for *peri-urban* was explained by 33.3% and 16.66 % of HHS with income < 599 birr/M/AE and ≥ 3000 birr/M/AE were respectively fetching water from spring with long waiting (4 jerricans per 15 days paying 10 birr per month in 2018). Similarly, HHS who use mainly vendor-provided water³ (10–13 birr/25 L Jerrican) were 26.14% and 61.4% for HHS with income per AE < 599 birr/M/AE and > 1500 birr to ≤ 3000 birr/M/AE, respectively. The SRC between income per AE and water consumption per Jerrican in liter for *peri-urban* was 0.4. The result indicated that the poorer the HHS in *peri-urban*, the less water consumption and the less afforded vendor-provided water. Based on interviewing women and observation, the poor women in *peri-urban* brought potable water from the formal neighborhood with reduced cost of 2 birr per 25 L jerrican to mitigate the high cost of vendor-provided water.

There was a significant association between income per AE and building floor material for the inner-city slum ($\chi^2 = 71.783$, $\alpha < 0.001$), and there was also an association between income per AE and housing wall material for *peri-urban* ($\chi^2 = 9.905$, $\alpha = 0.042$). The association for the inner-city slum was due to 54.35% and 1.09% of mud-floor houses had HHS income < 599 birr/M/AE and ≥ 3000 birr per M/AE, respectively. The association for *peri-urban* was due to 100% of HHS with < 599 birr/M/AE constructed wall material with wood/mud. The PPMC between income/person/month and parcel area/person for *peri-urban* was 0.447. So, the higher income corresponded with large parcel per capita for land speculation of *peri-urban*. The PPMC between income/person/month and building area per capita was 0.365. The above result indicated the vulnerability of the poorest of the poor for unhealthy and congested living conditions. The SRC between Income per AE and Mobility in minutes from work to home was 0.31 and 0.168 for the *peri-urban* and inner-city slum, respectively. The result implicated the higher likelihood of going long distances for employment opportunities for better income HHS of *peri-urban*.

4.2. Interrelationships within human capitals and human capitals with other livelihood capitals

The PPMC between the number of unemployed youth/18–29 age group/ with HHS members with educational status grade 9–10 was 0.334 and 0.302 for the inner-city slum and *peri-urban*, respectively. The result indicated HHS members who completed grade 10 but did not

² Sanitation Vulnerability category: zero (No vulnerability: -pour Flush latrine shared by ≤ 5 HHS and Clean or Ventilated pit latrine shared by ≤ 5 HHS). One (Slightly Vulnerable: -Unventilated Pit latrine (not Shared) and Flush Latrine/latrine connected to Septic tank shared by > 5 and ≤ 10 HHS). Two (Vulnerable: Unventilated Pit latrine Shared by 2–10 HHS and Flush Latrine/connected to septic tank shared by > 10 and ≤ 20 HHS). Three (High Vulnerable: Unventilated Pit latrine Shared by > 10 and ≤ 20 HHS and Flush Latrine/connected to septic tank shared by > 20 HHS). Four (Very High Vulnerable: Excreta Open Field, Bucket or Service latrine or Pit Latrine Shared by > 20 HHS).

³ The fetching of water (mostly by women) going a long distance of 1.5–2km with a cost of 1.5–2.5 birr for 25 liter Jerri can in 2018.4 Formal employment considers those who depend on employment of Government, Formal Private organization, and Formal Self-employed business.

Table 1

recommendation for Asset accession, Asset valorization and Asset transformation for attaining ABS policy, disaggregated by livelihood capital assets.

LivelihoodCapitalassets	Asset accession	Asset valorization	Asset transformation
Humancapital	<ul style="list-style-type: none"> - Registering and targeting low education level HHS(with gender mainstreaming) for informal education provision. - Ensure food security/nutrition's and participate in livelihood capital asset accumulation public works for the poor and vulnerable HHS Sub-groups. - Priority of MSSE employment opportunities for unemployed youths who failed secondary educations. - Public awareness on transmittable diseases, especially for vulnerable HHS (overcrowding, poor environment services). - Provide social protection for vulnerable HHS sub-groups (old and disabled) who cannot engage in productive work. 	<ul style="list-style-type: none"> - Investment in informal education for low education level HHS with gender mainstreaming. - Investment in skilled training tailored to the functioning of capabilities of the poor and vulnerable HHS sub-groups. - Investment in technical vocational training through providing priorities for youths who failed secondary education - Investment and awareness training on transmittable diseases by providing priority for high vulnerable sub-groups 	<ul style="list-style-type: none"> - Recognizing informal education in formal government and private work opportunities. - Certification accrediting the capability of poor and vulnerable HHS sub-groups. - Policy design and implementation to provide job opportunities for the poor and vulnerable HHS sub-groups in the work they are capable and do (the functioning of capability). - Policy design and implementation to provide priority of job opportunities based on capabilities for youths who failed secondary education. - Commence regular mass media program for transmittable disease prevention and health resilience.
Physical capital	<ul style="list-style-type: none"> - Recognize the various forms of rights for all tenure groups including group tenure and occupancy rights for landless in regulatory frameworks. - Authenticate and recognize the right to residence and on-site accommodation planning regulations (upgrading, land consolidation/ readjustment, land-sharing, and low-income housing) - planning policy and housing design to ease overcrowding 	<ul style="list-style-type: none"> - Investment in the provision of various forms of tenure such as group tenure and occupancy right for landless - Subsidize and invest in services and infrastructure provision for informal settlements, especially in socially excluded and inaccessible areas. - Investment in the implementation of planning and housing design to ease overcrowding. 	<ul style="list-style-type: none"> - Legitimize and transform the occupancy and group tenure right to lease right incrementally. - The informal settlement neighborhoods integrated with mainstream formal urban development. - Remove legal frameworks (building permit and regularization) that exclude physical capital asset accumulation for poor and vulnerable HHS sub-groups. - Housing policy implementation ensures on-site accommodation and vertical development (less overcrowding).—Ownership right recognition inhibits relocation and eviction of the poor and the land right dispossessed HHS . - The saving groups obtained credit opportunities to engage in job opportunities they are capable and do. - Opportunities for asset-based lending for the poor and vulnerable sub-groups based on legitimized right as collateral for credit. - Scale-up energy-saving and cost-effective cooking technologies to other informal settlements. - Legal framework recognized the contribution of matching funds by all dwellers. - Chronically poor dwellers established profitable MSSE. - Diversifying income sources enhance capital consolidation.
Financial capital	<ul style="list-style-type: none"> - Subsidizing the living cost of the poor (food, water, sanitation, health, transport, and education) and vulnerable sub-groups incorporated in multilateral and bilateral agencies programs through cash transfer and subsidies. - Local administrative offices avail foodstuff at a subsidized cost for the poor HHS and vulnerable sub-groups. - School feeding for poor students. - Introducing energy-saving and cost-effective cooking technologies. - Recognize the role of social inclusion (formal + informal) in matching fund contributions. - Facilitate financial institutions that provide a low-interest rate for poor and vulnerable sub-groups MSSE involvement. - Design methods and incorporate benchmarks for diversifying income sources for the poor. 	<ul style="list-style-type: none"> - Investment in training regarding saving, entrepreneurship, and diversifying income sources for beneficiaries HHS in partnership with government, multilateral and bilateral agencies. - Private organizations provide asset-based lending for machinery and equipment. - Opening blocked saving bank account for beneficiaries HHS that guarantee credit opportunities. - Investment in producing energy-saving and cost-effective cooking materials and distributing for the poor and vulnerable sub-groups at low cost. - All dwellers contributed matching funds (formal + Informal) - Provide low-interest-rate priority for chronically poor and vulnerable sub-groups for MSSE development. 	<ul style="list-style-type: none"> - The saving groups obtained credit opportunities to engage in job opportunities they are capable and do. - Opportunities for asset-based lending for the poor and vulnerable sub-groups based on legitimized right as collateral for credit. - Scale-up energy-saving and cost-effective cooking technologies to other informal settlements. - Legal framework recognized the contribution of matching funds by all dwellers. - Chronically poor dwellers established profitable MSSE. - Diversifying income sources enhance capital consolidation.
Social and institutional capital	<ul style="list-style-type: none"> - Formulate, increase and recognize the legitimacy of CBO and civic societies in local organization structure as partners of livelihood capital asset accumulation. - Government recognizes and supports programs and projects of multilateral and bilateral agencies working in poverty alleviations and asset building. - Government and the dwellers recognize and strengthen the existing structure of community police. 	<ul style="list-style-type: none"> - Investment in training and memberships of CBO and Civic societies that worked for the interest of the poor and vulnerable sub-groups. - Decentralize the institution of community police at the community level and invest in human capital deployment and trainings. 	<ul style="list-style-type: none"> - Redesign Urban development policy and strategies to accredit and legitimize institutions bargaining for the needs of chronically poor, voiceless, and dispossessed land rights HHS. - Strong multistakeholders partnership of CBO, Civic societies, multilateral and bilateral agencies. - Design social protection policy integrated with employment, poverty and environment policy. - CBO and civic societies bargain for rights in tenure, provision of services and infrastructure, inhibiting evictions for the voiceless poor and dispossessed land right HHS. - Making pragmatic safety and security regulations to reduce crime. - Building an environmentally resilient city that can respond effectively in case of shock and stress. - Reduce the effect of environmental disaster on other livelihood capital assets.
Natural Capital	<ul style="list-style-type: none"> - Recognize the role of UPSNP, multilateral/ bilateral agencies, and civic societies for the protection of natural capital erosion. 	<ul style="list-style-type: none"> - Investment in providing awareness training regarding environment protection and management. - Integrate the poverty alleviation programs investment with natural capital asset accumulations. 	<ul style="list-style-type: none"> - Building an environmentally resilient city that can respond effectively in case of shock and stress. - Reduce the effect of environmental disaster on other livelihood capital assets.

progress in further education, constituted the highest youth unemployed. There was a significant association between gender and occupational status for inner-city slum ($\chi^2 = 52.316$, $\alpha = 0.001$) and *peri-urban* ($\chi^2 = 29.581$, $\alpha = 0.001$). The above association was due to 23.7% of FHHS in the inner-city slum (against 12.2% for MHHS) relying on assistance from children/relatives. Similarly, 3.3 % of FHHS (8.53% of MHHS) depended on government employment as the livelihood source. Similarly, for *peri-urban*, the above association was due to 16.67% of FHHS (28.79% of MHHS) were depending on formal employment⁴. There was significant association between gender and HHS educational status for inner-city slum ($\chi^2 = 44.919$, $\alpha = 0.001$) and for *peri-urban* ($\chi^2 = 11.079$, $\alpha = 0.05$). The above result for the inner-city slums was attributed to 16.25% of FHHS (9.15% MHHS) being illiterate. In other words, 1.77 illiterate women for every male for the inner-city slum. For *peri-urban*, 38.5% of FHHS (15.24 % MHHS) belonged to either basic read and write or 1–4 education level. In other words, 2.15 less educated women for every male for *peri-urban*. The significant association between marital status with an occupational category for the inner-city slum ($\chi^2 = 82.862$, $df = 45$, $\alpha = 0.001$) has gender implications. In the inner-city slum, 50.64% of the widowed HHS depended on assistance from children/relatives (85.9% of the widowed were FHHS). The above result explained that the widowed FHHS were the most vulnerable to unemployment. From HHS > 60 years of age, 62.3 % and 0.79 % were surviving through the assistance of children and relatives for the inner-city slum and *peri-urban*, respectively.

There was a significant association between the education level of the HHS and % of family members progressing \geq diploma education level for the inner-city slum ($\chi^2 = 29.008$, $\alpha = 0.016$) and *peri-urban* ($\chi^2 = 31.018$, $\alpha = 0.001$). The above result for the inner-city slums was explained by 59.3% and 30.8% of HHS of illiterate and \geq diploma level did not have any HHS members progressing to \geq diploma level, respectively. The association for *peri-urban* was explained by 100 % and 60% of HHS with educational level illiterate and \geq diploma education level did not have any family members progressing to \geq diploma education level, respectively.

There was a significant association between Unemployment and Overcrowdedness status for the inner-city slum ($\chi^2 = 48.424$, $\alpha = 0.001$). The percent of employed HHS family members (18–64 age group) for the inner-city slum was 69.2 % for the overcrowded category < 1 people/room while 34.9% for the overcrowded category > 5 people/room. There was also a significant association between overcrowdedness and HHS grade level for the inner-city slum ($\chi^2 = 48.424$, $\alpha = 0.002$). The above association was due to HHS with high overcrowdedness (>3 people/room) was 63% and 19.23 % for illiterate and \geq diploma education level, respectively. Accordingly, the less educated HHS in the inner-city slum were likely to be living in highly overcrowded housing. Yet, some dwellers in the inner-city slum had tenure insecurity though they lived three decades as described below.

I have lived in the area for 29 years (since 1989) near the end of the Derg regime⁵. The site was waste disposal during the Derg regime. We have participated in the Kebele election and fund contributions for development activities. I am now a grandfather, and my children were born and brought up here. We have consistently written letters to Addis Ketema sub-city Wereda 07 office to be legalized at least with Kebele House rent. However, local authorities did not answer our consistent plead. We felt high insecurity by fearing that the government may evict us from the place without alternatives for our future livelihoods (Case study-3, 2018, Addis Ketema Wereda 07 inner-city slum).

⁴ Formal employment considers those who depend on Government Employment, Private organization formal, and Self-employed Formal business.

⁵ The Derg regime ruled Ethiopia from 1974 to 1983.

4.3. Interrelationships within physical capital

There was a significant association between overcrowdedness and sanitation vulnerability for the inner-slum ($\chi^2 = 54.587$, $\alpha < 0.001$). The association for the inner-city slum was due to the non-vulnerable to sanitation constituted 61.5% and 5.8 % for HHS < 1 person/room and for HHS ≥ 4 to < 5 person per room, respectively. The above findings indicated overcrowdedness liable the poor dwellers to sanitation and transmissible diseases. There was a significant association between tenure status and HHS water source for inner-city slum ($\chi^2 = 65.269$, $\alpha < 0.001$). The association was due to Vendor provided water being the major source for 60 %, 8.77%, and 0% of the unauthorized dwellers/renters, owner permit right holder, and Municipal house renters, respectively. The Unauthorized tenure status in the inner-city slum was the most deprived of own piped water connection. There was a significant association between Sanitation vulnerability and Tenure status of HHS for inner-slum ($\chi^2 = 33.348$, $\alpha = 0.031$) and *peri-urban* settlement ($\chi^2 = 22.869$, $\alpha = 0.029$). The above result was due to 100% of unauthorized dwellers and 48.51% of the renter from unauthorized dwellers categorized into high and very high vulnerable to sanitation for the inner-city slum and *peri-urban* respectively. The association of tenure right deprivation with poor sanitation/water services quarter of inner-city slum indicated the impact of the absence of de jure tenure right on the bargaining power of the poor for more services.

An authorized dweller who lived in the inner-city slum elaborated that:

The toilet that serves 46 HHS' is overflowing, not repaired despite appealing for Wereda 07 office. Therefore, the 46 HHS in the neighborhood is using a public toilet in CCF office area (consisting of 34 toilets) through paying 12 birr per month while during at night and illness we are suffering due to lack of toilets (Case study –4, 2018, Addis Ketema Wereda 07 inner-city slum).

There was a significant association between tenure status and Water vulnerability⁶ for inner-slum ($\chi^2 = 70.289$, $df = 15$, $\alpha < 0.001$). The association for the inner-slum was due to 70%, 11.3%, and 0% of the unauthorized dwellers, the owner permit right, and municipal house renters were highly vulnerable to potable water shortage. The result indicated that dwellers with no de jure tenure rights were also highly prone to water shortage; and paid a high cost for vendor-provided water in the inner-city slum. Regarding accessibility, 56.7% of the HHS were accessible within 0–15 m of paved road for inner-slum. Yet, only 2.8% of the HHS were accessible within 0–15 m of paved road for *peri-urban*. The graveness of road inaccessibility was elaborated by FHHS in *peri-urban* as follows:

I am a housewife. My husband is working in construction work. I lived in the hilly areas. I have to come up the hill Fetching water from Doro Erbata in the formal neighborhood. I have to send my Kids to School down the hill. When someone is ill or during pregnancy in the settlement where we lived, someone has to carry the person down the steep slope Near Mariam Church to the spot of the taxi center. So, road and transport inaccessibility are the critical problems affecting our daily life (Case study –5, 2018, Kolfe Keranyo Wereda 03 *peri-urban*)

Based on GIS service area analysis, 65.9% of HHS shall commute > 1.5 km to access primary school for *peri-urban*. 63.9% of the HHS shall commute > 3 km to access the health center for *peri-urban*. Yet, 100% of

⁶ Water Vulnerability inner-slum: one (No Vulnerability) =Own Piped Water Connection not shared at all, two (less Vulnerable) =Piped Water Connection shared by 2 to ≤ 5 HHS, Three (Vulnerable) =Piped Water Connection shared by > 5 to ≤ 10 HHS, Four (High Vulnerability) = Piped Water Connection shared by > 10 HHS or HHS use vendor-provided potable water. Five (Very High Vulnerable) =use Water from River or not potable water sources.

inner-slum were accessible to education and health services by <1 and 1.2 km, respectively. The PPMC between primary school and health services was 0.878 for *peri-urban*. The correlation indicated that social services deprivations were increasing with increasing distance from the formal neighborhood for *peri-urban*.

4.4. Interrelationships of social with financial and physical capitals

There was a significant association between tenure status and CBO for *peri-urban* ($\chi^2 = 26.988$, $\alpha < 0.001$) and inner-slum ($\chi^2 = 25.117$, $\alpha < 0.001$). The association for *peri-urban* was due to 40.74% and > 78 % of renters from unauthorized dwellers, and the remaining tenure groups were involved in at least one CBO, respectively. The significant association for the inner-city slum was due to 50 %, and > 81 % of the unauthorized dwellers and the remaining *de jure* recognized tenure groups were involved in at least one CBO, respectively. An elderly woman, with *de jure* Kebele house tenure right, described that “Edir(CBO) members have participated and assisted me financially by reconstructing my demolished house beyond the assistance in case of death and illness” (Case study-6, 2018, Addis Ketema Wereda 07 inner-city slum). Yet, an unauthorized tenure right HHS mentioned that “Edir members assisted each other in case a person is ill and assisting families of the deceased not extending beyond this (Case Study-7, 2018, Addis Ketema Wereda 07 inner-city slum). The quantitative result coupled with the individual case study indicated that the extent of social capital is strong for *de jure* recognized tenure groups HHS in relative to unauthorized dwellers for inner-city slums. For *peri-urban*, renters from unauthorized dwellers were less involved in CBO.

There was a significant association between participation in the election of Kebele and tenure status for *peri-urban* ($\chi^2 = 36.376$, $\alpha = 0.001$). The above association was due to the combined low plus very-low election involvement was 51.9%, 28.6%, 21.8%, and 15.6% for HHS Rented From Unauthorized Dwellers, Peasant Authority Permission, Unauthorized Dwellers, and Owner Permit right/tax receipt, respectively. The insignificant association for the inner-city slum explained that tenure status does not reflect involvement in the election in the inner-city slum. The unauthorized dweller person in the inner-city slum described that “I have been contributing funds for development and participated in the Kebele election. Yet, we do not have legalized tenure rights. We feared that the government might evict us from the site that our children brought up” (Case study –8, 2018, Addis ketema Wereda 07 inner-city slum). The above view indicated that the unauthorized dwellers considered enhancing social capital as a means of accession to tenure rights. The unauthorized dweller in *peri-urban* mentioned that “she is participating in wereda election while the wereda or local administration did not collect fund as part of community contribution for development activities even if we are interested in contribution” (Case study –9, 2018, kolfe Keranyo Wereda 03 *peri-urban*). The above result indicated how the *peri-urban* unauthorized dwellers were excluded to contribute resources for development. There was a significant association between CBO versus income per AE for the inner-city slum ($\chi^2 = 12.21$, $\alpha = 0.007$). The association was due to 7.39 % and 23.53 % of HHS, who was not involved in CBO had income < 599 birr/M/AE and ≥ 3000 birr/M/AE, respectively. The above result indicated that low-income HHS had higher social capital and network as means of survival strategies in case of hardships.

4.5. Interrelationship of natural with human and financial capital

The overlaying of slope class with HHS GPS location screened the Vulnerable HHS. Accordingly, 50.8% of the HHS of *peri-urban* was living on slope > 20 percent, liable to flooding and landslides. For the inner-slum, 21.8 % of HHS were vulnerable to constraints of topography. The topography constraints were due to 20.3% of HHS located in 0–2% slope, liable for waterlogging and flooding, and 1.5% of HHS lived on a riverside slope, susceptible to flooding and landslides. The natural

capital (River) is highly contaminated with offending odor for inner-city slums, as most of the nearby river dwellers are disposing the toilets directly to the river. Based on GIS analysis, 38.9% of HHS of inner-slum were living within 50-meter distance from the river: - highly liable to offending smell and transmittable diseases. There was inverse PPMC ($r = -0.465$) between slope level and distance from the river for the inner-city slum implicated the combined vulnerability of nearby river HHS to landslide, flooding, and water contamination. There was a significant association between income per AE and housing location to hazard for the inner-city slum ($\chi^2 = 31.066$, $\alpha = 0.039$). The association for the inner-city slum was due to 60.23 % of HHS < absolute poverty line of Ethiopia. The dominant hazard for inner-city slum were flood/drainage problems. For *peri-urban*, 97.6 % of HHS were prone to hazard regardless of income. The most prevailing natural hazards for *peri-urban* were flood/landslide-related.

4.6. The capability and Institutional aspects

4.6.1. Institutional aspects

Peri-urban and Inner-city slum: the key institutions directly working on job creation and poverty alleviations in *peri-urban* and inner-city slums were Job creation & Enterprise office (job creation & fund), Women and Children Affairs Office (jobs for women), Labor and Social Affairs office (registering unemployed person), Solid Waste Management Office(waste collection/sorting), Urban Productive Safety Net Program Office (UPSNP) (relief assistance and protect livelihoods) and Community Mobilization Office (participation and job creation in infrastructure projects) and construction office (job in construction and infrastructure) (T. Getu, personal communication, October 22, 2021) and (A.Ketsela, personal communication, October 28, 2021).

Inner-city slum: the local administrative office worked with private organizations /associations (Addis credit and saving, Consumers, handicraft, dwellers forums, Addis Capital (lending machinery). Non-Government Organizations (NGO) partnered with the local administrative office were Afro Health, Dawit Dreams, amref Health Africa / CCF, New Integrated Development Enterprises. The local administrative office worked in partnership with the civic society associations (youth league, women league, disabled, dwellers forum, condominium) for poverty alleviations and public mobilizations. The local administrative office has a more decentralized administrative structure devolved from Wereda- Ketena- Block unit- HHS unit (A.Ketsela, personal communication, October 28, 2021). The decentralized nature of the structure is crucial to work closer to the people and ensure efficient service delivery and realize safety/security. The NGOs complemented government work by bridging the gap of training UPSNP beneficiaries and addressing the needs of disabled and vulnerable women (S. Bogale, personal communication, November 3, 2021). The social and institutional capital accumulation is higher for the inner-city slum relative to *peri-urban*, due to an array of actors (CBO, Private, NGO's and civic society associations) involved. The allowed building permit regulation is mostly G + 7 and prohibited upgrading housing from substandard to standard materials (D. Abera, personal communication, January 15, 2018) that deter the capability of physical asset accumulation for the urban poor.

Peri-urban: CBO, recognized in the local organizational structure, played a role in maintaining houses of the vulnerable (the poorest of the poor, the disabled, and the elders) and availing educational facilities for chronically poor students. The local administrative office did not work with civic society associations (Women and Youth league) and NGOs (T. Getu, personal communication, October 22, 2021). The insignificant social and institutional capital obscured the crucial role of gender and youth in enhancing livelihood capitals. The NGOs, as well as Multilateral / Bilateral agencies, are involved less in poverty alleviations. The World Bank assisted programs of MSSE (Micro and Small Scale Enterprise) and UPSNP. The local administrative office has devolved the organizational structure from the Wereda-Ketena-block level for mobilizing development activities and ensuring safety/security (S. Eyassu, personal

communication, October 20, 2021). Currently, the farmers in *peri-urban* have de jure tenure rights that dwindle informal land transactions. Yet, informal settlers who acquired land through agricultural land transactions are subject to a coercive measure of bulldozing, stripping homeownership (M. Birhan, personal communication, October 20, 2021), which created double standard in tenure ownership right.

4.6.1. Capability aspects

Inner-city slum The potential capability functioning (individuals and collective) for livelihood capital accumulations is sounding due to the diversity of partners working in the government, non-government, private, and civic society relative to *peri-urban*. Yet, the wereda administration did not authenticate and work with CBO despite 90.3 % of HHS being CBO members. The government leveraged the individual capability in MSSE to be able and meet opportunities through a revolving fund. Yet, capital injection for micro-finance quitted currently due to failure to execute payment by previous beneficiaries. The above situation stunted the future development of micro-finance and functioning individual capability at the expected level. The earlier MSSEs' were exemplary and created livelihood capital accumulation through jobs creation for others. Yet, some MSSEs formulated by mobilizing their capitals while the poor did not have the initial cash to formulate MSSE. The current functional credit institution (Addis Credit and Loan association) interest rate is unaffordable (18 %) for the poor for engaging in the business of their capability functioning. Addis capital goods & finance business provide asset-based lending after the MSSE's beneficiaries pay 15 % of the machinery cost (A. Ketsela, personal communication, October 28, 2021).

Current research indicated that 58 % of the wereda HHS were not self-sufficient in food-one of the poorest areas of AA. UPSNP program benefitted all the target groups in the 1st and 2nd rounds (T.Bayu, personal communication, October 29, 2021). Since the area is closer to the CBD, the poor and vulnerable dwellers survived through diversifying their income sources by renting beds or houses and opening small businesses near their dwellings (E.Bayessa, personal communication, November 5, 2021). Under UPSNP, the beneficiaries participated in development activities through relief food assistance, compulsory saving of 1/5th of earning as a guarantee for graduation, took training (financial, work culture, and technical), and the UPSNP also assisted in diversifying their income sources portfolio. After three years of graduation, 500 USD granted plus 36 months 20 % income saving + additional income opportunity saving for MSSE) and become micro-finance clients involved in the business functioning their capability. The major problems faced in UPSNP executions were screening beneficiaries, not engagement in diversified business, and the syndrome of expecting assistance after graduation (T.Baye, personal communication, October 29, 2021). The participation office worked with offices such as UPSNP, job opportunity enterprise office, Construction, and Finance. The dwellers' contributed 65 % of the project cost, matched with a 35 % government share for infrastructure projects. The participatory-based cobblestone road and drainage projects generated job opportunities for the jobless and opportunities for the dwellers to participate in finance and labor. In general, projects executed by the participation office for 2020/21 through public mobilization were a public toilet, public kitchen, Culvert, public shower, cobble maintenance, new and maintenance ditch and drainage work, police center, bridge maintenance, green development, and street light. Based on Wereda 07 administrative office, the project executions of the local administration office against planned for 2020/21 were financial (18.1%), knowledge and skill (10.7 %), labor(9.5%), and material (12.9 %).

Peri-urban : the structure and process to transform assets for livelihood capital asset accumulations are not satisfactorily due to fewer institutions involved in livelihood capital accumulation and the functioning of capability. The wereda administration office tied poverty alleviation effort with income injection through the UPSNP program and the previous revolving fund of MSSE. Edir (the only accredited CBO in

the local administrative structure) engaged in maintaining houses of chronically poor and availing educational facilities for students of an impoverished families. Yet, the wereda administration did not induce a commendable effort to partner with multilateral/ bilateral agencies and civic society associations for capability functioning to ensure livelihood capital accumulation. No NGO is replicating the reputable experience on management of MSSE and poverty alleviations (T. Getu, personal communication, October 22, 2021). The process of leveraging community capacity to build the livelihood capitals assets is rudimentary. The Wereda administrative office facilitated the formulation of MSSE, members' fund allocation, and job choice commensurate with capability. The wereda administrative office equipped the beneficiaries with financial management skills, developing trust among members, and strengthening the sustenance of MSSE (G. Bihonegn, personal communication, October 24, 2021). The Wereda job creation and entrepreneurship office quit providing credit for MSSE establishments after 2017 due to unpaid arrears of credit by beneficiaries. Currently, the participation of the unemployed youth on MSSE has shown declining trends. Yet, some people formulated MSSE through assembling their financial resources (W. Getu, personal communication, November 1, 2021). The quitting of financial capital injection also affected the accumulation of human and physical capital of MSSE for poverty alleviation efforts that provide lessons regarding the necessity of AB policy.

Based on the HHS survey, 36 % of the wereda dwellers were not self-sufficient in food. According to UPSNP, the vulnerable dwellers (formal + informal) obtained food relief assistance through investing their capability to leverage livelihood capital assets. UPSNP program benefitted the poor and poorest of the poor in five years stretch period, focusing on the functioning of people's capability. The beneficiaries of UPSNP participated in livelihood capital asset accumulations through engaging in Solid waste collection and sorting, beautification and greenery, soil and water conservation, gully rehabilitation, road infrastructure, urban agriculture. The procedures of graduation of chronically poor HHS involved in UPSNP are similar to the inner-city slum. A reasonable number of the UPSNP beneficiaries showed commendable outputs in the urban agriculture sector (T. Solomon, personal communication, October 21, 2021). The contribution for infrastructure projects is 65 % and 35 % from dwellers and government, respectively. Yet, the wereda administrative office excluded informal settlement dwellers to contribute 35 % of resources for public work projects. The public participatory projects executed in the year 2020/21 were cobblestone roads, open ditches, drainages, and street lights (A. Yakem, personal communication, October 25, 2021).

4.7. Risks and vulnerabilities

Peri-urban: the main environmental risks are degradation of hilly and other areas and liability to gully erosion and flooding (T. Anteneh, personal communication, October 21, 2021). UPSNP included in the program the addressing of the above environmental issues. Based on a 2018 survey, 82.1 % of the HHS claimed that the main hazards were steep slopes and flooding. The security and safety risks are personal fights, robbery, burglary, and land invasions (T. Kuma, personal communication, October 28, 2021). According to Kolfe Keranyo Werda 03 health office for 2020/21, the top four leading causes of morbidity were: respiratory tract infection, urinary tract infection, inability to swallow, and tonsillitis.

Inner-city slum: the main environmental risks were overcrowding/ congestion, waste disposal, sanitation problems, and shortage of green space (F.Zeleke and Amedmariam. H, personal communication, November 1, 2021). Based on the 2018 socio-economic survey, 47 % of HHS claimed no hazard in the neighborhood, 21.8 % (flood and drainage problems), 6.7 % (toilet excreta smell/overflow), and 6.4 % (near a polluted river). The type of security and safety risks includes robbery, personal fights, burglary, gambling, and illegal houses of shisha smoking and chat chewing (T.Eshetu, personal communication,

November 5, 2021). According to Addis Ketema Addis Raey Health Station, the top four leading causes of morbidity for 2020/21 were Urinary tract infection, medical certificate issue, Diarrhea, and head injury (due to crime and fight).

5. Discussion

The study used explanatory sequential design primarily analyzing through quantitative research for refining strategic issues for ABS interventions that relate to many aspects of livelihood capital assets deprivations, considering the variation of vulnerability sub-groups. Then, the qualitative individual case study reflected the depth of dwellers' impression on their livelihood capital assets deprivations. The key-informants interview analyzed the institutional, capability, and safety/risk issues. The triangulation of quantitative with qualitative information provided a comprehensive picture for validating the facts for ABS recommendations. There is an interrelationship among livelihood capital assets following authors (Farrington et al., 2002; Sheilah et al., 2001; UNDP 2017). The more livelihood capital assets deprivations, the more likely the HHS risks and vulnerabilities following Lienert and Burger (2015). Financial capital is one of the crucial assets for capital accumulation and livelihood strategies in line with the author's (Wang et al., 2021a) argument. Urban areas relied on a cash economy for food (61.36% and 55.8% for the inner-city slum and *peri-urban*, respectively). The *peri-urban* settlers spent higher on water, transport, and energy for cooking (< 9 %) as compared with inner-city slum residents (< 5 percent) due to social exclusion and non-integration with the mainstream of urban development. The above findings indicated financial capital (cash, credit, and subsidy) is a strategic issue for livelihood capital assets accumulation. The reliance on cash economy for food, water, transport, and consumables justified the underestimation of urban poverty relative to rural conformed with authors (Mitilini & Satterthwaite, 2004; World Bank, 2015b) argument. The findings of the inner-city slum revealed income deprivation is associated with overcrowding, poor sanitation, sub-standard housing floor materials, and poor building quality. For *peri-urban*, income deprivation is associated with going long distances for water fetching, low water consumption, low mobility, low parcel per capita, poor building wall material, and poor building conditions.

Regarding the interconnections within human capital, there is a difference in access to human capital by gender and educational status. Gender and income do not show significant association in informal settlements conform to Jayamohan and Amenu (2014) argument. Yet, regarding human capital, women are deprived in occupation (85 % of HHS depended on assistance were widowed FHHS in the inner-city slum) and educational status (2.15 and 1.77 illiterate FHHS for every MHHS for inner-city slum and *peri-urban*, respectively). The vulnerability of the old age HHS to poverty interfaces with the author's (Abo-derin et al., 2017) arguments for an age-friendly slum initiative as the older people are co-habiting with and caring for children. The overall Unemployment rate of the inner-city slums (33.71%) exceeded the unemployment rate of 28.6% for 15–64 age groups of AA (CSA, 2015). Moreover, the youth unemployment percentage was associated with the education status of grades 9–10 for the two informal settlement areas ($r \geq 0.3$). The unemployment findings conform to FDRE (2018) that implicated creating job opportunities for youths of secondary education level. Unemployment is a strategic issue since a higher unemployment rate is significantly associated with overcrowded living conditions, low educational status, and low income. Moreover, the poor HHS education status leads to family members' poor education in line with the culture of poverty theory of Lewis (1966). The lesson is poverty alleviation programs shall enhance the class-consciousness of parents of low education levels through informal/adult education as it is a strategic issue. Over-crowdedness is the strategic issue in the inner-city slums; related to low income, unemployment rate, and poor sanitation. Hence, overcrowding is the survival strategy for diversifying sources of financial

capital by the inner-city slum dwellers based on key informant interview findings and the quantitative information (39.3% of HHS survived through renting beds). The above situation depicts Alonso-Muth's Mills bid rent model argued by UN-Habitat (2003) that the poor outbid the rich for CBD through overcrowding, renting and reducing mobility. (Figs. 1 and 2).

Tenure security is the strategic entry point for livelihood capital accumulations due to a link between SDG goal-1 on poverty reduction with goal-11 indicators of addressing inadequate housing and access to land in line with SDG Tracker (2019). Tenure insecure HHS in the inner-city slum is vulnerable to poor sanitation, poor water access, and low income. Most HHS in *peri-urban* (82%) were tenure insecure and associated with poor sanitation services. The inner-city slum and *peri-urban* findings indicated the association between tenure security levels and CBO (community bargaining potential). Therefore, asset accession through tenure security is the strategic entry point for capital accumulation through unlocking dead capital and bargaining means for credit, collateral, and service provision in line with authors (Dani & Moser, 2008; De Soto, 2001; Fontana, 2016). The legally recognized tenure groups (permit rights holders and Kebele renters) in the inner-city slum rented their house for exorbitant prices relative to the very-low rental price paid by Kebele renters to formal Kebele administration. Full titling (non-incremental regularization) could lead to exorbitant rent for renters and market-based eviction for owners (transacting property for a better price) due to neighborhood improvements conforming with authors (Payne et al., 2009) arguments. Group and occupancy tenure right provision for HHS who do not have tenure right pave the way for incremental regularization to lease or other forms of right in the future, as articulated in Payne et al. (2009).

The poor HHS in the inner-city slum that dwell in the edges of watercourses and on the sides of steep slopes tend to be more vulnerable to a lack of mainstream infrastructure and services (road access, sanitation, water, drainage) in general. In addition, they are also vulnerable to environmental hazards (recurrent floods, landslides, toilet overflow, poor refuse collection, water pollution, transmitted diseases, and so on) and crime (safety and security). In addition to suffering from similar problems to a considerable degree, *peri-urban* HHS lives in high slope and marginalized areas lacking critical infrastructure (motorable roads, water mains, power and communication grids, health facilities, and shopping services) and are liable to crime. The asset derived from natural capital (the river), for the inner-city slum, is polluted with human waste and excreta through direct toilet connection that adversely affects the health of human capital. The *peri-urban* squatters live on risky steep slopes, exposed to flooding and landslide hazards. In general, to accumulate livelihood capitals for poverty alleviations, informal settlement areas needs interventions to enhance the resilience capacity of the residents to disaster, economic shock, and stress.

The *Peri-urban* institutions used meager social capital (not recognized civic society associations except CBO) and other institutions (not partner with private organizations and NGOs) for accessing livelihood capital assets for the poor and vulnerable sub-groups. The inner-city slum institutions relatively mobilized the potentials of human capital assets by formulating civic society associations, NGOs, and private organizations while failing to utilize CBO for livelihood capital asset accumulation. The inaccessibility of enabling institutions and social capitals to enhance their asset base, especially pronounced in *peri-urban*, exacerbate poverty, bring social injustice, limit access to credit and labor for the poor in light of authors (Bebbington, n.d.; Shahbaz, Vinod, Geiser, Sadaf, Schäfer, & Müller-Böcker, 2010; UNDP 2017) argument. The imposition of high-standard building permit regulation (mostly G + 7) on the inner-city slum eroded the livelihood capital accumulation and valorization for the poor through incremental housing improvement. For *peri-urban*, the government recognized *de jure* tenure right for farmers while excluding HHS who bought land from farmers that contravene the global trends of leaving no one behind in informal settlement regularization and upgrading following UN-Habitat. (2020b).

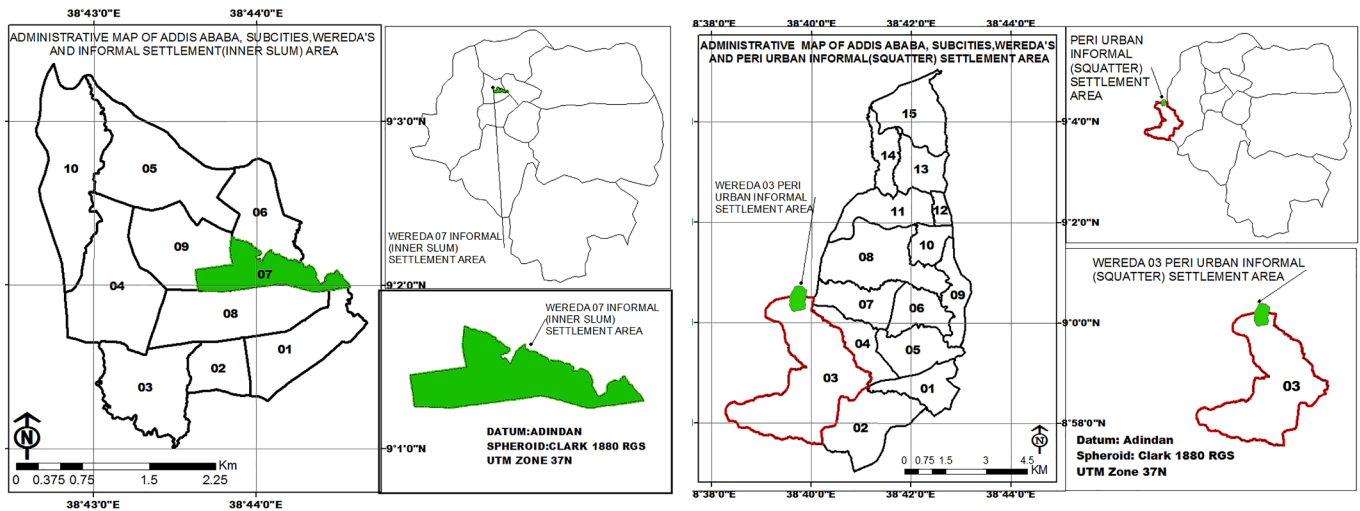


Fig. 1. Figure-1: The location of Wereda 07 case study area in relative to Addis-Ketema sub-city and Addis Ababa city (left) and Figure-2: the location of Wereda 03 case study area relative to Kolfe-Keranyo sub-city and Addis Ababa city (right).

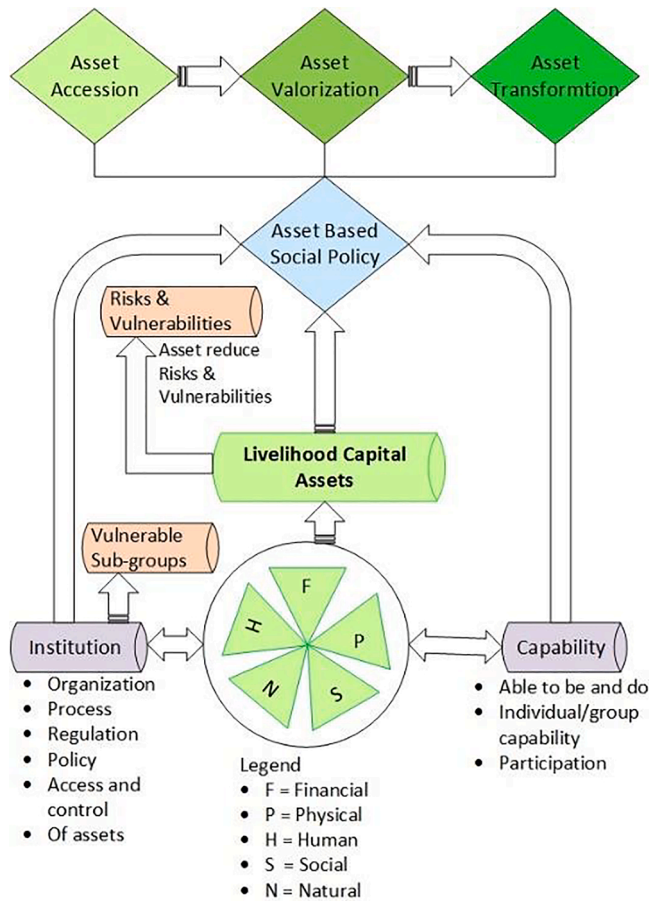


Fig. 2. Conceptual framework of the paper.

The government enhanced the job creation capability of the unemployed and the functioning of capability through MSSE development, revolving funds (the inner-city slum and *peri*-urban), and asset-based lending initiation for machinery (inner-city slum). Traditional collateral funding poses a challenge for the financial recovery of firms and the sustained functioning of capability. Therefore, expansion of asset-based lending and a special fund allotment for MSSE are the alternative options in line with authors (Nega & Edris, 2016), backed with training,

diverse sources of financing MSSE, and a robust management system for revolving fund recovery.

The inner-city slum has relatively better capability functioning considering the mobilized social and human livelihood capital assets in relative to *peri*-urban following the authors' (Lienert & Burger, 2015) argument regarding asset and capability. UPSNP contributed to asset accumulation by involving the poor in public works, reducing environmental risks, enhancing saving, creditworthiness, upgrading individual skills, and involving the beneficiaries in work they are able to be and do and capital accession. UPSNP shall be sustainable to realize asset consolidation for the chronic poor population through integrating revolving funds injection, low-interest rates, asset-based lending, and tenure security. Moreover, urban development policy and strategies need revisiting and fine-tuning to chronically poor following Kassahun and Tiwari (2012). Yet, in general, informal settlements required addressing capability deprivations and accessing vulnerable sub-groups with livelihood capitals through mobilization of the community, civic society, and other partner institutions following authors (Bebbington, n. d; Dani & Moser, 2008; Sen, 1995; Serrat, 2017; Shahbaz et al., 2010; UNDP, 2017) argument. The new trend in social policy shall bring transformational change through the principle of universal, inclusive, integrative, partnership and aligned to global/regional social policy following United Nations (2021).

6. Conclusions and recommendations

The interrelationships between livelihood capital assets deprivations and the variations of deprivations by sub-groups emanated strategic issues (issues related with multifaceted deprivations) for ABS policy. To sum up, the constraint of asset accumulations, poorly functioning individual and collective capability, and the lack of strong institutions that bring livelihood capital assets claim closer to the poor and vulnerable sub-groups degraded the social wellbeing of poor people in informal settlements. Accordingly, ABS policy (asset accession, asset valorization and asset transformation) is recommended basing the critical role played by asset, capability and institution in improvement of well being as indicated on table-1 recommendations.

Ethical statement

The journal I published complied with Ethical statement. I am confident that it is free from misconduct and plagiarism. The journal can perform any kinds of software check for plagiarism and search through

misconduct statement (if any). It is authentic work and original research to the best of my knowledge. I am ready to respect the ethical standards of the journal and COPE guideline on plagiarism to be practical. I am also abide by the rule of the journal for peer-reviewed (double-blind).

CRedit authorship contribution statement

Gizachew Berhanu: Writing – original draft, Methodology, Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Visualization. **Solomon Mulugeta:** Supervision, Methodology, Validation, Writing – review & editing. **Ephrem Gebremariam:** Supervision, Methodology, Validation, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.resglo.2022.100081>.

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