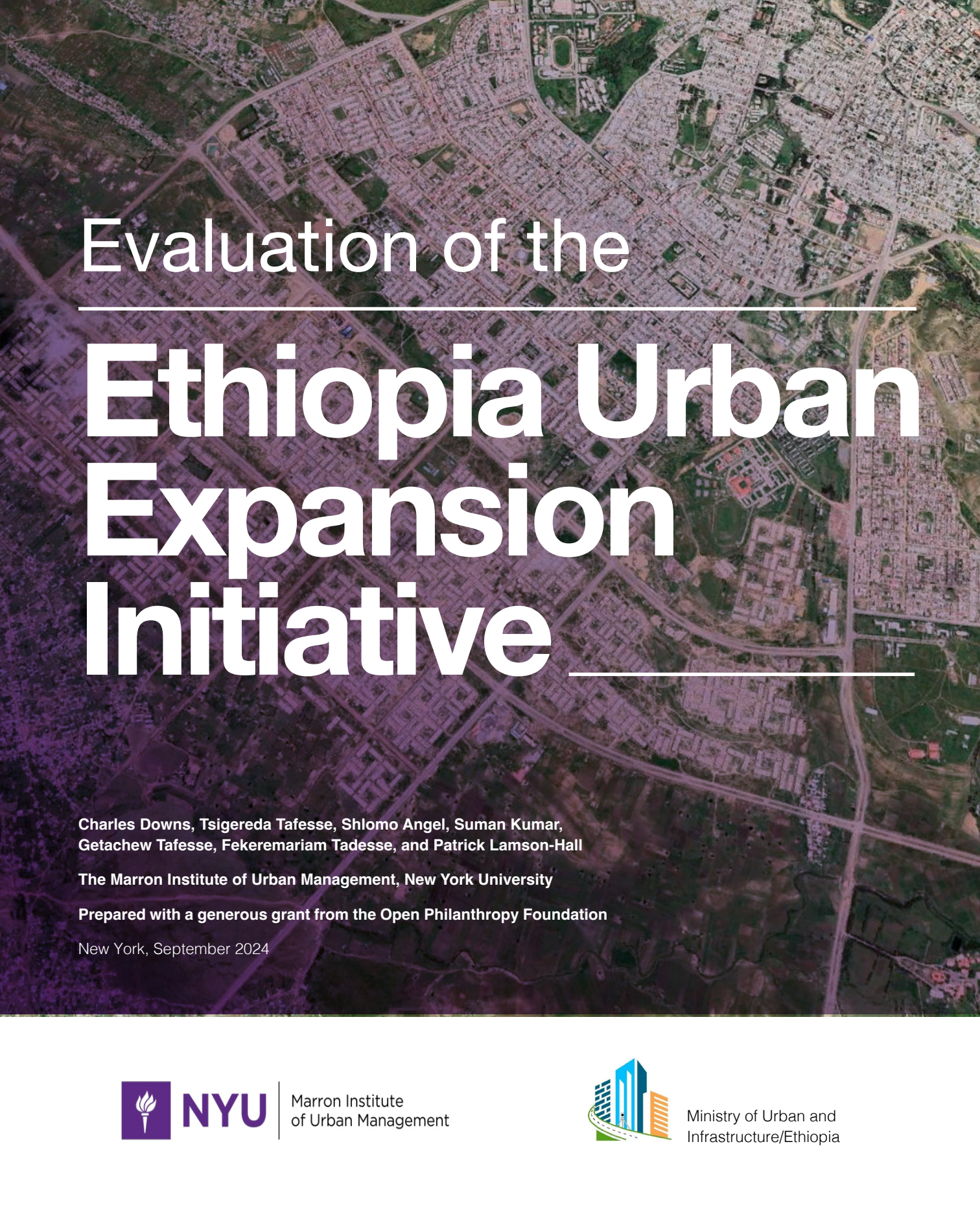




Evaluation of the **Ethiopia Urban Expansion Initiative**

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Getachew Tafesse, Fekeremariam Tadesse, and Patrick Lamson-Hall**

The Marron Institute of Urban Management, New York University

Prepared with a generous grant from the Open Philanthropy Foundation

New York, September 2024



NYU

Marron Institute
of Urban Management



Ministry of Urban and
Infrastructure/Ethiopia

Evaluation of the

Ethiopia Urban Expansion Initiative





Preface

Ethiopia stands at the crossroads of rapid urbanization fuelled by a surge in urban population growth mostly induced by rural urban migration. This is not unique to Ethiopian cities. According to OECD's Africa's Urbanisation Dynamics report of 2020 projections, African cities will need to accommodate an additional 950 million urban residents by 2050. Urbanisation is both promising and complex at the same time. On the one hand, it presents tangible economic growth opportunities. On the other hand, managing it properly requires competent and proactive urban leadership that can envision the future growth dynamics of cities. Without advance planning, the economic prospects of rapid urbanisation are diminished by the proliferation of informal settlements and by growing shortages in the provision of infrastructure services. As cities expand at an unprecedented scale, spatial planning and land management demand undivided attention. This requires thoughtful planning, infrastructure investments, and service provision that must be founded on coherent urban policies. The Ethiopian government has crafted an urban development policy, aiming to guide sustainable growth while enhancing residents' quality of life, and the Ministry of Urban and Infrastructure (MUI) has implemented several urban development programmes and projects to achieve the country's urban development objectives.

Between 2013 and 2015 MUI partnered with the Marron Institute of Urban Management at New York University (NYU), regional governments, and 18 selected secondary cities, to pilot the Ethiopian Urban Expansion Initiative. The programme pioneered by Marron Institute of Urban Management, under the leadership of Professor Shlomo Angel, introduced a proactive, long-term planning approach for cities, anticipating future population growth and the corresponding demand for land. A unique feature of this programme was that the planning process was led by municipal planners of the participating cities who would ultimately implement the plans. The simple spatial planning approach introduced by the programme enabled many Ethiopian urban leaders and practitioners to envision the future of their cities.



In 2023, ten years after the introduction of the Ethiopian Urban Expansion Planning Initiative, NYU, in collaboration with MUI and other local and international partners, launched an evaluation of the programme. The findings shed light on the influence and broad impact of Urban Expansion Planning on the development of Ethiopian cities. They provide valuable and strategic insights to MUI, to municipal official in Ethiopian secondary cities, and to urban practitioners in the country that will inform our future urban planning and land management programmes. My ministry is keen to use these insights to refine our spatial planning approaches as well as the legal and policy frameworks governing them. The findings also offer an objective assessment of the programme's impact in the participating cities which will be very useful in informing their future spatial planning.

At the regional scale, I believe many African urban local urban government leaders and planning practitioners will find this study useful in understanding how urban expansion planning can help them in their quest for orderly, environmentally sustainable, and productive cities that promote a good quality of life.

On behalf of MUI, I would like to extend my sincere appreciation to the Marron Institute of Urban Management at New York University for introducing the Urban Expansion Planning approach to Ethiopian cities, an approach that paved the path for proactive, long term, and environmentally sustainable spatial planning of our cities. I also want to commend the study team for implementing a thorough evaluation of the programme that can guide and instruct the future development of our cities.

Fenta Dejen Wudu, State Minister

Ministry of Urban and Infrastructure

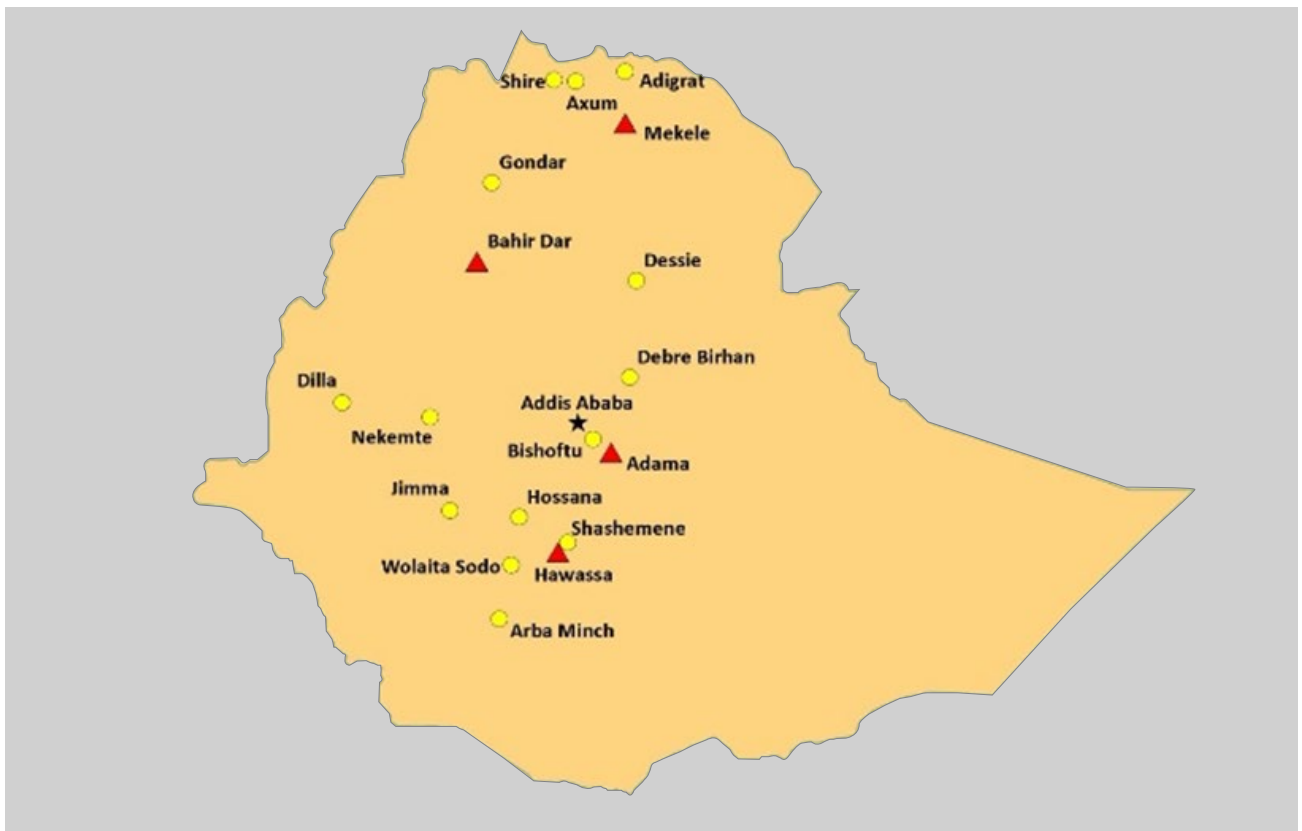
Government of Ethiopia



Executive Summary

In 2023-2024, the Marron Institute of Urban Management at New York University (NYU), supported by a grant from the Open Philanthropy Foundation, conducted a retrospective impact evaluation of the technical assistance and capacity building services that the Institute, in collaboration with the Ethiopian Ministry of Urban and Infrastructure, provided to local authorities of several secondary cities in Ethiopia during 2013-2015. The goal was to assess the effectiveness as well as both the socio-economic and health impacts of this technical assistance a decade after it took place.

The initial support provided by the NYU team, in collaboration with the Ethiopian Ministry of Urban and Infrastructure, included training, guidance, and mentoring of municipal officials in four Ethiopian regional capitals (Adama, Bahir Dar, Hawassa and Mekele) in 2013, empowering them to prepare and implement 30-year urban expansion plans needed to accommodate the projected increase of their populations during this period. The Ministry later requested the expansion of similar technical support services in 2014 to 14 additional cities in the country.



The four regional capitals (red triangles) and the 14 secondary cities (yellow circles) that participated in the Ethiopia Urban Expansion Initiative.



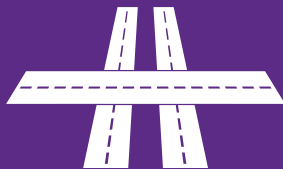
The engagement of the NYU team focused on a four-point program undertaken and implemented by municipal officials with support from regional governments and the Ministry:



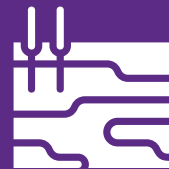
Projecting 30-year population growth.



Estimating and identifying the expansion area on the urban periphery needed to accommodate this growth.



Planning an arterial road grid throughout the expansion area and securing the rights-of-way for the roads there.



Identifying and protecting environmentally sensitive lands from development.



Evaluation of the results of the technical assistance effort was under discussion shortly before the Covid 19 epidemic interrupted many plans worldwide. In 2022, the Open Philanthropy Foundation responded to this interest with generous funding to conduct an impact evaluation, roughly a decade after the original support was provided. The evaluation was expected to determine: (a) whether and to what extent the substance of the Urban Expansion Initiative (UEI) support to Ethiopian cities had been translated into action by each of the participating local authorities; and (b) what impact did the initiative have on the residents of each city and, more particularly, did it improve their socio-economic and health conditions?



Methodology

The evaluation team conducted geospatial, qualitative, and quantitative research to respond to these questions. Geospatial analysis, using both historical and recent satellite imagery, was undertaken for all 18 cities. Qualitative interviews were conducted with municipal urban expansion team members from 5 cities, with officials from the Ministry of Urban and Infrastructure, and with staff of the Ethiopia Civil Service University. These interviews confirmed that the Urban Expansion Initiative approach had been broadly accepted and put to good use by the urban planning profession in Ethiopia, with several cities able to show concrete results on the ground, in the form of new arterial roads.

To determine whether expansion area residents benefited from the improved access provided by the newly opened arterial roads, household surveys were conducted with 500 households in each of the 8 cities that participated in the Urban Expansion Initiative where new arterial roads have been built during the 2013-2022 period. In the remaining 10

cities, either little or no new arterial roads were opened, there were an insufficient number of households in either category to sample, or civil conflict prevented the safe entry of survey teams into some areas in the Amhara Region (Gondar), Tigray Region (cities other than Mekele) and Oromia Region (Nekemte). In each of the 8 cities included in the household survey, impact group and control group households were identified, based on the geospatial analysis, and 250 randomly chosen households in each group were surveyed. The impact group consisted of households within 500 meters of the new arterial roads, while the control group consisted of households residing at least 500 meters further from the new arterial roads and at least 300 meters from the impact group. The sample of 4,000 households provided statistical results with a 99% level of confidence and with a margin of error of 2% for the eight cities taken together.

Household heads were queried using a structured questionnaire, regarding several topics:



Demographic characteristics



Economic wellbeing

(including food security, income, and assets)



Poverty Probability Index (PPI)

Question Package (Grameen Foundation/IPA)



Housing quality

(toilets, drinking water, flooring, and lighting)



Access to urban facilities and services

(duration and mode of travel)



Health conditions

(e.g. malaria, dysentery, worms, diarrhea, bleeding)



Other

(overall economic wellbeing, safety from crime)



Expected Results

The provision of arterial roads is hypothesized to improve access to the various resources of the city, including the metropolitan labor market, by facilitating transportation, ultimately leading to higher incomes and greater wellbeing. Arterial roads are also associated with higher levels of provision of basic urban infrastructure including drainage, piped water and sewerage, electricity, and waste management with anticipated positive effects on public health, on various housing-related health conditions, on access to health services, and to overall economic and social wellbeing, including improved overall health. If correct, these hypothesized causal relationships should result in a range of positive outcomes, including higher incomes, improved housing conditions, greater household assets, reduced travel time to urban facilities, lower likelihood of living in poverty and improved health conditions. Together, these would imply greater overall economic and social wellbeing including overall health.



Findings

The statistical analysis of the 4,000 household-survey questionnaires collected during the UEI evaluation confirmed most of the hypotheses outlined above. Summary conclusions, for the sample as a whole, are outlined in table 1 below. As for differences in socio-economic conditions, impact areas households had significantly higher levels of education, higher incomes, higher income growth, more home-based businesses, less likelihood of experiencing poverty, more non-health-related household assets, more advanced travel modes, shorter travel duration to non-health urban services, and greater improvement in overall economic wellbeing. As for health conditions, impact areas had significantly better health-related housing conditions (improved toilets, piped water, cement flooring), more health-related household assets (refrigerators, cookstoves), shorter travel time to health services, and significant improvements in



safety from overall crime. There were no significant differences between households in impact and control areas in health outcomes—either in the occurrence of malaria and dysentery, or in the occurrence of

diseases like worms, diarrhea, or bleeding. There were also no significant differences in the 10-year change in the likelihood of poverty and in food security. These findings are summarized in table 1 below.



Table 1

Statistical Significance of Well-Being Differences between Impact and Control Areas			
Impact areas had better conditions than Control Areas in the following	Significance of Differences		No Difference
	0.001	0.05	
Socio-Economic Conditions			
Level of education	✓		
Income and income growth	✓		
Home-Based Business	✓		
Poverty Likelihood (Both 10 years ago and today)	✓		
10-Year Change in Poverty Likelihood			✓
Non-Health-Related Household Assets	✓		
Travel Mode	✓		
Travel Duration to Non-Health Urban Services	✓		
Food Security			✓
Overall Economic Well-Being - Today vs. 10 Years ago		✓	
Health Conditions and Outcomes			
Health-Related Housing Conditions	✓		
Health-Related Household Assets	✓		
Travel Duration to Health Services	✓		
Public Health Outcomes: Malaria and Dysentery			✓
Other Health Outcomes (worms, diarrhea, bleeding)			✓
Overall Crime Safety - Current vs. Previous Location		✓	



Inter-city variations

The previous paragraph describes the findings for all 4,000 households in all 8 cities taken together, rather than results for each of the eight cities surveyed. This level of analysis ignores systematic differences that may exist between cities, in terms of their location, their overall economic performance, their overall municipal management and service delivery, or their level of security from internal conflict. The extent of implementation of the urban

expansion initiative (UEI) also varied among cities. There are good reasons to believe that inter-city variations introduced statistical noise into the overall results, and it is therefore important to note that the overall results reported in the previous paragraph were statistically significant despite this noise. That said, a city-by-city statistical analysis of the results, not reported in this document, will be reported in separate city summary reports to stakeholders.



The self-selection problem

It is acknowledged that the higher income or the higher level of education among households in the impact areas may be the result of their decisions to locate in closer proximity to arterial roads, to take advantage of the improved access to the economic opportunities and to the public services that these roads provide. To control for the possibility that higher income families may have intentionally moved to be in arterial road areas—and that, therefore, nearness to arterial roads

cannot be an independent factor in explaining higher incomes—the evaluation used a multiple regression model with the same-household income measure at previous residence (or 10 years prior, if same residence), as well as an impact-control dummy variable, as independent variables. The model established that location in impact area significantly increased income, most likely because of improved access to job opportunities and urban services by motorized transport.





Overall conclusion

The Ethiopia Urban Expansion Initiative had broad impact both globally, regionally, nationally, and at the city neighborhood level. It lent legitimacy to the planning for urban expansion at scale, and it was emulated by other cities in the Sub-Saharan Africa region. From a qualitative perspective, the arterial roads built in the cities studied improved access to the urban periphery; improved both the capacity and the confidence of local

authorities to plan the expansion of their cities; increased the serviced land supply; and allowed local authorities to lead the outward expansion. From a quantitative and measurable perspective, the introduction of new arterial roads into the urban periphery of the cities studied led to improvements in socio-economic outcomes and in health-related conditions, but not in direct health outcomes related to the occurrence of diseases.



Recommendation to the Open Philanthropy Foundation

The objective results of the investigation and analysis reported here speak for themselves, confirming that technical support for urban expansion planning and on-the-ground implementation is an effective development strategy for growing cities in the Global South—with positive impacts on the socio-economic wellbeing, including overall health, for large numbers of households. Contemplated *improvements* to future urban expansion initiatives, based on lessons learned in Ethiopia—improvements that go beyond the focus on arterial roads and focus on the empowerment of rural landholders on the urban periphery to pool and

subdivide their lands into plots, streets, and public open spaces before disposing of them—can have even more powerful positive effects on households residing there, particularly with respect to their socio-economic wellbeing including their health. Given the commitment of the Open Philanthropy Foundation to measurable improvements in wellbeing in the Global South, we believe that this evaluation confirms the merit of continued and expanded support by the Foundation for experimenting with, documenting, measuring, and evaluating new and improved urban expansion initiatives in selected countries in different regions in the Global South.



Introduction





This report presents the key results of the impact evaluation of the 2013-2015 Ethiopia Urban Expansion Initiative (UEI), conducted from March 2023 to June 2024.¹ The Ethiopia Urban Expansion Initiative is a partnership program of the Ministry of Urban and Infrastructure of the Federal Democratic Republic of Ethiopia and the Marron Institute of Urban Management at New York University that introduced a new and simple approach of accommodating rapid urban growth. The NYU/Marron Institute provided technical support to local authorities of several secondary cities in Ethiopia during 2013-2014, to assist them to plan for the coming three decades expansion of the cities and better serve their growing populations. An NYU/Marron team provided training, guidance and mentoring initially to local staff of four regional capitals (Adama, Bahir Dar, Hawassa and Mekele) to develop 30-year urban expansion plans for the projected increase of the geographic area and population of their cities. As the Ministry of Urban and Infrastructure witnessed the enthusiastic engagement of the initial four local authorities, it requested that similar support should be extended to an additional 14 cities in the four regions. A total of 96 city team members were trained in the UEI process beginning in 2013. With a more limited budget, support was provided via multi-day workshops to guide development of the Urban Expansion Plans for the second group of cities, but without the same degree of practical mentoring in each city. The engagement of the NYU team focused on a four-point program undertaken and implemented by municipal officials with support from regional governments and the Ministry:

- Projecting 30-year population growth;
- Estimating and identifying the expansion area on the urban periphery needed to accommodate this growth;
- Planning an arterial road grid throughout the expansion area and securing the rights-of-way for the roads there; and
- Identifying and protecting environmentally sensitive lands from development.

Over the ensuing years the NYU/Marron team remained in contact with the Ethiopian authorities, including some of those city authorities and the responsible national Ministry of Urban and Infrastructure. By autumn 2019, shortly before Covid interrupted many plans, a possible evaluation of the results of the earlier effort was under discussion.

In 2022, the Open Philanthropy Foundation responded to this interest with generous funding to conduct an impact evaluation, roughly a decade after the original support was provided. The evaluation was expected to determine: (a) whether and to what extent the substance of the Urban Expansion Initiative (UEI) support to Ethiopian cities had been translated into action by each of the participating local authorities; and (b) what impact did the initiative have on the residents of each city and, more particularly, did it improve their socio-economic wellbeing including their health conditions?

In summary, the NYU Urban Expansion Initiative provided support during 2013-2014 to the local authorities of 18 secondary cities in Ethiopia to plan for the growth of their existing urban population and the expansion of their geographic area. The UEI Evaluation assessed the impact on the socio-economic and health conditions and outcomes of the local population nearly ten years after the measures were originally taken. The evaluation includes two major components: (a) key informant interviews to provide a qualitative assessment of the extent to which measures taken were in line with the Urban Expansion Plans developed in 2013 and 2014; and (b) household surveys to determine the differential impact of the UEI-based measures on populations directly benefiting or not benefiting from improved access due to the arterial roads. This report presents the principal results of the UEI Evaluation.

1. The evaluation team was led by Charles Downs (Sr. Independent Evaluator) and included Tsigereda Tafesse (National Study Coordinator) and Shlomo Angel (NYU/Marron UEI Principal Investigator). They were joined in close partnership by Suman Kumar of the Mumbai-based Urban Observatory (responsible for the geospatial analysis), and Getachew Tafesse and Fekeremariam Tadesse of Addis Ababa-based Amistad (responsible for the household surveys). Patrick Lamson-Hall provided useful input during the final evaluation and report writing stage. The high quality and results of this evaluation are due to their close cooperation, as well as the generous input of time and information provided by the Ministry of Urban and Infrastructure Study Advisory Board (H.E. Fenta Dejen, State Minister of Urban and Infrastructure; Bizualem Admasu, Head of the Land and Cadaster Bureau; and Genet Gebreyesus, Head of the Plan Bureau) and the 4,000 household heads surveyed.

Urban Expansion Initiative Approach and Impact

2





The rationale guiding the Ethiopia Urban Expansion Initiatives

The Ethiopia Urban Expansion Initiative is a key component of the Urban Expansion Program of the Marron Institute of Urban Management at New York University. The central insight guiding the Urban Expansion Program is that it is normal and unavoidable that when cities grow in population, they both densify and expand. In fact, Angel *et al* have shown that over the 1990-2014 period, roughly three-quarters of population growth was accommodated in the expansion areas of a global sample of cities – the areas built between 1990 and 2014 – while one-quarter was accommodated by the densification of their 1990 footprints.²

Rural-urban migration is leading to rapid increases in the populations of both primary and secondary cities, causing massive urban expansion. Between 2000 and 2020, the total urban population in less-developed countries grew by 70%, or 1.39 billion people (United Nations 2018). This growth is driven both by natural increase and rural-urban migration (Keyfitz 2010).

Rapid population growth during this period has led to a quadrupling the built-up area of cities in less-developed countries (Pesaresi et al 2016). In particular, secondary cities in Sub-Saharan Africa doubled their population and increased their extents by a factor of 2.5 during this period (Angel et al 2016). Much of this urban expansion took place in the form of informal settlements without adequate infrastructure, often extending into environmentally sensitive areas (Friesen et al 2019 and Lamson-Hall et al 2018).

Rural-urban migration is leading to rapid increases in the populations of both primary and secondary cities, causing massive urban expansion.

Cities are engines of human productivity, and, other things being equal, the larger the city, the more productive it is. In larger cities, firms have more access to suppliers, workers and customers. They are more resilient to economic shocks, and workers have more access to jobs that suit their skills and ambitions. By bringing people closer together, cities encourage learning and skill sharing. The net effect of all this learning and exchange is a tremendous increase in productivity in cities compared to rural settlements (Glaeser 2011).

To realize this potential, urban workers must be able to access all of the workplaces in their city, and workplaces must be within reach of all workers. This works best when all locations in the city are accessible to all other locations. For this to happen, infrastructure must be laid out in an orderly way, with enough land allocated to streets and roads so that public transportation can work efficiently (Gerritse and Arribas-Bel 2018). This is difficult when cities are growing informally and with little planning so that large swaths of the urban periphery remain largely inaccessible to urban job seekers as is happening now in many developing countries.

2. S. Angel, P. Lamson-Hall, A.M. Blei, S. Shingade, and S. Kumar, 2021. [“Densify and Expand: A Global Analysis of Recent Urban Growth”](#) Sustainability 13(7), 31 March.



Moving beyond this informal development pattern requires city leaders to recognize a basic reality of urban development: cities in low-income countries that are in the early stages of urbanization and industrialization often grow horizontally rather than vertically, because most residents have incomes that are too low to underwrite vertical development; domestic savings is often quite low, and neither commercial banks nor governments are able to finance the construction of tall residential buildings at a scale that corresponds to the demand for housing in the context of rapid urbanization.

Importantly, this horizontal growth is a necessary stage in the development process, but not the final one. Rapidly growing cities can double their populations in a decade or less, creating tremendous demand for living and working space. Supporting horizontal development in the medium-term makes room for more people to benefit from the urbanization process

and allows businesses to grow and expand. Over time, urbanization itself leads to higher incomes and more consolidated growth, enabling more vertical development both in and away from the urban core.

If cities – and citizens – are going to address this challenge, municipal officials must be trained and empowered to control and manage their urban peripheries. One tested and cost-effective strategy for doing so is referred to as “Making Room for Urban Expansion” (Angel et al 2012). The approach uses rudimentary actions to prepare for the next thirty years of growth, by securing the rights-of-way for a grid of arterial roads and identifying and protecting environmentally sensitive areas. These two features – arterial roads and public open spaces – are combined into an evidence-based Urban Expansion Plan – a new type of plan that dramatically simplifies the process of planning for growth, putting it within reach of cities in developing countries.

Impact of the Ethiopia Urban Expansion Initiative at Various Scales

The Ethiopia Urban Expansion Initiative, both by itself and as an integral part of the broader Urban Expansion Program at New York University, has had a number of important impacts at the global scale, the regional scale, the national scale, and the city scale. This report focuses, for the first time, on the impact of the arterial road grid on city residents living within walking distance of arterial roads. But before reporting on this impact, we outline the broader impacts of the Initiative.

On a global scale, the acceptance of urban expansion as a natural and unavoidable consequence of rapid population growth – in contrast to decrying it using

the derogatory term “sprawl” – has now become more established. According to Google Books Ngram viewer, between 2005 – the year that saw the publication of *The Dynamics of Global Urban Expansion* – and 2022, the frequency of use of the term ‘urban sprawl’ declined by 4% while the frequency of use of the term ‘urban expansion’ increased by 89%. While the latter term was used only one-third as frequently as the former term in 2005, by 2022 it was used two-thirds as frequently.

The outward expansion of cities the world over is now taken as a serious global phenomenon that requires serious attention rather than a malady described in derogatory terms.



Research on and planning for urban expansion has come into its own. [The Atlas of Urban Expansion](#), originally published by the Lincoln Institute of Land Policy in 2012 and later updated by the NYU Marron Institute in 2016 has now been cited 391 times. Lamson Hall *et al* published an article on the Ethiopia Urban Expansion Initiative in *Urban Studies* that has now been cited 51 times.³ The Journal *Building and Planning* had a special issue on urban expansion in 2022. The World Bank hosted a global conference titled *Urban Expansion and the Future of Cities* in 2024. There are now several books and hundreds of articles focused on urban expansion.

The success of the Ethiopia Urban Expansion Initiative has not gone unnoticed in other countries in Sub-Saharan Africa either. As of 2021 the Cities Alliance, which was a financing partner of the second phase of the Ethiopian Urban Expansion Initiative, adopted Urban Expansion Planning as a programmatic response to support cities along the Ethiopia, Uganda and Somalia corridor to manage migration and ensure sustainable urbanization. Building on the encouraging results of the Ethiopia Urban Expansion Initiative, several cities started preparing 30-year urban expansion plans. These cities are Arua, Gulu, Jinja, and Mbale in Uganda, Gabiley, Boroma and Wajale in Somalia and Jijiga, Dire Dawa, and Tog-Wajale in Ethiopia. The Urban Expansion Planning approach was introduced to enable these cities to manage rapid urban expansion and to improve conditions for the migrants and IDPs coming to the cities. The Cities Alliance used the same technical advisory package developed by NYU to support these cities to prepare and implement their urban expansion plans. The lessons from the Ethiopia Urban Expansion Initiative have inspired more mayors to adopt Urban Expansion Planning to manage rapid population growth of their cities.

At an urban planning workshop organized by Cities Alliance in 2022, Dr. Sanya Wilson, the mayor of Koboko, Uganda, observed: “In 2016, Koboko was 20 square kilometers. When I came back from the Urban Expansion Planning workshop in Addis Ababa, I said

‘we are going to go the Ethiopian way, we are going to plan beyond, and I want to see the Koboko Municipality area expanded by 80 percent.’ Now I have 108 square kilometers of Koboko which is planned, and we call it peri-urban planning. You will never stop urbanization. I am doing a favor to the leaders of Koboko that will come after me.” The mayor of Gabiley, Somaliland, had this to say: “Now, we not only have a long-term urban expansion plan for our city, but we also know how to do it by ourselves. And this is exactly what we need.”

In November 2023, Cities Alliance organized a high-level peer-learning event on urban expansion planning in Mekele, Ethiopia. The participants included state ministers from Ethiopia and Uganda, regional government representatives, mayors and municipal officials from Ethiopia, Uganda, and Somaliland, and academics, including Tsigereda Tafesse from NYU. Although Mekele has suffered significant human and infrastructure loss due to the civil war that took place in the past three years, its successful experience in preparing and implementing an urban expansion plan provided a strong showcase on the benefits of planning for expansion. An area in the southwest periphery of Mekele showing the development of macroblocks within its arterial road grid is shown in the image below.

“Now, we not only have a long-term urban expansion plan for our city, but we also know how to do it by ourselves. And this is exactly what we need.”

3. Lamson-Hall, P., S. Angel, D. DeGroot, R. Matin, and T. Tafesse, 2018. [A new plan for African cities: The Ethiopia Urban Expansion Initiative](#), *Urban Studies* 56(6), March.



Newly opened sections of an arterial road grid on the southwest periphery of Mekele, Ethiopia

Site visits in Mekele showed participants the benefits of preparing lands on the urban periphery at scale to facilitate orderly growth, to attract and guide investment, and to make land accessible for housing, infrastructure, industry, and other services. Making space available through urban expansion planning proved beneficial in Mekele during the civil war as well. More than one million internally displaced persons (IDPs) came to Mekele over the 2020-2022 period, fleeing rural areas in the Tigray region. The IDPs are now temporarily settled in macro blocks in expansion areas

of the city that were originally designated for industrial development. Many of the IDPs are now likely stay in the city. The Mayor of Mekele observed: “As a mayor, urban expansion planning makes a lot of sense. You need to plan beyond your boundaries because cities should expand in a specific way. I am now planning beyond.”

At the completion of the high-level peer learning event, participants drafted and adopted the *Mekele Declaration of Cities*. The declaration resolves, among other things,



To adopt an urban expansion planning approach as a long-term planning framework to guide and secure room to accommodate future population growth.



To put in place or review relevant legal and regulatory frameworks to facilitate preparation and implementation of urban expansion planning.



To mobilize the necessary financial resources at all levels for the preparation and implementation of urban expansion plans in cities.



Partner

Cities Alliance
Cities Without Slums

powered by
UNOPS

MEKELE DECLARATION of CITIES

Adopted at the First High Level Peer Learning Event held at The Planet Hotel, in Mekele City, Ethiopia from 21st. to 23rd. November, 2023

We, the delegates comprising the Ministers, Mayors, Technical Officials, and University Representatives from Ethiopia, Uganda, and Somaliland:

- i. Noting the rapid urbanisation being experienced in Africa due to high rural to urban migration, and natural population increase;
- ii. Aware of the limited land to accommodate the future population growth;
- iii. Recognizing the ever increasing effects of climate change that are having serious impacts on cities;
- iv. Considering the inadequate institutional capacities of the City Authorities to effectively manage urbanisation;
- v. Conscious of the inadequate financial resources to support infrastructure development and service delivery in cities; and
- vi. Realizing the need for proactive land use planning to guide the urbanization process in order to enhance the role of cities in achieving productive, resilient, inclusive sustainable development;

Do hereby resolve as follows:



The Mekele Declaration of Cities, adopted in November 2023.

Urban expansion planning has now become an integral part of urban management in Ethiopia. The MUI is partnering with the Cities Alliance and the Ethiopian Civil Service University to establish a knowledge hub that will provide technical assistance and knowledge resources to scale up urban expansion planning in more secondary cities. The

initiative includes the training of trainers and the certification of urban expansion planning practitioners who will be delivering technical assistance to cities. A similar initiative is taking root in Uganda through the partnership between the Ugandan Ministry of Land, Housing, and Urban Development, The Cities Alliance, and Makerere University.



Since 2014, the Ethiopia Civil Service University (ECSU) has been teaching a module on urban expansion to all municipal officials, based on recorded lectures by Dr. S. Angel, summarizing his 2012 book titled *Planet of Cities*. In May 2024, in a stakeholder dialogue on the development of the Berbera Corridor between Somalia and Ethiopia, the state Minister of Urban and Infrastructure, H.E. Fenta Dejen, spoke about using urban expansion planning as a key preparatory step for cities along the corridor.⁴

A 2017 evaluation report of the Ethiopia Urban Expansion Initiative⁵ listed several of its accomplishments: Urban expansion teams had been created in every participating city. These teams were tasked with developing and implementing the strategies of the initiative and incorporating the existing structural plans into a 30-year planning framework. City boundaries had been expanded to accommodate future growth through 2040. Grids of arterial roads and networks of public open spaces had been designed for these expansion areas. As of 2017, a total of 570 linear kilometers of arterial roads had been constructed or secured in the expansion areas of Hawassa, Bahir Dar, Mekele and Adama. As of 2017, a total of USD\$77 million worth of leases had been sold in the expansion areas of these four cities, opening up a major new revenue stream for municipal governments. City officials in these cities reported a **reduction in informality**, as new urban residents were able to lease plots in the expansion areas. Existing informal settlements in expansion areas were being regularized to accommodate the arterial road network as well, notably in Hawassa, where 7,000 informal urban residents had been resettled and given formal leases in the expansion area.

The Ethiopia Urban Expansion Initiative also had a high return on investment. An initial commitment of

US\$500,000 from New York University, and a second investment made by the Cities Alliance of US\$200,000 enabled four Ethiopian cities to leverage further government funds from municipal revenue, regional government and national government sources to construct over 500km of arterial roads. Cities like Bahir Dar were able to align their urban expansion plans with their annual capital investment plans to leverage investment from the Urban Institutional & Infrastructure Development Program (UIIDP).⁶ Arterial-road construction and land acquisition for the grid has required the cities to invest a combined total of about US\$35,000,000, spread over five years. This money came from the local ULGDP II allocations. This total cost amounted to roughly 50% of the infrastructure construction budget in each city over the five-year period – a considerable investment, but within their fiscal and administrative capacity.

At the neighborhood scale, the core hypothesis to be addressed in this evaluation report is that improved access via new arterial roads in the expansion areas of participating cities resulted in improved socio-economic wellbeing including health for city residents and established a more productive and equitable foundation for urban growth and social wellbeing of affected city residents, ultimately enhancing their overall quality of life. For this evaluation, we identified “residents benefiting from new arterial roads” as “households in urban expansion areas within a 15-minute walk (roughly 500 meters) to new arterial roads”. In contrast, we defined “residents not directly benefitting from new arterial roads” as “households in urban expansion areas at least a further 300 meters from the new arterial roads.”

The Ethiopia Urban Expansion Initiative promoted an approach to urban planning that would provide for more orderly growth of secondary cities, at a lower

4. Cities Alliance, 2024. [Leveraging Migration for Economic Growth](#).

5. Federal Democratic Republic of Ethiopia (FDRE), 2017. Urban Expansion Development Plan Program: Implementation assessment report in case of Bahr Dar, Mekele, Hawassa and Adama cities, Unpublished Report, Ministry of Urban Development and Construction (MUDC).

6. UIIDP is a financing mechanism implemented by the World Bank and MUI to improve the institutional capacity for sustainable urban management and to increase access to climate-smart urban infrastructure and services in Program ULGs, and refugee-hosting ULGs. World Bank, 2024, Program Information Document (PID), second Urban Institutional & Infrastructure Development Program.



cost to the local administration, with improvement in access to municipal services and quality of life for city residents. Specifically, it advocated:



Projecting 30-year population growth,



Estimating and identifying the expansion area on the urban periphery needed to accommodate this growth,



Planning an arterial road grid throughout the expansion area and securing the rights-of-way for the roads there, and



Identifying and protecting environmentally sensitive lands from development.

These measures were expected to provide the following benefits:

1

Lower the financial and political cost to acquire land for road rights-of-way.

2

Keep informal settlements out of the planned rights-of-way.

3

Improve local economic development by drawing on larger labor force of a more accessible city.

4

Improve economic conditions of residents with greater access to jobs, markets and services.

5

Improve health and education conditions of residents with greater access to public facilities and services.

6

Greater availability of green/environmental resources within the city.

7

Increased supply of usable and affordable land for housing and business to address the needs of a growing population.



They also pointed out, as mentioned earlier, that more than two-thirds of urban population growth in recent decades is accommodated in the expansion areas of cities.

Objections have been raised that planning for orderly urban expansion would open large areas for settlement, potentially increasing urban sprawl and damaging the countryside. In its stead, it has been proposed that urban expansion be contained and that all, or most, urban growth be accommodated by the densification of the existing footprints of cities. In response, advocates of orderly urban expansion have pointed out that urban containment has largely failed in cities that are growing rapidly in population and have weak enforcement mechanisms, a description that closely fits many cities in the Global South, and, most particularly, cities in Sub-Saharan Africa. They also pointed out, as mentioned earlier, that more than two-thirds of urban population growth in recent decades is accommodated in the expansion areas of cities. The challenge then is not to contain urban expansion, but to make it 'green' by allowing it to occur at high densities, by using the arterial road grid to guide development away from no-build zones, by planning arterial roads with drainage and flood protection in mind, by allowing for mixed land uses, and by ensuring that a hierarchy of public open spaces is kept free of development.

This evaluation assessed the expected benefits from the implementation of the Ethiopia Urban Expansion Initiative through: (a) a qualitative review of the UEI experience through interviews with urban managers and government officials; (b) a household survey to compare residents' socio-economic wellbeing including health in areas impacted by the initiative with control areas.

Qualitative Review of UEI Implementation





Qualitative assessment of the implementation of the city-level Urban Expansion Initiative was conducted through a combination of a desk review of the 2013-2014 Urban Expansion Plans, a review of satellite images of urban development in each of the cities, visits to four of the eight cities planned for the household survey, and interviews with past UEI team members from five cities. The team met in their respective cities with the Urban Expansion team members from Adama, Bahir Dar, Bishoftu, and Hawassa

to discuss their experiences in planning and implementing the UEI. It also met with the UEI team from Mekele in Addis Ababa. The evaluation team met with a total of 16 original Urban Expansion team members from the five cities, as well as six people with related roles in current municipal departments (see Attachment 1). Questionnaires were sent to a total of 22 past UEI city team members from 8 cities (see Attachment 2), which included all past UEI city team members for whom current email addresses could be found.



Incorporation of UEI approach into national policy and training.

The team met with the Ministry of Urban and Infrastructure senior heads of the departments of Land Use and Cadaster, and Urban Planning and Urbanization, as well as two senior faculty members of the Ethiopia Civil Service University (one now at the Regional Development Studies Department of Addis Ababa University) to discuss the integration of the UEI approach into national policy and training. The ECSU staff confirmed that the course on “Urbanization and Urban Development Management”, built on S. Angel’s 2012 book *Planet of Cities*, is a core semester-length course for all students in all six specializations offered by ECSU. They indicated that the need to plan for inevitable urban expansion is a

cornerstone of national policy and relevant post-graduate training for public managers of local public administration; there is also attention paid to the development of existing city areas. While these two approaches are sometimes juxtaposed, the Ministry and the ECSU consider them to be two aspects of broader policy. They observed that local and regional politicians generally prefer to focus on densification and avoid potential political and social tensions that develop with urban expansion. All respondents mentioned current efforts, supported by UN-Habitat, to develop regional spatial plans for all regions, which are expected to provide a bridge between national economic planning and local city planning efforts.



Main observations from UEI city team focus group discussions.

Discussion with the five UEI teams was rich and informative. The experience of each city was unique yet with common

factors as summarized below (see Attachment 3 for the five UEI city team experience summaries).



Urban Expansion Plan (UEP) preparation

The members of the UEP teams were unanimous in their enthusiasm for the UEI approach and said that the experience was very rewarding and a high-point in their careers. The process of taking a longer-term perspective on the likely geographic and population

growth of their cities, considering alternative directions, the usefulness of planning arterial roads, arterial grids and macroblocks, reducing costs through obtaining rights-of-way in advance were all considered to have been important and to have continued relevance.



UEP Implementation

The UEPs were formally approved at city and regional levels for three of the five cities where qualitative reviews were conducted (Bahir Dar, Hawassa and Mekele) but not approved for two (Adama and Bishoftu, both in Oromia Region, where the regional government has responsibility for urban planning approvals). Implementation varied. Both Bahir Dar and Mekele extended arterial road grids for expansion zone housing areas. Bahir Dar, Hawassa and Mekele extended individual arterial roads in expansion areas as well as roads to connect to satellite communities. Hawassa, Adama and Bishoftu focused their attention primarily on improvement of existing roads and property status (“regularization”) within the pre-existing city, while Hawassa also extended shorter arterial roads and

regularization in one major expansion area. Adama completed most of the arterial ring road surrounding the pre-existing city and connecting peripheral expansion, while Bishoftu improved roads in the existing city and extended one of them as an expansion area arterial road connection. None of the cities obtained arterial road rights-of-way significantly beyond immediate projects, due in part to resource constraints to pay compensation and uncertainty about keeping private construction off the rights-of-way that were not immediately used for roadways. All UEPs included expansion of the urban administrative boundaries to better plan for and respond to expansion; new boundaries were approved as part of UEP approval in three cities and adjusted later via Structure Plans for the other two cities.





UEP Achievements

Most geographic expansion has been within the expansion areas designated as Phase 1 areas of the respective UEP, although some housing has been built on hillside lands that were to be protected. Significant expansion of arterial roads occurred in five cities; in three cities that extension was clearly due to the UEP, while in the other two cities it was aligned with the UEP. Based on figures compiled from meetings during the site visits, close to 80,000 households organized in housing cooperatives received plots in expansion areas over the past 10 years, primarily in Bahir Dar and Mekele, benefiting several hundreds of thousands of residents with the mix of urban services provided

for in the macroblock and Local Development Plan (LDP) guidelines. In the other cities, improved mobility for residents of the pre-existing neighborhoods and regularization of land titles benefited nearly 20,000 households in Hawassa alone. The UEPs have had a significant impact on the culture of planning, as seen clearly in 10-year Structure Plans which have adopted a wider geographic focus, include the UEP expansion areas, and built on its longer-term analysis. In all five cities, the UEP served as the basis for the Structure Plan that followed, and in this way the UEP continues to guide urban planning and land use development, including road planning and construction.



UEP Challenges

UEPs do not have a legal framework, and this lack of legal framework was considered a major limitation. Rather they are considered as practical technical actions at the city level. UEPs do not have a clear institutional home, such as a ministerial department responsible to guide and monitor implementation. Some teams reported that the potential benefit of the UEP was undermined by lack of political priority for urban planning, noting that land management was being used as a tool for day-to-day politics, and that new housing areas in participating cities often did not meet the macroblock/LDP guidelines for green space, commercial areas, and public services. The absence of urban planning departments in the Adama and Bishoftu municipal administrations was a technical challenge and reflected the Oromia Regional

Government's mandate that all urban planning be done at the regional level. Cities have not made much effort to increase revenues through acquiring, developing, and leasing land and other measures. Reportedly, migration and ad-hoc informal settlement on the urban periphery continue unabated in most of the cities, largely created by farmers subdividing and selling their lands to speculators or incoming migrants. All teams reported that urban expansion (not specifically the UEI) resulted in displacement of farm families and that these families had difficulties finding sustainable urban livelihoods. UEP-caused displacement provided rights to compensation and relocation to adjacent lands, rights that were not available from private speculators. While compensation and support for displaced farmers have improved, they were felt to still be insufficient.



Recommendations from UEI Qualitative Evaluation Phase



Recommendations from participants in the qualitative review regarding the overall Urban Expansion Initiative were as follows:



Include Urban Expansion Plans (UEPs) in the legal framework of urban planning.



Develop 30-year Urban Expansion Plans, to be revised each 20 to 25 years.



Incorporate UEP analysis in each 10-year Structure Plan.



Obtain rights-of-way for as many years of arterial roads as feasible.



Mark future arterial route extensions to guide roads, water, electricity, etc.



Protect environmentally fragile land.



Recommendations regarding other issues

The Urban Expansion Plan provided a 30-year perspective on development, informing the 10-year Structure Plans. To ensure continued relevance, it is recommended to conduct a new UEP exercise after 20 to 25 years, to update 30-year perspective and guide the next two 10-year Structure Plans. UEPs should be incorporated into the legal framework of city and regional planning, perhaps by requiring that they be formally considered in the preparation of Structure Plans. There is a need for a central office and support to UEP, which could raise awareness among new city political leaders and technical staff about the approach. While the usefulness of advanced acquisition of arterial road rights-of-way is clear to planners, the requirement to obtain *all* rights-of-way decades in advance is unrealistic and excessive. Greater attention should be given to the loss of livelihood and displacement effects of urban expansion and integration of affected farmers into sustainable urban livelihoods. The Urban Expansion approach has been criticized for ignoring the need for redevelopment of pre-existing city areas. The Urban Expansion approach is, in part, a response to the fact that urban policy has often focused primarily on pre-existing urban areas. General discussions of urban expansion planning need to recognize that the existing city must of course be managed, densified, and improved for benefit of current residents, including the absorption of as much as one-third of future city population growth.

The Urban Expansion approach is, in part, a response to the fact that urban policy has often focused primarily on pre-existing urban areas.

UEI Impact Household Survey Research Design

4

7



Theory of Change

Urban areas will continue to grow in population and geographic extent. As they do so, investments in arterial roads to provide better access for expansion areas, normally accompanied by investments in water, sanitation and

electricity networks, will provide socio-economic and health benefits for residents of such areas with improved access, when compared to residents of other parts of the expansion area that do not benefit from arterial road development.

Evaluation Question and Research Hypothesis

“Households in urban expansion areas in proximity to new arterial roads experienced improvements in living conditions that were greater than those experienced by households in urban expansion areas further away from new arterial roads.”

Have the UEI measures taken by local authorities in Ethiopian secondary cities benefited local residents, particularly in terms of their socio-economic wellbeing including their health? More specifically, and according to the residents themselves, are the economic and health conditions of households in expansion neighborhoods with improved access due to new arterial roads better than the conditions of households in expansion neighborhoods not directly benefiting from new arterial roads?

The research hypothesis is that “households in urban expansion areas in proximity to new arterial roads experienced improvements in living conditions that were greater than those experienced by households in urban expansion areas further away from new arterial roads.” The null hypothesis is that there is no significant difference in wellbeing between residents of “impact” and “control” areas.

This hypothesis and its sub-hypotheses listed below have been tested with data collected through the household (HH) survey in the expansion zones of eight cities that implemented the Urban Expansion Initiative with new arterial roads that improved access to the city and its services. (See Attachment



4: UEI Evaluation Household Survey Questionnaire.) Hypothesis testing was largely based on the comparison of the situation of randomly selected households located within 15 minutes walking distance (500 meters) of new arterial roads (the impact area)

and randomly selected households located further (800 meters or more) from new arterial roads (the control area). For some variables, a more refined analysis considered household own perception about whether they were located near arterial roads.

1

Sub-hypothesis 1: Houses built near new arterial roads had improved health-related housing conditions, particularly regarding connection to urban water, sanitation and electricity networks, which were typically expanded in conjunction with new arterial roads [greater frequency of flush toilets, piped drinking water, solid floors and metered electricity connection for HH in arterial road impact areas].

2

Sub-hypothesis 2: Greater access to jobs and economic activities of the city resulted in higher income [HH income higher in arterial road impact areas and HH could travel longer distances to work within a given time].

3

Sub-hypothesis 3: Greater access to consumer markets resulted in lower travel time to purchase food [HH time to market for groceries, vegetables and meat].

4

Sub-hypothesis 4: Poverty fell in areas benefiting from arterial roads [HH PPI between areas and over time].

5

Sub-hypothesis 5: Food security was better in areas benefitting from arterial roads [compare HH Food Security Index].

6

Sub-hypothesis 6: Improved access to the city resulted in lower time to access urban services including health facilities [HH travel time to jobs, city center and clinics lower with arterial roads].

7

Sub-hypothesis 7: Arterial-road infrastructure development improved community health outcomes [HH measures of public health outcomes, as well as the occurrence of selected diseases].

8

Sub-hypothesis 8: Presence of arterial roads brought improved personal safety [HH crime safety perception].



Geospatial Analysis in preparation for the household survey

Comparing randomly selected households in the impact and control areas of cities required a robust and well-thought-out geospatial analysis that involved several steps, each step generating a map (or maps) for each of the 18 participating cities. While the household survey was eventually

carried out in 8 cities, the final decision on which cities to survey depended in part on the geospatial analysis and in part on the security situation prevailing in each city at the time of the survey. The geospatial analysis was thus undertaken to some degree in all 18 cities. It involved nine steps:

1

Mapping Urban expansion 1990-2022.

2

Identifying the expansion area built during the 2013-2022 period.

3

Georeferencing and digitizing the approved urban expansion and arterial road maps prepared by municipal officials.

4

Creating a spatial inventory of all the existing road rights-of-way that were 10 meters wide or more in the entire 2013-2022 expansion area and up to 1 kilometer beyond. These roads have the following information attached:

**Road width categories:**

10-15, 15-25 and 25+ meters.

**Road building history:**

Roads existing before 2013 and new roads that were built or widened between 2013 and 2022.



- 5 The condition of the road surface in four categories: (1) opened; (2) laterite; (3) partially paved (only some of the width of the right-of-way is paved and the rest is open); and (4) fully paved (width of 10 meters or more is paved).

- 6 Mapping the new arterial roads in the 2013-2022 expansion area.

- 7 Mapping land use (formal and informal residential, non-residential) in the 2013-2022 expansion area.

- 8 Identifying impact and control residential areas in the expansion area.

- 9 Generating a sequence of quasi-random Halton Points in the impact and control areas, to identify household to be interviewed.⁷

With the support of a Geospatial Consultant (Mumbai-based “Urban Observatory”), satellite imagery for each city from about 2013 and 2022 was assessed to identify: (a) limit of the built urban area in each period, with the “urban expansion area” defined as the area built between the two periods; (b) new arterial roads (minimum 15 meters width roadway) providing connectivity from the expansion area to the pre-existing core urban area; (c) “impact” residential areas developed between 2013 and 2022 within 500 meters of the new arterial roads, and “control” residential areas at least 500 meters from new arterial roads and at least 300 meters beyond the “impact”

areas; and (d) a quasi-random set of Halton Point coordinates within each “impact” and “control” area to serve as enumerator starting points for the selection of 250 households to be interviewed in each area.

The Urban Observatory created a rigorous procedure for selecting households in a semi-random sequence for interview, both in impact areas and control areas. The procedure was based, in large part, on the use of satellite imagery and, to a lesser extent, on the urban expansion plans created by municipal officials in the 2013-2014 period. [See Attachment 5: Geospatial Analysis Methodology].

7. A Halton sequence is a statistical procedure that generates a set of points in space that is deterministic—i.e. it generates the same set of points each time from the same starting point—but, for most purposes appears to be random. The points are more uniformly distributed than a random distribution. [Halton, J. (1964), Algorithm 247: Radical-inverse quasi-random point sequence, Communications of the ACM, 7(12):701.



Operationalizing the Household Survey



Definitions

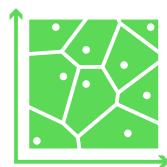
The key definitions used to operationalize the hypothesis for the evaluation were:



The “Urban expansion area” is the geographic growth area of the city residential area in 2022 that is outside the geographic boundaries of the residential area of the city in 2013. The inner and outer boundaries of the urban expansion area were determined via analysis of satellite imagery available for each city for approximately those years.



“Arterial roads” were identified from the satellite imagery as roads with minimum width of 15 meters in 2022 that did not exist as such in 2013.



“Impacted areas” are new residential areas in the urban expansion area benefiting from the new arterial roads, defined as located within 500-meter distance of the arterial road.



“Control areas” are those urban expansion residential areas which are at least 500 meters from an arterial road and an additional 300 meters beyond impact areas.



Household Survey Data

The household survey covered multiple variables to describe the demographics and assess the wellbeing of households, including both current and past situations. These included:



Demographic characteristics of households and household heads



Poverty Probability Index (PPI)
Question set (Grameen Foundation and IPA)



Economic wellbeing
(including food security, income and assets)



Health-related housing conditions
(toilets, drinking water, flooring and lighting)



Access to urban facilities and services
(duration and mode of travel)



Health outcomes
(malaria, dysentery, worms, vision, traffic, pregnancy)



Other
(overall economic wellbeing, crime safety)



Program intervention and variables

The focus of attention is the development of arterial roads in the expansion area, reflecting Urban Expansion Plans prepared in 2013-2014 (depending on the city).



Independent variable:

Household is (is not) in arterial road impact area.



Dependent variables:

Change over time for household income, Poverty Probability Index, health-related housing conditions (toilet, water source, flooring, lighting) and health-related—and non-health related—household assets, health outcomes, travel modes and trip duration (job, health services, grocery shopping, education), food security past seven days).



Cities Included in Household Survey

The initial plan was to conduct the survey in all eighteen cities that were engaged in the Ethiopia Urban Expansion Initiative, but it soon became clear that this was not possible because (1) several cities did not build any new arterial roads; (2) the impact and control areas of arterial road segments did not include enough households to merit a survey; and (3) security conditions in these cities did not permit household surveys. The number of cities was eventually reduced to eight in total, including three of the four regional capitals in the initial NYU/Marron support and five additional cities from

the fourteen included in the expanded support. It was initially assumed that it would not be possible to include Mekele or other cities from the Tigray region due to the 2020-2022 civil war. Based on preliminary assessment of new 25-meter-wide road satellite images, an initial selection of cities was made. Further satellite imagery analysis with a lowered road width threshold to 15 meters, delay and adjustment due to current armed political conflicts in the Amhara Region, and the realization that it would be possible to conduct the household survey in Mekele, resulted in the final list of cities surveyed.



Table 2

Urban Expansion Planning Implementation – 2013-2015

High Level (arterial road grids with significant housing development)	Bahir Dar*, Mekele*
Medium Level (multiple arterial roads, housing regularization, including in prior growth area)	Adama*, Dilla, Hawassa*
Low Level (limited extent of arterial roads)	Bishoftu, Dessie, Gondar, Hosanna, Shashemene, Wolayta Sodo
Limited or None	Adigrat, Arba Minch, Axum, Debre Birhan, Jimma, Nekemte, Shire

Notes: Eight cities included in the household survey in bold.

The four regional capitals provided with more intensive support in first phase (*)

Gondar, Nekemte, Adigrat, Axum and Shire were not surveyed due to security concerns.

This main evaluation report is based on 4,000 household interviews conducted in eight cities, with 500 interviews in each city. This sample size provided a 99% level of confidence with a margin of error of 2% for the eight cities combined; for each individual city, the sample provided a 95% level of confidence with a margin of error of 5%.

The evaluation identified significant statistical results at the national level, as reported below. At the same time, the evaluation team recognized the importance of the specific conditions of each city, to be considered further in individual city reports. Those differences included (a) the extent of implementation of the UEI measures (Bahir Dar

and Mekele having the highest level of implementation, Hawassa focusing heavily on regularizing existing areas, and regional authorities of Oromia not approving the UEI Plans of Adama, Bishoftu, or Shashemene, due in part to land disputes between Oromia and Addis Ababa), (b) the establishment of new regions and transformation of prior secondary cities into regional capitals (Dilla and Hossana); (c) varied economic circumstances, (d) varied political tensions; (e) armed conflict in cities of the Amhara region (Bahir Dar, Gondar and Dessie were inaccessible at some points); and (f) a period of civil war (Mekele and other cities in Tigray); and (g) being sender or recipient of displaced populations resulting from conflicts.



Survey process and logistics

A qualified Ethiopian firm (Addis Ababa-based “Amistad Civil Engineering PLC”) was selected as survey partner via a competitive tender process. Locally recruited survey teams were organized for each city, managed by locally based coordinators. Teams included both male and female enumerators with necessary local language skills. Household surveys were conducted in five languages (Amharic, Oromigna, Sidamigna, Tigringna and Wolayta), with two relevant languages used in each city. Surveys required about two weeks for each city, plus two weeks for data entry and cleaning. The firm applied extensive quality assurance measures, with progress reported and discussed weekly with the NYU team, resulting in continuing refinement to the questionnaire and review procedures to ensure high quality data and results. [See Attachment 6: Household Survey Methodology].

Test for significance of differences

The core analysis conducted compared relevant variables for households in impact areas with households in control areas; other variables were also tested. Most of the household survey data analyzed is in the form of categorical variables, for which the appropriate statistical analysis used is the Pearson Chi-square test which





calculates the likelihood that the difference measured would be encountered by chance if the two samples were drawn from the same normal set. Some of the variables are metric, for which regression analysis was conducted. Relevant significance test scores are provided for both types of data. A common threshold for rejection of the null hypothesis (that variation is simply the result of sampling) would be a p-value lower than 0.05, which would imply that 5% of the time the difference observed would appear randomly. In this report the significance of results is reported at four levels: 0.05, 0.01, 0.001, and “no significant difference.” Most differences found by the survey are at the most stringent $p=0.001$ level.

“Some of the variables are metric, for which regression analysis was conducted.”

Limitations

Key Informant Interviews and survey analysis highlighted the extent to which conditions for residents of each city: (a) depended to some degree on aspects of the national context according to which major national political and

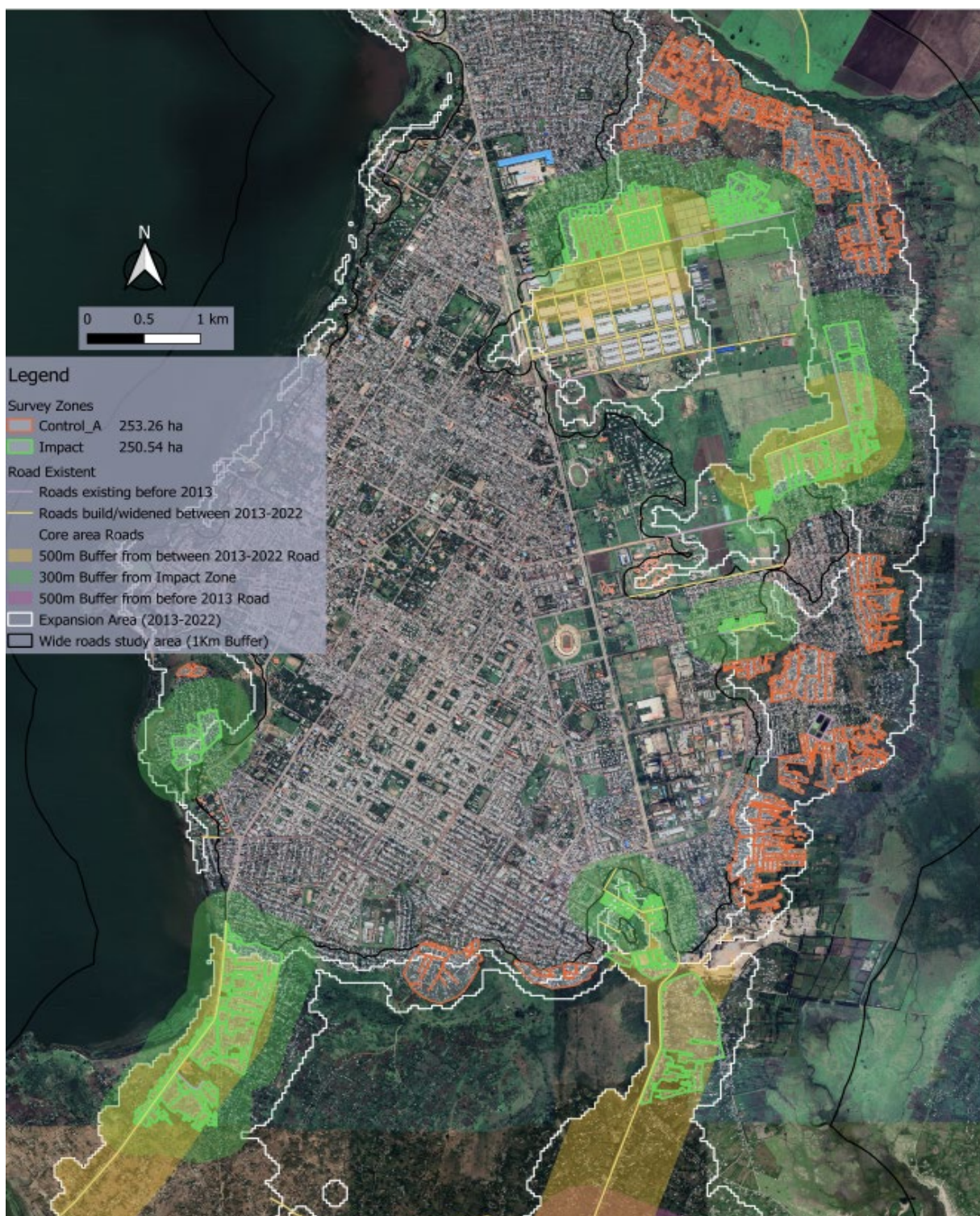
economic events affected cities differently, and (b) varied among cities according to how Urban Expansion Planning was implemented in each city. This has been taken into consideration in the data collection and analysis.



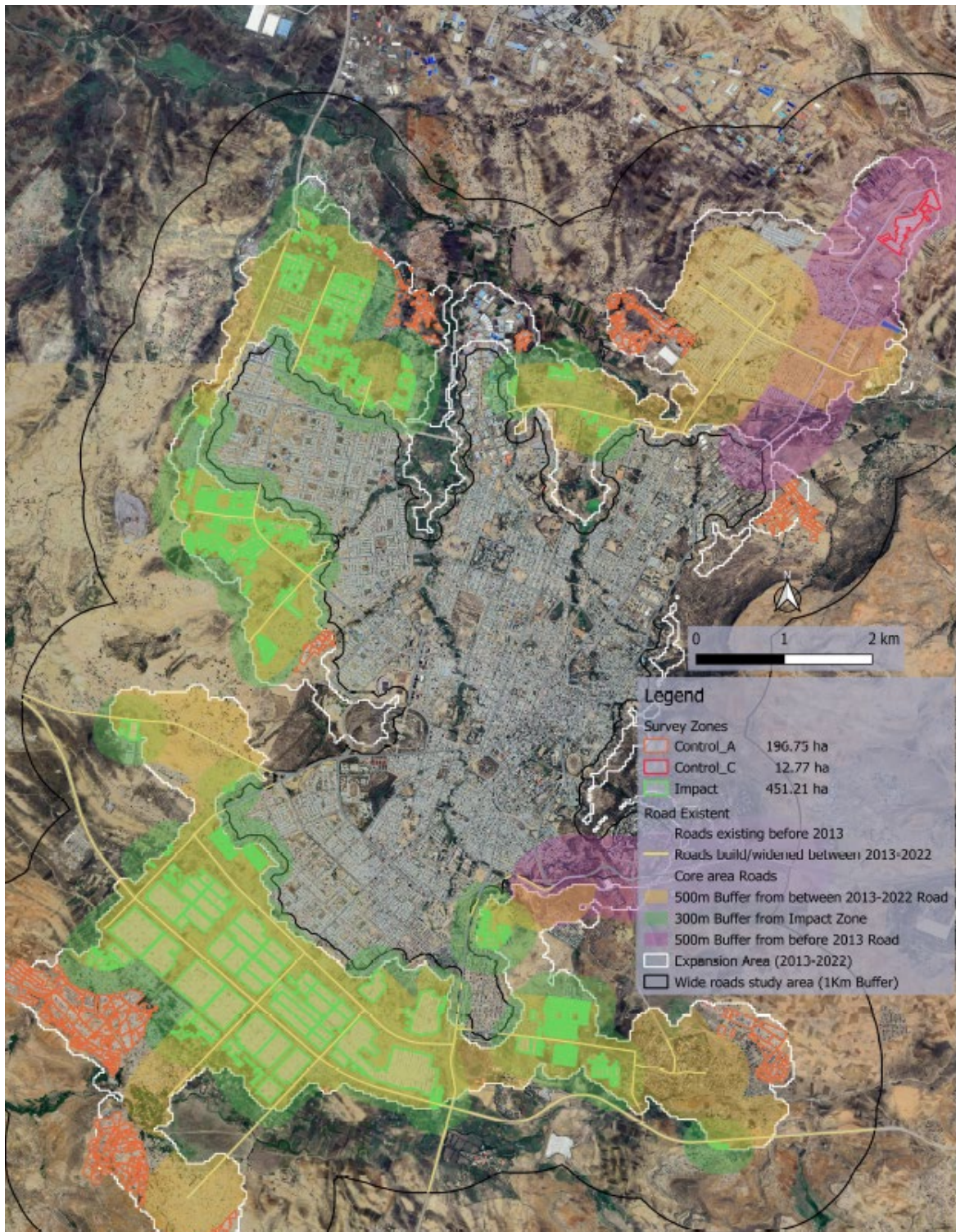
Other limiting factors

Arterial roads were developed at different times and thus some had more time to take effect; some neighborhoods were part of comprehensive formal urban developments; satellite image classifications may not match the on-the-ground experience of residents

as to their proximity to arterial roads, particularly further out; and certain survey responses are of doubtful reliability, due to issues of both memory and respondents' incentives to distort their answers (e.g., current income; past income; home ownership).



The identification of impact and control areas in the expansion area of Hawassa, Ethiopia



The identification of impact and control areas in the expansion area of Mekele, Ethiopia

Analysis of UEI Household Survey Results

5

7



Overall Summary of Results

The analysis highlighted those (a) key dependent variables that differ significantly between households in impact and control areas, and (b) dependent variables that are largely the same for households in

the two types of area. The survey analysis assessed several factors listed below and confirmed the significance of results, with the preponderance of detailed results reflected in the table below:



Similarity and difference between impact and control households (and cities)



Impact on poverty:
Poverty Probability, household income, food security



Housing conditions
and household assets



Access to city services:
duration and mode of travel



Health conditions
(public health, other health)



Overall economic and
crime safety wellbeing



Table 3

Statistical Significance of Wellbeing Differences between Impact and Control Areas				
Impact areas had better conditions than Control Areas in the following	Significance of Differences			No Difference
	0.001	0.01	0.05	
Higher level of education	✓			
Income and income growth	✓			
Poverty Likelihood (10 years ago and today)	✓			
Poverty Likelihood (change over time)				✓
Food Security				✓
Housing Conditions	✓			
Household Assets	✓			
Travel Duration to Urban Services	✓			
Travel Mode	✓			
Health Conditions – public health				✓
Health Conditions – general health				✓
Overall Economic Wellbeing – Today vs. 10 Years ago			✓	
Overall Crime Safety – Current vs. Previous Location			✓	

All else was not equal. The location of the households interviewed in a particular city proved to be an important factor in determining whether or not the improved access provided by the UEI had the expected results. UEI implementation varied among cities and there appeared to be some self-selection of residents with higher levels of education and income in impact areas. Broad economic and political factors had

strong influence on poverty, income and economic wellbeing, both countrywide and with varying degrees among cities as well. In most cases, the difference among cities was significant at the 0.001 level even when the difference between impact and control areas was less significant. Survey responses from each of the eight cities were analyzed separately with results provided to the respective local stakeholders.

Household characteristics



Gender of respondent

There were slightly more female than male respondents among households in both control and impact areas, but the difference was not significant ($p=0.119$).



Table 3

Gender of Respondent (%)			
Gender	Control	Impact	N=
Female	53.8	56.3	2201
Male	46.2	43.8	1799
N=	2000	2000	4000

Chi-square test for significance of difference: $p=.119$





Education

Household heads in impact areas tended to have completed higher levels of education than those in control areas ($p < .001$).



Table 4

Highest level of education of household head (%)		
	Control	Impact
Informal	2.5	1.3
Illiterate / Never attended	17.7	11.9
Primary – 1 st to 4 th grades	9.3	7.2
Primary – 5 th to 8 th grades	26.2	22.2
Secondary – attended	19.3	15.4
Secondary – completed	10.9	13.3
University/professional educ	14.2	28.7
N=	1950	1940

Chi-square test for significance of difference: $p < .001$

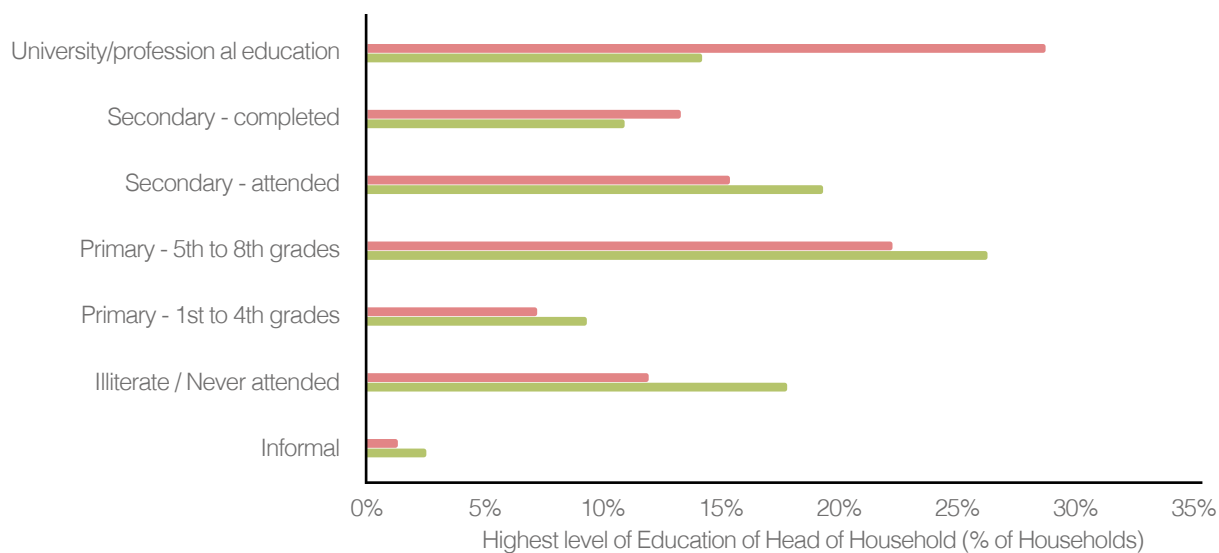


Figure 1: Highest Level of Education of Head of Household (from Table 6).



Household size

Households were larger in impact areas ($p=.003$), with small but insignificant differences in age distribution that might suggest that the control area households were slightly younger.



Table 5

Household size (%)			
Members	Control	Impact	N=
1-4	43.9	38.6	1642
5-6	35.8	39.2	1491
7 or more	20.3	22.2	847
N=	1994	1986	3980
Chi-square test for significance of difference: $p=.003$			



Property owned or rented

Home ownership has increased significantly in both control and impact areas, with a significantly larger increase among households in control areas.



Table 6

Did you own or rent the house? (%)				
	10 Years Ago		Today	
	Control	Impact	Control	Impact
Own	65.8	57.1	79.6	75.2
Rent	34.2	42.9	20.4	24.8
N=	1793	1750	1951	1962
Chi-square test for significance of difference: $p<.001$				



Household arrival date to neighborhood area

Households living in impact areas reported having arrived somewhat more recently than those in control areas ($p < .001$). It should be noted that the number reporting that they arrived more than 10 years ago is suspiciously high, given that the area was largely outside the built city 12 years ago. Falsely

reporting on residence in the area before 2014 would support a legal claim for right to ownership.



Table 7

When did you move to this neighborhood? (%)		
Years	Control	Impact
0-2	18.4	27.1
3-5	23.7	28.8
6-10	17.6	20.0
Over 10 (always)	40.3	24.1
N=	1870	1866

Chi-square test for significance of difference: $p < .001$





Reasons for moving to current neighborhood

The three most frequent primary reasons for moving to the neighborhood were the opportunity to buy land from an individual, followed by proximity to employment and marriage (over 50% of all respondents in impact areas and 60% in control areas). Primary reasons for the choice

to move to their current neighborhood varied significantly between households in impact and control areas ($p < .001$).



Table 8

What was your primary reason to move to this neighborhood? (%)		
Reason	Control	Impact
Opportunity to buy land/house from individuals	26.2	21.9
Close to employment	14.9	19.3
Married	21.7	11.2
Close to family members	7.9	8.4
Displaced from previous location	4.3	6.3
Opportunity to get land from the city through a lease system	5.2	10.7
Good road access	1.7	2.3
Others	18.3	19.9
N=	1764	1789
Chi-square test for significance of difference: $p < .001$		



Summary

There were some significant demographic and social differences between residents of impact and control areas. Impact area households were somewhat larger, possibly longer established, and more recently arrived. However, these differences were not likely to affect the overall impact of the UEI measures.





Impact on economic wellbeing



Employment

There was no significant difference in the likelihood that the respondent had a regular place of work between those households living in impact vs. control areas. This reflected the gender of the respondent who was home at the time of the interview who was not necessarily the main working head of household. Nearly two-thirds (64.3%) of female respondents

indicated that they did not have a regular place of work, while over half (52.7%) of male respondents indicated that they did have a regular place of work.



Table 9

Do you have a regular place of work? (%)			
	Yes	No	N=
Impact Areas	44.4	55.6	1908
Control Areas	42.4	57.6	1910

Chi-square test for significance of difference: $p=.213$

Interestingly, the difference among respondents was significant when compared between area residents who self-identified themselves as living near arterial roads and residents who self-identified as living away from arterial roads.



Table 10

Do you have a regular place of work? (%)			
	Yes	No	N=
Near arterial roads	48.1	51.5	1946
Away from arterial roads	38.5	61.5	1872

Chi-square test for significance of difference: $p<.001$

Considering the situation in each city, Adama (55%) had the highest share of respondents with a regular place of work while Hossana (32%) had the lowest.



Table 11

6. In what city is the house located? (%)									
		Adama	Bahir Dar	Dessie	Dilla	Hawassa	Hossana	Mekele	Shashemene
Do you have a regular place of work?	No	45.4	54.9	64.0	55.6	61.9	68.3	50.1	52.3
	Yes	54.6	45.1	36.0	44.4	38.1	31.7	49.9	47.7
	N=	456	475	453	489	491	483	495	476

Chi-square significance of difference: $p < .001$





Household Income

The survey included questions on household income, both ten years ago and today. There are many reasons to doubt the reliability of such self-reporting, especially when much income is not salary based and inflation over the ten years has been roughly 100%. Reasons include weakness of memory, avoidance of taxation, and avoidance of disclosure to household members who are present at the interview. Nonetheless, the results for this variable are consistent with the rest of the survey. Specifically, reported income overall is low and does not show much change in real terms for

most households over the ten-year period. Household income was already significantly higher in impact than control areas ten year ago and it increased significantly in nominal terms for households in both impact and control areas. However, 100% inflation over the past ten years reduced the real impact of the nominal change.



Table 12

Reported Household Income, 10 years ago and today (%)						
	Control		Impact		Total	
ETB	10 Yrs Ago	Current	10 Yrs Ago	Current	10 Yrs Ago	Current
0 – 2,000	38.4	30.6	36.4	23.2	37.4	26.8
2,001 – 4,000	40.3	27.4	34.4	23.8	37.3	25.6
4,001 – 6,000	11.9	19.3	14.8	18.5	13.4	18.9
6,001 – 8,000	4.2	9.6	5.6	9.4	4.9	9.5
8,001 – 10,000	2.9	6.4	4.5	11.6	3.7	9.0
10,001 and above	2.3	9.6	4.2	15.5	3.4	10.2
N=	1147	1590	1174	1633	2321	3223

Chi-square significance of difference: $p=.001$ (10 Yrs Ago) and $p<.001$ (Current)

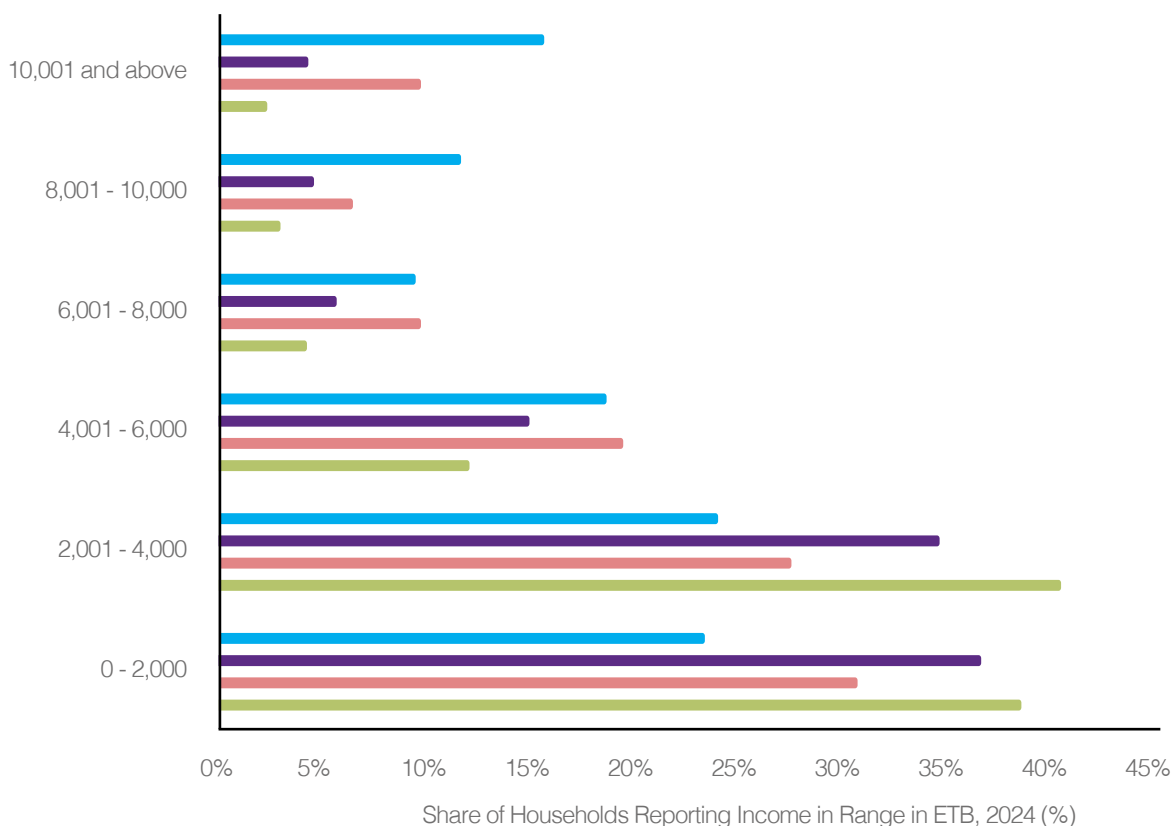


Figure 2: Household-Reported Incomes (from Table 14)

Current household incomes are higher in the impact areas of all cities. Linear regression analysis of the characteristics of households in impact versus control areas can make it possible to isolate the discrete effect of the impact area in income. Many of the variables have been provided in the survey as ranges, but continuous values were estimated from those levels and used to calculate a regression.

A regression considering income as the dependent variable, and years of education, household size, the operation of a home business, and a dummy variable for presence in an impact area as independent variables yields an R-squared of 0.127. All null hypotheses were rejected at the level of $p=.01$, and locating in an impact area was found to result in a monthly income premium of 768 birr:

$$(1) \text{ Income (present)} = 1,821.5 + 118.1 * \text{Household Size} + 767.9 * \text{Impact Area (0 or 1)} + 241.7 * \text{Education Year} + 506.4 * \text{Home Business (0 or 1)}.$$

An additional analysis that replaced education years as an independent variable with past income (the two variables are highly correlated, but past income is revealed to be a stronger predictor of future income than years of education), omitted household size, but retained impact area and home business as independent variables significantly influencing present income. In this regression, the estimated income gain from being in an impact area is lower than in the previous model, a monthly income premium of 374 birr:

$$(1) \text{ Income (present)} = 1,659.7 + 745.6 * \text{Home Business} + 374.3 * \text{Impact (0 or 1)} + 0.76 * \text{Income (10 years ago)}.$$

These results broadly follow what is indicated by the difference of means test, which highlighted the higher income and education levels of households in the impact area, and their greater likelihood to operate a business from their home.



Poverty Likelihood

The set of ten Poverty Probability Index (PPI) questions (tool launched by Grameen Foundation in 2005 and maintained by Innovations for Poverty Action (IPA) since 2016)⁸ were meant to determine the likelihood that an individual household or a group were living at a level below twice the National Poverty Line (NPL*2), based on factors related to household size, housing conditions, and normal consumption. Analysis of Poverty Likelihood (principal PPI indicator) indicates that there has not been a significant change overall in the likelihood that relevant groups live below or above the poverty level, based on comparison of overall impact and control

group Poverty Likelihood scores for ten years ago and today for individuals and groups. Whereas 10 years ago 27% of those now in impact areas lived below twice the national poverty line, that has increased today to 28% (due to the deterioration of household living conditions in Mekele impact areas). Households living in control areas are unchanged today compared to 10 years ago, with 30% living below twice the NPL.



Table 13

Households living below 2-times National Poverty Line (%)				
	Individual Poverty Likelihood		Group Poverty Likelihood	
	10 Years Ago	Current	10 Years Ago	Current
Impact Areas	.27	.28	.27	.28
Control Areas	.31	.30	.30	.30
Overall	.29	.29	.285	.29

Difference between impact and control areas was significant in each period ($p < .001$ in all cases), however change over 10 years is not significant at .05 level.

Poverty Likelihood has improved (reduced) in some individual cities (particularly Bahir Dar and Hossana in control areas) and deteriorated in others (Mekele and

Dilla in both impact and control areas). The effects largely cancel out at the overall country level.

Poverty Likelihood for each household is dependent both on whether the household is in an impact or control area ($p < .001$) and which city the household is in ($p < .001$), with both positive and negative changes

8. <https://www.povertyindex.org/about-ppi>



occurring in different cities. The mean score for changes to individual and group poverty likelihood are nearly the same, although variation is greater for individuals.



Table 14

Change in Poverty Likelihood (2-Times the Nat Poverty Level)?				
	Individual PPI 10-Year Change		Group PPI 10-Year Change	
	Control	Impact	Control	Impact
Adama	0	-.02	0	-.02
Bahir Dar	.07	.03	.08	.02
Dessie	.05	.09	.05	.09
Dilla	-.10	-.12	-.09	-.13
Hawassa	-.02	.04	-.02	.04
Hossana	.07	.03	.06	.02
Mekele	-.03	-.12	-.03	-.11
Shashemene	.02	.04	.01	.04
Overall (all cities)	.01	0.0	.01	-.01

Chi-square significance of difference: $p < .001$

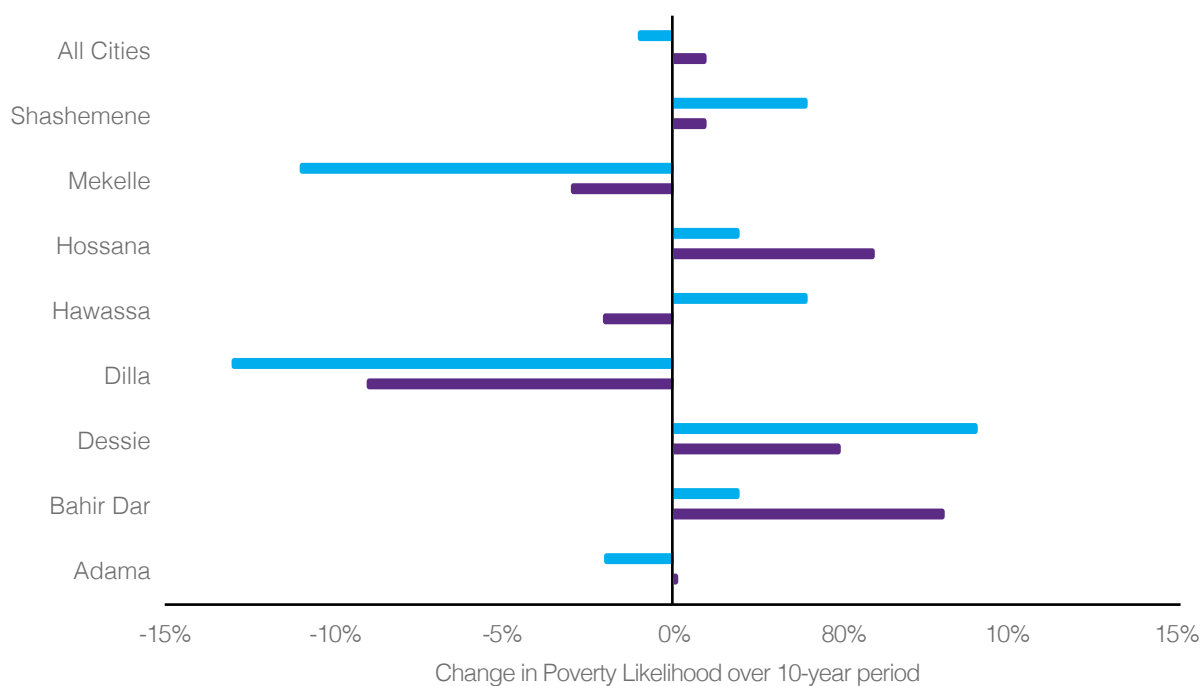


Figure 3: Change in poverty likelihood over the 10-year period in the impact and control areas of cities (from Table 16)



The small changes found in both the individual and group scores are similar overall, with standard deviations for individual's scores that are much greater than the respective differences.



Table 15

Share of Households Today Living below Twice the National Poverty Line by City						
		Frequen-cy	Mean	Std. Deviation	Mini-mum	Maxi-mum
F15. Poverty Likelihood - Current - Individuals	Bahir Dar	500	0.29	0.21	0.05	0.91
	Shashemene	500	0.26	0.18	0.04	0.92
	Adama	500	0.15	0.13	0.04	0.89
	Dilla	500	0.39	0.22	0.06	0.93
	Hawassa	500	0.32	0.20	0.06	0.93
	Hossana	500	0.35	0.24	0.06	0.95
	Mekele	500	0.26	0.18	0.06	0.9



Food security

There was some difference in food security between households in impact and control areas, but it was not statistically significant.



Table 16

Have you had difficulty obtaining sufficient food for your household over the past week? (%)			
	Yes	No	N=
Impact Areas	34.3	65.7	1929
Control Areas	36.4	63.7	1890
Overall	35.3	64.7	3819

Chi-square test for significance of difference: $p=.178$



The difference among cities in the responses to this question is greater than the difference in the responses between impact and control areas, as table 19 and figure 4 show.



Table 17

Have you had difficulty obtaining sufficient food for your household over the past week? (%)			
	Yes	No	N=
Adama	28.5	71.5	477
Bahir Dar	29.7	70.4	489
Dessie	22.1	77.8	420
Dilla	58.3	41.7	480
Hawassa	35.0	65.0	492
Hossana	34.0	66.0	485
Mekele	20.2	79.8	495
Shashemene	53.4	46.6	481
Overall	35.3	64.7	3819

Chi-square test for significance of difference: $p < .001$

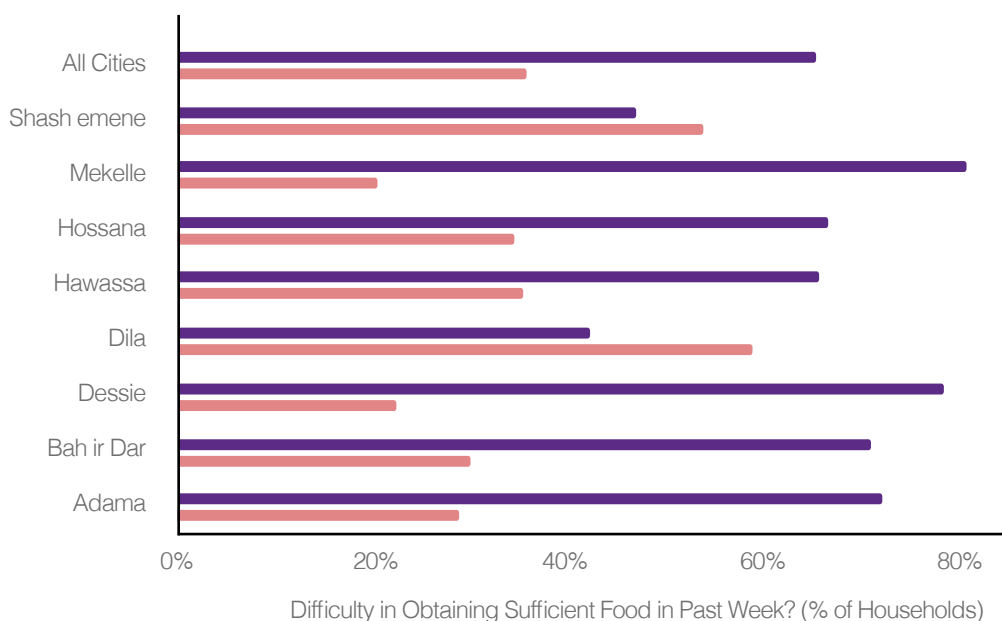


Figure 4: Difficulty in obtaining food in past week in cities (from Table 19)



Business operating from home

There was a higher rate of households with businesses operating from the house in impact areas, compared with control areas.



Table 18

Does anyone in the household operate a business from the house? (%)			
	Yes	No	N=
Impact Areas	25.8	74.3	1891
Control Areas	22.3	77.7	1877
Overall	24.0	76.0	3768

Chi-square test for significance of difference: $p=.012$

The frequency of household businesses varied more significantly from city-to-city than it did between impact and control areas, as shown in table 21 below.



Table 19

Does anyone in the household operate a business from the house? (%)			
	Yes	No	N=
Adama	32.4	67.6	466
Bahir Dar	16.7	83.3	484
Dessie	30.7	69.3	434
Dilla	14.8	85.2	465
Hawassa	10.4	89.6	482
Hossana	11.0	89.0	481
Mekele	28.0	72.0	490
Shashemene	49.6	50.4	466
Overall	22.8	77.7	3768

Chi-square test for significance of difference: $p<.001$



The type of business varied among cities as well. Shashemene, for example, with the highest rate of household-operated businesses, had a large proportion of agriculture-linked businesses as did both Dilla and Hawassa.



Table 20

What are the most frequent household businesses? (#)						
	Merchandise Sales	Personal Service	Food	Manufacturing	Agriculture	N=
Adama	16	67	10	16	15	141
Bahir Dar	24	16	16	6	7	77
Dessie	35	48	9	7	9	128
Dilla	11	21	5	4	15	64
Hawassa	14	11	3	0	7	47
Hossana	9	31	3	4	0	47
Mekele	51	51	24	4	0	130
Shashemene	27	57	13	32	26	168
Overall	187	302	84	73	79	802

Chi-square test for significance of difference: $p < .001$





Summary

Impact areas had relatively more higher income families, a higher rate of households with businesses operating on the premises, and a somewhat lower likelihood that their households lived below twice the national poverty line. Food security was slightly, but not significantly, higher among families living in impact areas. The survey analysis showed somewhat higher initial household income in impact areas, and a higher

rate of growth of nominal income. However, it was difficult to determine the extent of growth in real income, since the country experienced an inflation of roughly 100% over the past ten years, and most people remained in or near the same income category as they were ten years ago. Finally, there were significant positive and negative changes among cities, city-specific differences were lost in the analysis at the national level.



New arterial road development in Adama, Ethiopia



Impact on access to city services



Duration of Travel

One basic hypothesis of the Urban Expansion Initiative was that improved arterial roads and neighborhood road grids would improve access to the services offered by the city, including jobs, markets, grocery stores, clinics, and schools. The measurement of this impact is based on having foot travel of 15 minutes or less to the arterial road, which also implies that the arterial road and roads within the neighborhood are more likely to be paved. Together this could result in travel trips of a shorter duration, or longer trips within a given time period. The survey

results confirm that average travel time for impact area households is shorter than for control area households. The analysis also found that the differences in average travel times among cities were larger than the overall average differences between impact and control areas.



Table 21

Duration of Travel to Urban Services (%)										
Minutes	Travel to Work Place		Travel to Center		Travel to Grocery		Travel to Clinic		Travel to Primary School	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control	Impact	Control
0-15	26.8	24.7	25.3	18.9	33.5	27.9	40.1	29.5	40.3	38.9
16-30	47.3	51.1	48.4	45.9	44.6	46.8	39.3	42.7	42.2	43.0
31-45	16.1	18.0	18.2	20.0	15.1	14.5	13.1	16.3	12.8	11.9
46+	9.7	6.2	8.0	15.2	6.8	10.9	7.5	11.5	4.6	6.2
N=	824	777	1953	1933	1829	1806	1934	1943	1940	1953

Chi square significance of difference at the $p < .001$ level for travel to center, grocery and clinic; [workplace ($p = .031$), primary school ($p = .128$)]



The difference between travel times for impact and control area residents is clearly evident figure 5 below, which shows the percentage of households traveling 15 minutes or less to each type of urban service (data from table 23 above).

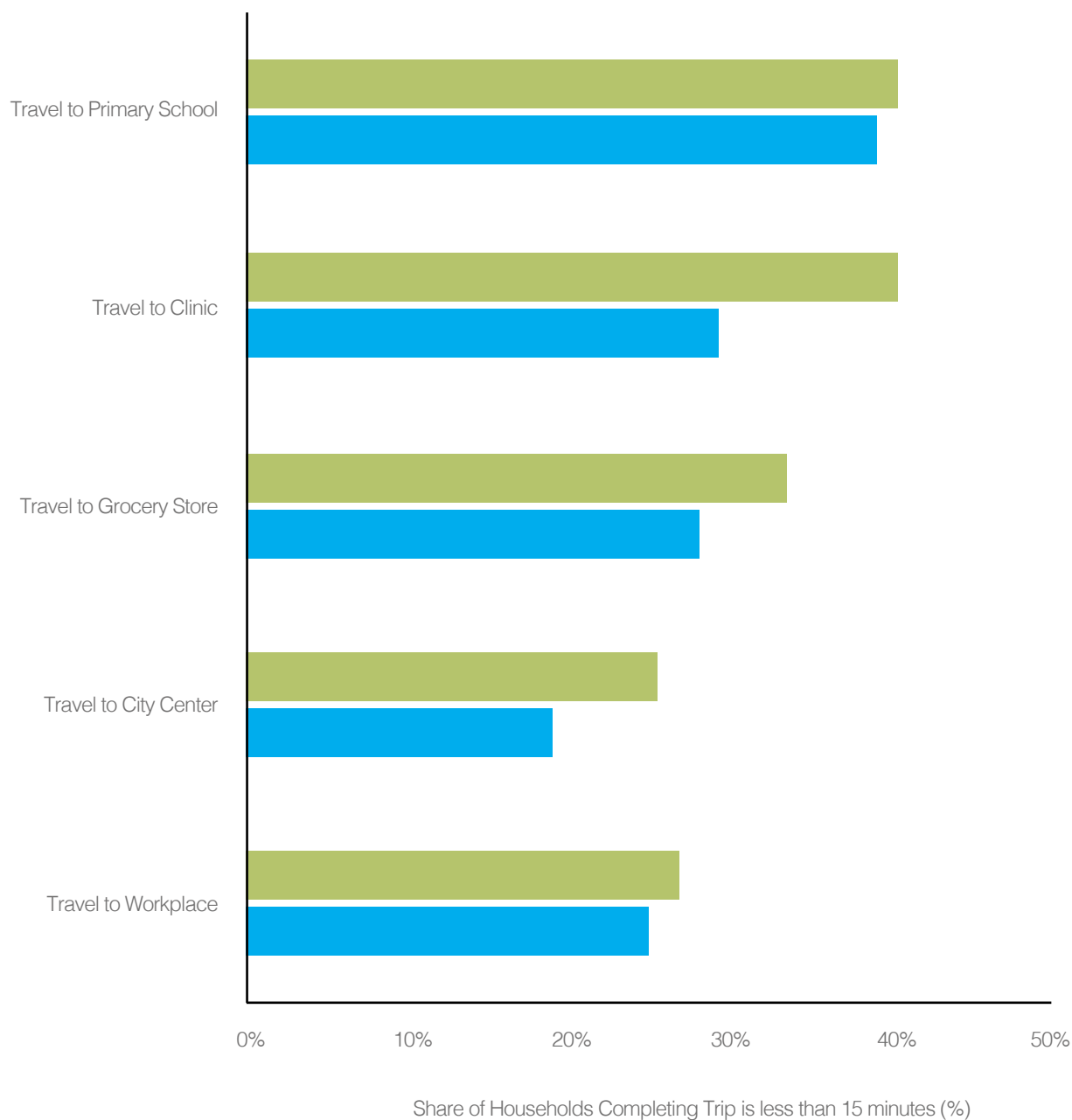


Figure 5: Differences in time of travel to Urban Services (from Table 24)



Interestingly, while households in impact areas, all-vehicle road areas, and self-reported arterial road areas all had shorter travel times than the other households, those in formal settlements had longer travel times, on average, than those in informal settlements. Table 24 suggests that formal settlements were located further away from the city center than informal settlements, possibly opting for larger plots in exchange for longer travel times. The longer

journey to work of residents of formal settlements may also indicate access to a wider job market, allowing workers greater choice of employment and hence higher incomes.



Table 22

Typical Mean Travel Time (% with <15 minutes)						
Area		Workplace	City Center	Grocery Store	Clinic	Primary School
Impact Area	Yes	26.8	25.3	33.5	40.1	40.3
	No	24.7	18.9	27.9	29.5	38.9
Proximate to All-vehicle roads	Yes	28.5	27.1	37.9	40.3	43.3
	No	23.0	17.7	24.3	30.0	36.4
Proximate to Arterial Roads	Yes	28.9	27.4	37.5	40.6	43.9
	No	21.7	16.7	23.6	28.9	35.2
Formal Settlement	Yes	23.7	20.7	33.6	33.6	37.3
	No	26.7	22.7	29.5	35.2	40.5



Mode of Travel

An unanticipated result from the household survey regarding travel was that there was a significant difference in the mode of travel used by households in impact areas compared to control areas. Specifically, impact area households were more likely to travel by for-hire motorized

transport (car or motorcycle taxi) while control area households were more likely to walk.



Table 23

Mode of Travel to Urban Services (%)								
	Travel to Work		Travel to Center		Travel to Grocery		Travel to Clinic	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Walking	34.1	53.3	31.5	44.1	46.1	56.1	35.8	43.7
Taxi/Bajaj	54.4	34.8	61.30	47.3	48.8	39.1	55.4	46.1
Other	11.5	11.9	7.3	8.7	5.1	4.7	8.8	10.2

Chi-square significance of difference: $p < .001$ in all cases, except clinic ($p = .035$)

An initial question is whether this is simply a result of their higher incomes, or whether it is linked to the presence of arterial roads. This was tested with the following regression analysis. Regressing the use of wheeled transport (a dummy variable) against income and impact area yields the following equation:

$$(1) \text{ Wheeled transport (0 or 1)} = 0.28 + 0.00003 * \text{Income} + 0.15 * \text{Impact (0 or 1)}$$

Both variables are significant, but the R-squared = 0.11 - relatively low explanatory power. Still, the regression model suggests that the use of wheeled transport was higher in impact areas than in control areas after controlling for the differences in incomes between them.

Specifically, impact area households were more likely to travel by for-hire motorized transport (car or motorcycle taxi) while control area households were more likely to walk.



Summary

Households in impact areas generally spent less time to travel to city resources. Impact area households also traveled more often by for-hire vehicles rather than by walking. The two factors together mean that impact area households could have traveled further in a given amount of time to access more and better

jobs and other services. One possible contributing factor to the higher incomes observed in the impact areas is the improved access to transportation that the impact area afforded households. This appears to be the case even after controlling for income as a driver of transportation choice.





Impact on housing conditions and household assets



Housing Conditions

The household survey included questions on the types of toilet, source of drinking water, flooring material, and lighting. The analysis distinguished among basic/rural conditions, partially improved, and modern facilities in the current location in comparison to ten years earlier, defined as follows:



Table 24

Housing Condition Definitions			
	Basic	Partially Improved	Modern
Toilet	Latrine: Open	Latrine: Covered and ventilated	Flush
Drinking water	Water hole or other	Shared tap water	Private tap water
Flooring	Mud/dung	Bamboo or Wood Planks	Cement or Tile
Lighting	Lantern, Firewood	Solar, Flashlight	Electricity meter

The quality of housing conditions was found to be significantly better in impact areas than in control areas. Households currently residing in impact areas already had better housing conditions ten years ago, and the difference increased since

then. While the majority of urban expansion zone households live with at least partially improved conditions, the share of households in impact areas with modern standard facilities was significantly higher, as shown in the tables below.



Table 25

Household Current Housing Conditions (%)					
		Basic	Partially Improved	Modern	N=
Toilet	Control	39.3	53.4	7.4	1979
	Impact	25.4	55.4	19.2	1976
Drinking water	Control	33.1	41.9	25.1	1978
	Impact	25.7	40.0	34.3	1981
Flooring	Control	56.3	6.5	37.2	1950
	Impact	39.7	4.9	55.4	1955
Lighting	Control	21.3	1.5	77.3	1965
	Impact	14.5	1.1	84.4	1973

Chi-square significance of difference: $p < .001$ in all cases



Table 26

Household Housing Conditions Ten Years Ago (%)					
		Basic	Partially Improved	Modern	N=
Toilet	Control	47.2	43.9	8.9	1821
	Impact	33.0	52.3	14.6	1828
Drinking water	Control	45.1	28.6	26.3	1810
	Impact	33.5	30.4	36.1	1823
Flooring	Control	70.2	8.2	21.6	1910
	Impact	55.3	8.6	36.0	1941
Lighting	Control	42.0	1.8	55.4	1905
	Impact	32.9	1.5	65.6	1926

Chi-square significance of difference: $p < .001$ in all cases



There was already some difference between the housing conditions ten years ago of the current impact and control area households. Conditions have improved since then for most households, although to a lesser degree for water services (toilet and drinking water). These two services rely on municipal investments to upgrade water networks, which did not generally take

place for households in control areas. All facilities for households in impact areas improved quite significantly in most cities, although least for drinking water.



Table 27

Percentage of Households with Modern House Utilities				
	Past: Ten Years Ago		Current: 2024	
	Impact	Control	Impact	Control
Flush Toilet	14.6	8.9	29.2	7.4
Piped Drinking water	36.1	26.3	34.3	25.1
Solid Flooring	36.0	21.6	55.4	37.2
Electric Lighting	65.6	56.3	84.4	77.3

Difference is significant at the $p=.001$ level in all cases (Chi Square)

These differences are presented visually in the following figure 6.

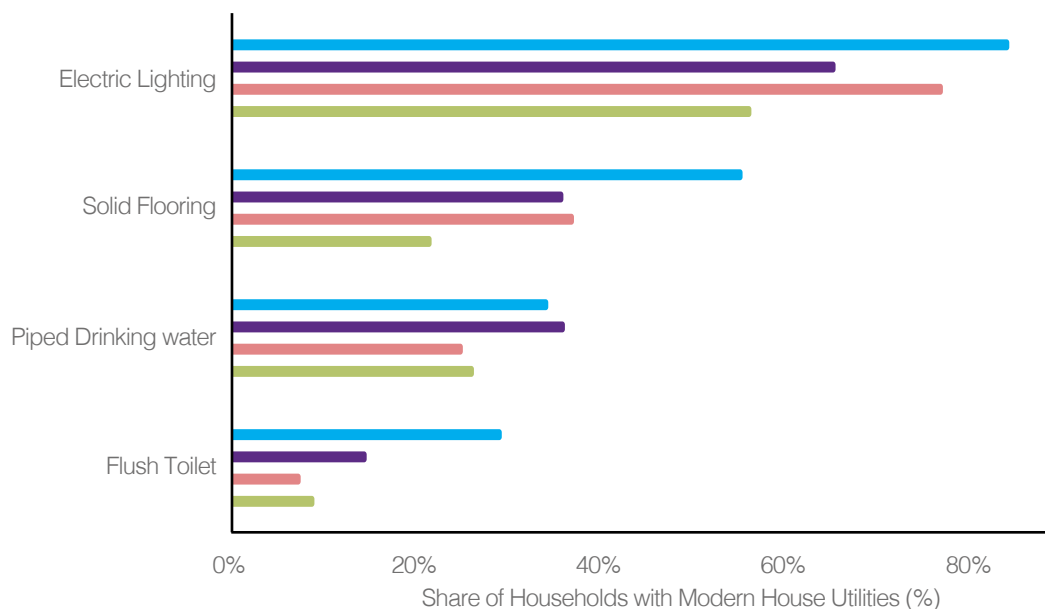


Figure 6: Differences in the Availability of Modern House Utilities (from Table 29)



New arterial road development in Bahir Dar, Ethiopia



Household assets

The household survey asked about possession of ten different household assets, television, kitchen appliances, sofa, animals and vehicles. Households in impact areas were more likely to have at least five of the ten assets surveyed, although even then they were a minority of households. For all households whether in impact or control areas, the most frequent assets were televisions, cook stoves and sofas, all of which were significantly more common in impact areas than in control area households. Farm and domestic animals were more frequent in

control areas than in impact area households. While over one-fourth of impact area households had at least five of the ten assets queried, fewer than one in seven control area households had at least five of the assets.



Table 28

Does your household have (following) assets? (%)				
	Control Area	Impact Area	N=	P=
Television	49.8	62.4	3922	<.001
TV Satellite Dish	46.7	59.3	3928	<.001
Cook stove	23.4	37.7	3931	<.001
Sofa	23.0	36.6	3929	<.001
Refrigerator	13.5	30.9	3915	<.001
Edible/Work/Farm Animals	24.2	16.4	3934	<.001
Domestic Animals	20.7	16.0	3445	<.001
Car	1.5	3.5	3923	<.001
Motorcycle	6.4	8.0	3924	.064
Bicycle	4.7	6.1	3883	.047
Have at least five of above assets	14.3	26.7	819	<.001

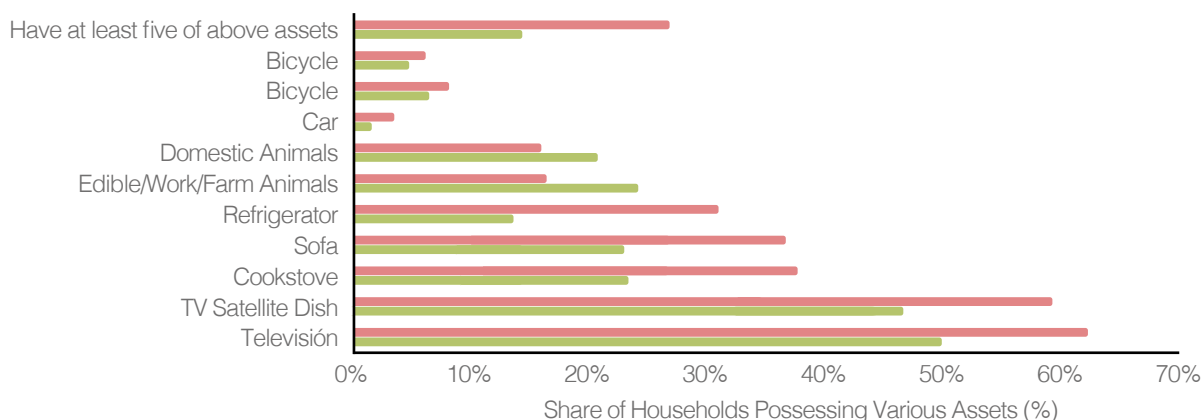


Figure 7: Differences in the possession of assets (from Table 30)

Household asset possession varied significantly among cities. Mekele, Bahir Dar, Hawassa and Adama households had the highest rate of possession of most items, while Dessie, Dilla and Shashemene tended to have the lowest rates of possession. This was consistent with differences among cities in average household income and poverty probability. Curiously, Hawassa households had the greatest frequency of farm animals and motorcycles, Bahir Dar had the greatest frequency of domestic

animals and bicycles, and Mekele had the greatest frequency of domestic animals and cars, while Dessie had the lowest rates of ownership of bicycles, motorcycles and cars.



Table 29

Does your household have (following) assets? (%)								
	Adama	Bahir Dar	Dessie	Dilla	Hawassa	Hossana	Mekele	Shashemene
Television	61.4	66.9	50.5	43.8	60.1	50.6	83.9	30.8
Satellite Dish	57.8	62.1	49.6	41.4	57.6	49.0	80.7	27.4
Sofa	27.7	44.9	11.0	13.9	46.9	31.8	49.8	10.5
Cook stove	47.0	34.7	20.1	5.7	27.8	10.6	75.4	22.0
Refrigerator	31.1	31.2	14.9	8.1	24.4	24.4	48.4	7.8
Edible/Work Animals	14.9	23.9	22.4	16.4	29.0	25.1	17.9	12.6
Domestic Animals	15.5	25.3	15.0	7.6	18.8	17.5	33.3	13.4
Motorcycle	3.6	3.2	0.9	8.9	25.9	8.4	2.6	3.2
Bicycle	5.1	13.5	1.8	2.0	6.5	2.3	7.6	4.1
Car	3.3	6.4	0.7	1.4	1.4	1.8	4.2	0.6
Have at least five of above assets	24.0	28.6	8.4	5.8	29.8	14.4	45.6	7.2

Chi-square significance of difference: $p < .001$ in all cases



Summary

Housing conditions improved in both control and impact areas, but much more so in impact areas, both in overall terms and specifically regarding modern facilities.

Household assets were also at significantly higher level in impact areas. Both differences contributed to improved relative levels of daily comfort in impact areas.



New arterial road development in Hawassa, Ethiopia



Impact on health conditions

Each household was asked whether in the previous month anyone in the household had experienced certain (a) public health conditions and (b) other health conditions.



Health Conditions

There was no significant difference between impact and control areas regarding the prevalence of public health conditions of malaria or dysentery. There was no significant difference between impact and control areas regarding frequency of pregnancy. Impact area households

reported a higher rate of being “sick” ($p=.013$) or having been in a road accident ($p=.009$).



Table 30

Frequency of Health Conditions during Previous Month (%)			
	Control	Impact	Chi Square P=
Malaria	7.8	8.3	.600
Dysentery	4.9	4.5	.548
Worms	7.3	7.7	.674
Diarrhea	8.6	7.5	.289
Bleeding	1.1	1.5	.205
Sick	5.0	6.9	.013*
Pregnancy	6.9	7.4	.499
Road Accident	0.6	1.4	.009*
Vision/Eye Issue	3.7	3.1	.292

* Difference significant for “sick” and “road accidents”, Chi-Square test



The association of improved public health conditions (malaria and dysentery) with better access is reflected in the differential health conditions of households self-reporting as located near arterial roads compared to those who reported they were not in arterial

road-served area, while general health conditions were unrelated to these access differences.



Table 31

Frequency of Health Conditions (%)			
	Non-Arterial	Arterial	Chi Square P=
Malaria	9.2	6.9	.006*
Dysentery	5.6	3.8	.006*
Worms	8.2	6.8	.106
Diarrhea	8.3	7.8	.642
Bleeding	1.1	1.5	.240
Sick	5.9	6.0	.898
Pregnancy	6.7	7.6	.288
Road Accident	0.9	1.0	.568
Vision/Eye Issue	3.4	3.3	.878

* Difference significant at p=.01 level, Chi-Square test

There were greater differences among cities than between impact and control areas regarding the presence of health conditions.



Table 32

Frequency of Health Conditions (%)								
	Adama	Bahir Dar	Dessie	Dilla	Hawassa	Hossana	Mekele	Shashemene
Malaria	2.4	10.2	1.0	12	13.4	7.2	1.2	16.6
Dysentery	3.2	2.4	2.8	1	4	3	4.2	16.6
Worms	2	7.2	6.8	7.2	4.6	6.4	5.8	19.8
Diarrhea	11.0	5.6	4.4	9.3	9.3	6.1	5.9	16.1
Bleeding	0.6	1.4	1.8	0.2	0.2	0.2	2.2	3.6
Sick	4.6	4.4	4.6	5	3.2	6.8	6.2	12.6
Pregnant	7.8	9.2	3.0	8	8.4	3.8	4.8	12
Road Accident	0	1	0.2	0.6	1	0.4	0.6	3.8
Vision/Eye Issue	1	4.6	4.2	1.2	0	4.4	4.6	6.8

* All city differences significant at p<.001 level in all cases, Chi-Square test



Health conditions were generally significantly better in the first four cities supported by the UEI project in Cycle One, all of which are regional capitals with higher public service budgets. They also received more intensive UEI support.



Table 33

Frequency of Health Conditions (%)			
	Two Cycles of UEI City Support		
	First	Second	Chi Square P=
Malaria	6.9	9.2	.006*
Dysentery	3.5	5.9	<.001*
Worms	4.9	10.1	<.001*
Diarrhea	7.2	10.6	.089
Bleeding	1.1	1.5	.324
Sick	4.6	7.3	<.001*
Pregnancy	7.6	6.7	.296
Road Accident	0.7	1.3	.05*
Vision/Eye Issue	2.6	4.2	.005*

Cycle One Cities: Adama, Bahir Dar, Hawassa, Mekele

Cycle Two Cities: Dessie, Dilla, Hossana, Shashemene

* Difference significant as noted, Chi-Square test



Use of health services

Overall, there was no significant difference in the use of health services by the households in impact and control areas. They made similar recourse to clinics and hospitals for treatment of various health conditions, including for prenatal care. Similar overall access to health facilities seems to reflect measures by respective ministries to ensure the mandated level of service provision to all areas of the city. Mandates require the location of health facilities and services based on the population of their catchment areas.



Summary

No significant differences were expected between impact and control areas for general health conditions, although some difference on public health conditions were predicted based on expected improved water and sanitation conditions in the impact areas. While the predicted results were not observed, when comparing households in impact and control areas, they were found when comparing households in self-reported arterial road areas. As with other topics, there was greater difference among individual cities than among impact and control areas.



Impact on overall wellbeing



Economic Situation Today vs. 10 Years Ago

Respondents were asked whether their overall economic situation was better today than it had been ten years ago. The wide range of responses reflected the difficult situation of the past few years for many people, with only one-

third saying they are better off today and over 50% saying they were better off 10 years ago.



Table 34

Was your overall economic situation better before 10 years ago or today?		
	Control Area	Impact Area
Much better before	39.0	38.4
Somewhat better before	20.1	16.5
About the same	11.8	13.0
Somewhat better today	19.4	20.6
Much better today	9.7	11.5
N=	1900	1894

Difference is significant at the $p=.022$ level (Chi Square)

Those in impact areas were slightly less negative about their situation today.



Table 35

Was your overall economic situation better before 10 years ago or today?			
	Better Before	Similar	Better Today
Impact Area	54.9	13.0	32.1
Control Area	59.1	11.8	29.1
Overall	55.7	12.4	30.6



City differences

There is a larger difference in the response to this question depending on the city where respondents live. Shashemene was the only city where a majority of households indicated that their overall economic situation today is better than it was 10 years ago, while only 30% of households in the other cities would agree with that assessment. Mekele is at the other

extreme with 84% reporting that their overall economic situation was better 10 years ago, namely before the civil war, and only 10% saying they are better off now.



Table 36

Was your overall economic situation better before 10 years ago or today?			
	Better Before	Similar	Better Today
Adama	56.7	19.1	24.2
Bahir Dar	54.7	12.4	32.9
Dessie	65.8	12.1	22.2
Dilla	63.3	12.1	24.7
Hawassa	56.1	7.9	36.1
Hossana	42.6	16.8	40.7
Mekele	84.1	5.4	10.5
Shashemene	32.8	14.0	53.3
Overall	55.7	12.5	31.8

Chi-square significance of difference: $p < .001$



Crime Safety Situation Today vs. Ten Years Ago

The household survey asked whether safety from crime today is better than it was where the respondent lived 10 years ago. Households in both impact and control areas generally felt that safety from crime where they lived 10 years ago was better than the situation where they live today, and only one-third

of residents in both types of areas indicated that safety from crime was better today than before.



Table 37

Was the crime safety situation better where you lived 10 years ago or today?			
	Better Before	About the Same	Better Today
Control areas	46.2	18.0	35.8
Impact areas	47.5	16.2	36.3
Overall	46.8	17.1	36.1

Chi-square significance of difference: $p=.022$

Those respondents who felt that safety from crime where they live today is worse than it was where they lived ten years ago tended to attribute it to the general political, economic, peace and security situation. Those who felt the situation is better today attribute it more to factors related to the specific city and to their own personal conditions.



Table 38

Why was the crime safety situation better before 10 years ago or today?			
Primary Reason	Better Before	About the Same	Better Today
Overall Political Situation (n=335)	71.1	6.3	22.7
Economic Conditions (n=490)	52.5	15.9	31.6
Peace and Security (n=1082)	51.5	9.0	39.6
Factors Specific to the City (n=529)	31.8	17.4	50.9
Personal Conditions (n=253)	20.2	23.7	56.1

Chi-square significance of difference: $p<.001$



Considering the perception of crime safety in each city, Bahir Dar (63.2%) and Mekele (85.5%) stand out with a strong majority stating conditions were better where they lived ten years ago than where they live today. Over half the households in Dilla (57.2%) and Shashemene (58.3%) stated that crime safety is better today than before.



Table 39

Was safety from crime better 10 years ago or today?			
	Better Before	Similar	Better Today
Adama	40.5	24.4	35.1
Bahir Dar	63.2	15.9	17.9
Dessie	69.9	13.2	16.9
Dilla	20.2	22.6	57.2
Hawassa	43.9	11.3	44.7
Hossana	25.3	27.2	47.5
Mekele	85.8	3.9	10.4
Shashemene	22.6	19.2	58.3
Overall	46.8	17.1	36.1

Chi-square significance of difference: $p < .001$



Summary

Residents in both impact and control areas are heavily divided as to whether overall economic conditions and safety from crime are better today than they were ten years ago. There is a small but significant difference between residents of impact and control areas on both issues. Actual opinions varied widely overall and between cities. Nonetheless, relatively more of both impact and control groups said that the overall economic situation and safety from crime were better 10 years ago, with high correlation between when overall economic wellbeing was better and when crime safety was better, with the exception of households in Dilla for which 63% reported that the economic wellbeing was better before and 57% reported that safety from crime is better now.



Conclusion

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Analysis of the household survey data collected during the UEI evaluation confirmed the major impacts of improved access via arterial roads as: (a) strongly improved housing conditions, (b) greater household assets, and (c) reduced travel time to urban resources and services. There was no significant improvement in public health in impact areas, but poverty likelihood was somewhat lower among impact area households. There was a significant increase in monetary income for both

impact and control area households, and a significantly greater increase for impact area households, although due to inflation its real importance remains unclear.



Table 40

Statistical Significance of Wellbeing Differences between Impact and Control Areas				
Impact areas had better conditions than Control Areas in the following	Significance of Differences			No Difference
	0.001	0.01	0.05	
Higher level of education	✓			
Income and income growth	✓			
Poverty Likelihood (10 years ago and today)	✓			
Poverty Likelihood (change over time)				✓
Food Security				✓
Housing Conditions	✓			
Household Assets	✓			
Travel Duration to Urban Services	✓			
Travel Mode	✓			
Health Conditions – public health				✓
Health Conditions – general health				✓
Overall Economic Wellbeing – Today vs. 10 Years ago			✓	
Overall Crime Safety – Current vs. Previous Location			✓	



Overall conclusion:

NYU's technical support provided at a modest cost and implemented in close collaboration with the Ministry of Urban and Infrastructure (MUI), formerly the Ministry of Urban Development and Construction (MUDC), and implemented to varying degrees by local authorities in participating Ethiopian secondary cities during the period 2013-2014 resulted in a host of qualitative as well as measurable improvements in these cities, largely brought about by the introduction of new arterial roads on the urban peripheries of these cities. The initiative had broad impacts both globally, regionally, nationally, and at the city neighborhood level. It lent legitimacy to the planning for urban expansion at scale, and it was emulated by other cities in the Sub-Saharan Africa region. From a qualitative perspective, the arterial roads built in the cities studied improved access to the urban periphery, making it possible to better integrate it into the overall economy of the city. They improved both the capacity and the confidence of local authorities to plan the expansion of their cities. They increased the serviced

land supply on the urban periphery, avoiding land supply bottlenecks and keeping land, and therefore housing, affordable. And they allowed local authorities to lead the development of lands on the urban periphery, rather than follow behind formal and informal developers, providing arterial roads on the urban periphery before development gets there, making it too late to provide such roads. From a quantitative and measurable perspective, the introduction of new arterial roads into the urban periphery of the cities studied led to significant improvements in socio-economic outcomes, but not in health outcomes, in the areas in the vicinity of the new arterial roads, in comparison with areas further away. These benefits, both for the city as a whole and for the new neighborhoods served by the newly opened arterial roads, strongly suggest that this mode of modest technical assistance and capacity building provided by NYU, in collaboration with public authorities, to growing cities in the Global South is an effective and beneficial intervention that should be broadly expanded to other cities.





Recommendation to the Open Philanthropy Foundation:

The Open Philanthropy Foundation supported the evaluation of the NYU Urban Expansion Initiative in Ethiopia, to assess its qualitative and quantitative impact on economic and health outcomes in a selected group of cities in the Global South, with a view of broadening and extending financial support for urban expansion initiatives to other cities and countries should the evaluation prove that these impacts are real and substantial. The authors of this

report, although intimately associated with and committed to the NYU urban expansion initiative in Ethiopia, believe that the objective results of their investigation and analysis reported here confirm that evidence-based technical support for urban expansion planning and on-the-ground implementation is an effective development strategy for growing cities in the Global South that merits expanded support by the Open Philanthropy Foundation.

Attachments

(separate document file)





These attachments can be found in a Google Drive folder that can be accessed by the following link: <https://drive.google.com/drive/folders/1Qm4td80jF-6LQiXpbB1jNs1M1YIzju2j?usp=sharing>

1. **Attachment 1** – UEI team members interviewed or surveyed during qualitative study
2. **Attachment 2** – UEI Evaluation questionnaire sent to UEI team members
3. **Attachment 3** – UEI city summaries from the qualitative study phase
4. **Attachment 4** – UEI Evaluation Household Survey Questionnaire
5. **Attachment 5** – UEI Geospatial Assessment Methodology
6. **Attachment 6** – UEI Household Survey Methodology
7. **Attachment 7** – Maps – City geographic boundaries – 2013 and 2022
8. **Attachment 8** – Maps – City Urban Expansion Plans, produced 2013 to 2014
9. **Attachment 9** – Maps – City Structure Plans
10. **Attachment 10** – Maps – City expansion area arterial roads, impact and control area
11. **Attachment 11** – Photos
12. **Attachment 12** – UEI Evaluation City Reports provided separately to authorities
 - Adama City UEI Evaluation Report
 - Bahir City Dar UEI Evaluation Report
 - Dessie City UEI Evaluation Report
 - Dilla City UEI Evaluation Report
 - Hawassa City UEI Evaluation Report
 - Hossana City UEI Evaluation Report
 - Mekele City UEI Evaluation Report
 - Shashemene City UEI Evaluation Report





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