



Navigating Informality

Perils and Prospects in Metro Manila's Slums

Gayatri Singh and Gauri Gadgil

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Acknowledgements

The report has been authored by Gayatri Singh (Urban Development Specialist, GPSURR) and Gauri Gadgil (Consultant, GPSURR) under the AAA on Making Cities Inclusive (TTL Judy Baker, TF017581), with significant research inputs from Gauri Gadgil. Statistics based on National Household Survey 2014 data were provided by the World Bank Poverty Team, particularly Nandini Krishnan. Metro Manila slum mapping was carried out by consultants from GIM, led by Vincent Tigny, and funded by the European Space Agency under their pilot urban demonstration projects coordinated by Zoltan Bartalis. The slum survey was designed by Gayatri Singh, supervision of the survey team in Metro Manila was led by Bernice Varona-Soriano, and data quality was strengthened by the ground monitoring of Bebot Aguirre. Data management and analysis support was provided by Huong Dang.

The team is deeply appreciative for the advice received from Judy Baker (Lead Urban Economist), throughout the fieldwork and report preparation process.

The hard work of the fieldworkers who tirelessly worked to collect data in challenging circumstances of the informal settlements, at times in extreme weather conditions, is sincerely appreciated. This report would not have been possible without their efforts. Most importantly, we are grateful to all research participants who generously shared important information about their lives.

The work was carried out under the overall guidance of Abhas Jha (Practice Manager), Ede Jorge Ilijasz-Vasquez (Senior Director, GSURR), Sameh Wahba (Director, GSURR) Agata Pawlowska (Country Manager, Portfolio and Operations, the Philippines) and Mara Warwick (Country Director, the Philippines).

The activity was made possible through the generous support of Australian Aid.



Executive Summary

Introduction

Urban areas will undoubtedly be critical spaces for pursuing the objectives of integrating the social, economic and environmental goals set forth within the new 2030 Agenda for Sustainable Development. Considerable evidence shows that an exclusionary and ill-managed course of urbanization invariably leads to durable forms of inequality that persists in the long term. Exclusionary urbanization can lower the resilience of urban communities and increase forms of insecurity, particularly for those who are unable to access tenure, secure homes and stable jobs. Urban residents who live in informal settlements and work within the informal sector are physically part of the city but often subject to multiple social, economic and spatial exclusions within it. Such dynamics within cities are therefore a major barrier to the achievement of the Sustainable Development Goals (SDGs).

This report takes a closer look the nature of informality and its relationship with urban poverty and exclusion in one of the most complex and sprawling urban agglomerations in Asia, the National Capital Region (NCR) of Philippines, also known as Metro Manila. The analysis leverages a unique and innovative mapping of slums using satellite imagery and remote sensing methods, a technique developed in collaboration with the European Space Agency. This data was used to develop a typology of slum settlements based on built environment characteristics. This geo-referenced database of slums formed the basis for a spatially representative random sample survey of slum households in three municipalities, namely, Manila, Quezon City and Muntinlupa. The analysis of the survey data categorized by typologies allowed for a better understanding of the experience of living and working in informality, including how multiple dimensions of deprivation exacerbate the experience of income poverty. Finally, this report also challenges the myth that migration into cities is responsible for the growth of slums, and that migrants are responsible for urban poverty.

Context

The Philippines boasts of a dynamic economy, and has averaged growth of above 5 percent per year in the past decade. Economic growth, projected to reach 6.2 percent in 2017, is likely to remain strong. However, the pace of poverty reduction over the past decade has been slow, particularly given Philippines' strong economic growth. Poverty decreased by 1.3 percentage points (from 27.9 to 26.3 percent) between 2012 to 2015, and by only 0.3 percentage points from 2009 to 2012, according to revised estimates of PPP. The Philippines is also one of the fastest urbanizing countries in East Asia and the Pacific (EAP). The growth in jobs in the low-skill service sector that are more often located in urban areas, has focused attention on increase in urbanization of poverty. From 2003 to 2009, urban poverty increased in from 11.3 percent to 13.2 percent. Since then, the urban poverty rate has remained relatively unchanged, though there has been a slight increase (1 percentage point) in the share of the urban poor when accounting for population growth.

Metro Manila is the country's primary urban agglomeration. Together with its peri-urban areas, it accounts for 30 percent of the country's population and 50 percent of economic output, while occupying less than 4 percent of the national territory. Economic growth is concentrated in Metro Manila, which accounted for 36 percent of GDP in 2012. Alongside this, income inequality within the city is also high, with the GINI coefficient increasing from 0.399 in 2006 to 0.403 in 2012. Urban planning has failed to keep pace with urban population growth and rural-urban migration, leading to haphazard and unregulated development of the city. Access to affordable housing for urban poor is dismal, resulting in overcrowded and congested slum settlements with limited access to basic services for millions of urban residents of Metro Manila.

Recently developed National Informal Settlements Upgrading Strategy includes estimates of over 1.5 million Informal Settler Families (ISFs) across the country, with nearly 600,000 (or 40 percent) living in Metro Manila. This is the equivalent of 3 million people, or 1 out of every 4 Metro Manila residents, relying on informal housing. The deprivations that accompany informal housing, include increased vulnerability to natural disasters, inadequate access to infrastructure and services, a lack of physical safety and tenure insecurity, all of which exacerbate and deepen the experience of urban poverty. Informality also leaves workers with lower wages, insecure employment, vulnerable to exploitation, and deprived of social safety nets. This report takes a closer look at the nature of informality and its relationship with urban poverty and exclusion in Metro Manila.

Income Poverty in Metro Manila

In Philippines, poverty is a result of low earning jobs rather than joblessness. As of January 2016, the rate of urban unemployment was at 6 percent while urban underemployment reached 21 percent. Nearly 30 percent of wage workers earn less than two-thirds of the median wage. Among the urban poor, 86 percent belong to households where the head of household is employed.

With low-paying jobs, the urban poor are often unable to afford secure housing with adequate access to services. In terms of service delivery, over 25 percent of the urban poor live without in-home electricity, and one third cannot access a toilet with a septic tank. Only about half of urban poor own the homes they live in, as compared to over 70% of non-poor, with home ownership rates being lowest among the poor in Metro Manila. Indeed, in 2012, the magnitude of the housing shortage was estimated at 3.9 million people.¹ Without living wages or sustainable government support, the urban poor are left to resort to living in slums and informal settlements.

Mapping and Surveying Metro Manila's Slums

The first ever data-base of 2500 slums of various shapes and sizes (derived from an innovative remote sensing methodology discussed in the report) was used to develop five distinct slum typologies; Highly dense, Linear dry, Wet, Pocket and Mixed. These typologies provided a way to generate a spatially representative sample of slums across Metro Manila, and allowed us to ask whether these differences in physical attributes and location in the city corresponded to socio-economic advantages or disadvantages. While urban poor across the city faced a number of similar challenges, certain issues were more prominent within given typologies. Most notably:

Dependency Ratios

The National Capital Region has a general dependency ratio of 48, meaning that for every 100 working-age persons, there are 48 dependents (42 children and 6 elderly dependents). However, the burden of dependents is much higher in slums, and is particularly pronounced in High Dense and Wet slum settlements which both have general dependency ratios of 57, driven mostly by higher populations of children. These ratios signal important differences in the social welfare and social protection needs of slum settlements, where the greater benefits may arise from interventions focused on the needs of children and youth populations.

Vulnerability to Disasters

The loss of productivity due to flooding is acutely felt in informal settlements, where informal work is prevalent and households with limited savings are dependent on wages. Given their proximity to water bodies, Wet settlements experienced higher flood rates (71 percent) and additional days of disruption due to flooding. Disruptions included inability to travel to work, inability of children to attend school and damages sustained to homes.

Additionally, informal settlements are highly susceptible to fires due to such environmental factors as congested living conditions, housing built from flammable materials, and

¹ Housing Industry Road Map of the Philippines 2012–2030.

narrow streets and pathways that are difficult for emergency vehicles to access. Fire risk is greatest within High Dense settlements.

Community Life and Tenure Insecurity

Natural hazards are not the only threat faced in informal settlements, with nearly 68 percent of surveyed residents reporting threat of eviction and tenure insecurity as a major concern. The highest levels of tenure insecurity were reported by residents of high dense settlements (76 percent) while the lowest levels were reported by residents of mixed settlements (61 percent).

In addition to tenure security, residents of high dense settlements also reported concerns of crime (69.1 percent), natural hazards (66 percent), harassment (49 percent), poor road conditions (41.4 percent) and prostitution (21.2 percent) in rates higher than average. Conversely, residents of mixed settlements consistently reported being concerned with these problems at lower levels than other typologies; crime (63.5 percent), natural hazards (52.9 percent), harassment (35.8 percent), poor road conditions (27.7 percent) and prostitution (14.8 percent).

Across the board, residents of Pocket slums fare the worst in terms of both income and multidimensional poverty measures. Slum dwellers living in the Pocket typology have significantly lower levels of per capita household income as compared to other typologies after controlling for a range of socio-economic characteristics. Special efforts are needed to design interventions that take into account the nature of deprivations faced by these small and marginalized communities.

Navigating Informality in Slums

Slum households' experience of informality is not limited to the spaces they inhabit but extends to their jobs, modes of transport and access to basic services.

Employment

When considering the main activity of household members aged 15 or older, a significant majority, 59 percent, are working. Of the working population, approximately 31 percent are self-employed. However, only a quarter of self-employed workers are operating with a business permit. The remainder work informally and are vulnerable to a number of obstacles that can range from an inability to access credit and expand business to being victimized by authorities by extracting bribes or shutting down informal working spaces.² Of those who are employees for a wage, less than half (42 percent) have a written contract. Similar to their self-employed peers, informal workers are left vulnerable to potential exploitation,

² ILO. 2011 Women and labour markets in Asia: rebalancing towards gender equality in labour markets in Asia/ ILO Regional Office for Asia and the Pacific; Asian Development Bank. Bangkok. ILO.

in this case, abuse by employers in the form of unfair hours, withheld wages, and unannounced layoffs.³

Notably, 14 percent of workers are in a professional role as support staff, accountants, teachers, and medical professionals. When taken together with the 25 percent of the slum population that has attended some college or graduated from college, it seems apparent that some middle class families also reside in the slums and informal settlements of Metro Manila. Their presence in slums highlights the issue of limited affordable housing and also demonstrates how slums have diverse populations that range in education, employment, and income more than is commonly assumed.

Transportation

While nearly 70 percent of daily trips in Metro Manila are made using public transportation,⁴ among the surveyed population only 22 percent reported using public transportation for their daily commute. A far larger share of respondents relies on informal transportation (66 percent) including jeepneys (43 percent) and tricycles (19 percent). Following informal transportation and public transit, walking is the third most popular form of commute, at 22 percent. While public transportation use is not entirely trivial, the preference for informal transit (jeepneys and tricycles) and walking suggest that public transportation is inconvenient, unaffordable, or some combination of both for populations living in slums.

Service Provision

The exclusion created through limited mobility or access to employment opportunities is mirrored in the home by the lack of provision of basic city services like water and electricity. In the case of Metro Manila, while nearly 100 percent of households use electricity for lighting, less than half of all surveyed households (46 percent) have their own connection to MERALCO, the only electric power distributor in Metro Manila. Additionally, only 67 percent of surveyed households have a piped water connection in their home that can be used for such domestic activities as washing, cleaning and bathing. Informal and improvised service provision of both electricity and water has the potential to affect the health and productivity of households.

Multidimensional Poverty

Multiple challenges in various aspects of Metro Manila slum dwellers' life suggest that income poverty alone is not sufficient for us to have a holistic view of the development situation in these settlements. In order to further understand the obstacles faced by slum dwellers, 21 different deprivation indicators from the survey data were categorized into eight dimensions of deprivation, namely: clean water, sanitation, health services, education, transportation,

³ ILO, 2011.

⁴ World Bank (2015) Urban Transport & ICT Capacity Building Completion Report.

security of tenure and quality of community, stability of income and employment, and household assets. These eight dimensions are believed to comprehensively cover various aspects of slum dwellers' living conditions and mark their well-being.

Within slum communities, almost a quarter of slum dwellers who are non-income poor are still multidimensional poor (i.e. deprived in 9 or more indicators). In other words, a significant proportion of non-income poor are unable to access good quality of everyday living. Further, quite a high percentage (almost 35 percent) of the income poor are also multidimensional poor, which means that their experience of income poverty is harsher than their counterparts who are not classified as multidimensional poor.

Among the five typologies, the wet settlements have the highest multidimensional poverty headcount ratio (with 30.4 percent of the people considered multidimensionally deprived) and also the highest MPI (0.157), which means the prevalence and breadth of poverty, or the extent of average deprivation among multidimensionally poor people, are the most severe in the wet settlements. Among the cities, Muntinlupa seems to be the most troubled place with both the highest multidimensional poverty headcount ratio and highest MPI. This also suggests that multidimensional poverty in Muntinlupa is “broader,” which could be linked to the fact that this city has the highest proportion of wet settlements.

Migrants

A close look at the residency status of the survey population reveals that the majority of individuals surveyed (over 66 percent) have lived in Metro Manila since childhood. Among those who moved to Metro Manila after childhood, more than half have arrived 20 to 75 years ago, and can be classified as lifetime migrants. On average, heads of migrant households are more educated than non-migrants and a linear regression model for determinants of income poverty showed that households headed by migrants are likely to make almost 14 percent more income per capita than households headed by non-migrants, when controlling for slum typology along with key household and individual level characteristics. The discussion in this section highlights that viewing rural-urban migration as the reason for development of slums is misleading. Scapegoating migrants as the source of urban overcrowding, poverty and mushrooming of slums glosses over the failure of urban planning and land policies in generating adequate affordable housing.

Conclusion

The discussion presented in this report further highlights that slum settlements are simultaneously spaces of opportunity as well as constraint. However, opportunities and challenges are highly structured by informality that touches social, economic and spatial aspects of slum dwellers' lives. Any solution that attempts to improve the wellbeing of slum dwellers and to enhance their inclusion in the urban fabric needs to take into account the pervasive elements of informality. Interventions must go beyond straightforward brick and mortar approaches

of urban upgrading and leverage better infrastructural and architectural design that takes into account the nature of livelihoods as well as social structures of slum communities.

Finally, the report briefly highlights possibilities of leveraging technological innovations and better urban data in reducing marginalization of slum populations within cities. Leveraging technology for inclusive urbanization is going to be a defining feature for the attainment of the SGDs and successful achievement of the Agenda 2030. From a policy perspective, building urban data systems and capacity to utilize the data will allow local governments to move from making reactive, ad-hoc decisions, to creating proactive, evidence driven solutions for many of the urban challenges.



Introduction

Urbanization is strongly associated with economic growth and also offers an opportunity to governments to extend service delivery efficiently to large numbers of citizens. Urban areas will undoubtedly be critical spaces for pursuing the objectives of integrating the social, economic and environmental goals set forth within the new 2030 Agenda for Sustainable Development. However, considerable parallel evidence⁵ shows that an exclusionary and ill-managed course of urbanization invariably leads to a vicious and durable cycle of inequality that persists in the long term and proves difficult to break. Exclusionary urbanization can lower the resilience of urban communities and increase forms of insecurity, particularly for those who are unable to access tenure secure homes and stable jobs. Urban residents who live in informal settlements and work within the informal sector are physically part of the city but often subject to multiple social, economic and spatial exclusions within it. Such dynamics within cities are therefore a major barrier to the achievement of the Sustainable Development Goals (SDGs).

This report takes a closer look the nature of informality and its relationship with urban poverty and exclusion in one of the most complex and sprawling urban agglomerations in Asia, the National Capital Region (NCR) of Philippines, also known as Metro Manila. After providing an overview of urban poverty as the backdrop at the national and NCR level, the report delves deeper into the household and community structures within slums and conditions faced by slum dwellers in Metro Manila. The analysis leverages a unique and innovative mapping of slums developed using satellite imagery and remote sensing methods, which allowed for the development of a typology of slum settlements. This geo-referenced database of slums formed the basis for a spatially representative random sample survey of slum households that has been analyzed for the purposes of this report. The findings focus on the demographics of slum dwellers, the capacity-enabling opportunities available to them, their experience of living and working in informality and the vulnerabilities they face in this context. Another important finding of the report challenges the myth that migration into cities is responsible for the growth of slums, and that migrants are responsible for

⁵ For a good discussion of the challenges and suggestions for Agenda 2030, see: McGranahan, Gordon, Daniel Schensul, and Gayatri Singh. «Inclusive urbanization: Can the 2030 Agenda be delivered without it?». *Environment and Urbanization* 28.1 (2016): 13–34.

urban poverty. The report also offers a multidimensional analysis of urban poverty within slums, including a quantification of the extent to which different dimensions contribute to the overall level of multidimensional poverty.

The concluding discussion reflects on whether slum upgrading approaches are adequate to address the nature of vulnerabilities produced by informality. Can the sociality of informality be divorced from interventions directed at upgrading physical attributes of slum settlements? Alternatively can physical interventions address some of the social vulnerabilities in the long run? Finally, the report discusses possibilities of leveraging technological innovations in reducing marginalization of slum populations within cities.



Country Context

Economic Growth without Poverty Reduction

The Philippines boasts of a dynamic economy, and has averaged growth of above 5 percent per year in the past decade. Economic growth, projected to reach 6.2 percent in 2017, is likely to remain strong. However, the Philippines has not seen poverty reduction at levels that might be expected given its strong economic growth. Poverty decreased by 1.3 percentage points (from 27.9 to 26.3 percent) between 2012 to 2015, and by only 0.3 percentage points from 2009 to 2012, according to revised estimates of PPP.⁶

One of the primary reasons for persistent poverty in Philippines has been linked to particular pattern of growth in jobs. The dominant sector of the economy has been the low-skill and low productivity services sector, while agriculture and manufacturing have remained weak. Such a pattern of economic growth is atypical for the region, and significant, given that agriculture and manufacturing tend to allow for pro-poor labor-intensive development. The service sector accounts for about half of total employment and approximately 75 percent of all jobs are informal. In urban areas, about two-thirds of all jobs are informal.⁷ Informality leaves workers with lower wages, insecure employment, vulnerable to exploitation, and deprived of social safety nets as they neither benefit from the minimum wage policy nor from employment protection legislation. Widespread informality means that the poor neither benefit from the minimum wage policy nor from employment protection legislation. Such a situation results in pervasive in-work poverty, primarily due to low earning capacity of the poor and their limited access to regular and productive jobs. In addition to the scarcity of productive job opportunities, low educational attainment is another underlying factor.

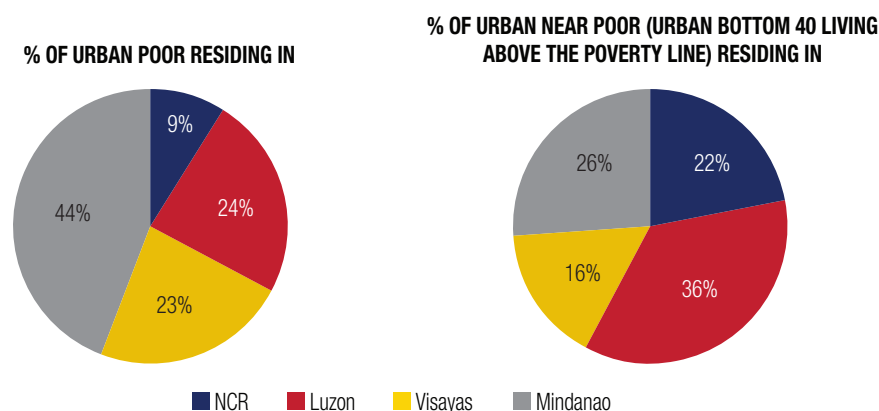
Urbanization of Poverty

The Philippines is one of the fastest urbanizing countries in East Asia and the Pacific (EAP). However, contrary to expectations, increasing urbanization (despite high levels of

⁶ World Bank (2016) "Philippine Economic Update".

⁷ World Bank (2016) Republic of the Philippines Labor Market Review: Employment & Poverty.

FIGURE 1: Distribution of Urban Poor Using National Poverty Line (2012)



Source: FIES 2006, 2009, and 2012, WB staff calculations.

economic growth) has not been accompanied with a parallel reduction in urban poverty. Pace of poverty reduction over the past decade has been slow. While similar to most East Asian nations, rural poverty in the Philippines is considerably higher as compared to urban areas, urban poverty is an increasing concern.⁸ The growth in jobs in low-skill service sector that are more often located in urban areas, has focused attention on increase in urbanization of poverty. From 2003 to 2009, urban poverty increased in from 11.3 percent to 13.2 percent. Since then, the urban poverty rate has remained relatively unchanged, though there has been a slight increase (1 percentage point) in the share of the urban poor when accounting for population growth.

The urban poor are distributed between the Philippines three main island groups; Luzon, Visayas, and Mindanao as seen in Figure 1 below.⁹ The national capital region (NCR), or Metro Manila, is presented separate from Luzon, and is one of the region's megacities with a population of well over 16.5 million.¹⁰ Metro Manila is the country's primary urban agglomeration. Together with its peri-urban areas, it accounts for 30% of the country's population and 50% of economic output, while occupying less than 4% of the national territory. In contrast, the next largest city, Cebu, has only 1.5 million people. When taken together, Luzon and Metro Manila account for a third of all urban poor and about half of the near poor.

⁸ At 39.4 percent, poverty in rural areas is significantly higher than the national average of 26.5 percent and three times the poverty rate in urban areas at 13.2 percent. Additionally, three-quarters of the bottom 40 percent of households (by income) live in rural areas.

⁹ The following poverty lines have been used for analysis in the Philippines, US\$1.90/day international poverty lines at 2011 PPP, \$3.10/day in 2011 PPP, and the national poverty lines which are set broadly following the cost of basic needs approach. The total poverty line (computed for each domain or rural/urban area per province) is the minimum cost to meet 1) basic food needs that satisfy the nutritional requirements set by the Food and Nutrition Research Institute (FNRI) and 2) basic non-food needs such as clothing, housing, transportation, health and education expenses.

¹⁰ Megacities are defined as having populations over 10 million people.

As the primary urban agglomeration in the Philippines, Metro Manila features among the top 20 largest urban agglomerations in the world and has been sprawling at a tremendous pace (See Box 1). Economic growth is concentrated in Metro Manila, which accounted for 36 percent of GDP in 2012.¹¹ Alongside this, income inequality within the city is also high, with the GINI coefficient increasing from 0.399 in 2006 to 0.403 in 2012.¹² Urban planning has failed to keep pace with urban population growth and rural-urban migration, leading to haphazard and unregulated development of the city. Access to affordable housing for urban poor is dismal, resulting in overcrowded and congested slum settlements with limited access to basic services for millions of urban residents of Metro Manila. Recently developed National Informal Settlements Upgrading Strategy includes estimates of over 1.5 million Informal Settler Families (ISFs) across the country, with nearly 600,000 (or 40 percent) living in Metro Manila. This is the equivalent of 3 million people, or 1 out of every 4 Metro Manila residents relying on informal housing.¹³ The deprivations that accompany informal housing, include increased vulnerability to natural disasters, inadequate access to infrastructure and services, a lack of physical safety and tenure insecurity, all of which exacerbate and deepen the experience of urban poverty.

For many, slums of Metro Manila highlight the tangible face of urban poverty that symbolize the juxtaposition of income and non-income deprivations. That being said, slums are also vibrant spaces of economic and social activity that are certainly not synonymous with income poverty. As will be demonstrated in this report, socio-economic conditions and structures that define the lives of slum dwellers in Metro Manila demonstrate considerable opportunities alongside significant risks and constraints. In the following section, the report provides an overview of income poverty Philippines' urban areas. Following this discussion, we turn specific attention to slums in Metro Manila, taking a closer look into the spaces of informality in the nation's capital city.

¹¹ Oxford Economics' (OE) Global Cities Historic Database.

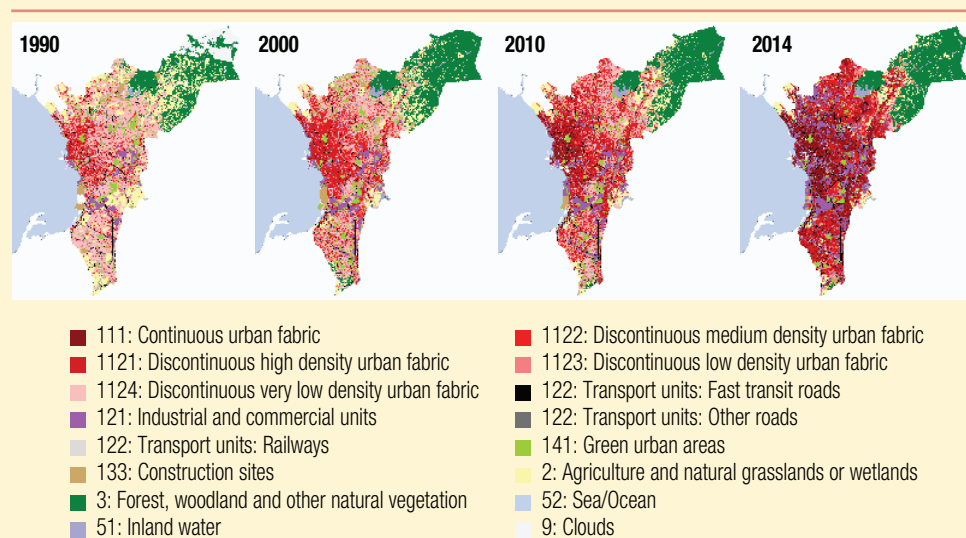
¹² Philippine Statistical Authority. (2012). Family Income and Expenditure Survey Final Results. Manila.

¹³ NHA data as of July 2011.

Box 1: Urban Growth in Metro Manila: Two Decades of Sprawl & Densification

In order to understand the extent and spatial distribution of urban poverty in Metro Manila, the World Bank team in collaboration with European Space Agency (ESA), used satellite imagery to develop Land Use Land Cover (LULC) maps of Metro Manila. Land use refers to the socio-economic function of the land (ie. commercial, agricultural, etc.) while Land Cover represents the biophysical state of the land. Maps were developed using imagery from 1990, 2000, 2010 and 2014, allowing for a temporal analysis of LULC distribution and insight into the causes and consequences of observed changes over time. The results of the analysis show that while the growth of Metro Manila's total urban area was relatively small, the city nevertheless experienced internal sprawl and densification at dramatic rates.

FIGURE 2: Time Series of LULC Classification of Metro Manila



Source: EOWorld2, World Bank (2015) Slum Analyses in Metro Manila (SLAMM) Operational Document.

Sprawl. Sprawl is defined as the conversion of natural areas, agricultural land or inland water areas into 'artificial areas' that have been built up for residential or commercial use. Land designated as "agriculture land, semi-natural areas and wetlands" which accounted for 17.23% of land cover in 1990 was among the most affected by urban sprawl and accounted for only 8.81% of land cover by 2000. Urban sprawl was 6.5% from 1990–2000, 3.93% from 2000–2010 and finally 4.37% from 2010–2014. This trend was concentrated within certain areas of Metro Manila, and cities showing the highest urban sprawl include Valenzuela city, Taguig city, Pasig city and Caloocan/Quezon city.

Densification. Perhaps more consequential than sprawl, were the changes to the existing urban fabric. In 1990, discontinuous very low density urban fabric* accounted for the largest share of land cover at 27.74% while very high dense urban fabric** accounted for only 4.93% of total area. Between the years 1990–2000, however, Metro Manila experienced a period of densification when 17% of low dense areas were converted to very high dense areas. By 2014, high dense areas accounted for 34.75% of total surface area. Importantly, 92.47% of informal settlements are concentrated within high dense areas.

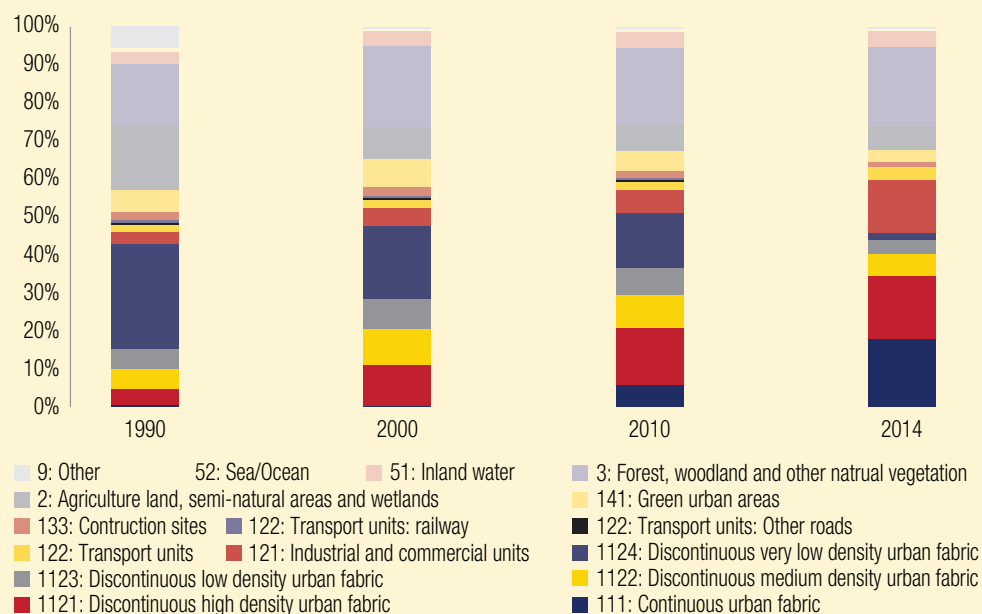
* *Discontinuous very low density urban fabric:* Sparsely built-up urban neighborhoods with predominant residential use. Less than 10% of the area is sealed by houses and roads.

** *Discontinuous high density urban fabric:* densely built-up urban neighborhoods with predominant residential use. Between 50% and 80% of the area is sealed by houses and roads.

(continued on next page)

Box 1: Urban Growth in Metro Manila: Two Decades of Sprawl & Densification *(continued)*

FIGURE 3: Distribution of LULC in Metro Manila





Unpacking Income Poverty: Who are the Urban Poor in Philippines?

Potential to Reap Demographic Dividends

Similar to trends in many other developing countries, urban poor in Philippines tend to have more youthful household heads along with a larger family size. In this case, the family size is larger than households in rural areas (contrary to many other developing nations) as well as when compared to the urban non-poor. These demographic patterns are particularly pronounced among urban poor in the National Capital Region of Metro Manila. 42.24 percent of urban poor households in Metro Manila are headed by an adult under the age of 40 compared with just 33.26 percent of poor households in other urban areas. In rural areas, this number drops to 31.58 percent, and among the non-poor in urban areas only 21.7 percent of households are headed by an adult under the age of 40. In Metro Manila, 66.8 percent of urban poor households have 6 or more members, compared with 57.04 percent in other urban areas, and only 50.81 percent in rural areas.

Youthful household heads and large family size may signal higher fertility rates among urban poor, early onset of childbearing, and/or the predominance of multi-generation households. Higher fertility rates and younger ages are globally associated with lower levels of educational attainment, an area that has been of concern from a development policy and economic growth perspective for Philippines.

Interestingly, and contrary to the trends observed in many other parts of the world such as sub-Saharan Africa, female-headed households are most prevalent among urban non-poor at 27.09 percent. Given Philippines extensive immigration trends, this trend may be due in part to the household having an overseas foreign worker whose remittances increase the overall household wealth.

Strikingly Low Educational Attainment of Urban Poor Prevents Upward Mobility

As might be expected, lower levels of education are highly correlated with urban poverty (See Figure 4 below). But the differences between educational attainment of heads in urban poor

TABLE 1: Household Demographics Using National Poverty Line, 2012

Share of Households	Rural		Urban		Urban poor	
	Poor	Poor	Near-Poor (B40 non-poor)	Non-Poor (top 60)	NCR	Other
Household demographics						
Female headed	10.02	14.61	19.75	27.09	19.32	14.15
Head aged <= 40	31.58	34.06	27.48	21.7	42.24	33.26
Head aged 40–50	34.16	32.77	30.46	26.64	25.53	33.49
Head aged 50–60	19.27	17.19	24.05	28.09	17.81	17.13
Head aged 60+	14.98	15.97	18.01	23.57	14.42	16.12
Family size <= 3	5.01	3.33	7.49	20.18	1.45	3.52
Family size 3–4	8.85	7.01	12.85	19.29	7.45	6.96
Family size = 4–5	16.36	13.08	20.01	19.65	9.09	13.47
Family size 5–6	18.98	18.67	19.01	16.23	15.21	19.01
Family size >= 6	50.81	57.91	40.64	24.65	66.8	57.04

Source: Staff calculations, FIES 2012.

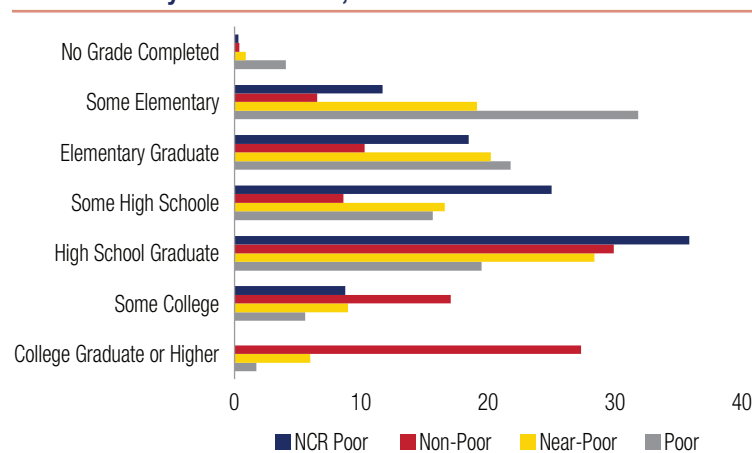
and non-poor households are striking. 36 percent of urban poor households are headed by individuals who have incomplete or no elementary education and are effectively illiterate, compared with only 7 percent of the urban non-poor and 20 percent of the urban near poor households. Individuals belonging to households whose heads have completed a college degree make up less than 2 percent of the poor (urban or rural), less than 6 percent of the urban near poor, and 27 percent of the urban non-poor.

Urban poor in Metro Manila fare better on this critical human development indicator, as the household heads are on average more educated. Only 12 percent of households have

less than elementary education. Notably, over 40 percent have a high school education or higher, and nearly 9 percent have attended college.

Taken together with the demographic characteristics presented earlier, particularly the presence of younger heads of household, relatively higher educational attainment of the urban poor suggests the presence of a more skilled and capable labor force in Metro Manila. However, educational attainment in and of itself is not sufficient to create better life outcomes in an economy that is dominated by the informal sector, which has been linked to pervasive in-work poverty.

FIGURE 4: % Highest Level of Educational Attainment for HH by Income Level, 2012



Source: Staff calculations, FIES 2012.

TABLE 2: Employment & Unemployment Rates in 2013

	Total	Urban	Rural	Male	Female
Employment/ Population 15 +	59.5	57.5	61	71.9	47.3
Unemployment rate*	7.1	8.6	6	7.5	6.5
Underemployment rate**	21	16	24.5	23.6	16.8

Source: World Bank (2016) Republic of the Philippines, Labor Market Review.

* Unemployment definition includes persons who are available for work but not looking for a job.

** Underemployment defined as share of workers who want to work more hours.

The Working Poor: Informal Employment Creates Poverty Traps

In Philippines, poverty is a result of low earning rather than joblessness. Significant under-employment, rather than unemployment, poses a bigger challenge for the wellbeing of the urban poor. As of January 2016, the rate of urban unemployment was at 6 percent while urban underemployment reached 21 percent as seen in Table 2 below. Somewhat counter-intuitively, there is a negative correlation between poverty status and the share of employed head of households (see Table 3). The unemployment rate is lowest among the poorest quartile at around 3 percent, and highest among the richer quartiles at around 10 percent. However, in-work poverty is persistent, and the majority of workers are trapped in low-skill and low-wage informal employment.¹⁴ Nearly 30 percent of wage workers earn less than two-thirds of the median wage.

Among the urban poor, 86 percent belong to households where the head of household is employed. As mentioned previously, this anomaly can be explained by the high incidence of informal employment and subsequent underemployment experienced by the Filipino urban poor. The importance of wage incomes for urban wellbeing is evident as 62.22 percent of the urban poor rely on wages and salaries for their primary income compared with only 45.47 percent of the rural poor. For the urban poor within Metro Manila, this number is even higher at 69.24 percent. Depressed wage gaps for a large proportion of urban populations are also instrumental in increasing intra-urban inequality, which has been on the rise over the last decade.

Substandard Quality of Housing for Urban Poor

With low-paying jobs, the urban poor are often unable to afford secure housing with adequate access to services. In terms of service delivery, over 25 percent of the urban poor live without in-home electricity, and one third cannot access a toilet with a septic tank. About 45 percent urban poor overall (and about 39 percent in Metro Manila) are able to afford dwellings constructed with strong quality of wall materials, as compared to 89 percent of non-poor. The near-poor fare better than the poor in urban areas, but a

¹⁴ World Bank (2016) Republic of the Philippines, Labor Market Review.

TABLE 3: Labor Market Outcomes Using National Poverty Line, 2012

Share of Households	Urban			Urban Poor	
	Poor	Near-Poor (B40 non-poor)	Non-Poor (non B40)	NCR	Other
Employment					
Head with job/business	85.93	81.8	73.25	80.3	86.49
Class of worker					
Worked for private household	2.72	4.14	2.87	5.53	2.47
Worked for private establishment	54.98	57.27	47.63	59.66	54.56
Worked for government/government corporation	3.67	5.3	12.81	5.79	3.47
Self-employed without any employee	35.18	30.01	28.48	26.98	35.75
Source of Income					
Main source: Wage/Salaries	62.22	67.14	60.52	69.24	61.53
Main source: Entrepreneurial Activities	25.63	18.83	14.59	19.54	26.22
Main source: Other sources of Income	12.15	14.03	24.89	11.22	12.25
Agricultural household	27.62	7.84	1.67	0.21	30.31
Sector of Employment					
Not employed	14.07	18.2	26.75	19.7	13.51
Agriculture	32.82	13.31	4.58	1.59	35.89
<i>Agriculture and forestry</i>	28.9	10.29	3.8		31.74
<i>Fishing</i>	3.92	3.02	0.78	1.59	4.15
Industry	18.06	23.79	15.65	19.1	17.96
<i>Mining and Quarrying</i>	1	0.71	0.3		1.1
<i>Manufacturing</i>	6.42	8.69	8.04	5.78	6.49
<i>Elec, gas and water</i>	0.32	0.52	0.63		0.35
<i>Construction</i>	10.32	13.87	6.69	13.33	10.03
Services	35.05	44.7	53.02	59.61	32.64
<i>Trade</i>	9.53	15.05	16.01	18.16	8.69
<i>Transport, storage, communication</i>	13.27	13.42	10.81	21.22	12.49
<i>Finance and real estate</i>	0.13	0.65	2.96		0.14
<i>Other services</i>	12.12	15.58	23.25	20.22	11.32

Source: World Bank Poverty Team Staff calculations, FIES 2012.

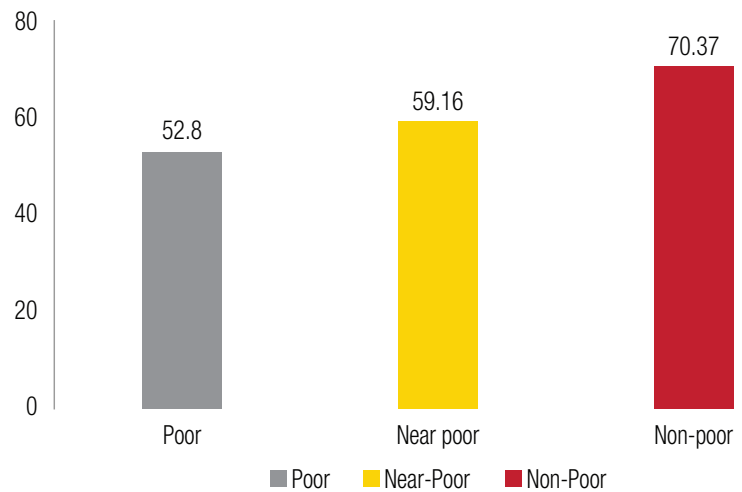
TABLE 4: Characteristics of the Poor – Housing, Infrastructure and Services, 2012

Share of Households	Urban Population			Urban Poor	
	Poor	Near-Poor	Non-Poor	NCR	Other
Roof made of strong materials	67.21	83.07	94.18	70.26	66.91
Wall made of strong materials	45.05	68.26	88.84	39.3	56.49
Toilets with septic tank	63.27	85.69	96.6	92.18	60.43
With electricity	75.65	94.9	99.27	91.94	74.05

Source: World Bank Poverty Team Staff calculations, FIES 2012.

significant proportion (32 percent) also have homes with poor quality of wall construction. Low-quality of construction puts urban poor households at a high risk of damage and destruction caused by natural disasters, especially typhoons and flooding, which have been increasing in frequency and intensity in Philippines over the past decades. The increased disaster risks have an additional danger of pushing the near-poor into poverty, especially those living in low-quality housing with the potential to face significant property losses.

FIGURE 5: % Homeownership Rate by Income Level, 2012



Source: World Bank Poverty Team Staff calculations, FIES 2012.

Living in Informality: Limited Affordable Housing Stock, Unregulated Land Markets and Unplanned Urban Development

Only about half of urban poor own the homes they live in, as compared to over 70 percent of non-poor, with home ownership rates being lowest among the poor in Metro Manila. More than 40 percent of near-poor also do not own homes. Indeed, in 2012, the magnitude of the housing shortage was estimated at 3.9 million people.¹⁵ Without living wages or sustainable government support, the urban poor are left to resort to living in slums and informal settlements. Additionally, evidence points to a complex political economy of land in Metro Manila contributing to the prevalence of slums and other informal settlements. Private developers exert an unprecedented level of control on the planning and development of residential and commercial land in Metro Manila.¹⁶ Without much regulatory oversight and high levels of institutional corruption, private developers have the incentive to build housing stock from which they can derive the greatest profits. In addition, because their focus is on improving and expanding private spaces, infrastructure development has been fragmented, reaching only select neighborhoods at the expense of larger citywide improvements. These dynamics, along with persistent trends of underemployment and increasing inequality, result in unplanned and spatially exclusionary urban development and marginalization of poor and near-poor groups.

In response to the housing shortages, the Government of Philippines has experimented with different social assistance programs, but with little success. The National Housing Authority (NHA) typically favored off-city resettlement due to high land prices and limited land availability within urban areas. However, off-city resettlement has at times been

¹⁵ Housing Industry Road Map of the Philippines 201220–30.

¹⁶ Shatkin, Gavin (2008) The city and the bottom line: urban mega-projects and the privatization of planning in Southeast Asia. *Environment and Planning A* 40 (2), 383–401.

implemented against the wishes of the informal settler families (ISFs), resulting in perverse socio-economic impacts such as loss of livelihood, lack of adequate access to basic services, and disruption of social networks. As a result, many slum dwellers have opted to return back to in-city locations relocating themselves in old or new informal settlements. A five-year longitudinal study that compared the bottom 30th percentile of ISFs who were resettled off-city and those that remained in-city found that after five years, the income gap between the two groups was more than 50 percent. The study also found that off-city resettlement resulted in increased costs of transportation to work, schools, and health facilities.¹⁷

A second program, housed in the Social Housing Finance Corporation (SHFC) centered on providing affordable financing for predominantly on-site, in-city shelter upgrading through a community mortgage program (CMP). The reach of the program, however, was limited. Communities that did receive mortgages were often able to secure financing for land acquisition, but lacked the financial capacity to borrow for site development or housing. As a result, many of the CMP sites were run down, and the program has been referred to as “*going from slum to slum*.” Under the *Oplan Likas* program, Php. 50 billion (approximately US\$1.15 billion) was allocated in 2011–16 to resettle 104,000 ISFs out of high risk areas in Metro Manila. *Oplan Likas* advocates for in-city relocation, though in practice, about 75 percent of resettlement occurs off-city due to lack of available land and high land prices.¹⁸ To address the land constraints, both NHA and SHFC initiated in-city high-density housing that has been well received by ISF households. However, there is an affordability gap and World Bank estimates show that almost 60 percent of ISFs won’t be able to afford the in-city high density housing unless the Government reforms its subsidy scheme.

The limited success of the abovementioned slum upgrading approaches can also be attributed to the fact that traditional poverty alleviation and slum upgrading programs have typically approached slums as a monolithic entity. In the complex built environment, informal employment context and political economy of land markets of Metro Manila, the diversity of informal spaces and their socio-economic characteristics of their residents is likely to be considerable. The task of tailoring interventions to urban poor or slum dwellers is further complicated due to a lack of accurate data available to the government, NGOs and international organizations. Slum residents are often missed in the decennial census, and, at best, estimates could be made as to their numbers and current living conditions. Additionally, there are insufficient sampling frames available to allow for representative surveys of various slum dwellers. One avenue of addressing the gaps in understanding of slums settlements is now offered with the advances in geospatial technologies, and is discussed in the next section.

¹⁷ John J. Carroll Institute of Church and Social Issues (JJCICSI). (2008) “A Study of Resettled

¹⁸ Families’ Perceptions of Vulnerability and Resilience to Disasters” (Draft Report). Manila. 18 Republic of the Philippines. (2013). Draft Joint Memorandum Circular (signed by Secretary of Interior and Local Government) on “Policy Guidelines on the Operationalization and Utilization of the P.50 Billion Housing Fund for ISFs in Danger Areas of the NCR”. Manila. Part I. Policy Guidelines Article 1 states that “relocation of the affected ISFs shall be on-site, near-city, and in-city” and that “off-sites shall only be resorted to in accordance with the People’s Plans after adequate and genuine consultation, or when directly requested by the affected ISFs themselves.”

From Satellites to Settlements: Mapping & Surveying Metro Manila's Slums

The Black Box of Data on Slum Settlements

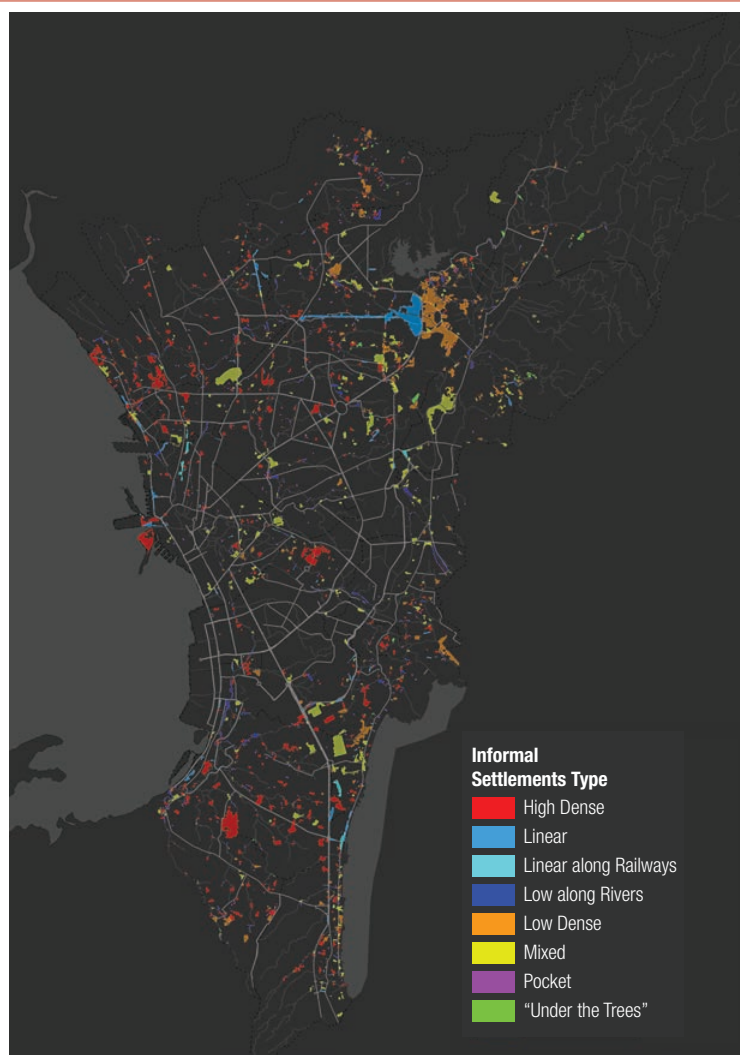
Lack of comprehensive, accurate, up-to-date data on locations of slums and their characteristics has been a barrier to proper planning and addressing the needs of the urban poor in Metro Manila. Over the last decade, this need has become more severe given the increased risk of natural disasters such as typhoons in the Philippines, which affect slum dwellers more critically given the lack of access to proper shelter protection. However, identifying slums and delineating their boundaries at the city scale without any base information is challenge for any city but a much bigger one a complex urban context such as that of Metro Manila. At the inception of this study in late 2014, the government records were found to be outdated and no comprehensive basis for developing a random sample of slum dwellers was available. Various fragmented efforts underway to count slum residents were facing tremendous difficulties in scaling up beyond specific spatial locations (such as slums along waterways) or within specific districts in certain LGUs such as Quezon City.

Geospatial Solution: City-Wide Slum Database and Typology

To address this challenge in Metro Manila, a unique geospatial approach was applied, which utilized advanced semi-automated Object-Based Image Analysis (OBIA) to process very high resolution satellite images at spatial resolution of 50 cm and identify and delineate the slums at scale and in a short time frame.¹⁹ A statistical analysis of various slum settlement attributes related to objects found inside slums was combined with a linear index and other spatial relations into a model. Then a basic analysis of the characteristics such as spatial distribution of slums and accessibility to public infrastructure, was further carried out as slums were overlaid with other GIS map layers.

¹⁹ Contact authors for details of methodology that was developed in collaboration with analysts from GIM, a Belgium based firm contracted by the European Space Agency (ESA). See also powerpoint: Singh, Gayatri (2016) From Satellites to Settlements: Identifying Slums from Outer Space within Metro Manila's Complex Urban Landscape. World Bank Group.

MAP 1: Distribution of Different Informal Settlements Types Within MM Available for 2014. It is a First Attempt in Classifying the Informal Settlements in an Objective Way on the Basis of their Physical Characteristics as Captured from Remote Sensing Data.

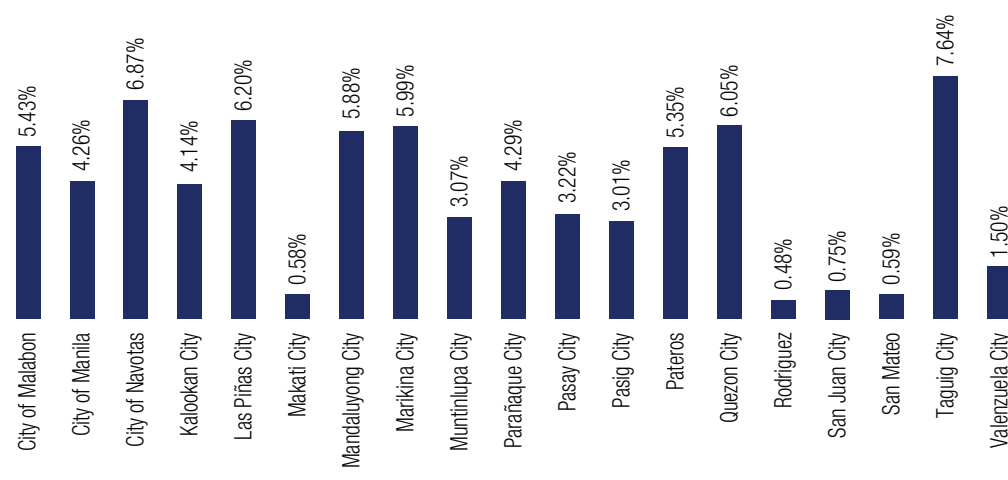


Source: EOWorld2, World Bank (2015) Slum Analyses in Metro Manila (SLAMM) Operational Document.

Distribution of Slums across LGUs

As a result of this analysis, the first ever database of **2500 slums** of various shapes and sizes were developed for Metro Manila. Spatial analysis demonstrates that informal settlements are not distributed evenly across Metro Manila. Quezon City, Metro Manila's largest municipality, has the largest share of total area of informal settlements at 33.89 percent. At 10.6 percent, Taguig City has the next largest share. Several municipalities including San Juan City, Makati City and Pateros have less than 1 percent. The areal proportions of slum settlements found across LGUs is shown in Figure 6 below.

FIGURE 6: Areal Proportions of Informal Settlements in Each Municipality



Slum Typologies

Given the contextual information leveraged within the object-oriented methodological approach, a unique slum typology was extracted based on built environment characteristics at city scale. The generation of such a typology highlighted the diversity of slum settlements at a glance, which then became the basis for carrying out further investigation to understand whether the differences in physical attributes mapped onto socio-economic differences that would be important when designing interventions. As will be discussed in the subsequent sections, a random sample of slum households, stratified by the slum typologies was carried out to understand whether there are differences in socio-economic conditions of slum dwellers across different types of settlements.

The development of slum typologies highlighted that there were various types of informal settlements that could be differentiated based on built characteristics and relationship to their surroundings. Available information on physical attributes was leveraged to identify the characteristics offering the highest discrimination power between the different types of slum settlements. Statistical methods were used to this effect and the selected attributes then combined in advanced spatial analysis models. This resulted in an informal settlement typology that consists in a first attempt to classify the slums in an objective way according to physical attributes.

Eight different classes were defined based on visual analysis of Pléiades data from 2014, Google Earth images and *a priori* knowledge. The description and illustrations of the different types of informal settlements can be found below.

- **High dense:** very dense informal settlements without any regular pattern, no or very few open spaces and composed of very small and compact objects. Largest settlement type in terms of area as well as settlement type with among the lowest levels of vegetation.

FIGURE 7: Examples of “High Dense” Informal Settlements



- ▶ **Low dense:** less dense informal settlements containing more open space or vegetation and mainly composed of small objects
- ▶ **Mixed:** less dense informal settlements composed of bigger buildings along with embedded small and dense objects. This class also concerns informal settlements which have grown inside residential areas. These settlements grow as new residential districts and road networks are built with some formal housing. Either remaining plots are not sold quickly enough or formal houses are not built quickly enough allowing informal settlers to come in and build structure between formal units.
- ▶ **Linear:** other informal settlement with a linear shape
- ▶ **Linear along railways:** informal settlements that have grown along railways and typically with a linear shape.
- ▶ **Linear along rivers:** informal settlements that have grown along rivers and typically with a linear shape.

FIGURE 8: Examples of “Low Dense” Informal Settlements



FIGURE 9: Examples of “Mixed” Informal Settlements



FIGURE 10: Examples of “Linear” Informal Settlements



FIGURE 11: Examples of “Linear Along Railways” Informal Settlements



- ▶ **Pocket:** small and very densely informal settlements which have grown in small vacant spaces often linked to commercial or industrial units or surrounded by big buildings. Traditionally overlooked in similar informal settlement identification exercises. Challenging to detect and likely present at a greater extent than measured.
- ▶ **“Under the trees”:** informal settlements composed of several polygons in informal settlements and in fact corresponding to only one informal settlement entity. This type of informal settlements are located below vegetation and thus not detected as one entity.

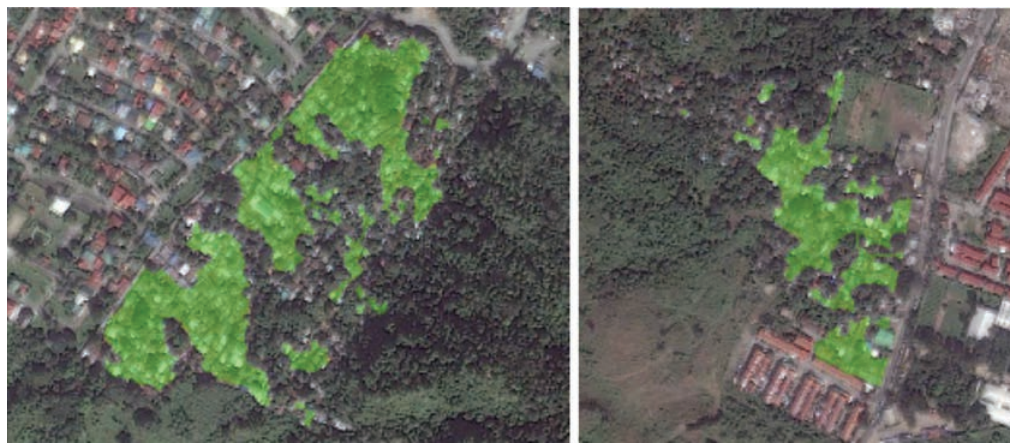
FIGURE 12: Examples of “Linear Along River” Informal Settlements



FIGURE 13: Examples of “Pocket” Informal Settlements



FIGURE 14: Examples of “Under the Trees” Informal Settlements



Distribution of Slum Typologies

The proportion of high dense settlements is the largest in terms of area (32 percent) and the second largest in terms of number of informal settlements (18.3 percent). Mixed and low dense settlements have the next highest share of area at 25.7 percent and 20.4 percent respectively. The under the tree category is comprised of settlements that are masked by tree canopy, resulting in only a small portion being detected by satellite. As a result, the proportion based on area is high (11 percent) compared with the proportion based on area (1 percent).

One surprising finding was that of the extent of Pocket Slums in Metro Manila. As Figures 15 and 16 show, while the proportion of 'pocket' slums within slum area is small (3.5 percent), it is the largest proportion of the total number of settlements (27 percent). Pocket slums are likely to be missed in traditional methods for identification and their situation not addressed when designing interventions.

FIGURE 15: Proportion of Slum Types (%) – Area

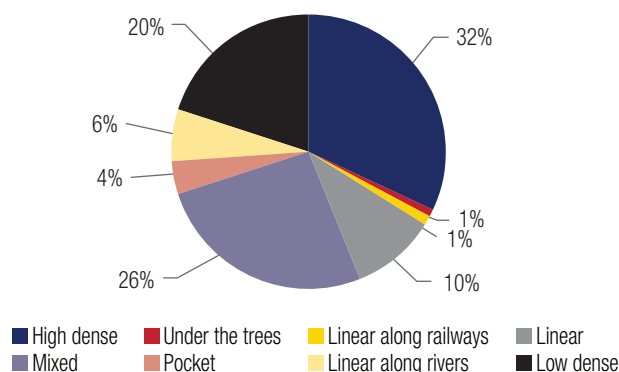
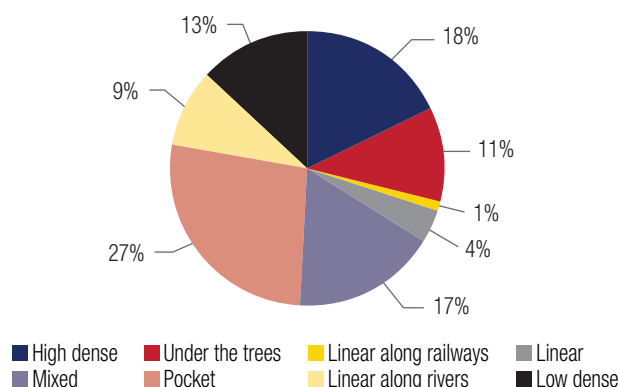


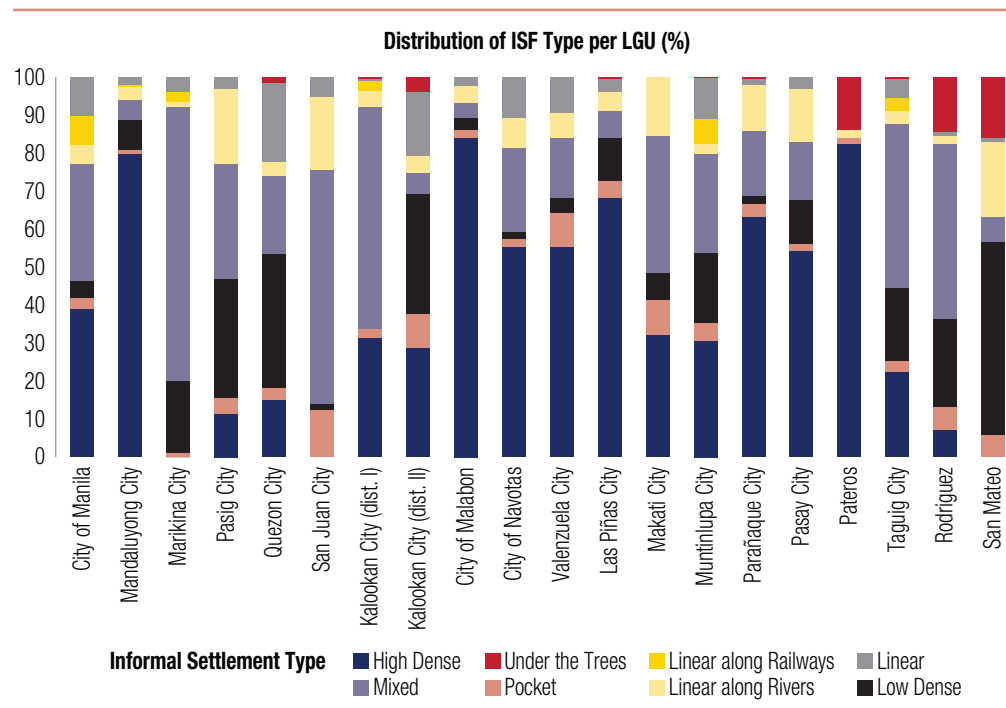
FIGURE 16: Proportion of Slum Types (%) – Number of Slums



Surveying Slums

While the mapping exercise generated extremely valuable information on the extent of slums in Metro Manila and their built characteristics, it provided little insights into the lives of slum dwellers and differences, if any, across typologies. At the very least, the typologies provided a way to generate a spatially representative sample of slums across Metro Manila, but more importantly, they allowed us to ask whether these differences in physical attributes and location in the city corresponded to socio-economic advantages or disadvantages. An understanding of differences in socio-economic and demographic context of slums would be particularly crucial to determining the types of interventions that may benefit slum dwellers in different locations of the city.

Given the funding constraints and the need for sufficient sample size distribution across the typologies, three Local Government Units (LGUs) or cities within Metro Manila were selected given their geographic location and history of development. These included, the city of Manila in the east and center, Quezon City in northwest and Muntinlupa on the southern shores of the Metro. Manila is the oldest municipality and forms the heart



of the urban expansion of Metro Manila, with some of the oldest slum settlements. The other two cities are located in newer areas of expansion as the city has expanded both in the north and the south over time (see Box 2 below). These two municipalities are more accessible to new migrants. In addition, Muntinlupa is home to a significant number of settlements along water bodies, whereas Quezon City has more settlements along infrastructure projects. Together, these three cities offer a representative sampling frame for the purposes of this study.

For the purposes for the survey, another iteration of typology classification was done to create a more manageable number of typologies to allow for meaningful stratification within the constraints of the overall sample size. Additionally, all segments/sub-polygons falling within the 100-m buffer from the lakeshore/shoreline of Laguna Lake and Manila Bay are to be re-classified as wet. Upon discussion with local experts, a 100-m buffer was deemed sufficient to cover for any flooding/storm surge hazards that could occur along the more open waterways such as the Lake and the Bay. Along the narrower waterways traversing the cities, segments/sub-polygons falling within 50 m on both sides of the river were re-classified as wet. This process resulted reducing the original eight typologies to five as follows:

- ▶ Highly dense
- ▶ Linear dry (combining linear along railway and other linear type of settlements)
- ▶ Wet
- ▶ Pocket
- ▶ Mixed (merged with low density and under the trees categories, with the latter being verified and categorized as needed during the household listing process)

Box 2: The Rise of Slums: When & Where?

Slum settlements were established as early as the 1920s and gradually increased over the years (see Table 5). Slum development peaked in the 1970s and 1980s when approximately half of all current settlements were established, continued at a high rate in the 1990s, and began to slow down following 2000. While Manila saw the most slums established prior to the 1970s, more settlements were established in Muntinlupa and Quezon City during the peak period between the 1970s and 1980s and Quezon City continued to see the development of slum settlements at higher rates into the 1990s and 2000s.

Today, Quezon City is home to the largest area of informal settlements across Metro Manila at 33.89 percent while Manila and Muntinlupa have only 6.10 percent and 3.95 percent respectively.

Informal settlers first inhabited wet and linear dry areas during and prior to the 1940s. Wet settlements spread rapidly along waterways and reclaimed or filled up riparian and coastal zones. As construction of infrastructure intensified in the 1970s and 1980s, linear dry settlements developed largely alongside the Philippines National Railway and major roadways. The 1980s also saw the expansion and proliferation slums in highly dense, pocket and mixed areas.

TABLE 5: Year Settlement Was Established by City

	Manila	Muntinlupa	Quezon City	All
1940s and Prior	6	3	0	9
1950s	8	4	4	16
1960s	14	8	9	31
1970s	13	22	27	62
1980s	18	17	52	87
1990s	8	11	28	47
2000 onward	3	7	8	18
Total	70	72	128	270

TABLE 6: Year Settlement Was Established by Typology

	High Dense	Linear Dry	Mixed	Pocket	Wet	Total
1940s and Prior	1	2	5	0	1	9
1950s	2	5	1	4	4	16
1960s	7	6	3	6	9	31
1970s	8	16	14	14	10	62
1980s	19	15	24	17	12	87
1990s	8	8	10	8	13	47
2000 onward	5	1	9	1	2	18
Total	50	53	66	50	51	270

Following this process, for all the slums in the three selected LGUs, a segmentation of large polygons was carried out to create segments of more or less similar number of small buildings (~200), which served as Primary Sampling Units (PSUs). Such segmentation by approximate number of buildings was only possible by leveraging the power of

Object-Based Image Analysis applied to very high resolution imagery that allowed us to not only detect and delineate informal settlements but also to roughly reach the level of the individual dwellings. Segmentation took into account as much as possible important access points (i.e. street/roads) and landmarks (river, institutional buildings, commercial and residential areas) defining the boundaries and entry to the sub-polygon or segment. Attribute data was provided for the segmented polygons particularly coordinates, number of small buildings and barangay location, which facilitated the household listing process for drawing the final sample of households to be interviewed and determining the sampling weights. The sample was stratified by city and typology such that a strata was jointly represented by a city and typology.

The development of the survey instrument followed a two-stage process: the preparation of the paper questionnaire followed by the programming and transforming of the paper questionnaire into a tablet-readable Computer-Assisted Personal Interview (CAPI) form. The stages of development are iterative going from paper to CAPI and vice versa until finalization to attain congruence and consistency. The data collection followed rigorous protocols and accuracy checking mechanisms were established within and outside the field to ensure high quality data. For interested readers, a detailed Operational Report of the spatial sampling approach utilized in this survey is available from the World Bank.

A total of 2,606 households, corresponding to a population of 11,840 persons, were interviewed across the National Capital Region cities of Manila, Quezon City, and Muntinlupa.



Navigating Informality: A Closer Look inside Metro Manila's Slums

The data collected through the household level survey provided an in-depth understanding of the socio-economic differences in living conditions of slum residents living in Metro Manila. This section attempts to offer a more granular understanding of lives of slum dwellers in Metro Manila. Overall, we find that slum households' experience of informality is not limited to the spaces they inhabit but extends to their jobs, modes of transport and access to basic services. Life in informal settlements has advantages alongside the considerable disadvantages, though these advantages are often left out of the cost benefit analyses accompanying the design of urban upgrading initiatives.

Opportunities and Challenges of Youthful Age Structure and High Burden of Dependents

On an average, the slums are inhabited by young, productive-age groups. The mean age of the sample population is 26 (standard deviation 18.4), and is quite similar across the three cities and the typologies. Table 7 below provides a more detailed distribution of age. Just over 32 percent of the population is under the age of 15 while nearly 65 percent are in the productive age range of 15–64. Manila has a larger dependent population (youth and elderly) with a higher presence of children in wet and high dense settlements and a higher presence of elderly in linear dry settlements.

Dependency ratio is helpful for understanding the social support requirements imminent in a community's population age structure.²⁰ For the National Capital Region on the whole, the general dependency ratio was 48 based on the Census 2010, which indicates that for every 100 working-age persons, there were 48 dependents (42 young dependents and 6 old dependents). However, in the case of slums (across cities as well as typologies), the burden of dependents is much higher for the working age population living in slums

²⁰ General dependency ratio is the number of children (0–14 years old) and older persons (65 years or over) per 100 people in the working age (between 15 and 64 years old). The young age dependency ratio is the number of children per 100 people in the working age. The old age dependency ratio is the number of older persons per 100 people in the working age. Typically, three types of dependency ratios complement each other: general dependency ratio, old age dependency ratio and young age dependency. http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/demographics/dependency_ratio.pdf.

TABLE 7: Age Distribution by ISF Category and City

City/Age	High Dense	Linear Dry	Mixed	Pocket	Wet	All
Manila						
0–14	33.7	30.83	31.65	31.77	37.19	33.12
15–64	63.14	64.81	65.36	64.62	59.88	63.46
65+	3.03	4.36	3	3.43	2.78	3.32
Don't Know	0.14	0	0	0.18	0.15	0.1
Quezon City						
0–14	32.83	31.17	33	30.88	31.41	31.83
15–64	65.03	65.67	64.52	66.46	66.07	65.57
65+	2.14	3.07	2.48	2.57	2.52	2.56
Don't Know	0	0.09	0	0.09	0	0.03
Muntinlupa						
0–14	34.79	28.35	26.36	34.01	33.48	31.77
15–64	61.79	68.87	69.55	63.75	63.19	65.08
65+	3.42	2.78	4.09	2.23	3.33	3.15
Don't Know	0	0	0	0	0	0
ALL						
0–14	33.59	30.38	31.34	31.86	33.34	32.15
15–64	63.62	66.21	65.74	65.34	63.79	64.89
65+	2.74	3.37	2.93	2.7	2.83	2.91
Don't Know	0.05	0.04	0	0.09	0.03	0.04

(See Table 8). Among the three cities, Manila has a notably higher dependency ratio (approximately 58 dependents per 100 working age adults).

With respect to the typologies, High Dense and Wet slum settlements face the highest burden of dependents. Across most of these categories, the burden of care is driven by

TABLE 8: Dependency Ratios Across Metro Manila Slums

City/Typology	General Dependency Ratio	Young Age Dependency Ratio	Old Age Dependency Ratio
Manila	57.58	52.34	5.23
Quezon	52.50	48.58	3.91
Muntinlupa	53.65	48.81	4.84
High dense	57.18	52.87	4.31
Linear	51.02	45.94	5.08
Mixed	52.12	47.66	4.45
Pockets	53.03	48.89	4.13
Wet	56.75	52.32	4.43

younger populations and the old-age dependency is overall lower than the NCR levels, particularly in Quezon City. These findings signal important differences in the social welfare and social protection needs of slum settlements, where the greater benefits may arise from interventions focused on younger populations needs. From a generational perspective, the young age structure of slums and higher youth dependency ratios poses both opportunities and challenges to the government: opportunities to harness the abundant human capital for the future and challenges to create adequate employment for them all.

Slum Dwellers Have Higher Levels of Education than Urban Poor in NCR

At the NCR level analysis of urban poor presented earlier in the report, low educational attainment was shown to be strongly associated with income poverty. Less than 9 percent of the heads of urban poor households in NCR had attained any college education or above (see Figure 4). In contrast, in the case of the surveyed slum dwellers 18 years and older, the more than 25 percent of the population has completed some college education (see Table 9). This pattern was maintained across the three cities as well as typologies with the exception of Pocket slums where the share of college students or graduates is slightly lower albeit still significant. Linear settlements had the highest percentage of college educated population. These findings are important as they underscore the fact that slum dwellers are not synonymous with urban poor, as is anecdotally believed. Rather, they suggest that slums are home to a significant proportion of youth who are pursuing or have attained higher education but are unable to convert it into social mobility of residence in better provisioned neighborhoods.

Independent of the comparison with urban poor, the data highlights that there is still room for improvement in the educational attainment of slum residents given that more than half of the 18 years and over population had not completed high school level education. Labor-market entrants with limited education often resort to low-skill and low-wage jobs that are generally informal. Indeed among the surveyed population, nearly 60

TABLE 9: Highest Level of Educational Attainment by City (%)

Highest Level of Educational Attainment	Manila	Quezon City	Muntinlupa	All
No Grade Completed	1.63	0.82	0.64	0.99
Some Elementary	13.49	11.27	10.81	11.73
Elementary Graduate	11.39	9.6	8.31	9.73
Some High School	30.94	31.84	28.06	30.64
High School Graduate	18.77	20.37	26.52	21.53
Some College	18.24	20.99	19.91	20
College Graduate or Higher	5.06	4.91	5.75	5.16
Don't Know	0.42	0.2	0	0.21
No Data	0.05	0	0	0.01

TABLE 10: Highest Level of Educational Attainment by Typology (%)

Highest Level of Educational Attainment	High Dense	Linear Dry	Mixed	Pocket	Wet	All
No Grade Completed	1.42	0.47	1.32	0.73	1.02	0.99
Some Elementary	12.79	9.38	10.53	11.68	13.87	11.73
Elementary Graduate	9.72	9.78	8.39	9.93	10.57	9.73
Some High School	30.44	28.21	28.72	35.17	30.76	30.64
High School Graduate	21.54	24.29	20.1	21.17	20.58	21.53
Some College	18.62	20.31	24.15	18.06	19.1	20
College Graduate or Higher	5.24	7.15	6.63	3.12	3.93	5.16
Don't Know	0.22	0.4	0.15	0.07	0.17	0.21
No Data	0	0	0	0.07	0	0.01

percent of respondents are employed in unskilled or semi-skilled positions (see section on Employment for further details). The long-term ramifications of early informal employment are decreased wages and employment potential over a worker's lifetime.²¹ Looking across cities, the lowest levels of educational attainment were found in Manila and the highest in Muntinlupa. When considering typology, pocket slums tend to have the lowest levels of overall educational attainment, followed closely by Wet settlements. Linear and Mixed settlements fare much better across all typologies.

That said, perhaps in recognition of the opportunities created through education, nearly 92 percent of school-aged children in the surveyed households are currently attending school (a discussion of conditional cash transfer programs tied to school enrollment can be found in Box 3 below). It is no surprise that in focus group discussions on potential relocation from slum settlements, participants reported that easy access to schools was a major concern along with access to transportation and employment opportunities (See section on Choice of Residential Location).

Slum Communities Significantly Contribute to the City's Economy but Employment is Marked by Informality

As discussed previously in the report, employment in the Philippines is marked by informality, with over three-quarters of all workers employed informally nationwide. Two thirds of all urban jobs are informal, and even among wage workers, 6 out of 10 are hired without a formal contract.²² Not surprisingly, slum settlements in Metro Manila are no exception. The job opportunities available to residents of slums consist largely of low-skilled or low-wage labor. When considering the main activity of household members aged 15 or older, a significant majority of 59 percent are working. Their incomes largely support the remaining

²¹ Packard, Van Nguyen. 2014. East Asia Pacific at Work: Employment, Enterprise, and Well-being. Washington, DC: World Bank.

²² World Bank (2017) The Philippines Urbanization Review (forthcoming).

Box 3: Are Social Protection Programs Reaching Slum Dwellers?

Many urban poor benefit from conditional cash transfer though the amount is relatively small.

Introduced in 2007, *Pantawid Pamilyang Pilipino Program (Pantawid Pamilya)*, which is managed by the Department of Social Welfare and Development (DSWD), provides cash in exchange for compliance with age-specific health and education conditions, such as receipt of pre- and post-natal care, immunization, and 85 percent attendance rate at daycare, primary, or secondary schools. Since its inception, it has reached 4.2 million households, or approximately 21 percent of the country's total population. It has a budget of US\$1.5 billion, equivalent to 0.5 percent of the GDP. Beneficiaries are poor households with children aged 0–18 and/or with pregnant women that have permanent address, identified through *Listahanan*, the national household targeting system.

On average, *Pantawid Pamilya* beneficiary household received a monthly grant of Php.703.5 (US\$16.4) in 2013, which corresponds to 11.6 percent of beneficiary households' monthly income from the poorest quintile in the same year. This is lower than the benefit level of around 23 percent of potential households' income which the program intended to achieve at the time of its design in 2006, which is on par with CCT programs in other countries such as Brazil and Mexico. Nevertheless, *Pantawid Pamilya* has proven effective. Impact evaluation found that the program reduced the poverty rate among the beneficiaries by 6.5 percentage points and the national income inequality as measured by Gini coefficient.

Social Protection is directed at the urban poor but not specifically at slums. *Listahanan* used the “pockets of poverty” methodology to identify the poor in urban areas. While targeting accuracy is high compared to CCT programs in other countries, nevertheless, inclusion errors remain at 37 percent, 15 percentage points higher than 22 percent in rural areas. In 2013, among poor households with children 0–14, the coverage rate was 58 percent. Of the program's total beneficiaries, 65 percent are income poor and 35 percent are non-income poor, while ISFs only represented 4.4 percent of the beneficiary households. Among slum populations surveyed for this study, only 15 percent reported receiving PPPP.

Source: World Bank (2017) *The Philippines Urbanization Review* (forthcoming).

TABLE 11: Primary Activity by Typology

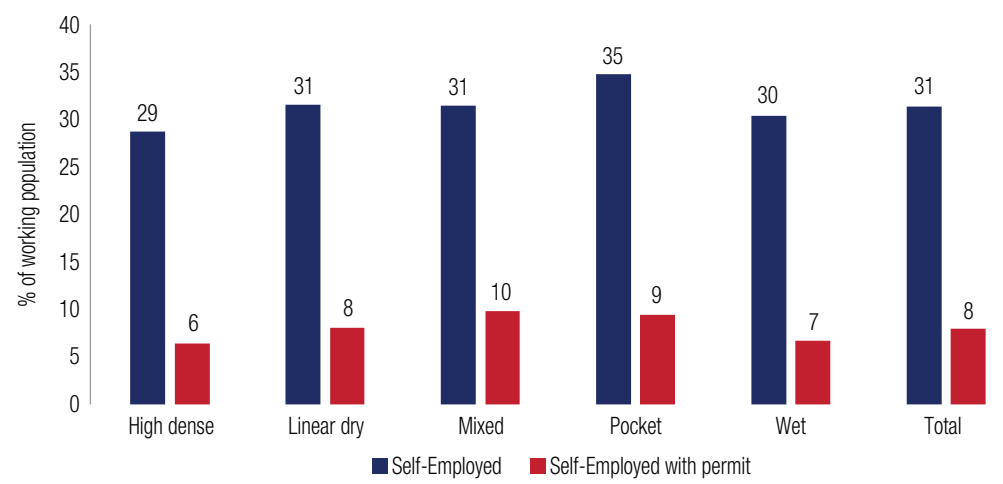
	High Dense %	Linear Dry %	Mixed %	Pockets %	Wet %	All %
Working	59.99	59.09	56.90	57.55	59.47	58.64
Student	8.20	11.33	12.39	10.13	9.89	10.39
Retired Pensioner	1.86	2.63	1.33	1.79	1.14	1.73
Home Makers & Unemployed	29.89	26.88	29.31	30.20	29.19	29.06
Other	0.07	0.06	0.07	0.33	0.31	0.17

adult household members of whom 10 percent are full time students, almost 2 percent are retired pensioners and nearly 30 percent either home makers or unemployed.

Of the working population, approximately 31 percent are self-employed as seen in Figure 17 below. Self-employed workers are most prominent in pocket settlements (35 percent), particularly in Muntinlupa (39 percent) and least prominent in high dense settlements (29 percent).

Only a quarter of self-employed workers are operating with a business permit. The remainder work informally and are vulnerable to a number of obstacles that can range from

FIGURE 17: % of Workers That are Self-Employed by Typology



an inability to access credit and expand business to being victimized by authorities by extracting bribes or shutting down informal working spaces.²³ Until 2000, street vendors in Cebu City were subject to unannounced eviction and saw their stalls demolished by city officials without warning. The practices ended when vendors organized and lobbied city officials for reduced harassment. Up until that point, city administrators could demolish vendor stalls without notice.²⁴ Nevertheless, biases held by authorities and the association of informal shops and business with slums and poverty remain damaging for self-employed workers.

A similar sentiment was echoed during the pre-survey qualitative fieldwork undertaken for this report. The discussion with a community leader from Barangay Culiati in Quezon City summarized the biases held against home-based work within the context of a slum upgrading operation. The community he was a part of was in the process of in-situ upgrading, with families relocating to newly constructed buildings in phases. Most of the families undergoing relocation said that they were willing to pay for maintenance of the community but the leader charged with site management of the new property would not allow sari-sari stores (small home-based shops) or the set-up of other home based businesses as he believed them to be signs of informal settlements rather than progress. When asked how the families would pay off loans for their new residences if they weren't allowed to run their businesses based on which their loan pay-back capacity was determined, the community leader conceded that there might be justification for allowing some activities on a case by case basis. When suggested, he was open to the idea of building some sort of community hall for sale of goods. However, no such plans for a multi-purpose space existed

²³ ILO. 2011 Women and labour markets in Asia: rebalancing towards gender equality in labour markets in Asia/ ILO Regional Office for Asia and the Pacific; Asian Development Bank. Bangkok. ILO.

²⁴ Etemadi, Felisa. 2004. The politics of engagement: gains and challenges of the NGO coalition in Cebu City. *Environment and Urbanization*, 16(1), 79–94.

at the resettlement site, nor was the community being engaged in the plans for banning all (or at least, many) informal activities.

Of those workers who are not self-employed, the large majority (92 percent) work in private industry. The remaining workers are employed in government (7 percent), or work for private households (1 percent). Less than half of all employed workers have a written contract (42 percent). Across cities, contracts were rarest in Manila where the share of workers with contracts was 35 percent compared to 41 percent in Quezon City and 52 percent in Muntinlupa. Similar to their self-employed peers, informal workers are left vulnerable to potential exploitation. In this case, workers without contracts can be vulnerable to abuse by employers in the form of unfair hours, withheld wages, and unannounced layoffs.²⁵

Over a quarter of those working, are employed in unskilled labor (28 percent), performing jobs such as janitors, porters, trash collectors and working in households as maids and childcare providers. An almost equal number are in business and sales roles (26 percent), with jobs in call centers, eateries and stores. Another 32 percent are in semi-skilled but low-wage work in fields such as construction or transportation. Unskilled workers are more concentrated in high dense settlements (32 percent) while business and sales professionals are found at higher rates in linear and mixed settlements (27 percent in both).

Notably, 14 percent of workers are in a professional role as support staff, accountants, teachers, and medical professionals. The highest concentration of professional workers are found in linear settlements (16 percent). When taken together with the 25 percent of the ISF population that has attended some college or graduated from college, it stands to reason that some middle class families also reside in the slums and informal settlements of Metro Manila.

Their presence in slums points to the larger issue of limited affordable housing and highlights how the city's housing stock has not kept pace with growing populations. It also demonstrates how slums have diverse populations that range in education, employment, and income more than is commonly assumed. Rather than being viewed as a manifestation of poverty, slum communities are productive and households contribute widely to the city's economy.

Informal Transport Promotes Access to Jobs

Nearly 70 percent of daily trips in Metro Manila are made using public transportation.²⁶ A look at the transportation modes used by slum dwellers, for their daily commutes, however, reveals a different usage pattern. Public transportation is used by 22 percent of the respondents, with the largest share residing in linear settlements (26 percent). This makes sense given that linear settlements tend to concentrate along primary transit routes. Somewhat surprisingly, however, bus use in Manila accounts for only 5 percent of commutes, compared with 16 percent overall.

²⁵ IIO, 2011.

²⁶ World Bank (2015) Urban Transport & ICT Capacity Building Completion Report.

TABLE 12: Occupation of Employed Adults

Occupation	High Dense	Linear	Mixed	Pocket	Wet	Total
Unskilled	31.72	27.01	24.94	27.71	29.18	28.17
Janitor/Janitress	2.08	1.65	1.66	1.36	1.47	1.63
Junk Collector	0.58	0.62	0.59	0.45	1.04	0.68
Delivery Person/Services	1.50	1.34	0.95	0.79	0.87	1.08
Garlic Peeler	1.04	0.21	0.12	0.00	1.13	0.53
Porter/Truck Helper	3.00	1.65	1.78	1.13	1.56	1.80
Household Service Provider (Maid, Babysitter, Laundrywoman)	5.88	5.77	5.11	6.33	5.11	5.62
Security Guard	3.34	3.40	3.21	2.83	3.03	3.16
Other Unskilled Labor	14.30	12.37	11.52	14.82	14.98	13.67
Semi-Skilled	30.10	29.48	33.61	34.05	32.38	31.90
Technician	6.23	4.12	6.53	4.41	4.76	5.15
Carpenter/Mason	7.38	7.01	7.48	7.24	8.66	7.61
Service Crew	3.00	3.40	3.33	3.39	3.20	3.26
Beautician/Cosmetology	2.08	3.20	1.66	2.38	2.08	2.29
Cook/Chef	1.04	1.34	1.54	0.90	1.73	1.34
Farmer/Fisherman	0.23	0.31	0.59	0.34	0.95	0.51
Car/Bus/Jeep/Truck	8.30	8.76	10.93	13.91	9.35	10.17
Sewer	1.85	1.34	1.54	1.47	1.65	1.57
Business and Sales	25.26	27.73	27.08	23.87	24.68	25.69
Betting Services Staff	0.46	0.72	0.24	0.34	0.35	0.42
Salesman/Saleslady	4.38	5.05	2.97	3.05	3.55	3.82
Sports and Entertainment	0.35	0.62	0.24	0.90	0.78	0.59
Sales Agent/Trader	2.42	2.99	3.80	2.60	2.34	2.80
Eatery Owner/Operator	0.23	0.52	1.07	0.57	0.09	0.47
Computer Shop Owner/Operator	0.23	0.31	0.24	0.45	0.43	0.34
Entrepreneur/Manufacturer	0.69	1.55	1.19	1.47	1.30	1.25
Vendor	16.38	15.67	16.86	14.03	15.67	15.71
Lender	0.00	0.00	0.36	0.00	0.09	0.08
Lessor	0.12	0.31	0.12	0.45	0.09	0.21
Professional	12.69	15.77	14.37	14.37	13.51	14.14
Call Center Agent	2.31	2.16	3.33	0.68	1.21	1.89
Manager/Coordinator/Director	0.12	0.82	0.24	0.23	0.61	0.42
Medical Personnel/Staff	0.69	0.82	1.07	0.57	0.69	0.76
Research/Technical Support Staff	1.38	1.44	1.31	1.24	1.65	1.42
Accounting/Administrative Staff	6.23	7.11	6.65	8.26	6.75	6.99
Barangay Official/Government Employee/Police	1.27	1.65	1.78	1.58	1.04	1.44

(continued on next page)

TABLE 12: Occupation of Employed Adults (continued)

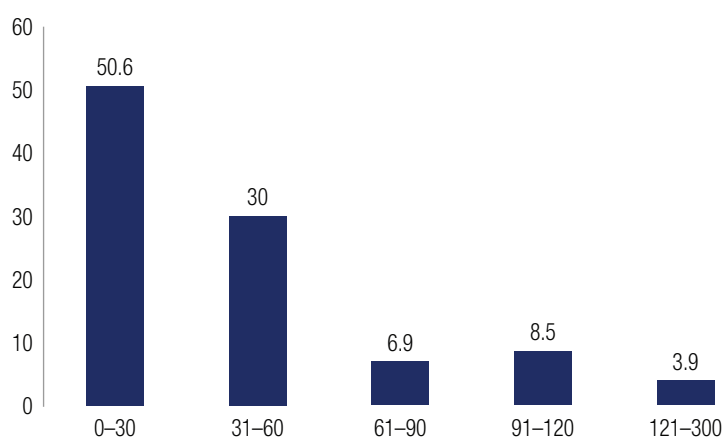
Occupation	High Dense	Linear	Mixed	Pocket	Wet	Total
Physical Planner/Designer	0.58	0.52	0.36	0.57	0.17	0.42
Seaman	0.69	1.13	0.00	0.23	0.26	0.47
Teacher/Professor	0.81	1.75	1.19	0.57	1.47	1.19
Others (OFW, Pastor, Volunteer, Journalist)	0.92	0.52	1.78	1.13	0.87	1.02
<i>Don't Know</i>	<i>0.12</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.35</i>	<i>0.46</i>
<i>Refuse to Answer</i>	<i>0.12</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.12</i>
Total	100	100	100	100	100	100

A far larger share of the surveyed population rely on informal transportation (66 percent) including jeepneys (43 percent) and tricycles (19 percent). Jeepneys are not recognized as part of Metro Manila's formal transit network, though there was a recent joint effort by the World Bank and Department of Transportation & Communications to map Jeepney routes in order to build out Metro Manila's first multi-modal transit map and database. Following informal transportation and public transit, walking is the third most popular form of commute, at 22 percent.

TABLE 13: Primary Means of Transportation for Work Commute (Multiple Response)

Transportation	High Dense	Linear	Mixed	Pocket	Wet	Total
Home-based (No Commute)	0.93	0.88	0.00	0.00	0.50	0.49
Pedestrian	21.95	19.30	22.07	27.16	19.85	21.82
Private Vehicle	14.37	14.33	13.79	14.53	14.27	14.26
Private (Car, Motorcycle)	8.66	9.80	10.00	8.82	10.30	9.56
Bicycle	4.33	3.65	2.24	3.46	2.73	3.28
Taxi	0.31	0.29	0.34	0.00	0.12	0.21
Skates/Trolley	0.15	0.00	0.34	0.52	0.00	0.18
Other	0.93	0.58	0.86	1.73	1.12	1.03
Public Transit	20.87	25.88	22.41	23.18	20.35	22.46
Bus	13.45	18.27	17.24	16.09	15.76	16.15
Train (LTR/MRT/PNR)	7.11	7.16	5.17	6.57	3.85	5.89
Boat/Ferry	0.31	0.44	0.00	0.52	0.74	0.42
Informal Transport	66.46	66.37	66.90	55.88	73.20	66.31
Jeepney	39.41	45.91	46.72	38.75	44.67	43.22
Tricycle	23.65	17.69	17.93	13.49	22.58	19.36
Pedicab	1.55	0.58	0.52	1.56	1.61	1.18
FX	1.85	2.19	1.72	2.08	4.34	2.55

FIGURE 18: Time Spent Commuting to Work in Minutes for Household Heads (%)



There is a heavy reliance on informal transport in wet settlements (73 percent) and relatively fewer users in pocket settlements (56 percent). This might suggest that more residents of wet settlements must commute to employment in general compared to residents of pocket settlements, which are often times developed around industrial areas or neighborhoods where they might engage in small business activities. In corroboration of this narrative, surveyed populations were asked about what benefits were derived from their particular settlements (see Choice of Residential Location section for full discussion). Residents of pocket settlements had

the highest number of responses for ‘proximity to work’ at 64 percent and ‘availability of customers and markets’ at 27 percent among all typologies. They are also more likely to walk to work (27 percent), which could suggest a closer workplace. Conversely, only 23 percent of those living in wet settlement recognized “availability of markets and customers’ as a benefit of their settlement, the lowest among all typologies. Wet settlements also had among the lowest percentage of residents walking to work at 20 percent. Only linear settlements had a lower percentage (19 percent), though again, these respondents were most likely to use public transit.

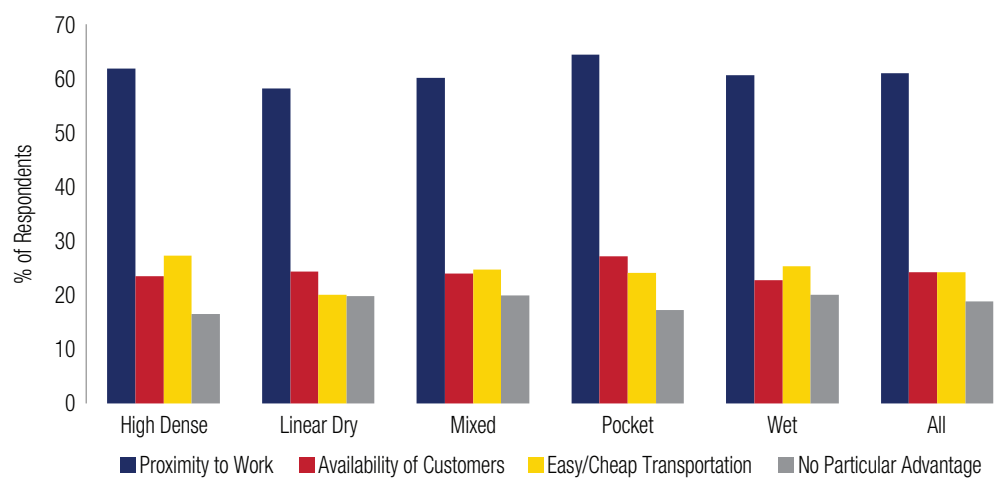
While public transportation use is not entirely trivial, the preference for informal transit (jeepneys and tricycles) and walking as well as the significant underuse of the buses in Manila suggest that public transportation is inconvenient, unaffordable, or some combination of both for populations living in slums. Previous studies have shown transportation costs to account for 15 percent of total household expenditures among those living in informal settlements.²⁷ As a point of comparison, an equal amount could be spent for a kilo of rice or three cans of sardines, sufficient for a daily meal.²⁸

Additionally, the Numbeo Quality of Life Index has shown average car commute times in Manila to be 58 minutes long, though anecdotal evidence suggests much longer commute times during rush hour. A trip from Quezon City to Makati during peak morning or afternoon rush can take as long as two hours. However, half of all slum residents commute for less than 30 minutes, and 80 percent commute for under an hour, less than the average commute time for Metro Manila. This provides further evidence of slum settlements developing in close proximity to employment opportunities. The next section will show that proximity to work is indeed perceived to be a primary benefit of living within slum settlements.

²⁷ JICA (2014) Roadmap for Transport Infrastructure Development for Metro Manila and its Surrounding Areas.

²⁸ Ateneo School of Government. (2014). “Inclusive Mobility Network Action Plan”. Manila.

FIGURE 19: Benefits of Living in Informal Settlement by Typology



Choice of Residential Location is Driven by Ease of Access to Work

Literature on informal settlements and slums suggests that easy access to employment within the city is a strong factor behind the choice to live in slums. In Nairobi, Kenya only 11 to 20 percent of all formal industrial and commercial work can be reached by the average household within an hour when travelling by bus, *matatu*, or on foot. While most residents of informal settlements in Nairobi have jobs as well as relatively higher levels of education than those living in formal housing, they are willing to compromise and remain in informal settlements to maintain proximity to their employment.²⁹

Indeed, for Metro Manila, when asked about the benefits of living in an informal settlement relative to employment opportunities, proximity to workplace was the most popular reason given, accounting for 61 percent of all respondents as shown in Figure 19 above. There was some variation across cities as 63.92 percent of respondents in Manila citing proximity to work as the primary benefit compared with 60.68 percent in Muntinlupa and 59.36 percent in Quezon City. These corresponded closely with commute times, as Manila had the highest percent of residents with commutes under a half hour. Additionally, Manila had the highest percent of commuters who walked to work (27.84 percent) compared to Muntinlupa (17.8 percent) and Quezon City (17.8 percent).

Self-employment is one way of coping with limited accessibility to formal employment opportunities as well as high transportation costs.³⁰ In fact, availability of clients, customers and markets tied with easy/cheap transportation as the next greatest benefit of living in an informal settlement garnering 24.27 percent of the respondents each.

²⁹ Cira, Dean A.; Kamunyori, Sheila W.; Babijes, Roderick M. 2016. Kenya urbanization review. Washington, DC: World Bank.

³⁰ Baker, Judy L. 2008. Urban poverty : a global view. Urban Papers ; no. UP-5. Washington, DC: World Bank.

Availability of customers and markets was valued more highly compared with easy transport in Manila (26.25 percent compared to 19.65 percent) and in pocket slums in particular (35.34 percent). In both Quezon City and Muntinlupa, the preference was switched, and easy transport was perceived to be a greater benefit (25.26 percent in Quezon City and 27.21 percent in Muntinlupa) compared with access to customers and markets (23.29 percent in Quezon City and 24.04 percent in Muntinlupa). Finally, nearly 19 percent of respondents perceived no advantage at all.

The extent that residential location is influenced by mobility was made apparent in interviews with informal communities that were considering or facing relocation (see Box 4 below).

Costs of Inadequate Services

The exclusion created through limited mobility or access to employment opportunities is mirrored in the home by the lack of provision of basic city services like water and electricity. In the case of Metro Manila, while nearly 100 percent of households use electricity for lighting, less than half of all households (46 percent) have their own connection to Meralco,

Box 4: Accessibility of Informal Urban Settlements in the Philippines

Focus Group Discussions were carried out with residents of four informal settlement communities in the Philippines. Two of the communities were located in “danger zones” susceptible to flooding. The importance of location of slums and access to transportation were among the issues raised. Discussants offered the following observations:

Proximity to services and transit increased the desirability of the informal settlement location:

“While the men would usually have to commute or bike to their work areas (some as far as Cubao), the participants agree that the settlement is near areas which they consider important: the malls, the public market, school for their children (walking distance) and the highway to get around to other areas of Metro Manila. Proximity to malls indicates better access to transport.” (Community Franville 4, Caloocan City)

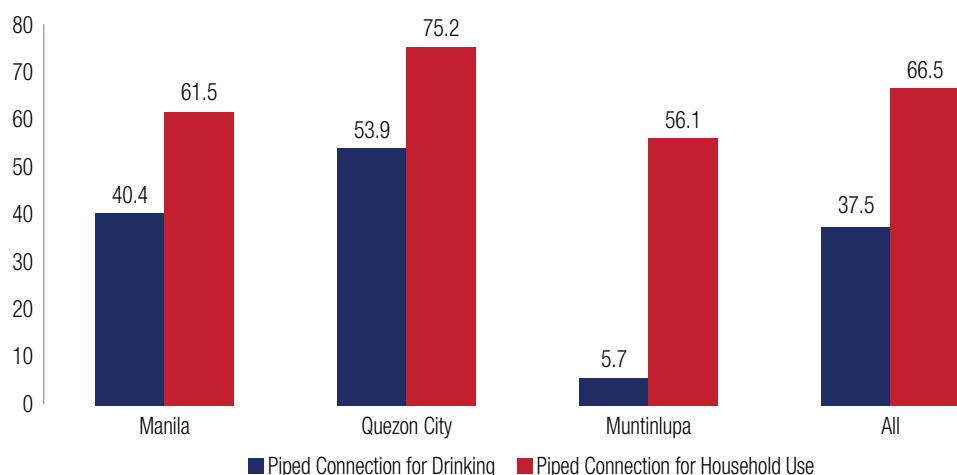
Accessibility of community services compensates for commuting times & related expenses:

“Most [residents] would need to commute to work and do several transfers to get to their place of employment. The participants said that they are willing to commute because it is more expensive for them to stop work in order to look for employment nearer their place of residence (it is harder for them to lose work). The settlement is accessible to the malls and other areas such as the public market, which makes it also beneficial to the community because they believe that since they are near the ‘busy centers’ there is more work for them (ex. as tricycle driver, the transportation hub at SM offers more passengers for him), and the mall serves as a community center as well.” (Community Sto. Nino, Caloocan City)

Relocation to safer/ upgraded living quarters was associated with new household expenditures directly related to availability and affordability of transport:

“For the participant who was relocated, she said that the relocation site in Bulacan is accessible to the road and to the school (one jeepney ride away), but the public market is too far from the site and there are no butcher shops or sari-sari stores in the relocation site, while the nearest shops to the site are more expensive than those at the public market. This adds to the expenses of the family as they have to make several trips to the public market since they cannot store food in the house (lack of electricity). Also because the relocation site is far from the place of work of the participant’s husband, the husband has to stay in at work and just go home during weekends.” (Community Bistekville 2, Barangay Culiati Quezon City)

FIGURE 20: Water Sources for Domestic Use Versus Drinking by City



the only electric power distributor in Metro Manila. This due largely the Philippines having the fifth most expensive electricity rate in the world, averaging \$0.24 per kilowatt-hour in 2012.³¹ High rates force the remainder of households to either share a group connection (37 percent), use a neighbor's line through an illegal "jumper" connection (14 percent) or forgo any home electricity (2.5 percent). Reliance on jumper connections is higher in Manila at 21 percent than in both Quezon City at 12 percent or Muntinlupa at 11 percent.

There are even greater disparities with the provision of water. Only 67 percent of households have a piped water connection in their home that can be used for such domestic activities as washing, cleaning and bathing while 17 percent fetch water from a neighbor and an addition 8 percent are directly connected to their neighbor's connection. Major constraints to potable water include new user connection fees, which can range from US\$97 in Manila West to US\$176 in Manila East, as well as administrative requirements such as proof of land titles.³² Use of one's own piped connection is lowest in the wet slums of Manila (48.2 percent) and Muntinlupa (50.2 percent). Interestingly, in the wet settlements of Quezon City, use of piped household connection is high at 78.2 percent.

The barriers to municipal water and electricity provision, namely prohibitive costs and administrative obstacles, are common to informal settlements around the world. In fact, high connection fees and the inability to pay regularly are both direct consequences of the informal nature of slums.³³ Box 5 on electricity provision in Latin America highlights not only the similarities in barriers, but also how solutions can be targeted to address the problems posed by informality.

Among households with available home water connections, a large percent use their piped water connection only for domestic activity and not for drinking water (see comparison of water

³¹ International Energy Consultants. (2012) "Regional Comparison of Retail Electricity Tariffs". Meralco. Manila.

³² World Bank (2017) The Philippines Urbanization Review (forthcoming).

³³ Nel-lo, O., & Mele, R. (Eds.). (2016). *Cities in the 21st Century*. Routledge.

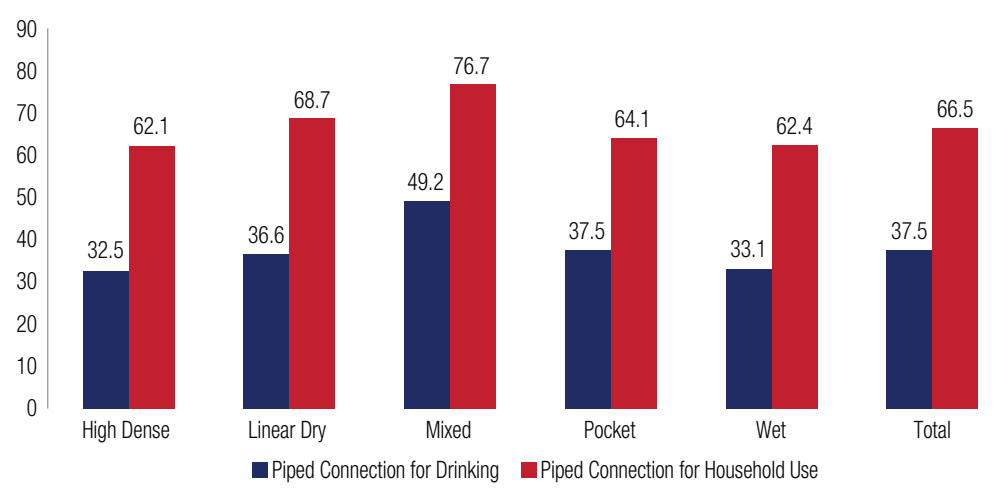
supplies for drinking and domestic use in Figure 20 above). Just over half of all households purchase drinking water from private water vendors. In Manila this percentage drops to 44.4 percent and in Quezon City to 34.9 percent. However, in Muntinlupa, where only 5.7 percent of households drink water from their piped connection despite 56.1 percent of households using the same water for domestic chores, a surprisingly high 85.7 percent of households opt to purchase water from vendors. When considering typology, residents in mixed settlements have the highest rates of piped water connection, with nearly 77 percent using piped water for domestic chores. Yet within this same group, just under fifty percent use the same piped source for drinking water. Given that water sources in urban areas can be contaminated by improper disposal of domestic and industrial waste, there is a perception that water sold through private vendors is safer for drinking. However, residents of informal settlements pay 9–13 times more for water delivery than residents of adjacent neighborhoods that are fully serviced.³⁴

Informal and improvised service provision of both electricity and water has the potential to affect the health and productivity of households. With regards to health, it is unclear whether water vendors are supplying water that has been properly treated or meets municipal safety standards. With regards to productivity, a number of informal households engage in home-based businesses, and relying on neighbors or other sources for water and electricity can potentially disrupt income-generating activities at home (see Box 6 below).

Vulnerability to Disasters

In addition to inadequate service provision, informal settlements must also contend with threats posed by natural disasters and other safety hazards. Settlements tend to form on land that is flood-prone or otherwise lacking. Nearly 100 percent of households have experienced

FIGURE 21: Water Sources for Domestic Use Versus Drinking by Typology



³⁴ Ballesteros, M. (2010). "Linking Poverty and the Environment: Evidence from Slums in Philippine Cities". Philippine Institute for Development Studies; Manila.

Box 5: Barriers to Service Provision in Latin America Stemming from Informality

Similar to Metro Manila, in Latin America, physical access to electricity is available to a high percentage of households. The average across Latin America is 93 percent and in countries like Chile and Brazil, electrification rates are 99 and 98 percent respectively. Despite high access rates, and grid access within slums, non-physical barrier hinder slum dwellers access to electricity. Two such barriers are the connection fee and inability to pay regularly, “both a direct consequence of the informal nature of the settlements.”

Like in Metro Manila, many people in informal settlements cannot sign contracts due to lack of documents, and intermittent income from informal work also prevents them from making regular bill payments. As a consequence, slum dwellers resort to electricity theft or buying electricity from informal service providers (ISPs) who are oftentimes themselves slum residents and able to offer flexibility with delayed payments.

In order to solve this problem of distribution and theft, collaboration between a number of actors is necessary. One successful initiative took place in Fortaleza, Brazil, where a local electricity distribution company, Coelce (Companhia Energética do Ceará) launched a program to exchange recycled solid residues (e.g. paper, glass, iron, plastic and car batteries) for an electricity bonus. Recyclable garbage is taken to collection sites (mobile or fixed) and is automatically scored as credit on an electronic card, which is used to calculate a discount on the client's energy bill. Collection sites are fully automated and the interaction is intuitive and security-wise for the user, not involving the exchange of money.

Today there are about 30 collection points in Fortaleza and more than 100 in the whole state of Ceará, distributed in more than 29 municipalities. According Coelce data, over 18,500 tons of trash has been properly disposed of, more than 425,000 consumers registered, and US\$950,000 in electricity bonuses have been granted in Fortaleza alone since 2007. This successful initiative, also replicated in Rio de Janeiro (Ecoampla) and Santiago de Chile (Ecochilectra), has received awards from Brazilian and international institutions and has been voted a winning project in Latin American by UN Global Compact.

The program embeds many crucial aspects of sustainability: private partners and local communities interact, adopting innovative technologies and new business models to create a bottom-up economic system with benefits in terms of pollution and waste management, as well as improved socioeconomic structure and living conditions in the settlements.

Source: Nel-lo, O., & Mele, R. (Eds.). (2016). *Cities in the 21st Century*. Routledge.

Box 6: The Toll of Inadequate Services on Home-based Workers

A study of home-based workers in seven countries across South Asia and Southeast Asia highlighted the impact that the provision of municipal services, particularly electricity, has on the livelihoods and health of home-based workers. The overhead costs of a household workspace can become onerous for home-based workers when electricity is unreliable. Illegal connections or arbitrary pricing can diminish earnings significantly.

- Workers in Bangladesh reported purchasing electricity from illegal connections controlled by interest groups who varied prices dramatically. Electric utilities, meanwhile, refused to provide electricity in slums due to lack of ownership papers.
- Workers in Phnom Penh reported avoiding using electricity for lights or fans in rooms without windows in order to reduce their bills.
- Workers in Pakistan reported on the disruptions caused by blackouts from load-shedding and having to work by candlelight, which over time caused weakened eyesight.

Source: Sinha, Shalini. 2013. *Housing and Urban Service Needs of Home-Based Workers: Findings from a Seven-Country Study*. WIEGO

typhoon in their current place of residence, while 55 percent have suffered from the flooding that accompanies typhoons and heavy rains (see Table X below).

The highest incidence of flooding is in Manila (80.3 percent) followed by Muntinlupa (51.2 percent) then Quezon City (44.1 percent). Not surprisingly, wet settlements (given their proximity to water bodies), experienced higher flood rates (71 percent), a pattern that held across cities at 84.7 percent in Manila, 66.8 percent in Quezon City and 67.9 percent in Muntinlupa. Linear settlements in Manila also saw a higher rate of flooding at 89.6 percent.

The major impacts on households caused by flooding include the inability to travel to work (44 percent), inability of children to attend school (40 percent), and damages sustained by homes (37 percent). These impact were felt the least by houses in linear settlements across all three cities. In 2014, 86 percent of households experienced disruptions due to flooding. Disruptions regarding work and school lasted 2–3 days for 30 percent of households, a full week for 26 percent of households and over 10 days for 11 percent of households. The loss of productivity due to flooding is acutely felt in informal settlements,

TABLE 14: % of Households Experiencing Hazards, by Typology

	High Dense	Linear	Mixed	Pocket	Wet	Total
Typhoon	96.5	94.6	96.3	95.9	95.6	95.7
Earthquake	64.4	65.6	68.8	62.3	64.7	65.1
Flood	56.2	46.1	49.8	49.5	71.0	55.4
Fire	58.8	48.4	47.1	41.2	44.9	47.9

Box 7: Impact of Flooding on Informal Settlements

While those living in flood-prone settlements understand the risk they face from floods, they have few alternatives. In a focus group discussion, residents of a community near Laguna de Bay in Muntinlupa were keenly aware of the hazards posed to their settlement, which was built on stilts. In times of flood, they had in the past rented out boats from fishermen in order to rescue family members or household possessions. Men of the settlement would have to go “undertime” or leave work to travel home and ensure the safety of their families. The community also designated people to stay at the settlements to ensure that there was no looting once floodwaters recessed. However, the community stayed because that was they only housing that residents could afford. Given the persistent threat of flooding, the community was open to relocation, not only as a community, but also as individual households. Improvement in living conditions was a larger priority rather than retaining community, however this is not always the case among vulnerable communities in Metro Manila

This pattern of behavior was also seen following Tropical Storm Ondoy and Typhoon Pepeng in 2009. Inundation forced some households out of informal settlements, with one flooding victim reporting “I had one neighbor, their house was submerged in knee-level mud. It takes almost two months for the mud to dry up. They left for Batangas.” However, resettlement options were often in peri-urban areas. “I sent my two children to Binangonan because it’s difficult here. Just a little rain and it floods.” A number of households reported that some family members stayed in the damaged areas in order to stay near their employment because they could not afford to commute back and forth.

World Bank. 2011. The social impacts of tropical storm Ondoy and typhoon Pepeng - The recovery of communities in Metro Manila and Luzon. Washington, DC: World Bank.

TABLE 15: Mean Number of Days of Disruption Due to Flooding among Households Who Report Experience Delay Due to Flooding in Each Locality

ISF Category	Manila	Quezon City	Muntinlupa	ALL
High Dense	4.43	2.96	8.91	5.69
Linear Dry	4.25	4.86	3.95	4.35
Mixed	4.21	6.58	6.75	5.73
Pockets	4.97	3.91	9.89	5.67
Wet	5.66	5.43	11.40	7.40
All	4.70	5.32	9.05	6.02

where informal work is prevalent and wages are typically low. The effect of flooding events in Thailand illustrate the long-lasting consequences of such shocks (Box 8).

Across all settlements, households reported an average of 6 days of disruption. Table 15 above shows us that if we only consider the average impact of flooding among the households who report having experienced delays by flooding in each locality only, Muntinlupa stands out as suffering from the worst incidence of delay by flooding among the three cities as the mean number of days of delay due to flooding in this city is around twice as many as each of the other two cities. This pattern holds across typologies, and is particularly significant in among the wet settlements. These observations can be related to the fact that Muntinlupa has the highest proportion of wet settlements, which are the most vulnerable to flooding.

Informal settlements are also exposed to other hazards including earthquakes (65.1 percent) and fires (47.9 percent). Slum fires are relatively common and often originate from unattended candles or gasoline lamps, faulty Liquefied Petroleum Gas (LPG) tanks, unattended cooking stoves, fireworks and electrical wiring. Across cities, incidence of fire is highest in Manila at 71.6 percent, followed by 40 percent in Quezon City and 38.9 percent in Muntinlupa. Fire risk is higher in high dense settlements at 58.8 percent, particularly in Manila at 74.8 percent. Environmental factors contributing to slums fires, which can start in minutes and often take hours to suppress include; congested living conditions; housing built from flammable materials like scrap wood, cardboard, tin roofs and tarpaulin; and narrow pathways for firefighters and emergency vehicles.³⁵ These factors are not unique to slums in Metro Manila, and have resulted in the creation of a unique fire warning system specifically targeting informal settlements in South Africa (see Box 9 below). Given the general vulnerability of the urban poor, and their reliance on wages and cash incomes, economic disruption of even a few days time can have potentially devastating consequences that last well into the future.

Community Life & Tenure Insecurity

Natural hazards are not the only threat faced by IFS households. Nearly 68 percent of all residents reported threat of eviction and tenure insecurity as a major concern. This was closely

³⁵ World Bank (2017) The Philippines Urbanization Review (forthcoming).

Box 8: Disruption of Home-based Work due to Flooding in Thailand

The Informal Economy Monitoring Study is a current longitudinal study by WIEGO on the urban informal economy of 10 global cities. As part of that study, focus groups meetings were conducted with home-based workers in Bangkok, Thailand. Participants in the focus groups spoke of the sustained impact that severe flooding in Bangkok from July 2011–January 2012 had on their livelihoods.

Mobility Constraints: As a consequence of flooding, roads were damaged and communities isolated. This was particularly devastating for home-based workers who had no alternative workspace and were unable to collect supplies or deliver final products. One group of workers who recycled waste plastic described how they had no space to dry plastic, and that their employer was unable to come pick it up. Another snack food seller reported, “During the big floods last year, my house was underwater and we could not work for more than two months. We had no money to repair the flood damage and no money to restart our business and had to borrow from the moneylender by using our house as collateral.”

Limited incomes: The loss of work and wages had immediate impacts on household expenditures. The dramatic change in quality of life demonstrates how vulnerable the urban poor remain to external shocks and how fluctuations in cash incomes are more consequential in urban areas than in rural areas. One worker described her efforts to cut back on spending, “I used to cook two dishes to have with the rice, but when I had no job, I cooked only one dish. I couldn’t share my food with my neighbors, which is our normal practice.” Another woman reported asking relatives in her home village to send food. “They are farmers, they grow rice for their own consumption, so they shared rice with us.” She noted that her experience was not unique, and that others also “got food support such as rice and fermented fish from their relatives in the rural area.”

No guaranteed return to employment: Once the floods had receded, workers had mixed experiences going back to work. Some worked overtime to make up for lost production during the floods. Five workers who made brand-name shirts for a factory reported, “the factory gave us a lot of work, to catch up on orders and get back into business”. Others had the opposite experience like two women who were subcontracted to embroider garments. “We have always for a long time received work from this owner but since the flood problem last year, we have received less work; and for the last two-three months, we have no work. Fortunately, we were supported by our husbands and children”

Source: Chen, Martha (2014) Informal Economy Monitoring Study Sector Report: Home-Based Workers. WIEGO.

Box 9: Lumkani – A Networked Heat Detector Designed for Slums

A standard smoke alarm cannot work in slums, where open fires from cook stoves, candles, and gas burners are the norm. Lumkani offers a heat detector that instead measures the rate of temperature rise. While cooking might raise the temperature of a home in minutes, a fire would raise temperatures in seconds, which would trigger the alarm to sound.

The device is networked to homes within a 40m radius, and once the alarm sounds, text messages are sent to residents of networked homes asking them to confirm whether they see a fire. If someone responds “yes”, then emergency personnel are notified.

Both the mechanism for triggering the alarm and the reliance on the surrounding community recognize and accommodate the specific fire risks faced in slums.

Source: <http://lumkani.com/>.

FIGURE 22: Major Problems Faced in Informal Settlements (%) (multiple Responses)

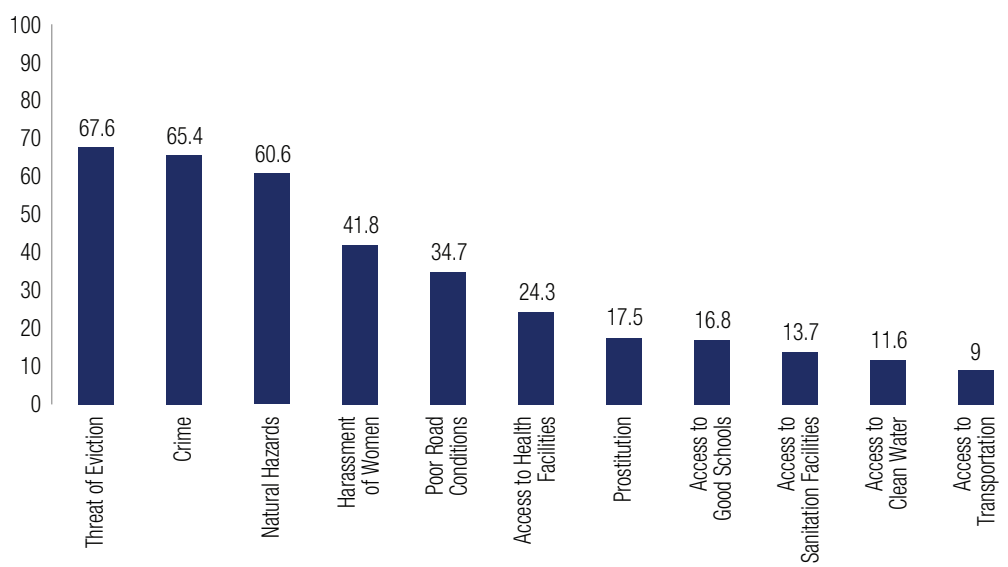


TABLE 16: Major Problems by Typology (Multiple Responses)

	High Dense %	Linear %	Mixed %	Pockets %	Wet %	Total %
Threat of Eviction	75.51	63.42	61.25	72.58	65.99	67.61
Crime	69.14	69.46	63.54	58.76	65.83	65.43
Natural Hazards	66.05	52.72	52.92	54.23	73.17	60.55
Harassment of Women	48.97	40.27	35.83	38.56	44.46	41.79
Poor Road Conditions	41.36	30.16	27.71	35.46	37.75	34.65
Access to Health Facilities	22.84	24.71	20.21	25.36	27.30	24.29
Prostitution	21.19	14.79	14.58	16.91	19.50	17.50
Access to Good Schools	16.46	13.81	13.96	20.21	19.03	16.81
Access to Sanitation Facilities	16.87	8.75	8.33	19.59	14.98	13.74
Access to Clean Water	14.61	9.53	6.67	11.13	15.13	11.63
Access to Transportation	11.11	6.81	6.88	8.45	11.08	8.98
N	486	514	480	485	641	2606

followed by concern with crime ranging from vandalism, petty theft and stealing to drug dealing, violent crime and gang activity. A range of other concerns are illustrated in Figure 22 below. Despite the numerous challenges faced in slums, that tenure security is the highest reported concern speaks to the importance of housing (or lack thereof) on quality of life.

Nearly half of NCR households do not own the land they occupy, driven in large part by high land prices and low household incomes.³⁶ As a consequence, the number of

³⁶ World Bank (2017) Philippines Urbanization Review (forthcoming).

informal settlers continue to rise. Nearly 90 percent of surveyed households reported having either a slip of paper showing ownership of their property or engaging in an informal rental arrangement without any written contract. Unsurprisingly then, threat of eviction was the biggest concern across settlements and cities. Looking at typologies, the highest levels of tenure insecurity were reported by residents of high dense settlements while the lowest levels were reported by residents of mixed settlements as shown in Figure 23 below.

In addition to tenure security, residents of high dense settlements also reported concerns of crime (69.1 percent), natural hazards (66 percent), harassment (49 percent), poor road conditions (41.4 percent) and prostitution (21.2 percent) in rates higher than average. Conversely, residents of mixed settlements consistently reported being concerned with these problems at lower levels than other typologies; crime (63.5 percent), natural hazards (52.9 percent), harassment (35.8 percent), poor road conditions (27.7 percent) and prostitution (14.8 percent).

FIGURE 23: Households Concerned with Threat of Eviction by Typology

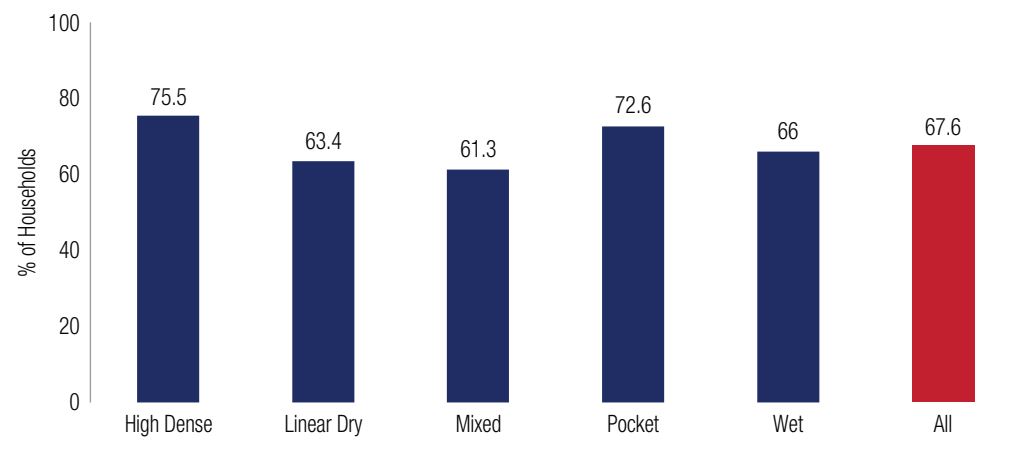
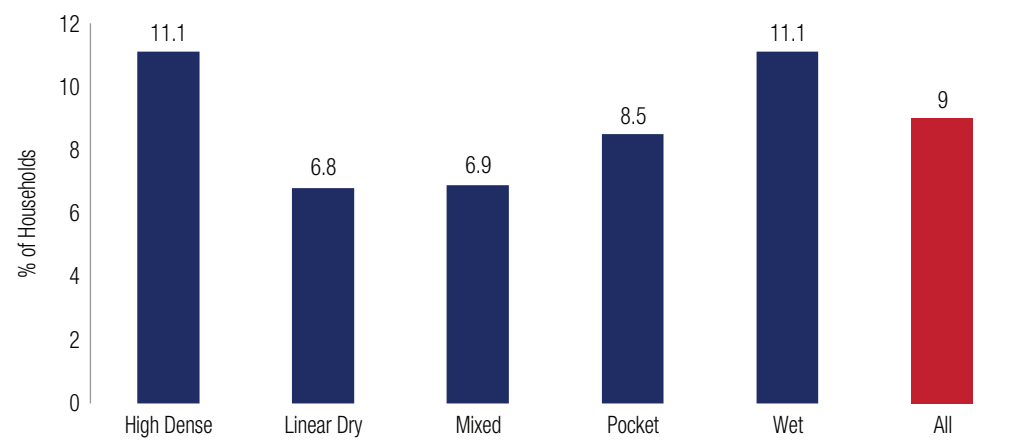


FIGURE 24: Households Concerned with Access to Transportation by Typology



Of note, only 9 percent of residents reported access to transportation as a problem faced within their settlement. This figure did vary by typology, as shown below, with higher percentages of high dense and wet settlements concerned with transport. Nevertheless, access to transportation was consistently reported as the lowest concern across typology. One reason for this is that many settlements are located close to transport hubs, especially informal transport as demonstrated in earlier sections of the report.

Despite the difficulties encountered in slums, there is also a strong sense of community that develops within informal settlements (see Table 16). People depend on neighboring households for day-to-day assistance, best exemplified by the 40.6 percent of households

TABLE 17: Nature of Aid Received from Neighbor in Past 3 Months (Multiple Responses)

City/Type of Aid Received	High Dense		Linear dry		Mixed		Pockets		Wet		ALL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Manila	163		144		115		117		137		676	
Clean up, environment and disaster-related assistance	47	28.8	48	33.3	32	27.8	48	41.0	46	33.6	221	32.7
Sickness-related	43	26.4	43	29.9	30	26.1	42	35.9	46	33.6	204	30.2
Basic provisions	60	36.8	57	39.6	39	33.9	41	35.0	55	40.1	252	37.3
Child-care related activities	33	20.2	34	23.6	30	26.1	38	32.5	36	26.3	171	25.3
Work or business related	35	21.5	32	22.2	18	15.7	27	23.1	28	20.4	140	20.7
Quezon City	204		235		261		242		289		1,231	
Clean up, environment and disaster-related assistance	86	42.2	95	40.40	87	33.3	97	40.1	116	40.1	481	39.10
Sickness-related	49	24.0	67	28.50	70	26.8	60	24.8	92	31.8	338	27.50
Basic provisions	81	39.7	91	38.70	103	39.5	98	40.5	111	38.4	484	39.30
Child-care related activities	53	26.0	52	21.10	61	23.4	60	24.8	72	24.9	298	24.20
Work or business related	37	18.1	52	22.10	57	21.8	54	22.3	61	21.1	261	21.20
Muntinlupa	119		135		104		126		215		699	
Clean up, environment and disaster-related assistance	58	48.7	54	40.00	37	35.6	48	38.1	91	42.3	288	41.20
Sickness-related	37	31.1	32	23.70	32	30.8	38	30.2	63	29.3	202	28.90
Basic provisions	56	47.1	55	40.70	45	43.3	62	49.2	105	48.8	323	46.20
Child-care related activities	37	31.1	29	21.50	20	19.2	39	31.0	59	27.4	184	26.30
Work or business related	24	20.2	30	22.20	16	15.4	24	19.0	50	23.3	144	20.60
All	486		514		480		485		641		2,606	
Clean up, environment and disaster-related assistance	191	40.5	197	39.50	156	39.0	193	41.4	253	42.3	990	40.60
Sickness-related	129	39.3	142	38.30	132	32.5	140	39.8	201	39.5	744	38.00
Basic provisions	197	26.5	203	27.60	187	27.5	201	28.9	271	31.4	1,059	28.50
Child-care related activities	123	25.3	115	22.40	111	23.1	137	28.2	167	26.1	653	25.10
Work or business related	96	19.8	114	22.20	91	19.0	105	21.6	139	21.7	545	20.90

who reported receiving basic provisions (think food and basic supplies) from neighbors. They also turn to their neighbors in times of emergency according to the 38 percent who reported receiving help following a disaster. Assistance with childcare is received by 25.1 percent of households, though higher in pocket slums at 28.2 percent and higher still in the pocket slums of Manila at 32.5 percent. In focus group discussion, residents of informal settlement communities expressed a strong preference for keeping their communities together through relocation. The implication here is that the urban poor are developing a support system in the absence of outside assistance or family ties. This is particularly relevant when considering plans for relocating or evicting slum populations, which threaten to break up communities and daily support they provide.



Multidimensional Poverty Analysis

Multidimensional Poverty in Metro Manila

Multiple challenges in various aspects of Metro Manila slum dwellers' life suggest that income poverty alone is not sufficient for us to have a holistic view of the development situation in these settlements. Taking into account the deprivations that obstruct slum dwellers' access to a decent life would help shed light on areas that require more attention from a policy perspective. This section makes use of the comprehensive data collected from the Metro Manila slums survey and employs a quantitative method to measure the prevalence and breadth of the multidimensional poverty experienced by Metro Manila's slum residents in both economic and non-economic dimensions.

Scholarly discussion on alternative approaches to poverty measurement arises from a common and increasingly popular view that poverty should be regarded as multidimensional (a comparison of income and multidimensional poverty within surveyed communities is found in Box 10). Various efforts have been made to construct new measures that capture poverty in more than one dimension.³⁷ In the context of this study, we follow a recent method of multidimensional poverty measurement by Sabina Alkire and James Foster (2011) (henceforth called AF method), in which they combine Atkinson's counting-based method with adjusted income-based Foster-Greer-Thorbecke measure to convey the breadth, depth and severity of multidimensional poverty. This method leads to the development of the Multidimensional Poverty Index (MPI), which has been widely utilized within United Nations reports, academic papers and has even been adopted within official poverty measurement in countries such as Vietnam. The method has also been highlighted and discussed in *Monitoring Global Poverty: Report of the Commission on Global Poverty* (2016).

³⁷ Examples of research in multidimensional poverty literature include Anand and Sen (1997), Brandolini and D'Alessio (1998), Deutsch and Silber (2005), Thorbecke (2008), Chakravarty et al. (1998), Tsui (2002), Bourguignon and Chakravarty (2003), Atkinson (2003) and Chakravarty and Silver (2008).

Box 10: Overlaps between income and multidimensional poverty

Slums in Metro Manila are home to a mix of urban poor and non-poor, with a quarter of households falling below the absolute (non-food) poverty threshold (i.e. household per capita equal to or less than PHP 22585 or USD479). At the same time, more than half of the households fall below the bottom 40 percent of the income distribution (i.e. household per capita income equal to or less than PHP 39131 or USD829) and are vulnerable to poverty. However, deprivations within slums are multidimensional and not fully captured by income poverty. Table 18 presents a 2X2 table highlighting the relationship between consumption poverty (monetary) and multidimensional poverty (non-monetary dimensions only) i.e. what percent among the income poor are multidimensionally poor, and what percent are not. The analysis uses the non-food poverty threshold for Metro Manila (see Annex 1 for an analysis of the bottom 40 percent which yields similar results). In this analysis, income poverty is not included as one of the indicators of multidimensional poverty, with the weights adjusted accordingly.

This simple table shows that within slum communities, in almost a quarter of cases, slum dwellers who are non-income poor are still multidimensional poor (i.e. deprived in 9 or more indicators in Table 16 above). In other words, a significant proportion of non-income poor are unable to access good quality of everyday living. Further, quite a high percentage (almost 35 percent) of the income poor are also multidimensional poor, which means that their experience of income poverty is harsher than their counterparts who are not classified as multidimensional poor.

TABLE 18: Comparing Income Versus Multidimensional Poor in Metro Manila

Panel A: Income poverty based on nonfood poverty threshold for Metro Manila 2015		
Income (Poverty Threshold)	Transitional Probabilities	
	Multidimensional Poverty ^a	
	Total	
	Poor	Non-Poor
Poor	34.45%	65.55%
Non-Poor	23.36%	76.64%

^a Income is not included as an indicator of multidimensional poverty for this analysis.

Dimensions of Deprivation in Metro Manila's Slums

For this report, we select 21 different deprivation indicators from the survey data that were categorized into eight dimensions of deprivation, namely: clean water, sanitation, health services, education, transportation, security of tenure and quality of community, stability of income and employment, and household assets. These eight dimensions are believed to comprehensively cover various aspects of slum dwellers' living conditions and mark their well-being. The choice to apply the AF method on this set of indicators is based on two major reasons. Firstly, the AF method enables us to generate analyses and comparisons of the level of deprivation across dimensions and subgroups. In our case, well-being of households across the five different typologies can be estimated. Secondly, it allows us to decompose the contributions of each of the constituent dimensions to overall multidimensional poverty to better understand the multiple elements of urban poverty.

The AF method identifies multidimensional poverty using a “dual cut-off” method. First, a dimensional cut-off is applied to each indicator (see definitions of Deprivation Line for each Indicator in Table 17, below which or within which a person is considered deprived for that indicator. The application of this first cut-off is used to identify those individuals who were deprived in each of the dimensions to get a dimension-specific deprivation for each individual in the data. For example, deprivation in the dimension of “education” is captured by deprivation in three indicators: “access to internet,” “school attendance of youth” and “adult education.”

Table 19 presents the list of selected dimensions and the indicators for each dimension along with the criteria for deprivation in each indicator. The last column of the table shows the proportion of households who are identified as deprived in each indicator out of the total population of the Metro Manila slums.

The basic descriptive statistics in Table 19 offer striking results on the living standards, human development and living conditions of these residents. Overall, the dimensions in which

TABLE 19: Dimensions of Deprivation: Deprivation Line and Proportion of Deprived Households for Each Selected Indicator

No.	Dimension	Indicator	Indicator Deprivation Line	Proportion of Households Deprived
1	Access to clean water	Deprived in water supply	Anything other than piped connection	0.293
		Deprived in water source	Anything other than Manila Water	0.137
2	Access to sanitation	Deprived in regular garbage collection service	Not collected or irregular or “don't know”	0.039
		Deprived in type of toilet	No flush toilet with central sewage discharge	0.024
		Deprived in access to toilet	Toilet shared by more than 2 households	0.058
3	Access to health services	Deprived in medical care where youngest child was born	Where youngest child was born: anything other than public or private health clinic	0.306
		Deprived in good health	Households with any member having experienced a major illness	0.127
4	Education	Deprived in access to internet	Household member does not have access to internet	0.409
		Deprived in school attendance of youth	Children in school age (5–14 years old) not attending school	0.064
		Deprived in adult education	Household with a member at least 15 years old not in school and did not complete high school	0.769
5	Access to transportation	Deprived in access to close bus stop	More than 30 mins of distance	0.314
		Deprived in access to close jeepney/tricycle or taxi stop	More than 20 mins of distance	0.043
		Deprived in fast access to work place	More than 60 mins of distance	0.210

(continued on next page)

TABLE 19: Dimensions of Deprivation: Deprivation Line and Proportion of Deprived Households for Each Selected Indicator *(continued)*

No.	Dimension	Indicator	Indicator Deprivation Line	Proportion of Households Deprived
6	Security of tenure and quality of community	Deprived in secure tenure	Having only a piece of paper as ownership document or rental arrangements without contract	0.894
		Deprived in safety from flooding	Household has suffered from flooding	0.554
		Deprived in perception of community safety	Household reports "Vandalism, petty theft and stealing, drug use/drug dealing, violent crime and gang activity" as a problem facing their community	0.670
		Deprived in CSO participation	No participate in any CSO	0.296
7	Stability/regularity of income and employment	Deprived in regular employment	Over 25% of household members at working age are unemployed	0.191
		Deprived in secure employment	Over 50% of working members work informally	0.554
		Deprived in household per capita income	Household per capita income below nonfood threshold for Metro Manila	0.257
8	Household assets	Deprived in household assets	Not having more than 31.25% of essential assets	0.394

most people are deprived include education, security of tenure and quality of community, stability/regularity of income and employment, and transportation. However, in each dimension, there are indicators that display a higher level of deprivation than others. In the dimension of education, while only 6.4 percent of the households have children of school age not attending school, over 40 percent of the households are deprived in access to internet and 77 percent of households are deprived in terms of adult education. Such differences between child and adult education, may signal that the importance placed on the children's education by slum households, while offering a warning that early educational enrollment may not translate into fulfillment of educational potential with age. In addition, the low penetration rate of internet in these settlements demonstrates that the Metro Manila slum population may not be fully prepared to reap digital dividends or be a part of the technological innovation within urban management and governance. Such findings call for policy responses to better integrate slum residents into the technological transformations within the society.

Regarding income and employment, while slum dwellers are economically active and relatively low on deprivation in terms of regular employment and income, the same does not hold for quality of employment. Informal employment seems to be the most prevalent with 55 percent of families having a high share of informal jobs among working members. Informality signals a lack of job security, stability of income and potential for exploitation by employers. Insecurity is not limited to jobs but also extends to physical safety as well as housing tenure. 67 percent of households interviewed mentioned crime as a key problem plaguing their communities. Lack of tenure security is particularly alarming across these slums

with almost 90 percent of households either having only a slip of paper showing ownership of their settlements or engaging in informal rental arrangements (without any form of written contract) with their landlords, making them highly vulnerable to eviction and less likely to invest in their neighborhoods. Slum dwellers are also vulnerable to flooding as 55 percent of the households reported having experienced flooding in their units. Given the sampling strategy employed, these dimensions of deprivation are at least representative of slums in at least the three LGUs—Manila, Quezon City and Muntinlupa—where the survey was administered, and also likely to signal the conditions of slum settlements in other parts of Metro Manila.

Following the dimensional cut-off is a second cut-off, also known as the poverty cut-off (denoted as k), across dimensions. This second cut-off identifies the poor by counting the number of dimensions in which a person or household is deprived. Results presented in this report are based on a 40 percent poverty cut-off ($k=40$ percent), implying that for a household to be considered deprived, it has to be deprived in at least 40 percent of the 21 weighted indicators (i.e. 9 or more indicators in the case when all indicators are applied equal weights). *Further details on the rationale for the cut-off point and the steps employed within the AF method can be found in section 1 of the Methodological Annex.*

A final step in the AF method is the assignment of weights to dimensions or indicators constituting the dimensions. The choice of weights (whether equal or differential) could be highly subjective and solely at the discretion of the analyst. However, for this report, we follow the innovative approach of integrating **qualitative weighting** into the estimation of multidimensional poverty, which was also applied in the report on Urban Poverty in Ulaanbaatar, Mongolia (World Bank 2016). This methodology makes use of the data on the survey question in which household members were asked to rank each relevant dimension by its importance to the reduction of poverty.

Qualitative weights for each of the dimension (as well as its component indicators) are determined based on the number of dimensions of analysis, the levels of ranking in which each dimension appears frequently and the associated frequencies. Given that qualitative weighting is more context-specific, it is likely to produce a more realistic representation of the depth and dimensionality of deprivation.

Level and Distribution of Multidimensional Poverty in Metro Manila Slums

Using the information on the indicators of deprivation and applying qualitative weights to the dimensions as discussed above, two summary measures of multidimensional poverty are discussed in this section—namely, multidimensional poverty Headcount Ratio (hereafter, Headcount Ratio) and the Multidimensional Poverty Index (MPI). The results of analysis for the multidimensional poverty headcount ratio and the MPI across different cities and typologies are presented in Tables 20 and 21 below.

Proportion of Multidimensional Poor:

The Headcount Ratio is simply the proportion of multidimensional poor households. The analysis found overall multidimensional headcount ratio to be 26.41 percent, meaning that

TABLE 20: Multidimensional Poverty Indicators by Typology

Typology	Multidimensional Poverty Headcount Ratio	MPI
High dense	0.293	0.150
Linear	0.236	0.116
Mixed	0.218	0.111
Pockets	0.295	0.145
Wet	0.304	0.157
Overall	0.264	0.135

TABLE 21: Multidimensional Poverty Indicators by City

City	Multidimensional Poverty Headcount Ratio	MPI
Manila	0.371	0.192
Quezon	0.212	0.105
Muntinlupa	0.373	0.199
Overall	0.264	0.135

26.41 percent of the population in the slums in the three cities Manila, Muntinlupa and Quezon in Metro Manila can be categorized as multidimensional poor. In other words, 26.41 percent of the slum population in Manila, Muntinlupa and Quezon are simultaneously deprived in nine or more of the weighted dimensions of consideration.

Broken down by cities, multidimensional poverty is consistently higher and more intense in Manila and Muntinlupa in comparison with Quezon City. Such relatively lower incidence of multidimensional poverty among slums in Quezon City, was robust to changes in the levels of poverty cutoffs applied. The same pattern of robust results was observed across different typologies with the high dense, pocket and wet settlements consistently having higher rates of multidimensional poverty in comparison with mixed and linear settlements.

Multidimensional Poverty Index (MPI):

However, if we only look at H we merely know that 26.41 percent of the population is poor. But the question remains whether are they all equally poor? Are they deprived in 100 percent of all the considered deprivations or less? To address this issue, the Multidimensional Poverty Index (MPI) is generated, which represents the share of the population that is multidimensionally poor adjusted by the intensity of the deprivation suffered. MPI reflects both the *incidence* of poverty (the percentage of the population who are poor) and the *intensity* of poverty (the percentage of deprivations suffered by each person or household on average).³⁸ It reflects not only the prevalence but also the breadth of poverty, or the average extent of a poor person's deprivation. In this sense, MPI can be seen to capture the most acutely poor,

³⁸ The Multidimensional Poverty Index (MPI) is also known as the adjusted headcount ratio or M_0 . M_0 is the product of the multidimensional poverty headcount (H) and the average deprivation share (A). Detailed explanations can be found in the Methodological Annex.

who may be missed in measurements that only capture wellbeing in one dimension. Thus, comparing the values of MPI across different cities or typologies would allow us to make a judgment on how the combined levels of prevalence and breadth of poverty vary across these units of comparison. Most importantly, MPI can be decomposed into relative and absolute contributions by dimension and categories by sub-groups, making it more useful than a singular summary measure.

In terms of sub-group comparisons, the pattern of results for MPI is similar to that of the Headcount Ratio discussed above. Within the typologies, the intensity of multidimensional poverty measured by MPI is lowest in Linear and Mixed slums. Among the cities, MPI is highest in Muntinlupa and lowest in Quezon City.

As we can see from Tables 20 and 21 above, both poverty headcount ratios and the MPIs vary significantly across the typologies and cities. Among the five typologies, the wet settlements have the highest multidimensional poverty headcount ratio (with 30.4% of the people considered multidimensionally deprived) and also the highest MPI (0.157), which means the prevalence and breadth of poverty, or the extent of average deprivation among multidimensionally poor people, are the most severe in the wet settlements. It is very interesting to notice that although the pockets slums have slightly higher multidimensional poverty headcount than the high dense typology (i.e. about 29.5 percent of people living pockets settlements are multidimensionally deprived as compared to 29.3 percent in high dense settlements), the high dense settlements' MPI is 0.150, which is higher than the MPI among the pockets slums which is only 0.145. This pattern of results tells us that although the proportion of multidimensionally poor people is higher in the pockets slums is higher than in the high dense slums, those who are multidimensionally deprived in the high dense slums are deprived in a larger breadth of dimensions than those in the pockets slums. Such knowledge and the ability to capture the average extent of deprivation among the poor would be tremendously helpful for policy makers in crafting effective strategies to tackle the deep roots of poverty rather than just touching it at the surface.

Among the cities, Muntinlupa seems to be the most troubled place with both the highest multidimensional poverty headcount ratio and highest MPI. Muntinlupa's MPI is significantly higher than Manila's (0.199 versus 0.192) despite the fact that the two cities almost have the same multidimensional poverty headcount. This also suggests that multidimensional poverty in Muntinlupa is "broader," which could be linked to the fact that this city has the highest proportion of wet settlements.

Which Dimensions of Deprivation Matter More?

As a summary measure, MPI condenses a lot of information, and in doing so conceals useful information that can be extracted from its decomposition. It can be unpacked to show the composition of how the dimensions (and indicators) of multidimensional poverty across cities and typologies in the case of Metro Manila. By doing so, MPI offers a powerful analytical tool to identify the most prevalent deprivations. Relative contributions of different indicators in each dimension as well as the relative contributions of each dimension to overall level of multidimensional poverty are discussed in the following section.

FIGURE 25: Relative Contributions of Dimensions to the Overall Level of MPI

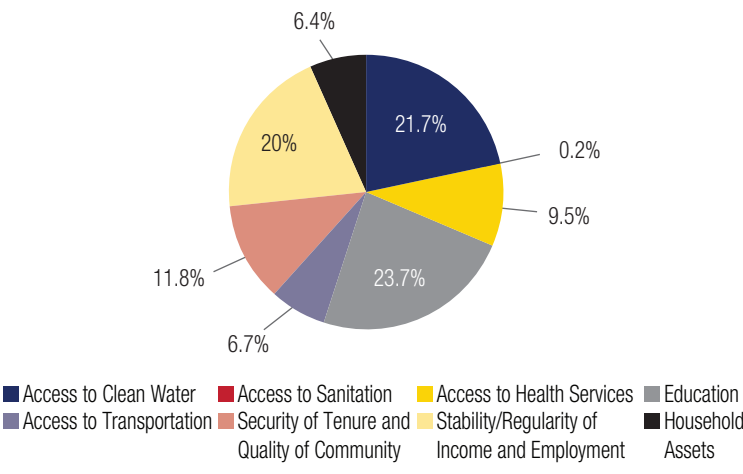


Figure 25 displays the share of each dimension as a percentage of the overall MPI for Metro Manila slums. As can be seen in Figure 25, the biggest components of the overall level of multidimensional poverty come from derivations the dimensions of education (23.7 percent), access to clean water (21.7 percent), income and employment (20 percent) and security of tenure & community quality (11.8 percent). Lack of security in terms of tenure, physical and environmental safety within slum communities is also a significant concern. Interestingly, access to sanitation, health services and transportation are not the topmost concerns for slum dwellers. It is important to note here that

the dimensions are weighted by qualitative ranking provided by slum dwellers and as such, the results place higher emphasis on the lived experiences of poverty and dimensions that slum dwellers see as most significant in affecting their wellbeing.³⁹

These results have important implications for policy making as it is clear that the major contributors to the prevalence and breadth of multidimensional poverty include education, health and clean water, which are the key contributors of human development. The solution to Metro Manila’s urban poverty conundrum is likely to require a strong human capability focused set of policies, along with interventions that improve the security of living environments.

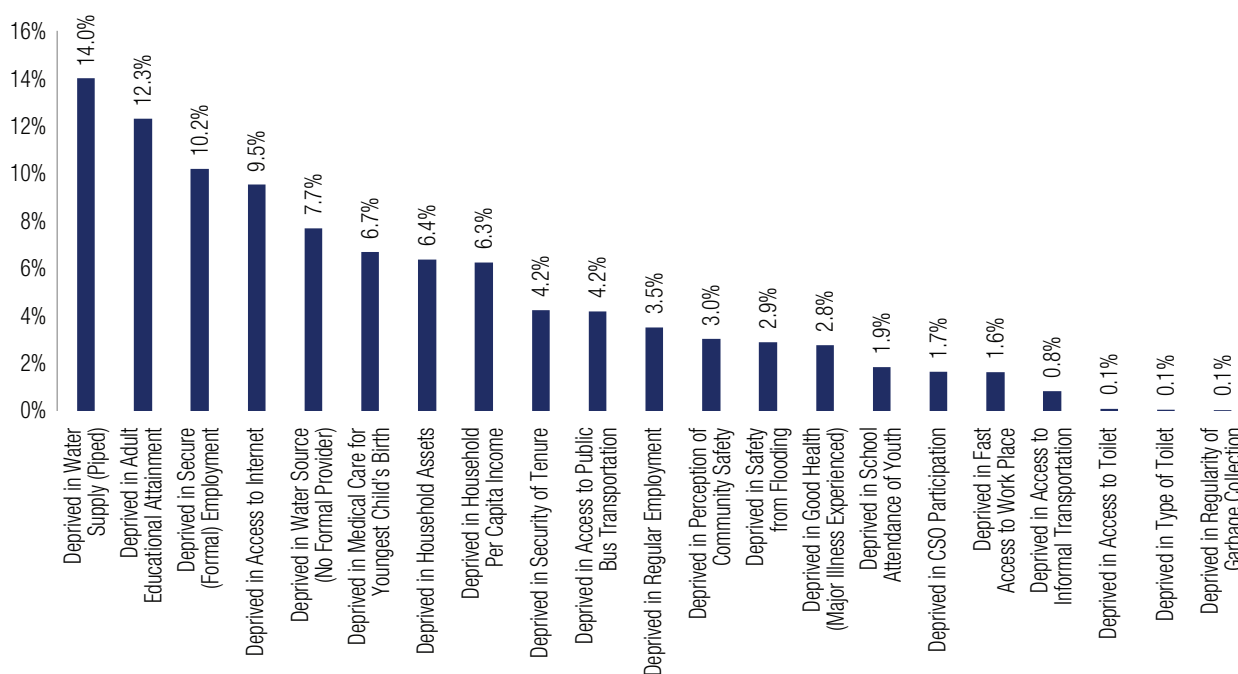
Going one step further, an examination of the indicators underlying the contributions of dimensions (Figure 26), highlight the dominance of deprivation due to (a) lack of access to piped water supply, (b) low levels of adult education attainment in terms of high school completion, and (c) high job insecurity due to a lower share of participation in formal employment among household members. These are followed by a lack of access to internet and absence of medical assistance during childbirth. Interestingly, the contribution of economic indicators including income and assets is lower, signaling that the factors driving well-being in the lives of slum-dwellers in Metro Manila are predominantly non-monetary.

Slum Typologies Differ on Dimensions of Deprivations

Looking across the typologies, the relative contributions of dimensions to the MPI highlight some similarities and differences that can be leveraged by policy makes when developing target measures to improve the wellbeing of urban poor. On the whole, dimensions of access

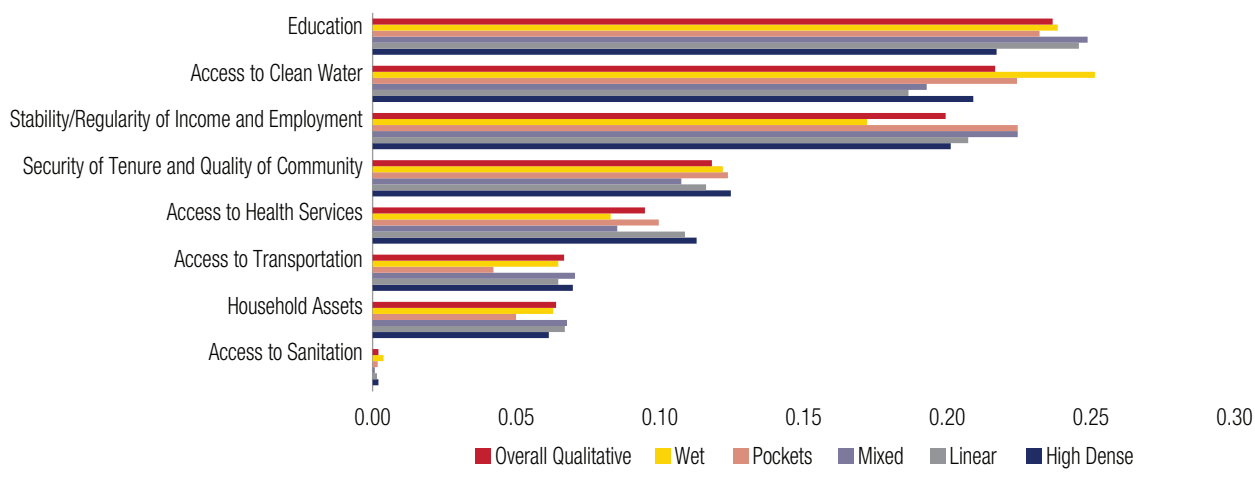
³⁹ Results of equal weighting are accessible from the author.

FIGURE 26: Relative Contribution to Overall MPI



to education, clean water and stability of income and employment remain the top three contributors to MPI in every slum typology. But a closer look reveals that settlements along waterways (Wet typology), are most deprived in terms of access to proper water supply—a dimension that contributes to over a quarter of the MPI share. Slum dwellers in these settlements are more likely to be dependent on private sources of water, which may pose a higher burden of cost and potentially have lower quality as discussed in the previous section. In

FIGURE 27: Relative Contributions of Dimensions to MPI Across Typologies



comparison, the topmost contributor in other typologies is deprivation in the dimension of education, predominantly driven by lack of adult educational attainment (i.e. lower levels of education in a larger proportion of household members). In the case of Linear and Mixed slum typologies, access to clean water contributes relatively less to MPI, signally somewhat better water service provision in these contexts as compared to other dimensions.

Lack of stability in income and employment is a more important contributor of multidimensional poverty in Pocket and Mixed slum typologies as compared to others. Contribution of monetary dimension of poverty determined by per capita household income relatively higher in the case of Pocket slums. However, access to transportation contributes very little to the MPI for pocket slums, signaling their locational advantage in this sense.

Another dimension that is noteworthy in terms of the differences across settlements is that of Health. This dimension is most significant in High Dense typology (followed closely by Linear and Pocket typologies). Further analysis⁴⁰ highlights that in the case of High Dense typology, overall dimensional deprivation with respect to health is primarily driven by the higher presence of medically unassisted childbirths in this typology (contributing 9 percent to the overall MPI as compared to 4–6 percent in other typologies). This signals a significant gap in the reach of basic public health interventions that are critical to reducing maternal mortality and infant mortality. It is a pertinent finding, especially given the high and persistent maternal mortality rate prevailing in Philippines. In 2013, about 3,000 Filipino mothers died from childbirth out of 2.4 million deliveries (WHO 2014).^{41,42} Maternal mortality is persisting at unacceptably high levels, and this finding can allow better spatial targeting of public health interventions for urban poor.

⁴⁰ Available from author.

⁴¹ World Health Organization Maternal mortality: Fact sheet No. 348 (WHO, updated May 2014).

⁴² Statistical significance level of 0.01.

Pockets of Poverty

Compared to other slum typologies, residents of Pocket slums fare the worst in terms of both income and multidimensional poverty measures. A series of generalized linear regression analyses, controlling for socio-economic characteristics at the household and individual level (see Annex 1), find that slum dwellers living in the Pocket typology have significantly lower levels of per capita household income as compared to other typologies after controlling for a range of socio-economic characteristics. For example, residents in Pocket settlements fare the worst in terms of household per capita income as their incomes tend to be significantly lower than those of households in other typologies, with the least gap in comparison to the Mixed typology. The negative outlook on poverty also holds for multidimensional poverty where a logistic regression model demonstrates that the Pocket slum households are at the highest risks of being trapped in multidimensional poverty as compared to all other typologies, except the Wet typology. In the Wet typology, the odds of a household being more severely multidimensionally poor than those in Pocket slums are not statistically significantly different, signaling similar levels of deprivation in the two typologies when considering non-monetary dimensions.

While these findings are not causal, they do highlight robust associations between Pocket typology and high burden of monetary and non-monetary dimensions of poverty. Special efforts are needed to design interventions that take into account the nature of deprivations faced by these small and marginalized communities.



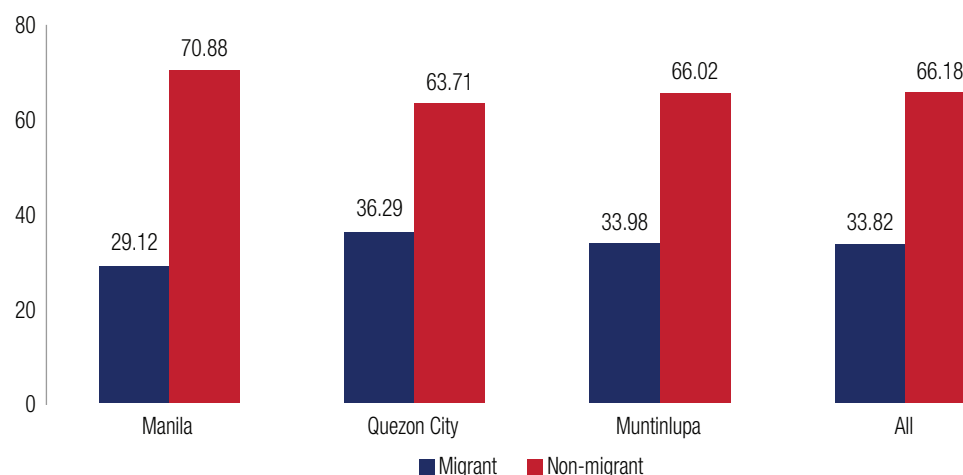
Migration, Slums and Urban Poverty

Across the region, growth of cities and the accompanying over-crowding and congestion has led to the scapegoating of rural-urban migrants as harbingers of poverty to cities. Often, migrants and the urban poor are assumed to be one and the same by government and the more privileged urban residents. The richness of the data available for this report sheds some light on disentangling the relationship between migration, slum populations and urban poor. The discussion in this section questions the negative assumptions about migrants.

Are There More Migrants in Slums?

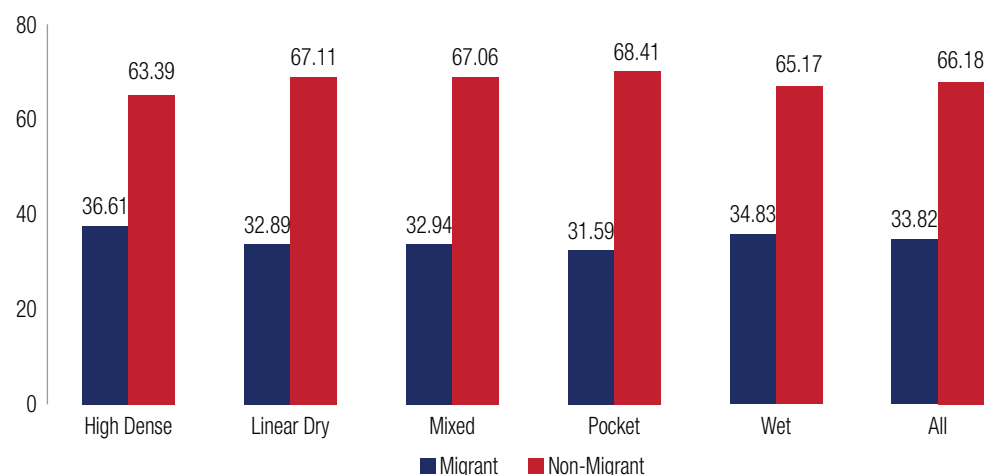
A close look at the residency status of the survey population reveals that the majority of individuals (over 66 percent) surveyed have lived in Metro Manila since childhood (see Figure 28 below).⁴³ This pattern remains consistent across cities, though Manila boasts of

FIGURE 28: Residency Status by City (%)



⁴³ Non-Migrant defined as a resident since childhood (0–5 years).

FIGURE 29: Residency Status by Typology (%)



a higher population that has lived there since childhood (71 percent) than either Quezon City (64 percent) or Muntinlupa (66 percent). Across slum typologies, pocket settlements account for the highest share of residents since childhood (68 percent), followed closely by Linear and Mixed categories. Among those who moved to Metro Manila at a later stage, more than half have arrived 20 to 75 years ago, while only 14 percent have moved to NCR within the last five years.

Migrants are Not the Urban Poor, Rather Migration Supports Poverty Reduction

On average, heads of migrant households are more educated than non-migrants. For example, 12 percent of non-migrants have no education as compared to only about 1 percent of migrant heads. 90 percent of migrants above the age of 18 are currently working as compared to 82 percent of non-migrants. A generalized linear regression model for determinants of income poverty showed that households headed by migrants are likely to make almost 14 percent more income per capita than households headed by non-migrants, when controlling for slum typology along with key household and individual level characteristics (see Annex 2). This is contrary to the popularly held views that migrants are synonymous with urban poor. In the case of Metro Manila, migrants are productive members of the working population and not an economic burden on the city. However, their mobility to the national capital city and higher incomes as compared to non-migrants have not necessarily translated into better housing opportunities.

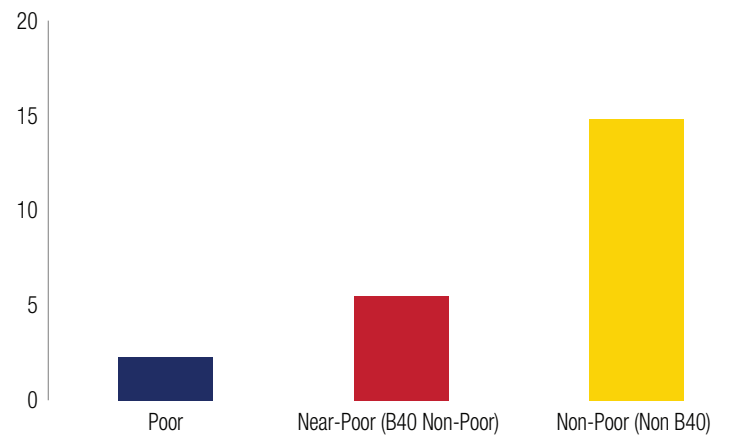
Further, the national sample survey data for the country, reveals that a key distinguishing feature of the urban non-poor households is that 15 percent report receiving at least some foreign remittances while only 2.29 percent of the urban poor report the same. Among the poor in Metro Manila, only 1.53 percent receive remittances, highlighting the

significant positive financial impact that a migrant household member abroad can have on a family.

The discussion in this section suggests that blaming rural-urban migration as the primary reason for development of slums is misleading. Scapegoating migrants as the source of urban overcrowding, poverty and mushrooming of slums glosses over the failure of urban planning and land policies in generating adequate affordable housing. In fact, existing informal and underserviced settlements may already be in part the result of policies to avoid attracting rural migrants as quantitatively shown in the

case of Brazilian municipalities.⁴⁴ While policies discouraging migration are rarely successful, they can serve to reinforce migrant exclusion and marginalization, thus increasing social inequality within the city. The iconic legacy of durable inequality in Brazil's favelas and in urban villages that have arisen in response to China's hukou (household registration) system are a consequence of such exclusionary attitudes of the elites and the governments. Migrant exclusion in one of its most formal formulation under China's hukou system was initially a way to limit mobility to cities and was further adapted during liberalization to allow controlled "temporary" urbanization without social inclusion. With liberalization, the spatial controls were loosened; rural hukou holders could move to urban jobs, but not secure urban rights, and have settled in peripheral 'urban villages' with dismal access to services and slum-like conditions. These rural migrants continue to be labeled as outsiders and are socially and economically marginalized despite the recent attempts to dismantle the hukou system. If SDG goals are to be achieved and Agenda 2030 fully realized, greater attention needs to be placed on shifting the narrative that blames migrants and urbanization for the failings of large metropolitans.

FIGURE 30: Share of Households Receiving Foreign Remittances (%), 2012



Source: World Bank Poverty Team Staff calculations, FIES 2012.

⁴⁴ Feler, L., & Henderson, J. V. (2011). Exclusionary policies in urban development: Under-servicing migrant households in Brazilian cities. *Journal of urban economics*, 69(3), 253–272.



Conclusion

The nature of possession and dispossession in slums goes beyond the simple income measurements. The discussion presented in this report further highlights that slum settlements are simultaneously spaces of opportunity as well as constraint. However, opportunities and challenges are highly structured by informality that touches social, economic and spatial aspects of slum dwellers' lives. Challenges faced by these communities are not only limited to insecure tenure or gaps in access to basic services due to the informal nature of settlements. Rather, they extend to other forms of informality, such as with respect to employment and livelihood activities. Home-based enterprises and small entrepreneurs within informal settlements often embody informal practices of sociality as well as economic production. Social networks and support systems that arise in response to insecurity and uncertainty also form the foundation of resilience within slum communities.

Additionally, it is clear that certain opportunities and constraints are exacerbated by the physical attributes and locations of settlements within the city, and that slum typologies can corresponded to socio-economic advantages or disadvantages. In particular, Wet and Pocket slums see heightened levels of deprivation and multidimensional poverty. Today's technology allows for a full survey of the presence of these particular informal settlements, and their unique attributes must be taken into account with devising policy initiatives.

Any solution that attempts to improve the wellbeing of slum dwellers and to enhance their inclusion in the urban fabric needs to take into account the pervasive elements of informality. Such interventions necessarily go beyond straightforward brick and mortar approaches of urban upgrading. For instance, the informal aspects of livelihoods within slums are not easily retained in a transformation to formal housing. A lack of attention to the design of formal housing that pays attention to informality of economic activity can have potentially negative effects on the wellbeing of the beneficiaries of such interventions. This concluding section presents some reflections on how exiting approaches to slum upgrading can be strengthened by better accounting of the social and economic contexts of slums.

Are Current Slum Upgrading Approaches Enough?

The World Bank's Philippines Urbanization Review (2017) highlights that while the Government of Philippines has developed a number of social housing programs for the urban

poor over the years, they have not been entirely successful. Despite the magnitude of the informal settlements, the Government has only allocated a staggering 0.1 percent of the total GDP for the housing sector between 2000 and 2014. This makes Philippine public spending on housing the lowest compared to its peers in Asia such as Singapore, Thailand, and Malaysia.⁴⁵ Further, as highlighted in the earlier sections of this report, different social housing programs have met with limited success, with particularly little success of the off-city resettlement.

Off-city resettlement in Metro Manila has been involuntary in many circumstances and has resulted in negative socio-economic impacts for the relocated households, such as loss of livelihood, increased cost of transportation, set-backs to the education of children, lack of adequate access to basic services, and disruption of social networks (see Section: Navigating Informality). Beyond such negative impacts on the slum dwellers, developing resettlement sites far away from transport, employment opportunities and social infrastructure such as schools and hospitals, also goes against the principles of developing low-carbon cities, which are the need of the hour. Limited in-city shelter upgrading through the community mortgage program (CMP) of SHFC has not been as successful as it was hoped, given the limited loan amounts. Loans are mostly spent on land acquisition and slum dwellers lack the financial capacity to borrow for site development or housing, let alone set aside funds for estate management or for better design of the new settlements.

The Philippines Urbanization Review 2017 highlights the following key constraints to enhancing affordable housing, including for slum upgrading: (i) land availability; (ii) affordable housing finance; (iii) governance; and (iv) lack of inclusive urban development that optimizes land use. Another element that can be added to this list is the need for leveraging better infrastructural and architectural design that takes into account the nature of livelihoods as well as social structures of the slum communities. Research shows that among urban poor and informal settler families, there is a particular dependence on the networks of streets, lanes and communal spaces, particularly to allow the domestic production to spill into public space with high levels of intensity and efficiency.⁴⁶ Informality in the organization of living as well as working spaces within slum communities enable flows of information and materials that support income generation and make living under the conditions of poverty more bearable. Communal spaces become important conduits of information by encouraging social interactions. If designed well, they are critical in facilitating social cohesion and enhancing community safety.

Attempts to formalize slums or develop new low-income public housing, often tend to standardize private spaces into small apartments that are separated from street networks, and allow less flexible and productive spaces. This artificially imposed formality that is divorced from the sociality of informality can have negative consequences on social and economic aspects of the beneficiaries of these approaches. In order to create sustainable models of urban upgrading, an engagement with the intrinsic logic behind the informality of infrastructure within slums is likely to be important—irrespective of in-situ or off site

⁴⁵ C. Habito (2016). “Public Housing Expenditures in Selected Asian Countries, 2000–2014”. Manila. (*Mimeo*) The study compared public housing expenditures as a percentage of GDP between 2000–2014 for 9 Asian countries, namely Singapore, Nepal, Mongolia, Indonesia, Sri Lanka, Thailand, Malaysia, Bangladesh, and Philippines.

⁴⁶ Dovey (2013) *Informalizing Architecture*.

approaches. An interesting example that takes these principles into account comes from the work of Prasanna Desai Architects with Mahila Milan, the National Slum Dwellers Federation (NSDF) and the Society for the Promotion of Area Resource Centres (SPARC) in Yerawada, Pune (India), involving community-based mapping as a diagnostic tool for incremental upgrading, following which some dwellings are replaced and others renovated with only minor adaptation to the building footprint. Kenya's Mukuru Kwa Njenga slum upgrading has utilized urban design that integrates the house and business typologies to take into account home-based work, leveraging ground floors for economic units and providing space along streets for kiosks and street vendors. Alejandro Aravena, a Chilean architect, is well-known for his approach of creating “half of a good house”, or low-cost, social and emergency dwellings that combine social and economic aspects. The homes can be finished, extended and developed by their inhabitants by personalizing the sparse dwellings, adding value, and creating a sense of belonging.

In order to ensure sustainable urban upgrading, housing design that allows incremental housing developments is important, especially given that most low-income families rely heavily on self-construction and invest small amounts of money over time in home improvements. Home-construction is usually undertaken by an informal, local community network of masons and other semi-skilled or unskilled workers, wherein the homeowner is heavily involved in design and construction. This approach is known to be the single largest source of affordable housing generation in many countries of the global South. Low-income urban dwellers face crucial but complex decisions when they engage in the construction or expansion of their houses. But given that poor communities are completely unserved by such construction professionals as architects and engineers, they rely solely on advice from neighbors and local masons and their decisions often lead to poor use of limited financial resources and technical mistakes during construction. To address this gap, in India, Micro Home Solutions (a Social Housing initiative, mHS), JPAL and the NGO Saath are working together to organize trainings of community masons, tailored at self-construction and incremental slum upgrading practices in two Indian cities. The main aim behind organizing these innovative trainings was to make local masons aware of how to make strong, durable and disaster resilient structures using optimum available resources.

A greater attention to aesthetics within slum upgrading interventions can also help counter the negative perceptions of informality while increasing the community's ownership of common spaces and public safety. The well-known Gondolayu project in Yogyakarta, Indonesia, led by architect Romo Mangun in the 1980s, incorporated art projects that transformed the urban image of the community and helped prevent eviction. The favela painting project of artists Haas&Hahn, in Rio, seeks to transform dilapidated buildings with striking colors, with the hope to enhance community ownership, pride and participation of youth. For example in 2010, in Rio's Santa Marta favela, they trained young favela residents and worked with them to paint over 34 houses in a 7,000-square-meter area at the central square of Praça Cantão. These examples and approaches are not an end in themselves but rather as an element in a more integrated approach to slum upgrading that links an understanding of the needs for social assistance and community participation with infrastructure interventions.

As we move towards a greater focus on inclusive urbanization under the SGD 11, a better integration of social, environmental and economic elements of communities with infrastructure upgrading will be needed to ensure sustainability and urban resilience. This is also one of the biggest lessons learnt from the decades of slum upgrading approaches in Latin America. A recent IADB publication⁴⁷ highlighting the successes, failures and lessons learnt in the Latin American Countries (LAC) over the past several decades, particularly from Brazil, Chile, and Colombia, emphasizes the need to shift the focus of policy from quantitative outputs to qualitative outcomes i.e. from providing housing to creating better cities. Another important lesson is that the location of housing and socially integrated design of housing is more important than simply its provision, if the aim is to create socially diverse and inclusive urban communities that have access to quality urban services.

Can Technological Solutions Support Slum Upgrading and Facilitate Inclusive Urbanization?

The short answer is ‘yes’. The remote sensing based slum mapping approach discussed in the earlier sections of this report was not only leveraged to identify slum settlements in a rapid and accurate manner at scale, but also allowed a basis for better understanding the socio-economic aspects informal settlements. Different approaches to slum mapping have been applied in other contexts, such as in Nairobi and Addis Ababa. In Nairobi, a methodology on violence mapping in slums was tested through GPS data collection, community-based mapping and data visualization,⁴⁸ while in Addis Ababa, geospatial mapping tool allows the team to develop housing maps from government housing data.⁴⁹

Increasingly, there are advances in the quality of data produced by drones for mapping complex urban areas. This offers considerable opportunities for land use inventories and land administration. The costs and labor intensity of land use inventories and cadastral surveying can be major hurdle to land use planning, land acquisition/resettlement, disaster preparedness, achieving land tenure security at scale in urban areas. Combining drones with satellite imagery, automated feature extraction and ground truthing offer major opportunities to reach more people and work faster with the same amount of resources. Notable ongoing projects in this regard that the World Bank is supporting include, large scale high resolution mapping work in Tanzania, and the Real Estate and Cadastre Project to assist the Kosovo government in producing a national cadastre system and geospatial data infrastructure.

Technological advances can be combined with participatory mapping approaches, which have been successfully used by many EAP cities. A notable example is the Solo Kota Kita initiative which has been developing tools for neighborhood advocacy and citizen planning in Surakarta (Solo), Central Java, Indonesia since 2009. The goal of Solo Kota Kita is

⁴⁷ Magalhães, F., Acosta Restrepo, P., Lonardoni, F., & Moris, R. (2016). Slum Upgrading and Housing in Latin America.

⁴⁸ GIS and Participatory Violence Mapping in Kenya, Margarita Puerto Gomez, 2016, World Bank Group.

⁴⁹ <https://collaboration.worldbank.org/projects/spatial-development-research/blog/2016/03/18/spatial-development-of-african-cities-program-pilots-innovative-new-research>.

to increase awareness of urban issues so residents can strengthen their voice in participatory budgeting—known locally as *musrenbang*. This is accomplished through a community-based approach of collecting, mapping sharing data about the urban environment with residents and local government in Solo. The main tool of the project is the “mini atlas,” which shows how neighborhoods work and illustrates patterns of social and economic problems and opportunities. The data is shared online through the Open Street Mapping platform to make it openly accessible. Community facilitators have been trained to collect data for every neighborhood in Solo twice. The first survey was completed in 2010 and the information was compiled into a database as well as 51 mini atlases. The survey was conducted again in 2012 to update the database, this time using a new SMS tool that allows residents to send data to the team using mobile phones.

Participatory mapping approaches, in combination with technological advances have also been leveraged to provide addresses to slum dwellers. The *Addressing the Unaddressed* initiative turns geo-coordinates into unique addresses in slums and informal settlements in a standard, non-political way that can change and adapt as the settlement changes. Addressing can empower slum dwellers, particularly those with insecure tenure, by increasing access to basic social and civic services. Without an address, slum dwellers are not able to open a bank account or register with private sector companies, denying them such basic services as electricity, along with access to social services and the right to vote. Another innovative approach of pre-assigned addressing system has been developed by “what3words”. This start-up company has provided every 3m x 3m square globally with has an address using a unique three-word combination, which simply needs to be discovered by an individual or shared with them via paperwork or in person. It means the development of communities and cities does not rely on the implementation of slow and costly street addressing projects. 3 word addressing can be used in any GIS system or as a layer on any map, where 3 word addresses are converted to coordinates and vice versa. This enables governments, agencies and the private sector to use it in urban planning, community building and upgrading projects, and asset management by providing a simple and unique way for everyone to refer to each building or land parcel – from planners to construction workers, from agents collecting census information to health visitors and midwives. what3words is now being used in crowdsourcing projects such as to map community and government assets, in health service and solar delivery in slums, in smart utility projects, and in informal settlement upgrading. It has also been adopted as a national addressing system in Mongolia.

Finally, innovation in digital tools can leverage the increasing penetration of mobile phones in developing countries and urban poor communities to deliver technical assistance and support directly to the communities, such as slum households. In the context of the above mentioned masons skill training program, the mHS team is piloting a “Smart Construction” app that can directly guide and improve the output of the mason’s skill training by targeting low income dwellers who take up construction (or expansion) of houses on small plots. The service aims to bring to the users pragmatic inputs (through easy-to-understand, customized visual messages) for the construction phase (thus, positively influencing the quality and resilience of these buildings). The prototype is now being tested in Delhi and Ahmedabad, the next key steps are launching a mobile based application that

will be available on desktops and smartphones as well as an intermediate IVR service for feature phones.

Leveraging technology for inclusive urbanization is going to be a defining feature for the attainment of the SGDs and successful achievement of the Agenda 2030. There is tremendous room for building the technical capacity of communities as well as local governments to enhance sustainable urban planning and inclusive urbanization. From a policy perspective, building urban data systems will allow local governments to move from making reactive, ad-hoc decisions, to creating proactive, evidence driven solutions for many of the urban challenges, including resilience to climate change, planning for rapid urbanization, urban poverty reduction. The development of data collection, management and sharing platforms in cities will be foundational to building sustainable cities that are efficient, equitable, and adaptable with empowered communities.



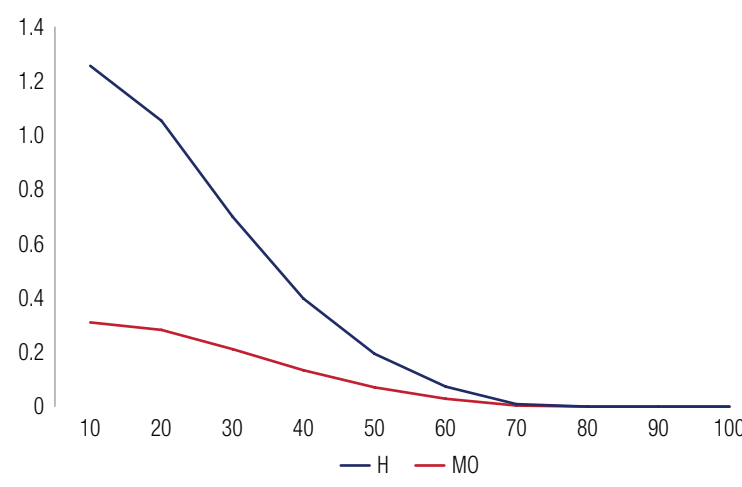
Annex 1: Methodological Details

Rationale for the Poverty Cut-Off Point and the Steps Employed Within the Alkire-Foster Method

In order to identify a suitable poverty cut-off point, we conduct different calculations of the multidimensional headcount ratio (H) and adjusted headcount ratio (M0) based on different poverty cut-off levels (k) from k=10% to k=100%. Then, we graph the overall values of H and M0 across these cut-off levels as shown below:

Finally, we pick up a cut-off point that relies on a region of the graph where change from one cut-off level to the next is not dramatic. Based on the graph above, k=40% is the appropriate cut-off point to use for this analysis.

FIGURE A1: Overall Values of H and M0 Along Different Poverty Cut-Off Levels



Uncensored and Censored Headcount Ratios

In addition to the regular headcount ratio presented in the text, which is also known as the “uncensored headcount ratio” or the proportion of households deprived with respect to a specific indicator regardless of whether or not they are deprived in other indicators i.e. regardless of whether they are multidimensionally poor, the censored headcount ratio, which is the proportion of households deprived with respect to a specific indicator while simultaneously being multidimensionally poor, is another useful measure of multidimensional poverty that helps improve our understanding of the problems facing the urban

poor community in Metro Manila. Table A1 below presents both ratios for each of the 21 indicators in our analysis.

The censored headcount ratios as opposed to their uncensored counterparts give us a sense of how prevalent the deprivations are among slum dwellers. In most indicators, the uncensored headcount ratio is at least twice as high as the censored headcount ratio, meaning that less than half of the households that are deprived in each indicator are considered multidimensionally poor. Such comparisons highlight that the dimensional deprivations in these slum settlements are scattered quite widely across many households, many of whom are not considered multidimensionally poor within the scope of this analysis. This pattern of results indicates that comprehensive improvements to diverse aspects of slum life can only be achieved with rigorous efforts to tackle the issues in each dimension and should not be restricted to a focus on the multidimensionally poor alone.

TABLE A1: Poverty Level and Dimensional Contribution to Overall Poverty in Metro Manila Urban Slums: 2015

No.	Dimension	Indicator	Uncensored Headcount Ratio	Censored Headcount Ratio
1	Access to clean water	Water supply	0.293	0.199
		Water provider	0.137	0.109
2	Access to sanitation	Regularity of garbage collection service	0.039	0.017
		Type of toilet	0.024	0.018
		Access to toilet	0.058	0.036
3	Access to health services	Birth place of youngest child	0.306	0.128
		Experience of a major illness	0.127	0.053
4	Education	Access to internet	0.409	0.194
		School attendance of youth	0.064	0.038
		Adult education	0.769	0.251
5	Access to transportation	Access to public transportation	0.314	0.122
		Access to informal transportation	0.043	0.024
		Access to work place	0.210	0.047
6	Security of tenure and quality of community	Security of tenure	0.894	0.254
		Exposure to flooding	0.554	0.174
		Perception of community safety	0.670	0.182
		CSO participation	0.296	0.099
7	Stability/regularity of income and employment	Average unemployment share in household	0.191	0.077
		Share of informal unemployment in household	0.554	0.221
		Household per capita income	0.257	0.136
8	Household assets	Average scale of assets	0.394	0.199

Source: Metro Manila Slums Survey (World Bank, 2015).

Note: Sample size = 2244 (sample size for this analysis after excluding missing observations).

Multidimensional Poverty Index

The Multidimensional Poverty Index (MPI) used in this study can also be known as the adjusted headcount ratio or M0. M0 is the product of the multidimensional poverty headcount (H) and the average deprivation share (A), which calculates the deprivation share among the poor by dividing the total count of deprivations by the number of dimensions then average it among all poor persons. M0 can be considered a multidimensional poverty index (MPI) that reflects not only the prevalence but also the breadth of poverty, or the average extent of a poor person's deprivation. One simple way to illustrate the difference between H and M0 is to consider the case when a person who is already multidimensionally poor becomes deprived in an additional dimension. In this case, the value of H would remain the same while the value of M0 would increase because A, which reflects the average extent of deprivations experienced by the poor, would increase. Thus, comparing the values of M0 across different cities or typologies would allow us to make a judgment on how the combined levels of prevalence and breadth of poverty vary across these units of comparison.

The results of analysis for the headcount ratio (H), average deprivation share (A) and the adjusted headcount ratio (M0) across different cities and typologies are presented in Tables A2 and A3 below.

As the average deprivation shares across different typologies and cities are at around the same level (approximately 0.5, which means that on average, each multidimensionally poor person in this analysis is deprived in half of the weighted dimensions), the adjusted headcount ratio, which is the product of the headcount ratio (H) and average deprivation share (A), parallels H in terms of its variations across different typologies and cities.

TABLE A2: Multidimensional Poverty Indicators by Typology

Typology	Multidimensional Poverty Headcount Ratio (H)	Average Deprivation Share (A)	Adjusted Headcount Ratio (Mo) or MPI
High dense	0.293	0.510	0.150
Linear	0.236	0.491	0.116
Mixed	0.218	0.511	0.111
Pockets	0.295	0.493	0.145
Wet	0.304	0.518	0.157
Overall	0.264	0.510	0.135

TABLE A3: Multidimensional Poverty Indicators by City

City	Multidimensional Poverty Headcount Ratio (H)	Average Deprivation Share (A)	Adjusted Headcount Ratio (Mo) or MPI
Manila	0.371	0.518	0.192
Quezon	0.212	0.499	0.105
Muntinlupa	0.373	0.532	0.199
Overall	0.264	0.510	0.135

Absolute Contribution to MPI

In addition to the relative contribution of each dimension to MPI as discussed in the main text, the absolute contribution of each dimension to the adjusted headcount ratio is another useful measure that further sheds light on the extent of deprivation in each dimension as part of overall level of multidimensional poverty. This measure is presented in Table A4, in which the figures show how the extent of deprivation in each dimension individually adds up to the overall level of M_0 , which is 0.135. Consistent with the relative measures, the absolute contributions of education, access to clean water, income and employment and security of tenure to overall poverty are the greatest.

Transitional Probabilities: The Intersections between Income and Multidimensional Poverty

Beyond the measures of multidimensional poverty, we also look into transitional probabilities that illustrate the intersections between multidimensional poverty and income poverty. Through this exercise, we can garner better understanding of the dynamics and prevalence of multidimensional poverty across different income standards. Table A5 presents the transitional probabilities from absolute poverty to multidimensional poverty i.e. how many percent among the income poor, by each of the two income standards, are multidimensionally poor, and how many percent are not.

The analysis is conducted based on two absolute income poverty lines: (i) poverty threshold⁵⁰ for Metro Manila (household per capita equal to or less than PHP 22585) and (ii) monetary poverty evaluated as the bottom 40% of the income distribution (household per capita income equal to or less than PHP 39131). In this analysis, income poverty is *not*

TABLE A4: Absolute Contribution of Each Dimension to the Overall Level of Multidimensional Poverty

No.	Dimension	Absolute Contribution to M_0 (k = 40%)
1	Access to clean water	0.029
2	Access to sanitation	0.000
3	Access to health services	0.013
4	Education	0.032
5	Access to transportation	0.009
6	Security of tenure and quality of community	0.016
7	Stability/regularity of income and employment	0.027
8	Household assets	0.009
Total		0.135

⁵⁰ Non-food threshold.

TABLE A5: Transitional Probabilities Comparing Income Versus Multidimensional Poor in Metro Manila, Philippines: 2015 – Income is Not Included as an Indicator of Multidimensional Poverty

Panel A: Income Poverty based on Nonfood Poverty Threshold for Metro Manila 2015		
Income (Poverty Threshold)	Transitional Probabilities	
	Multidimensional Poverty	
	Total	
	Poor	Non-Poor
Poor	34.45%	65.55%
Non-Poor	23.36%	76.64%
Panel B: Income Poverty evaluated as the Bottom 40% of the Income Distribution		
Income (bottom 40%)	Transitional Probabilities	
	Multidimensional Poverty	
	Total	
	Poor	Non-Poor
Poor	37.38%	62.62%
Non-Poor	13.50%	86.50%

included as one of the indicators of multidimensional poverty, with the weights adjusted accordingly.

The tables above show that given income poverty evaluated by either income standard, quite a high percentage (over 30%) of the income poor are also multidimensional deprived. However, a higher proportion (37.38%) of those who are in the bottom 40% of the income distribution are multidimensional poor, which is a logical result since the bottom 40% poverty threshold is greater than the nonfood poverty line and consequently more people fell under it. This information shows us that income poverty and multidimensional poverty do overlap but not to such a great degree.

On the other hand, among those who are not income poor, we see a significant incidence of multidimensional deprivation as 13.50% of those above bottom 40% of the income distribution and 23.36% of those living above the absolute poverty threshold are found to be multidimensional poor. This suggests that multidimensional poverty is highly prevalent among these slum communities and that a decent monetary income is not necessarily accompanied with decent standards of living.

Transitional Probabilities – An Additional Scenario

While the analysis above presents the transitional probability analysis when income poverty is not included as one of the indicators of multidimensional poverty with the weights adjusted accordingly, Table A6 below shows the analysis in which income poverty is included in the measurement of multidimensional poverty for purpose of comparison.

TABLE A6: Transitional Probabilities Comparing Income Versus Multidimensionally Poor Individuals Based on their Income Status - Metro Manila, Philippines: 2015 – Income is Included as an Indicator of Multidimensional Poverty

Panel A: Income Poverty Based on Nonfood Poverty Threshold for Metro Manila 2015		
Income (Poverty Threshold)	Transitional Probabilities	
	Multidimensional Poverty	
	Total	
	Poor	Non-Poor
Poor	32.43%	67.57%
Non-Poor	23.36%	76.64%
Panel B: Income Poverty Evaluated as the Bottom 40% of the Income Distribution		
Income (Bottom 40%)	Transitional Probabilities	
	Multidimensional Poverty	
	Total	
	Poor	Non-Poor
Poor	37.38%	62.62%
Non-Poor	13.50%	86.50%

This analysis yields similar results with the first scenario in terms of the percentage of people who are both income poor and multidimensionally poor as well as the proportion of those who are not income poor but multidimensionally deprived. These similar patterns of results suggest that whether income is included as one indicator of multidimensional poverty or not, the extent of people's overall deprivations after the weights are adjusted is still significant enough for them to be consistently multidimensionally poor.

Regression Analysis

We explore the correlations between key variables in the dataset to better understand the potential impact of households' conditions of living and characteristics on their income and poverty status. We set up two survey regression models with variables selected from the dataset to represent household- and individual-level characteristics as derived from the framework presented by Haughton and Khandker (2009).

Using the same set of explanatory variables, we run (i) a survey linear regression model with the dependent variable being the log of household per capita income and (ii) a survey logistic regression model with the dependent variable being the multidimensional poverty status (in the form of a dummy variable). The results give us interesting insights into how individual and household characteristics can influence the welfare outcome of each household.

First of all, both regression models are set up based on considerations of the design of the sample that follows the strategy of "stratified sampling" in which households are selected

from “primary sampling units” (PSUs). By a refinement technique known as “stratification,” the PSUs are grouped into 15 “strata” based on a combination of location (Manila, Quezon or Muntinlupa) and typology (high dense, linear, mixed, pockets or wet). General survey regression model along with probability weights are thus applied to account for the design of the sample i.e. stratification, clustering, and unequal selection probabilities. Due to possible autocorrelations of error terms within one PSU, “probability weighted” point estimates are obtained to derive possible correlations between variables of consideration. We do not try to make conclusions about causal relationships but the correlations alone can provide useful insights into the patterns of life outcomes in these slum settlements.

Based on the framework for analysis of the determinants of poverty specified in Haughton and Khandker (2009) as well as the availability of data, the following variables are selected as explanatory variables for both regression models:

- ▶ At the household level:
 - Average level of education among household members in working age (15 to 64 years old)
 - The number of essential assets in the household (out of a total of 16 assets⁵¹ have been identified as essential for decent living in the slum community)
 - Unemployed household members as a share of total number of household members in working age
 - The share of informal employment in the household (the ratio of members having informal jobs to the total number of working members in the household)
 - Household size
 - Household location: dummy variable on the primary sampling unit to which the household belongs
- ▶ At the individual level: the following characteristics of the *head of household* are selected:
 - Gender
 - Age and square of age
 - Migrant status
 - Employment status (whether household member has worked in the last 12 months)

Tables A7 and A8 below present the results of each of the survey regression models.

Overall, households headed by males tend to earn 11% more income per capita than those headed by females. A rather interesting result from Table A7 is that households headed by migrants are likely to make almost 14% more income per capita than households headed by non-migrants. This indicates that migrants tend to do quite well in terms of nominal income in these slum settlements. The age of head of household, however, does not seem to have a statistically significant relationship with the household per capita income.

⁵¹ The 16 essential assets include: radio, TV, stove, oven, microwave, refrigerator, dining set, telephone, computer, washing machine, water heater, water tank, power generator, rice cooker, motorcycle/ tricycle/ bicycle/ pedicab, and car/ jeepney/ boat.

TABLE A7: Survey Linear Regression Results

Independent Variables	Dependent Variable: Log of Household Per Capita Income
Typology (Ref: Pocket)	
High Dense	0.203*** (0.0318)
Linear	0.404*** (0.0340)
Mixed	0.124*** (0.0219)
Wet	0.284*** (0.0211)
Head of Household's Characteristics	
Gender (Ref: female)	0.112** (0.0532)
Employment status (Ref: not working)	0.213*** (0.0739)
Age	0.00542 (0.00978)
Square of age	-.000059 (0.000103)
Migrant status (Ref: non-migrant)	0.129*** (0.0401)
Household-Level Characteristics	
Average level of education	0.0297*** (0.00697)
Assets	0.0880*** (0.00816)
Share of unemployment	-0.383*** (0.0831)
Share of informal employment	-0.281*** (0.0418)
Household size	-0.123*** (0.0102)
Constant	9.964*** (0.288)
Observations	2,414
R-squared	0.393

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

TABLE A8: Survey Logistic Regression Results

Dependent Variable: Multidimensional Poverty Status (Using the Scenario of 21 Qualitatively Weighted Indicators)	
Independent Variables	
Typology (Ref: High Dense)	
Linear	0.703*** (0.227)
Mixed	0.914*** (0.163)
Pockets	1.895*** (0.213)
Wet	1.904*** (0.276)
Head of Household's Characteristics	
Gender (Ref: female)	0.0413 (0.241)
Employment status (Ref: not working)	-0.121 (0.377)
Age	-0.0422 (0.0485)
Square of age	0.000527 (0.000528)
Migrant status (Ref: non-migrant)	0.125 (0.252)
Household-Level Characteristics	
Average level of education	-0.297*** (0.0557)
Assets	-0.533*** (0.0489)
Share of unemployment	3.198*** (0.470)
Share of informal employment	2.018*** (0.340)
Household size	0.0179 (0.0439)
Constant	2.587* (1.352)
Observations	2,122

Standard errors in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

While shares of unemployment and informal employment in the household have highly statistically significant negative correlations with household per capita income, an increase of one unit in household size would also decrease per capita household income by 12%. One extra unit of essential assets would correlate with an increase of 8.8% in per capita household income.

At the same time, the coefficients on typologies show us at the statistical significance level of 0.01 that residents in pockets settlements seem to fare the worst in terms of household per capita income as their incomes tend to be 20% lower than those in the high dense typology (which is the base). Meanwhile, those in linear settlements are likely to do the best as living in these settlements is correlated with the level of household per capita income that is 20% higher than the high dense settlements. Living in mixed settlements is associated with a decrease in household per capita income by 7.7% compared with the high dense settlements while those in wet settlements tend to make 8% more income than the base typology.

The results of the logistic regression indicate that the selected characteristics of the head of household as well as household size do not have any statistically significant relationship with the likelihood of the household being multidimensionally poor. However, there are highly statistically significant results for the typology variables as well as the rest of the household-level characteristics.

While one extra year of education among household members at working age would decrease the probability of the household being multidimensionally poor by almost 30%, one unit of essential assets would decrease this likelihood by 53%. An increase in either the share of unemployment or share of informal employment in the household would correlate with a corresponding increase in the probability of the household falling into multidimensional poverty status.

Among the typologies, the pockets and wet settlements are at the highest risks of being trapped in multidimensional poverty as residents in these settlements are respectively 1.89 and 1.90 times more likely to be multidimensionally poor than those in high dense settlements. Meanwhile, residents in linear and mixed settlements are respectively 70% and 91% more likely to be multidimensionally deprived than dwellers of the base typology.

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