

The Malawi Priorities Project

A Cost-Benefit of Interventions to Increase Compliance with the Construction Permits Process in Malawi: Ensuring the Benefits of Urbanization - Technical Report

National Planning Commission Report with technical assistance from the Copenhagen Consensus Center and the African Institute for Development Policy



Report Contributors

Nancy Dubosse, Research Economist, Copenhagen Consensus Center

Brad Wong, Ph.D., Chief Economist, Copenhagen Consensus Center

Charles Jumbe, Ph.D., Professor of Economics at the Centre for Agricultural Research and Development, LUANAR

Salim Mapila, Development Planning Specialist - Infrastructure and Spatial, National Planning Commission

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www.copenhagenconsensus.com

www.npc.mw

www.afidep.org

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Malawi Priorities: Background

Malawi Priorities is a research-based collaborative project implemented by the National Planning Commission (NPC) with technical assistance from the African Institute for Development Policy (AFIDEP), and the Copenhagen Consensus Center (CCC) to identify and promote the most effective interventions that address Malawi's development challenges and support the attainment of its development aspirations. The project seeks to provide the government with a systematic process to help prioritize the most effective policy solutions so as to maximize social, environmental and economic benefits on every kwacha invested. Cost-benefit analysis is the primary analytical tool adopted by the project. Cost-benefit analysis will be applied to 20-30 research questions of national importance. Research will take place over the course of 2020 and 2021.

Research questions were drawn from the NPC's existing research agenda, developed in September 2019 after extensive consultation with academics, think tanks, the private sector and government. This sub-set was then augmented, based on input from NPC, an Academic Advisory Group (AAG) of leading scholars within Malawi, and existing literature, particularly previous cost-benefit analyses conducted by the Copenhagen Consensus Center. The research agenda was validated and prioritized by a Reference Group of 25 prominent, senior stakeholders. The selection of interventions was informed by numerous consultations across the Malawian policy space, and one academic and two sector experts provide peer review on all analyses.

Cost-benefit analyses in Malawi Priorities consider the social, economic and environmental impacts that accrue to all of Malawian society. This represents a wider scope than financial cost-benefit analysis, which considers only the flow of money, or private cost-benefit analysis, which considers the perspective of only one party. All benefit-cost ratios (BCRs) reported within the Malawi Priorities project are comparable.

The cost-benefit analysis considered in the project is premised on an injection of new money available to decision makers, that can be spent on expanding existing programs (e.g. new beneficiaries, additional program features) or implementing new programs. Results should not be interpreted as reflections on past efforts or the benefits of reallocating existing funds.

Inquiries about the research should be directed to Salim Mapila at smapila@npc.mw.

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1. Summary

Those who live in dwellings constructed with traditional materials are vulnerable to climatic hazards. This vulnerability can be traced to poor quality of materials; poor and variable construction practice, and the lack of adaptation provisions in building design for natural disasters, such as floods and earthquakes. All of these point directly to non-compliance with building regulations and perhaps also to the absence of technical guidance on the appropriate adaptation measures at the local council level.

Owner-developers of low-income housing face additional challenges. The dearth of accredited experts, the cost of consulting them and the time and resources required to coordinate with government officials effectively creates a 'barrier' to comply with building regulations. Consequently, the cost of compliance renders the construction permit process so expensive, that a significant percentage of houses are constructed with traditional materials, even in areas designated for housing construction.

Given the regulatory framework in place and the full devolution of powers to local councils, the lack of compliance to building regulations and the consequent increased climatic risk of urban populations is the matter of particular interest treated in this paper. Poverty, the cost of compliance, and lack of transparency are all motivations for non-compliance in the construction sector, and two interventions are proposed to address them. They are (1) the use of prototype plans to substantially reduce the cost of the plans approval stage of the construction permit process (BCR = 3.3) and (2) the use of ICT in the construction permit process or e-permits, which would improve council productivity and workflow and, render the process more transparent (BCR = 3.2).

2. Introduction

Migration to Malawi's urban centres has increased modestly since independence from 6.4% of the national population in 1966; 10.1% in 1977; 10.7% in 1987; 14.4% in 1998; 15.3% in 2008; and 16% in 2014 (Government of Malawi, 2015). It is still estimated at 16% in the 2018 Malawi Population and Housing Census, approximately 3.29 million people. Seventy-five percent of the urban population is concentrated in 4 cities: Lilongwe, Blantyre, Mzuzu and Zomba (Government of Malawi, 2019b)). Although Malawi's urbanization is in its infancy, occurring at a modest rate of 3% nationally, high growth rates can be observed in Machinga (3.9%), Mangochi (3.6%), Ntchisi (3.5%), Salima (3.4%) and Mwanza (3.4%), as noted in the 2018 Population and Housing Census (Government of Malawi, 2019b).

In many ways, Malawians living in urban areas, especially the four cities mentioned above, are doing comparatively better than rural residents. Literacy rates are markedly higher, 87%-91%, than the national average of 69%. Household size is 4.4 nationally; 4.2 in urban areas, where a higher proportion of the population is of productive age, as evidenced by the dependency ratio of 0.9, compared to 1.3 in rural areas (National Statistical Office, 2020). Finally, urban residents are markedly wealthier. Urban employment growth accounted for 17.3% of all new jobs created in Malawi in the period from 1998 to 2013, and the four cities also form the economic core of the national economy, contributing 33% of national GDP (World Bank, 2017).

Impressive social and economic indicators notwithstanding, the living conditions of urban residents are unsettling. The proportion of urban residents living in informal settlements is around 65% (UN-Habitat, 2020b), and the majority (52.8%) are living in rented structures (National Statistical Office, 2020).

2.1 Vulnerability of Housing in Informal Settlements

A city that plans looks to integrate land use, employment, education, infrastructure, culture, and natural resources, rather than letting this evolution be determined solely by market forces (UN HABITAT, 2016). However, not all residents of a locality benefit equally. Lessons from documented implementation of land use plans show that several (negative) externalities occur. Artificially restricting the amount of land available for commerce makes business investment more expensive, often at the expense of small and medium enterprises. Likewise, restricting the amount of land for residential areas makes housing more expensive. The effects of these dynamics are two-pronged: they force the urban poor out of the city centre to informal settlements and they incite informal exchanges between local government officials and the private sector so that the latter can meet the costs of regulations (Gondwe et al., 2011; Egbu et al., 2006; Kleeman et al., 2017; Grant et al., 2019; Monkonnien and Ranconi, 2016; World Bank, 2015b).

Housing that meets the requirements of the regulatory framework is too expensive for the average urban resident. The annual urban salary as projected by the Copenhagen Consensus Center is around MWK 960,000 in 2021. At an average price of MK10 million and average rentals of approximately MWK 75 000 (one month's salary), very few can afford to own or rent a decent house (Housing Finance Africa, 2020). Buckley and Bower (2019) argue that migration, particularly to fast-growing locations, should be facilitated. In order to do so, housing supply must be sufficiently responsive, and a key component of this responsiveness is that housing is affordable. Otherwise, migrants to urban areas become the urban poor.

Dwelling structures in Malawi are classified into three major groups based on construction materials of the roof and walls; permanent, semi-permanent and traditional. A permanent structure is made of durable roofing materials such as iron sheets and strong walling materials such as burned bricks. A semi-permanent structure lacks one of the materials of the permanent structure, from either the roof or wall. A traditional structure lacks both materials of the permanent structure. Nationally, 67% of urban dwelling units are classified as permanent or semi-permanent (National Statistical Office, 2020), but this proportion varies considerably across cities. In Mangochi, 45% live in traditional housing; whereas, in Mzuzu City only 6.6% live in traditional houses (Government of Malawi, 2019b).

Traditional houses are particularly vulnerable to damage, given Malawi's ecological zone and climatic risks. Nationally, there have been 19 major flooding incidents over the past 50 years (Government of Malawi, 2019). For example, in a town like Karonga, there have been flooding events every rainy season between 2009 and 2016.

The 2019 floods resulted in damage to 288,371 houses nationally. The 2019 Post Disaster Needs Assessment found that 89% of the affected houses were constructed of traditional materials. The total value of the effects of the floods on the housing subsector is estimated at US\$ 106.6 million, of which damage constituted US\$ 82.7 million of the total and loss constituted US\$ 23.9 million. The majority of houses affected by floods were privately-owned houses that did not comply with building standards. Apart from the impact of loss of dwellings, the destruction to private houses also led to a loss of rental income.

Flooding is considered the most serious environmental hazard by 56% of households (UNHABITAT, 2020). While only 20% of urban residents reported being affected by floods within the last 12 months, this percentage increased to 42% for the Southern region; nationally, this percentage is 27.6% (National Statistical Office, 2020). According to the 5th Integrated Household Survey (2019/2020), 38.3% felt that they had inadequate housing.

Kita (2017) investigates the level of flood risk in Mzuzu City, Malawi, the city with the overall highest growth rate (5.4%) in population, according to the 2018 Population and Housing Census, and where more than 60% of the population live in informal settlements. In April 2016, the city of Mzuzu experienced the worst floods ever recorded since its establishment. Fifteen settlements were affected, 19,000 people were displaced, seven people died and seven camps were set up to accommodate the displaced. Unsurprisingly, the flood effects were mostly felt in informal settlements.

There are other environmental consequences to sub-standard and unsustainable construction. Mawenda et al (2020), analyzing urban land use changes from 1994 to 2018 in Blantyre City using remotely sensed Landsat Thematic Mapper and Imager, find that the built-up area increased at an annual rate of 5.34%. This was accompanied by a decline in vegetation of 2.7% annually between 2007 and 2018. The vegetation loss observed in this study signifies the loss of green spaces (such as forests and parks). The vegetation loss results in declining ecosystem services, such as air and water purification, flood mitigation services, noise reduction and climate regulation, including urban cooling. It also causes soil degradation, which leads to the formation of gullies and derelict landscapes. In addition, such losses increase residents' vulnerability to environmental stress.

Disastrous consequences arise when vulnerable populations are exposed to hazards (Kita, 2017). The vulnerability of informal housing can be traced to poor quality of construction materials; poor and variable construction practice; lack of building design and construction provisions for natural disasters, such as floods and earthquakes. All of these point directly to non-compliance of building regulations, and perhaps also the absence of guidance on the appropriate adaptation measures in constructions projects.

2.2 Non-compliance in the construction sector

The built environment in Malawi, particularly housing construction, has a crucial influence in mitigating the socioeconomic impacts of natural disasters and in achieving environmentally sustainable, affordable solutions (Ngoma 2005; UN-Habitat 2010). The construction permit process requires the coordination of many agencies, and, as such, many hazards can be avoided when compliant with construction regulations.

However, many owner-developers remain trapped in the informal sector because the transaction costs of formalizing are just too high. That is, the costs of compliance are too high: either in the form of long waiting times, high fees, and corrupted local officials.

Housing construction costs depend on who is building and for which market. Traditional housing areas (THA) are high-density areas set aside for low-income urban residents and are composed of both formal and informal structures; the latter built with traditional materials. Traditional housing plots range from 250 to 450 square metres. Habitat for Humanity costs their two-bedroom dwellings at MWK 250,000. In the city of Lilongwe, the total cost of a house is in the range of MWK 250,000 to MWK 300,000 (UNHABITAT, 2010). Inflated to 2020, this range increases to MWK 1.5 and 1.8 million.

The main technical/construction-related reasons for high vulnerability of houses against natural hazards are multi-fold: (i) poor quality of construction materials (e.g. use of unburnt bricks with mud mortar), (ii) poor and variable construction practice (e.g. lack of skilled labour), and (iii) lack of building design and construction provisions for natural disasters, such as floods and earthquakes (Kloukinas et al, 2020).

Karonga Town suffered similar consequences after establishing a land use plan. Most of the houses as observed by Manda et al (2016) are built of temporal materials such as grass thatch, mud floors and sun dried bricks that cannot stand a major flood event. Whereas the plan was intended to mitigate the city's vulnerability to floods, according to Gondwe et al. (2017), it resulted in the inability of those with low incomes to meet the demands and requirements of formal spaces. Sixty per cent of informal houses were built on flood plains. Human activities such as farming and housing construction take place on the dyke and artificial channels that were built to drain water to the lake. Karonga is also known to experience earthquakes. In 2009, earthquakes caused over 775 to collapse, while 1,154 developed cracks. Other buildings like police houses, schools and business centres were also affected (Manda et al., 2016).

The consequences of informal settlements go beyond property damage from disasters. They include high faecal coliform, sulfate, nitrate, and phosphate levels in water, lower water levels, an increase in water-borne diseases.

Gondwe et al. (2020) use the concept of urban sustainability to refer to the fact that local government can create and implement land use plans that demonstrate more flexibility and recognize the challenges of lower income residents. This sustainability can be achieved if urban planning tools accommodate the coping mechanism of the urban poor and also when the complexity of rural-urban spaces are understood by urban planners. This argument could also be extended to construction guidelines. The promotion of safer construction guidelines could be a cost-effective means to optimize risk reduction, while also facilitating the achievement of other objectives, such as increased accessibility and usability for people with disabilities; climate change mitigation (through the construction of energy-efficient buildings); and climate change adaptation (through promoting buildings resilient to hydro-meteorological hazards) (Government of Malawi, 2019).

Even formally-constructed dwellings do not appear to sufficiently mitigate against Malawi's known environmental hazards. Ngoma et al. (2019) conducted a building survey in July 2017, in areas susceptible to seismic hazard in Central and Southern Malawi. The surveyed locations, according to the observed similarities of building typologies, were classified by 'secondary-urban areas with presence of the formal construction sector'; 'secondary-urban areas developed by the informal construction sector', and suburban areas and rural townships/market town areas'. In most areas, 50-60% of the permanent-type structures were built with single-skin walls, which are not recommended in the Safer Housing Construction Guidelines, because they are slender and vulnerable against lateral loads. Openings were poorly supported; less than 20% of the inspected buildings had proper lintels. More than 80% of the roofs were found to be of the gable type, which are popular in newer construction, but against recommended guidelines. The overall rating of quality and damage/maintenance condition showed that more than 50% of the inspected buildings exhibited signs of structural damage caused

by various mechanisms related to the masonry, the openings, the roof and the foundations, or signs of erosion/scouring, with insufficient protection, mitigation measures and maintenance.

2.3 Regulatory and institutional framework

The construction sector is not a significant contributor to national GDP, 3% in 2017, and, according to the Fifth Integrated Household Survey (2019/2020), less than 2% of households work in construction (National Statistics Office, 2020). Nevertheless, the productivity in the sector appears to be concentrated. According to the National Construction Industry Policy (2015), despite the heavy presence of local firms, participation in the construction industry in Malawi is dominated by foreign firms, which constitute only 2.8% of registered firms taking 85% of the construction business by value with the local firms scrambling for the remaining 15%. The policy identifies capacity constraints in the form of inadequate skills, inadequate capital base and inadequate equipment. These inadequacies have led to low participation of local firms in the industry, less trust in the local contractors and constrained growth of the firms themselves. The policy further identifies seven major priority areas; namely, improvement of the regulation of the construction Industry, improvement of standards, quality assurance, the promotion of good corporate governance, among others.

According to Malawi's Vision 2020, the strategic objective around housing was to develop and upgrade human settlements for "equitable access to housing for all". Local Assemblies of the have had responsibilities for the development and management of low-income housing since 1992. The National Physical Development Plan (NPDP) proposed a decentralised urbanisation strategy by promoting the development of small and medium size towns to steer migrants away from Blantyre and Lilongwe. In this way, it was thought that the perceived and real problems of housing, sanitation and congestion in the two cities would be reduced. This was followed by the National Decentralisation Policy, developed in 1996 which, with the Local Government Act 1998, devolves local project implementation, including development and management of low income housing, to local assemblies (UNHABITAT, 2010).

The Malawi National Land Policy (2002) identifies urbanization as an integral aspect of modern economic and social development. Major urban areas and all the designated Town Planning Areas in Malawi have Planning Committees responsible for ensuring that development in the urban areas conforms to the requirements of either the Urban Structure Plan or the Outline Zoning Plans. All urban land use and development plans will aim at more intensive use of urban land than has been the case in the past. To achieve these objectives, the Government revised all space and planning standards to promote more compact form of building in all urban areas and zoned more areas of towns for vertical development.

From an enforcement perspective, there are many stakeholders in the construction sector: the Ministry of Lands, Housing and Urban Development, the Malawi Housing Corporation, the National Construction Industry Council, and the Local Assemblies. The City Assemblies are responsible for the administration of Traditional Housing Areas (THAs), and local chiefs.

The National Construction Industry Council (NCIC) was set up under the National Construction Industry Act to promote, develop and regulate the construction industry. It is responsible for registering local practicing contractors, regulating and registering foreign firms working with local firms, regulating construction activities and standardizing quality control, codes of practice, and legal and contractual procedures, in liaison with other institutions. Malawi Bureau of Standards is responsible for setting standards and specifications for all goods or materials including methods of testing them.

Malawi's 28 districts have full responsibility over their development and administrative matters in line with national objectives as stipulated in the Malawi Growth and Development Strategy III. Local councils are responsible for nearly all essential services including roads and street services; water; public amenities including parks and sports grounds; businesses, including regulation, licensing and inspection; citizen services including registration of births, deaths and marriages (Government of Malawi, 2019).

Given the regulatory framework around land use and construction in place and the full devolution of powers to local councils, the lack of compliance with construction, especially with the construction permit process, and the consequent increased climatic risk of urban populations is the matter of particular interest treated in this paper. Two interventions are proposed to address non-compliance: (1) the use of prototype plans to substantially reduce the cost of the plans approval stage of the construction permit process and (2) the use of ICT in the construction permit process, which would improve local council productivity and workflow and render the process more transparent.

2.4 Malawi Priorities Project

The National Planning Commission (NPC), with technical support from AFIDEP, and the Copenhagen Consensus Center (CCC) is implementing cost-benefit analysis across a wide range of policy areas to assist the Government of Malawi to prioritize spending.

The project, 'Malawi Priorities', and its research agenda takes its starting point in the NPC's existing research agenda, which is structured around the six thematic areas of Sustainable Agriculture, Sustainable Economic Development, Human Capital and Social Development, Sustainable Environment, Demography, Governance, Peace, and Security. The NPC's research agenda predates the Malawi Priorities project and underwent an independent validation process. Furthermore, a Reference Group of 24 experts from a variety of sectors were polled to identify the most pertinent research questions and potential interventions for study. The above research question is the result of these two processes.

Research question (s):

What are effective strategies for managed urban population growth so that it is a catalyst for sustained economic growth, is at pace with growth of basic and social services and ensures rural areas are not left behind in economic transformation?

The prevailing sentiment among experts in the land use/urban planning field is that flexibility in land use regulations would stimulate greater compliance. This flexibility pertains to facilitating access to credit, identifying building materials that are affordable and that can

be locally procured, reducing the direct fees of compliance and the number of officials with whom owner-developers come in direct contact.

Given Malawi's existing regulatory framework on land use and the extent to which responsibilities have devolved to local councils, the interventions considered here to reduce compliance costs in construction include:

- *public disclosure of relevant fees and regulations in local languages.* This would prevent the exploitation of disadvantaged owner-developers by public officials.
- *compliance inspections.* Generally, enforcement mechanisms are expensive, especially physical inspections, but modern technology (i.e. drones) can be used to replace the human element and overcome the high cost of transport to remote areas.
- *setting fees for cost recovery.* There are various fees to be paid throughout the construction permit process, and the World Bank recommends that they be set at cost recovery rather than trying to use the revenue from construction project applications to finance other functions within the municipality.
- *supporting the retrofitting of houses and buildings.* Resettlement being a last option, retrofitting existing structures in informal settlement and offering owners incentives to do so by guaranteeing loans or subsidies.
- *risk communications to incite behaviour change.* As is the case for most African countries, most land is customary, administered by traditional authorities. Leaders may feel like the obligation to comply interferes with their land rights. Risk communication is a way of raising public awareness of the hazards that exist in a zone. This could be done in a community dialogue setting or via radio.
- *prototype architectural plans.* Template plans, upon which owner-developers can customize, that have already been preapproved by the relevant agencies would reduce the cost of individual plans, as well as ensure the resilience of structures.
- *digitalization of the construction permit system.* Integrating ICT in the construction permit systems entails automating the application process, establishing a platform of communication between agencies, allowing for digital payment, among other things. All of these would reduce the costs associated with the process and increase accountability.

3. Interventions to reduce compliance costs in the construction permit process

In the World Bank's Doing Business Index 2020, Malawi's overall rank is 109 of 190 countries; however, its rank falls to 128 in the construction permits category. Although it ranks 10 overall among sub-Saharan African countries, its rank falls to 24 for the Construction permit index.

Obtaining a construction permit in Malawi entails 13 procedures and begins with getting the architectural plans approved. Then there is a certificate that must be obtained from the Department of Environmental Affairs. The City Council must be formally notified of the start of the construction project, which must be inspected. Similar communication must be made regarding foundation excavation, brick work foundation, damp proof course, and when the project reaches wall plate level, and physical inspections must be arranged for each. An application must be made for water and sewerage connections, which will be followed by an additional inspection. Then an application must be made for an occupancy permit, followed by a final inspection. Finally, the property title must be registered with Lands.

The first step in obtaining a construction permit is the approval of the project's architectural plans. Albeit straightforward, this process is also costly, both financially and with respect to time. The plans must be prepared by licensed architects and signed by an engineer. Then all relevant forms (and the plans) are submitted to the City Council, along with payment of a fee based on the size of the building and the assessed value of the land. The panel reviews the building plans and application and either approves the development or suggests amendments. If the panel requires amendments, BuildCo is notified by mail of the changes required. The meeting of the City Planning Committee takes place only once a month, and the Technical Panel meets only once every 2 weeks. However, companies may choose to opt for a fast-track option, which allows for an emergency meeting of the Town and Planning Committee at a higher fee charged on top of standard fees. The fee for a fast-track option would be MWK 50,000. In this case, the meeting will take place within about one week of the payment being made. BuildCo will receive an oral decision at the end of the meeting. If there is an affirmative decision, construction can begin right away. The official document will be issued soon after. The plans and application are then forwarded to a technical panel for consideration, which includes no fewer than 11 public entities including the city council departments, the Ministry of Transport and Public Works, ESCOM and the Water Board.

By far the most expensive component of obtaining a construction permit is the approval of the architectural plan. Where it relates to time, approval of a plan from the local council takes 60 days, whereas the total time to obtain a construction permit is 172 days. The plans approval process alone is estimated at approximately MWK 941,000, 78% of the total cost of obtaining a construction permit, which is MWK 1.2 million (2020 Doing Business Survey).

The high cost of the plans approval phase is no doubt related to the shortage of accredited professionals in the construction sector. In 2011, Malawi had 0.2 accredited planners per 100,000 population, as opposed to Zimbabwe (2.06), South Africa (3.33), Nigeria (1.44). The neighbouring countries of Zambia and Tanzania had ratios of 0.45 and 0.34 respectively (UNHABITAT, 2016).

Another cost driver of the entire construction permit process is transaction cost; specifically, those emanating from the number of inspections required. Four to seven inspections are required for any construction project; the precise number depending on the degree of coordination between the builder, the local council and other public agencies.

The dearth of accredited experts and the cost of consulting them, and the time and resources required to coordinate and comply with land use and construction regulations effectively creates a 'barrier' to comply for owner-developers of low-income housing. Consequently, the cost of compliance (time and expert consultations) renders the construction permit process expensive, with the result that a significant percentage of houses are constructed informally.

Therefore, two interventions are proposed to reduce the costs of compliance with the construction permit process:

1. the use of prototype plans to substantially reduce the cost of the architectural plans approval stage, the first step to obtain the construction permit. This intervention is expected to directly reduce owner-developers' compliance costs. It will also mitigate the risks of environmental/climatic hazards in undesignated areas if offered to all owner-developers. The owner-developers in undesignated areas, because their houses are targeted for low-income renters have a particular need to know which materials are sustainable and what technologies to employ to increase the resilience of the structures.
2. the integration of ICT in the construction permit process. This intervention is expected to increase local council productivity and workflow. The digitalization of procedures would result in significant time savings. The process becomes more transparent, in turn improving compliance rates through improved confidence.

3.1 The use of prototype plans for housing

The intervention proposed is to make use of prototype (pre-approved architectural plans) to reduce the financial cost and time of the

plans approval process. The use of prototype plans encourage those who could not afford architectural fees to submit customized but pre-approved plans for approval, putting up structures that are properly guided.

The plans would include guidance on the use of raised foundations, damp-proof courses to the base of walls, waterproof and sacrificial coatings to walls, the incorporation of large roof overhangs or verandahs to keep the rain off walls, and effective local drainage networks and any other technologies that would minimize the damage from floods.

Local councils are expected to have 5 prototype plans, upon which owner-developers may customize. Customization takes 5 working days and is estimated to cost 15% of the current cost of the plans approval process. Local councils are also expected to review prototype plans every 10 years.

The current number of dwellings in Malawi is 4.8 million (2018 Population and Housing Census). The number of urban dwellings is assumed to be proportional to the percentage of the population living in urban areas (16%), hence 769,000 units. The future rate of housing construction was assumed to be in line with the national urbanization rate of 2.9% (2018 Population and Housing Census). This renders a projection of approximately 22,300 units in the first year, a close estimate to that of Habitat for Humanity's Malawi Country Profile (2019) whereby 21,000 new units per year are needed to meet anticipated demand for the next 10 years.

Informal (traditional) housing exists in both designated and undesignated areas for building, but the focus of this intervention are owner-developers in the former, as the analysis assumes no change in current land use regulations and hence no special dispensation for those building in those areas.

Table 1: Focus of proto-type plans is on houses in designated areas

| Type of dwelling | Zoning for housing construction | |
|------------------|---------------------------------|--------------|
| | Designated | Undesignated |
| Permanent | X | |
| Traditional | X | |

The rate of non-compliance with land use regulations is estimated to be 33%, based on the fact that 67% of urban residents already live in permanent housing structures. Furthermore, not all future formal construction projects are expected to use the prototype plans. Thus, the analysis was undertaken with an assumed 10% uptake rate of future formal construction and a 10% uptake rate of informal construction.

3.1.1 Benefits

The advantages of prototype plans are that it directly reduces the cost of compliance and ensures that a greater proportion of houses built in the future are sustainable and resistant to damage from disasters. The benefits included in the analysis are:

B1. Cost savings

This benefit refers to the avoided expenses of engaging architects and engineers directly to create an original architectural plan and accrues to the owner-developers of permanent housing, approximately 1,500 houses in the first year, increasing to 1,900 over ten years. The cost savings is substantial, as the 2020 Doing Business costed this phase of the construction permit process at MWK 941,000. The intervention saves MWK 14,287 million over the ten-year intervention period.

B2. Time savings

This benefit also accrues to owner-developers, who would otherwise have gone through the current plans approval process. The 2020 Doing Business Survey estimates that the plans approval phase takes, on average, 60 days in Malawi. The time savings thus ranges from 90,000 to 113,000 days annually over the intervention period. This is valued by the willingness-to-pay (WTP) to shorten the construction permit process: Malawi has a fast-track fee of MWK 50,000 to speed up the process by 50 days, rendering a WTP of at least MWK 1,000/day. Thus, the time savings is valued at MWK 90 million in the first year, increasing to MWK 113 million in year 10.

B3. Reduced risk of housing loss/damage due to flood or earthquake

The Malawi 2019 Post Disaster Needs Assessment has noted that \$23.9 million was incurred in housing loss and \$82.7 million in housing structure damages during the last major flooding event. Housing designs may be inherently vulnerable due to lack of technical knowledge, and houses are typically built without incorporating risk-reducing strategies (Government of Malawi, 2019). These design details can be developed in the prototypes, with affordable options. Designs can also be adapted to suit locally available materials and soil types to reduce vulnerability.

This benefit accrues to those owner-developers, who would have otherwise constructed traditional-type dwellings, which are non-resistant to disaster, floods especially.

Taking into consideration the expected annual growth of housing units, the current level of non-compliance (0.33), and the assumption of a 10% uptake rate among those who would otherwise have built traditional houses, the number of houses damaged/lost by flood (the principal disaster measured) number approximately 670 in the first year, rising to over 800 in year 10. The vast majority (89%) will be houses affected would have been constructed of traditional materials, based on the 2019 Post Disaster Needs Assessment, valued at MWK 309,000. The remaining 11% of houses that were affected were designated as semi-permanent, and are valued at MWK 2.5 million.

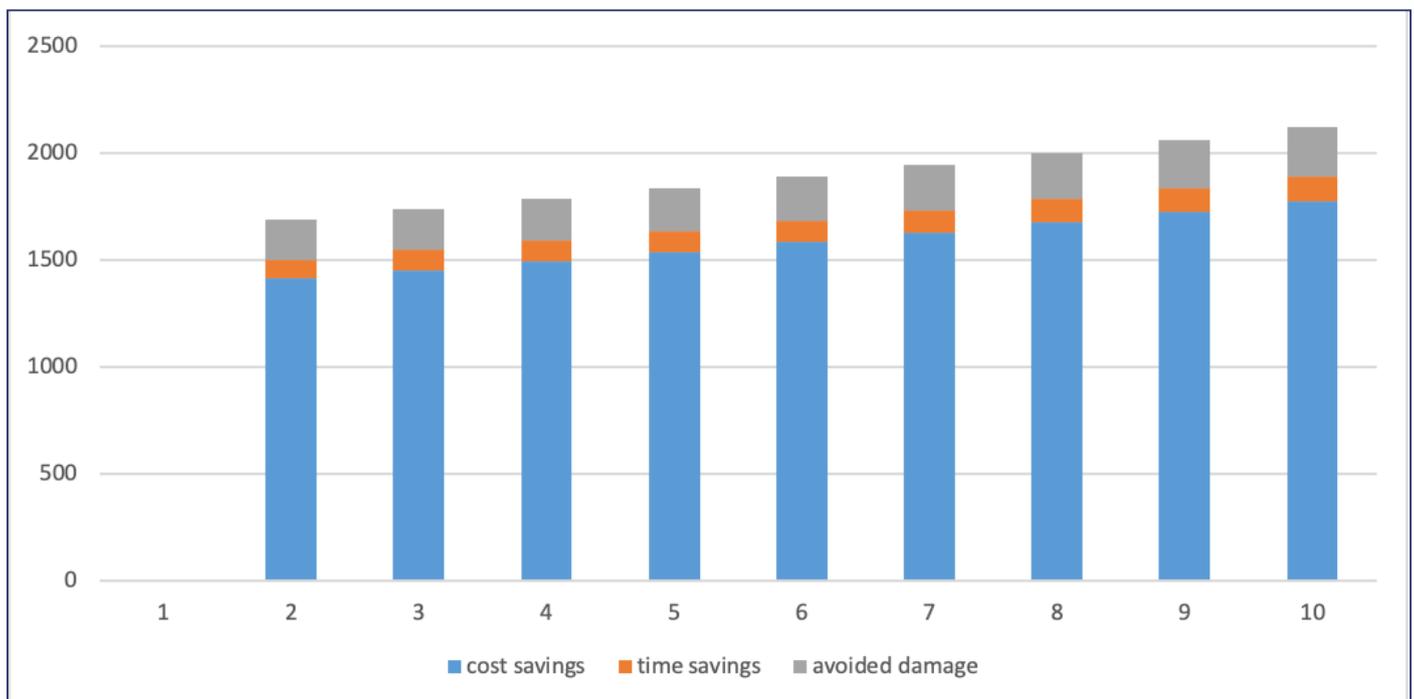
Total avoided damage from floods is valued at MWK 183.6 million in Year 1, increasing to MWK 230.7 million in Year 10.

Table 3.1: Benefits

| Benefit | Value, MWK millions |
|----------------------------------|---------------------|
| Plan cost savings | 14,287 |
| Builder time savings | 911 |
| Avoided housing damage | 1,857 |
| Total benefits, no discounting | 17,055 |
| Total benefits, 8% discount rate | 11,666 |

The net present value of benefits over the ten-year intervention period is MWK 11,666 million, using an 8% discount rate. Benefits not included in the analysis are the social and sanitary benefits associated with higher quality housing, the avoided loss of rental income arising from damage (as most urban residents are renters), and the new owner-developers enticed to build as a result of the decrease in compliance costs.

Figure 1: Prototype plan, benefits, MWK millions



3.1.2 Costs

The costs of the intervention are as follows:

C1. Direct cost of developing prototype plans. There are 28 districts in Malawi and each one is assumed to invest in 5 prototypes from which owner-developers may choose and customize. The cost of getting a prototype plan approved for a local council is assumed to be the same as it would be for a private entity; that is, MWK 941,000.

C2. Customization costs. It is assumed that owner-developers would still have to consult an architect/engineer regarding permissible options. Professional fees are therefore also included in the calculations, at 15% of the total cost (MWK 941,000) of the plans approval phase, which amounts to MWK 141,150. Choosing from a prototype plan and customizing it is assumed to take 5 days.

C3. Additional cost of construction. All things being equal, a dwelling that is disaster-resistant and meets building regulations is more expensive. Simple two-bedroom houses built by Habitat for Humanity in Lilongwe were costed at MWK 300,000 in 2010 (UNHABITAT, 2010); approximately MWK 1.8 million in present day value. On the other hand, traditional housing was costed at approximately MWK 262,000, which today would be valued at MWK 1.5 million. The difference in values represents the additional cost of building a dwelling which meets regulations. This difference is applied to the fraction of houses that would otherwise have been built using traditional materials.

Table 3.2: Costs

| Cost item | Value, MWK millions |
|-------------------------------|---------------------|
| Prototype plans | 132 |
| Customization | |
| • Professional fees | 3,184 |
| • Builder time | 113 |
| Upgrade costs | 1,635 |
| Total costs, no discounting | 5,064 |
| Total costs, 8% discount rate | 3,506 |

The net present value of costs is MWK 3,506 million, using an 8% discount rate.

The benefit-cost ratio (BCR) is 3.3.

The BCR is sensitive to the extent to which customization of a prototype architectural plan reduces the cost of the plans approval process. Here it is assumed to be 15% of total costs. The table below demonstrates the extent to which the BCR is affected by customization costs.

Table 3.3: Sensitivity of BCR to customization costs

| Customization, as % of plans approval cost | Benefit-cost ratio |
|--|--------------------|
| 10% | 4.2 |
| 15% | 3.3 |
| 30% | 2.0 |
| 60% | 1.2 |

An underlying assumption of this intervention is that complementary regulations are in place to facilitate sustainable land use and support compliance efforts with building regulations. This includes legislation governing the certification of building professionals and regulation of the property insurance and mortgage banking industries. Some common oversights, as mentioned by the World Bank (2018) include vetting of construction firms and qualification requirements of architects, engineers and other building professionals; specification of building standards that are not affordable by the local population; no archiving of designs for future reference; no clear assignment of responsibilities at local and national levels; the absence of clear guidance on improving the resilience of built-up areas while at the same time placing sanctions on informal/illegal construction; shortage of relevant and technically-qualified personnel at municipal level.

This intervention also addresses the existence and expected proliferation of housing in undesignated areas, which exist because of the high costs of compliance to construction and building regulations and increasing land values. If the government were to simply regularize unauthorized housing, developers would have little incentive to conform to regulations. Thus, the government must strike a balance between discouraging unauthorized housing and disrupting the informal housing market (Arnott, 2008), which is unfair to the poor. Therefore, access to the prototype plan which absolves owner-developers of costly consultations and individualized architectural plans and the bureaucracy associated with their approval process, thereby reducing the costs of compliance, may be sufficient incentive to improve housing quality in undesignated areas and mitigate against climatic hazards.

Lastly, the intervention is specified for housing construction; however, prototype plans could be used for other building types, such as schools and business centres.

3.2 Electronic construction permit system

The high cost of building materials and inefficiencies in the construction permit process make decent, quality housing unaffordable for the vast majority of Malawian urban dwellers. Tackling bureaucratic inefficiencies would contribute to a decrease in building costs and thus an increase in compliance.

One area that uses an unnecessary amount of resources is quality control and inspection. According to the World Bank (2020), the reliance on paper-based inspection is highest in Sub-Saharan Africa, with 85 percent of economies using this type of reports, followed by East Asia and Pacific (72 percent of economies), and Latin America and the Caribbean (59 percent of economies). Paper-based inspection reports are cumbersome, time consuming, costly as they require relatively more human resources, and can be very costly when modifications are required and are not communicated in time. Digitizing the quality control process – prior to, during, and after construction – reduces approval time and minimizes errors. This is largely due to enabling automatic verification of building code compliance and taking advantage of automatically generated inspection checklists.

Increasing compliance via improvements in transparency and efficiency has been documented as being relatively successful in many countries and several in Africa, namely Rwanda, Kenya, and Senegal. In 2011, the World Bank supported the pilot deployment of an online system supporting construction permit administration in Nairobi, Kenya. Existing open-source technologies were exploited, and

therefore the license to use the software was free. The World Bank, being the software developer, automated the entire application, which supported several permit types, including construction, occupancy permits and development permits (change of use, land subdivision, demolition permits etc.).

The software has features especially designed to both promote accountability and reduce transaction costs. The software can be integrated with electronic payment systems through a variety of online payment channels, such as debit cards and bank and mobile money transfers. Once registered in the system, building professionals can submit their permit applications online as well as upload blueprints and supporting documentation. Applications can be reviewed online by various government departments either sequentially or concurrently. Tracking and monitoring tools, such as SMS or email notifications and a personalized web interface, inform applicants at key milestones of the approval process (such as when a payment is due), and the actual permit document can be issued online when the review is completed. The application supports activities during construction as well. Field inspectors can upload information using mobile devices. A searchable archive helps ensure all captured information is secure and instantaneously retrievable. Various encryption mechanisms ensure that all stored information, as well as system messages, are protected. Finally, secure audit trails capture all actions performed by users, strengthening accountability (World Bank, 2018).

In a survey of electronic construction permit systems, the World Bank (2018) found that, over the past ten years, 19 countries have introduced electronic platforms for building code and permitting administration, three are low-income countries (Kenya, Nepal, Rwanda). In 81 percent of surveyed construction regimes, the application led to a paperless process, including both back- and front-office automation. In some cases, however, applicants must still visit the issuing authority's premises to submit applications and blueprints. Over 80% of the surveyed systems allow applicants to track the status of their applications, this percentage is higher in developing countries (89%). More than a third of the systems allow applicants to notify authorities of commencement of works, while over half allow applicants to notify authorities upon completion of works and request their occupancy permit. Most of these applications, in both developed and developing economies, also support online fee payment.

The benefits realized include increased transparency of permitting processes, reduced compliance costs for businesses, and, for governments, increased ability to handle growing permit volumes with existing staff and increased revenues through improved compliance and fee collection. Doing Business 2020 data show that, on average, it takes 168 days to complete the permitting process with no digital features (it is 172 days in Malawi). This time decreases by 32 percent, to an average of 114 days, when more than 5 digital features are available. That is, the availability of digital features is associated with less time. The five most common functions of e-permitting systems are on-line applications for construction/demolition with the capability of uploading plans; on-line plan reviews; access to the system by multiple authorities; data exchange between government agencies, and on-line fee payments (World Bank, 2018).

In the Doing Business 2015 report, the World Bank describes the integration of ICT in construction permit processes in both Mumbai and Delhi. The municipalities in both cities introduced an online common application form for plan clearance from multiple agencies, which helped streamline the plan approval process and eliminated the need for applicants to approach numerous agencies. The platform also included an online calculator, for building professionals to calculate fees and make payments online. The platforms used AutoDCR software, which reads CAD drawings, mapping them to the development control regulations for approval by municipal corporations and approving authorities. Changes had to be made to regulations to authorize and accommodate the use of online portals. Extensive engagements with stakeholders and end-users were conducted to identify challenges in the licensing, permitting, and inspections processes. Obtaining all construction-related permits now takes 11 procedures (down from 24) and 113.5 days (from 195) in Delhi, and 19 procedures (down from 44) and 98 days (from 171 days) in Mumbai (World Bank, 2020). Other examples of efficiency gains from e-permitting are presented in Table 3.4.

Table 3.4: Efficiency gains from e-permitting

| Country | Intervention | Value | Efficiency gain |
|--------------------------|--|------------------------------|---|
| China | Digitalization of the quality control process along with the implementation of an e-platform | 76% | Reduction in time to obtain the certificate |
| 19 countries | E-permitting system, with at least 5 functionalities | 32% | Reduction in time to complete construction permit process |
| Kuwait | E-submission platform to facilitate communication between public agencies and the private sector | 18 | Time savings (in days) to obtain building permit |
| Serbia | E-submission functionality | 67% | Reduction in time to obtain building permit |
| Rwanda | E-permitting system | 28% | Reduction in time to obtain building permit |
| India (Dehli and Mumbai) | E-permitting system | 33.6% and 49.7% respectively | Reduction in time to complete construction permit process |

3.2.1 Benefits

For the purposes of this analysis, principally because of the absence of a pilot in Malawi, the sole benefit measured is the reduction in time to complete the construction permit process. Elimination of the case of Kuwait because the benefit was reported differently gives a median time savings of 33.6% of the pre-digitalization process. The World Bank's Doing Business Survey measures the construction permit process in terms of days and estimates the average length of Malawi's paper-based system to be 172 days.

The total number of construction projects are proxied by housing construction, as mentioned in the previous intervention. It is assumed that the uptake rate is 35%; this is the proportion of future owner-developers who will use the digitized services offered.

Benefits accrue over a five-year period, after which replacement of capital equipment, license renewals, etc. are required. Time savings (in days) begin at 491,000 in Year 4 of the intervention and terminate at 551,000 in year 8.

The benefit is valued by using a proxy for willingness to pay for shortening the construction approvals process. The construction permit process allows for a fast-track option: for a fee of MWK 50,000, the Town and Planning Committees are convened within one week of payment to adjudicate the construction and building plans submitted. The 'time saved' with this option is approximately 50 days, valued at MWK 1000 per day. Thus, the total willingness to pay is MWK 2,604 million over five years; a net present value of MWK 1,775 million using an 8% discount rate.

3.2.2 Costs

The World Bank (2018) calculated that the costs per deployment average between US\$ 120,000 and US\$ 140,000 for system configuration, localization, and staff training, not including any needed upgrades to ICT infrastructure. They further noted that e-solutions having national scope and implemented in the Sub-Saharan Africa and Latin American regions generally cost in the range of US\$200,000 to US\$800,000. Given the low internet penetration and the higher-than-average number of days to obtain a construction permit, it is assumed that the high-cost scenario is the more realistic representation of costs in Malawi. It is further assumed that the Government of Malawi rolls out the intervention nationally, over 3 years and that the costs are evenly incurred during that time.

Table 3.5: Benefit-Cost Analysis, MWK millions

| Benefit | Cost | Benefit-Cost ratio (BCR) |
|---------|------|--------------------------|
| 1,775 | 553 | 3.2 |

4. Conclusion

An immediate consequence of these two interventions is that a portion of housing construction costs would decline; namely the cost of complying with building regulations. The total cost of constructing a two-bedroom house is approximately MWK 3 million, with the construction permit process costing at MWK 1.2 million. Making prototype plans available for owner-developers reduces the plans approval cost of the permit process by approximately 84%. All things being equal, a reduction in the cost of construction entices an increase in housing units constructed. New construction can also include conversion/upgrade of existing traditional-type dwellings. Whether there will be a proportional increase in houses depends on the price elasticity of supply.

Wang, Chan and Zheng (2010) report housing supply elasticity for 35 Chinese cities in the range between 0.79 and 1.58. Fu, Zheng and Liu (2012), who examine the population growth of 85 Chinese cities, between 1998 and 2004, find an average supply elasticity of 1.88, with a standard deviation of 0.22. Buckley and Mathema (2007) estimate supply elasticity estimate of about 0.7 for renters for Ghana. Buckley and Mathema (2008) estimate housing supply elasticity for four African cities: 0.43 for Accra (Ghana), 0.94 for Nairobi (Kenya), 1.25 for Addis Ababa (Ethiopia) and 2.83 for Dar es Salaam (Tanzania).

Among the factors which Fu, Zheng and Liu (2012) find most influence housing supply elasticity are urban income inequality, government efficiency, land cost, urban population density and road density. They also find that cities with a more efficient local government, which imposes lower regulatory costs on business, are found to have higher housing supply elasticity. These results are useful for informing housing policies, showing that local governments can play an important role in raising housing supply elasticity, even in high-density built-up areas, by lowering regulatory costs, improving the equity of land-use allocation, and investing in public transport infrastructure.

Finally, there may be no change in short-term selling or rental prices of these units as a result of the increase in housing supply; this depends on other factors, among which include the credit market and the supply-demand gap. Nevertheless, from a social policy perspective, an increase in the availability of higher quality, resilient housing units could be considered in itself a success.

Conclusion

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A COST-BENEFIT OF INTERVENTIONS TO INCREASE COMPLIANCE WITH THE CONSTRUCTION PERMITS PROCESS IN MALAWI: ENSURING THE BENEFITS OF URBANIZATION