Land and Housing management

Week Fourteen

Basic Infrastructure provision at community level (continued)

By

Ms. Gloria Angela Mukova

Last week

- Basic infrastructure provision at community level
  - Provision of transport and mobility services
  - Provision of water and sanitation services
  - Provision of energy services

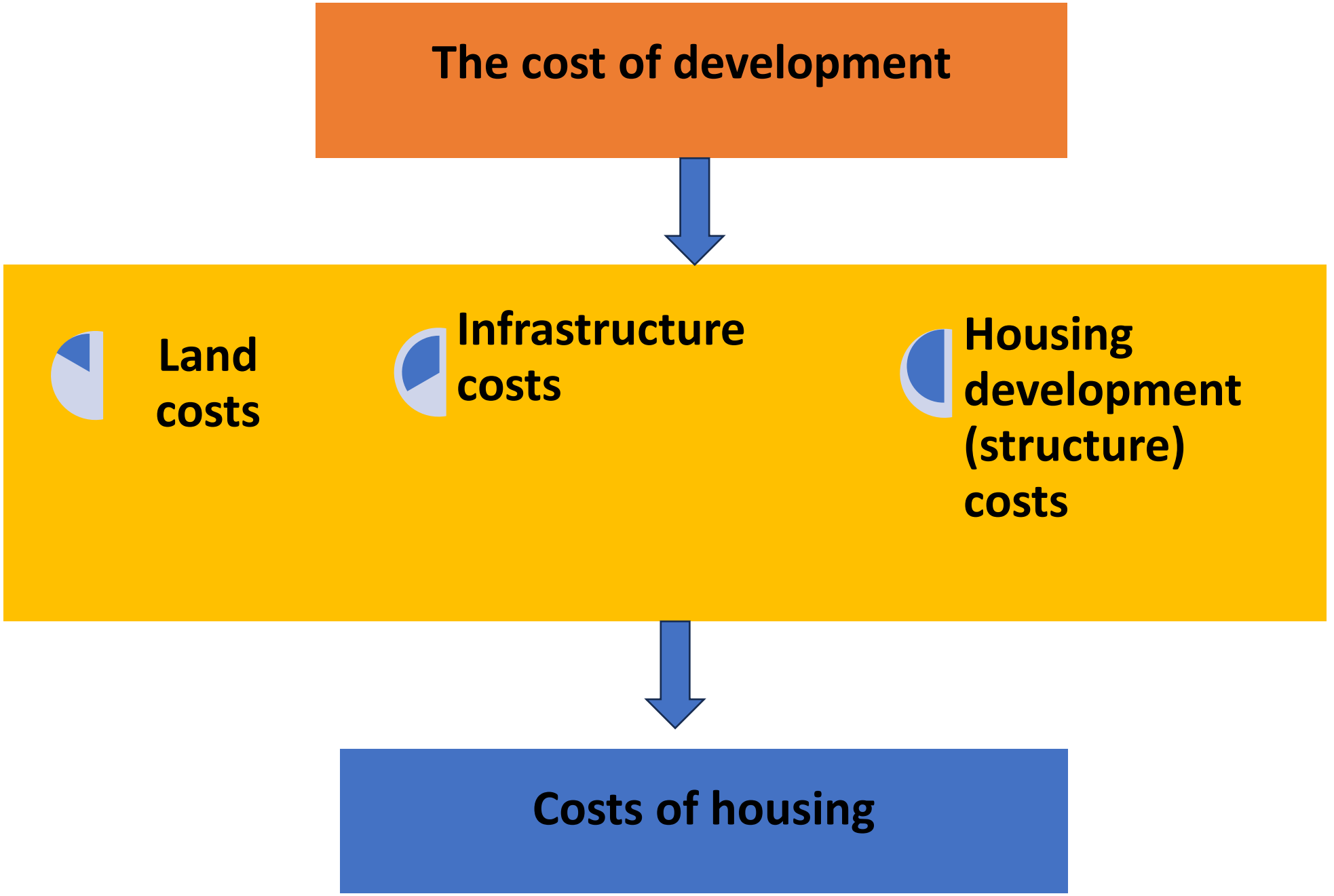
This week

- Basic infrastructure provision at community level (continued)
  - Opportunities for infrastructure provision
  - Threats to infrastructure provision
  - How to improve infrastructure provision at community level

Basic infrastructure provision at community level – opportunities and threats

- Housing Infrastructure typically consists of
  - Transportation (roads, water, railways and other transit systems);
  - Utility service (water, sewerage management, solid waste management, drainage services)
  - Energy supply (electricity, solar energy, other sources)

- Infrastructure development and provision at community level is majorly the responsibility of the public sector through various sectors, departments and institutions.
- Basic infrastructure provision presents both opportunities and threats
- It is important to understand these so as to plan and maximize the opportunities, and address the threats
- Basic infrastructure provision threats and opportunities range from;
  - Cost-related threats or opportunities
  - Social threats and opportunities
  - Political threats and opportunities


The cost of development
Land costs
Infrastructure costs
Housing development (structure) costs
Costs of housing

- Infrastructure provision is largely dependent on finances – the costs involved in its development and provision.
- Thus, infrastructure costs are of great concern to governments – both local and national, as well as other housing developers
  - Infrastructure development and provision projects usually require substantive financial investments that in most cases strain budgets
- The threats to infrastructure provision hence are largely informed by costs for infrastructure development and provision, in addition to other social factors

- Infrastructure costs will largely vary depending on various factors, and therefore impact the development and provision of basic housing infrastructure
- The opportunities in infrastructure also cut across various aspects
- Opportunities here focus benefits that come with developed infrastructure in a community or country
- Let’s delve into these before a look into the threats …

Opportunities in infrastructure provision

Economic growth and development

- Infrastructure provision comes with economic benefits like;
  - Job creation especially for big projects that require a human resource base
  - Increased investment because developed infrastructure is attractive to investors
  - Higher property values which benefits the housing owner, as well as the local tax base

Social opportunities

- Developed infrastructure enhances the **quality of life** through providing access to clean water; quality housing and reliable electricity among others
- Developed infrastructure offers shared spaces in some settings, such as parking space, public taps or water sources, parks which all support **community cohesion**

Health promotion

- Developed water and sanitation infrastructure results into supply and access to clean water and proper sanitation systems which promote health and prevent certain illnesses, hence promoting community health

Threats to infrastructure provision

Development setting of an area can impact infrastructure provision at community level. Development setting takes various angles; it includes;

- Urban form – Population size, density, plot size, housing typologies, dispersion of development, and network patterns among others
- Site conditions or topography – geographical location, access, space availability
- Capacity utilization of utilities
- Proximity to service areas – distance from existing infrastructure trunk and utility plants to the new development

Population size

- Larger populations need a greater number of specialized services
- Higher populations translate into higher demand for housing and more expenditure on housing infrastructure
- High populations are usually in cities and metropolises which call for efficient transportation systems – high capacity public transit systems, mixed-use spaces

- High density developments need more services and therefore require greater infrastructure and service costs
  - They require larger fleet transit services
  - Higher capacity treatment plants for consistent water supply
  - Greater garbage collection capacity
- All this comes with high costs of provision, but also long term maintenance and replacement costs
- This can threaten the quality of infrastructure services, as well as the urgency of their provision

Population and housing density

- Housing development is informed by the demand – the population
- Developments can be high-density or low-density
  - High-density is characterized by concentration of houses and people in a confined area, can be high rise/ vertical developments. This means that infrastructure services are concentrated and this reduces the costs of provision
    - High-density requires fewer service locations
    - Infrastructure here is distributed more compactly, hence saving costs

- Low-density can mean sparce developments. Developments are spread over a wide area leading to high capital costs
  - These developments call for stretching infrastructure to reach the separate houses. These require linear infrastructure.
  - Extension of water for example will require additional cost for additional pipes, and
  - Extension of electricity will require more electric poles and wires
- Low-density areas hence, require more infrastructure provision costs compared to high-density areas
- In addition, all additional developments come with additional maintenance costs

Topography

- Topography includes the terrain and soil conditions of a particular area
- Costs of water and sewerage infrastructure can vary immensely depending on the soil condition, and terrain of the residential area
- Mountainous areas for example may require different methods of installing infrastructure and varying costs compared to plain or flat areas.
    - For transport, roadways or walkways in mountainous areas may require some special safety features like guard rails which are not required in flat terrains

- Water, sewerage systems and electricity extension in mountainous areas will similarly be affected. There may be need for more material, more technology input and more labor and time – increasing costs of provision

- The high costs of installing and providing infrastructure are followed by high maintenance and replacement costs
- This variation in costs according to topography can delay infrastructure provision, and may affect the standards and efficiency of infrastructure provision at community level

Location and dispersion of development

Location of a new development can be in terms of

- **Urban or rural**. Infrastructure provision in urban areas tends to be easier and cheaper because of high population and concentration of developments compared to rural areas that face challenges due to low density and spaced out developments

- **Proximity to existing infrastructure**. Close proximity to existing infrastructure networks reduces the complexity of extending these to the new development. Remote locations however require significant investments to extend the services, and this may not be economically feasible – leading to delays
- **Land use and zoning**. Mixed-use zones tend to attract infrastructure development and improvement quicker because of the demand synergies. This helps reduce costs as well as optimize the usage of infrastructure. Developments in single-use zones attract duplication of infrastructure for each use which may result to inefficiencies and increase in costs.

Street patterns

- The pattern of the street has an impact on linear infrastructure costs
- There are typically two street patterns, the traditional grid street pattern and the conventional curvilinear street pattern
  - Traditional grid street pattern attracts higher costs of roads, utilities infrastructure and sidewalks construction
  - The conventional street pattern is more deliberately designed and therefore offers a bit lower costs of infrastructure provision

Plot size

- On-site costs for access road, sewerage infrastructure and water connection varies according to the developer’s parcel size
- It is anticipated that on-site infrastructure costs increase with a bigger size plot and costs reduce with a reduction in the plot size

Housing typology

- Some housing typologies favor compact developments while others favor sparce developments
  - Single-detached / single-family housing creates mostly low-density sprawl developments
  - Multi-family housing favors compact high-density developments

Funding shortfalls

- On a general note, infrastructure development and provision can be threatened by limited or lack of funding.
  - Sometimes infrastructure projects are dependent on grants or private investments which may delay or be insufficient
  - This can result into delayed infrastructure development, or even cancellation of projects

Political and regulatory issues

- Basic housing infrastructure development, provision and supply is regulated by respective ministries who have guidelines and expectations
- Regulatory and approval processes may be bureaucratic, this may delay the implementation of infrastructure projects
- In addition, corruption tendencies and misallocation or mismanagement of funds can threaten infrastructure.
  - This can result into substandard infrastructure
  - Can also lead to no infrastructure development at all!

Community attitudes and resistance

- Infrastructure at community level needs the full and dedicated support of community members
- Community members can threaten infrastructure provision when;
    1. They oppose change. Members may have concerns about environmental impact, community disruptions or changes into the community local character. Because of this, there may be resistance from the members

2. They have the Not-In-My-Backyard (NIMBYism) attitude. Community members may not be willing to have infrastructure lines or equipment in their vicinity, especially in their plots. Some members may resist electricity poles or water pipes for example if they have to run through their plots of land

Possible risky outcomes …

Gentrification – improved infrastructure can result into increased standards of living and increased costs of services in an area. This can result into displacement of low income residents and households

Social inequalities – infrastructure development may inadvertently exclude marginalized and vulnerable populations. This can intensify social inequities

Strategies for effective basic infrastructure provision at community level

1. Continuous planning

Effective infrastructure provision feeds off a continuous planning process;

from the very beginning all through maintenance. This can help ensure proper

and timely project implementation, as well as sustainability

2. Policy and regulation

Development and implementation of policies that support infrastructure can boast provision.

There can also be policies that attract investment in infrastructure – incentives like subsidies, tax credits or grants

3. Community involvement and education

Engaging community members in the planning and decision-making processes can help ensure that infrastructure solutions meet local needs and preferences.

This also helps to ensure equitable and inclusive infrastructure delivery

Community members can be educated about the impact and benefits of infrastructure to foster collaboration and support

4. Public-private partnership

Government and private sector partnerships are one way to ensure effectiveness and efficiency in infrastructure provision. Partnerships can be a financing mechanism, but also come with diversity in ideas and technologies

Conclusion

- Infrastructure provision at community level faces diverse threats that can hinder its effectiveness and efficiency.
- These threats range from economic, social, environmental as well as political.
- Strategies to check and mitigate the threats to infrastructure provision can help ensure smooth and effective provision of infrastructure at the community level
- Despite the threats, infrastructure development and provision comes with tremendous benefits to individuals, families, communities and nations at large.

Next week

- Challenges of land management
- Challenges on the housing sector

References

- Raghav, S.; Kasraian, D.; and Miller, E. J. (2019). Literature review of the costs of infrastructure provision for different development forms. iCity