CDIA **Learning Exchange Bishkek - Ulaanbaatar**

Strategies, Mechanisms and Financing Solution for Green Affordable Housing and Eco-District Development

Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Sector Project

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ULAANBAATAR SUB-STANDARD PERI-URBAN AREAS

Ulaanbaatar: 1.4 million population (Mongolia: 3 million)
Ger areas: 840,000 population; 60% of the City; 30% of the country

- Open pit latrines system leading to severe soil pollution especially when temperature rises
- Limited access to water, supplied by water kiosks
- Poor drainage, absence of green buffer zone, and dirt roads exacerbating flood events in summer
- Lack of public space; sport, cultural, education and health facilities; and business opportunities

- No heating network, inefficient individual stove burning low quality coal, and low energy efficient shelters cause vulnerability to low temperatures and high emission and extreme air pollution in winter

- **Continue to grow (migration + natural growth) due to lack of sustainable strategy, infrastructure, and affordable alternative**
- **High vulnerability to climate change, highly emitting, highly polluting**

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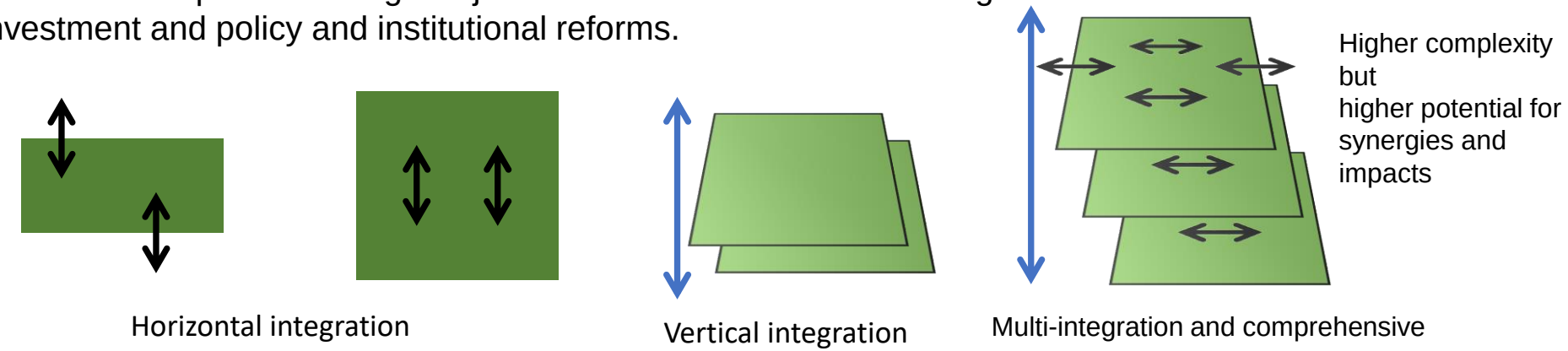
KEY PRINCIPLES

Transformative

- Transformation induce a change in paradigm and a reorientation of a development strategy. It introduce a systemic, structural, institutional transformation based on a vision, strategic objectives, and interdependent initiatives.
- Differ from incremental changes to and reforms of existing systems where change represent discrete, well-defined shifts.
- It require an overall transition for which a set blueprint to follow might not exist and delivering the capabilities for transformation.
- Transformations are only fully achieved when the new system and its disruptive innovations have been scaled-up to become the mainstream system, and are sufficiently resilient to maintain that position

Integrated

- Combine different level of horizontal and vertical integration, together with cross sectoral approach built on development strategic objectives and visions and combining multisector infrastructure investment and policy and institutional reforms.



Horizontal integration

Vertical integration

Multi-integration and comprehensive

Large-Scale

- Size is a quantitative dimension, but scale suggests complex interrelations involving socioeconomic and institutional impacts.
- Large-scale urban operations tend to stimulate other urban processes, involve many stakeholders, and have significant impacts for the cities or communities. They tend to better overcome certain systemic, structural, planning or capacity barriers, and can be presented instruments for planning as a kind of intermediate-scale planning.

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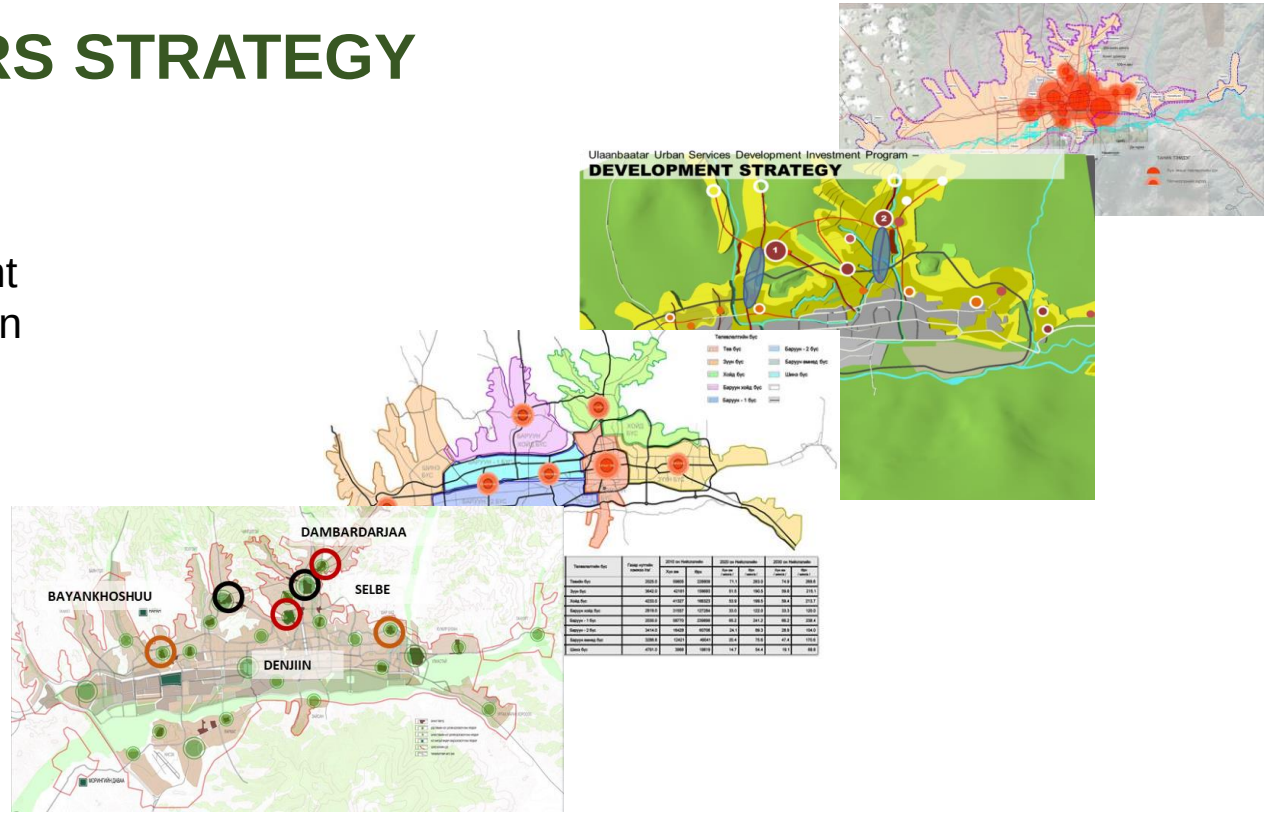
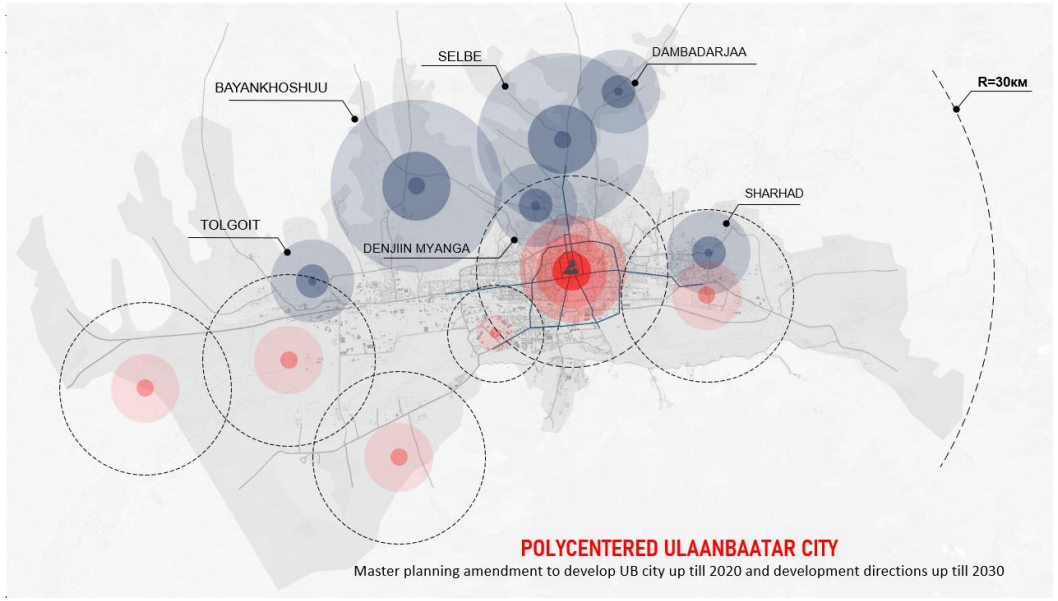
MASTER PLAN / SUBCENTERS STRATEGY

Revised 2013 masterplan
- For the first time integrates *ger* areas development
- Subcenter strategy as core element of Master Plan



Subcenters as the backbone of peri-urban developments to unlock economic and social potential

Infrastructure where growth potential is high, to encourage densification, and initiate a change in the urban fabric



LONG-TERM OBJECTIVE

Increase density where infrastructure are available
Decrease density where infrastructure are lacking

TWO STEPS APPROACH

1. **E**xtension of main truck infrastructure, and basic urban and social services
2. **A**ffordable Housing and Eco-District Solutions

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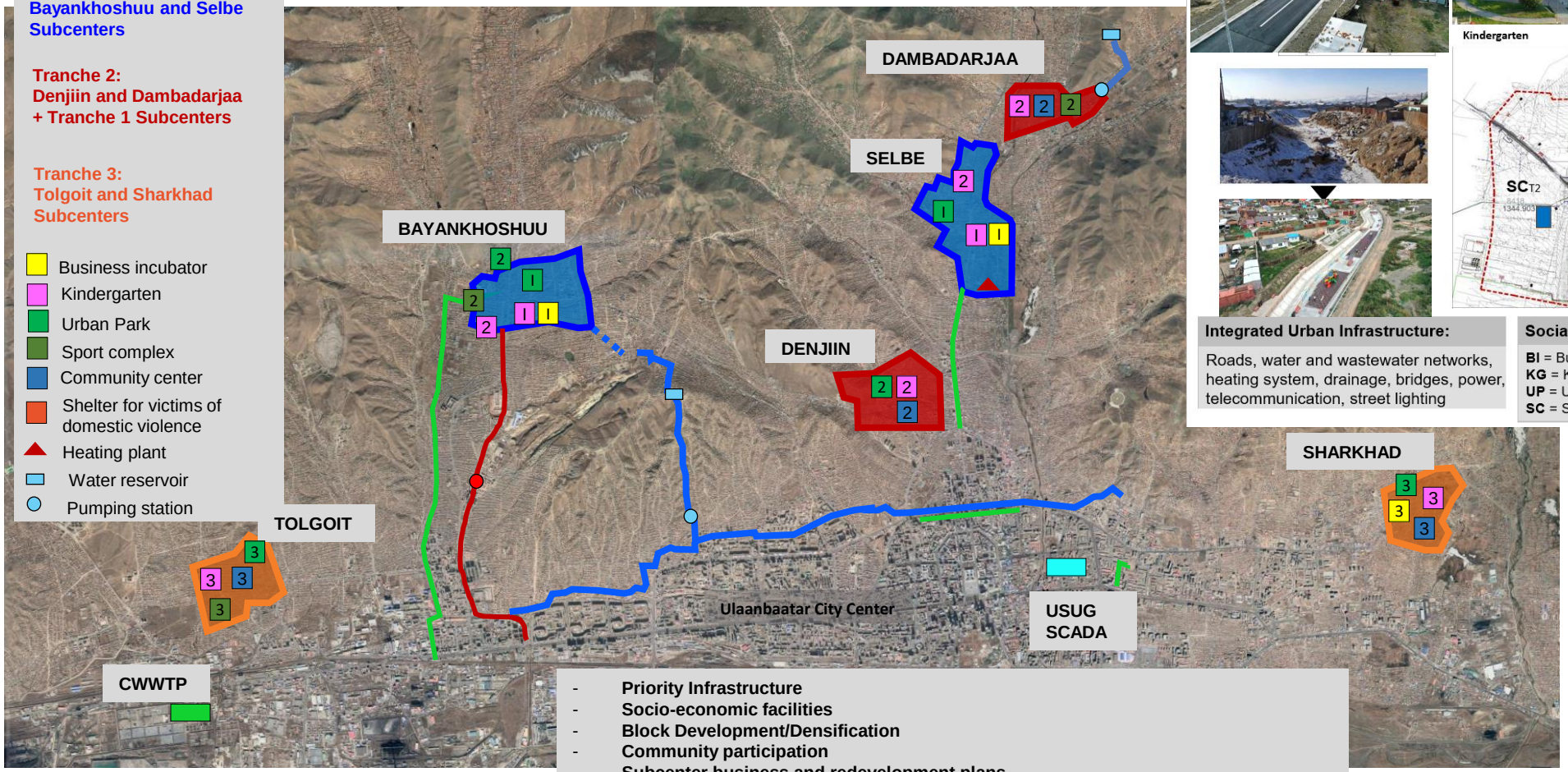
ULAANBAATAR URBAN SERVICES AND GER AREAS DEVELOPMENT INVESTMENT PROGRAM – Multitranche Financing: 3 Tranches

Tranche 1:
Bayankhoshuu and Selbe Subcenters

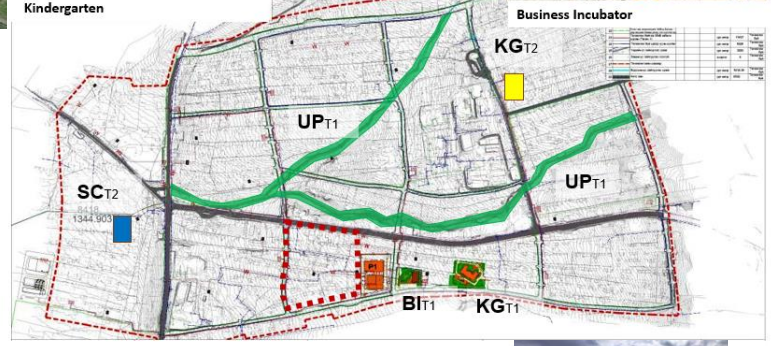
Tranche 2:
Denjiin and Dambadarjaa + Tranche 1 Subcenters

Tranche 3:
Tolgoit and Sharkhad Subcenters

- Business incubator
- Kindergarten
- Urban Park
- Sport complex
- Community center
- Shelter for victims of domestic violence
- Heating plant
- Water reservoir
- Pumping station



BAYANKHOSHUU SUBCENTER



Integrated Urban Infrastructure:
Roads, water and wastewater networks, heating system, drainage, bridges, power, telecommunication, street lighting

Social Facilities:
BI = Business Incubator
KG = Kindergarten
UP = Urban Park
SC = Sport Complex

T1 = TRANCHE 1
T2 = TRANCHE 2

Green Affordable housing core subproject

- **Priority Infrastructure**
- **Socio-economic facilities**
- **Block Development/Densification**
- **Community participation**
- **Subcenter business and redevelopment plans**
- **Improvement USUG operation and CWWTP rehabilitation**

ADB European Investment Bank

Investment Program	$ million
ADB	163.7
MUB	96.0
EIB	60.3
Total program	320.0

Infrastructure where growth potential is high, to encourage densification, and initiate a change in the urban fabric
Compact, low carbon and resilient development
Upgrade of 6 Subcenters as the backbone of peri-urban developments to unlock economic potential

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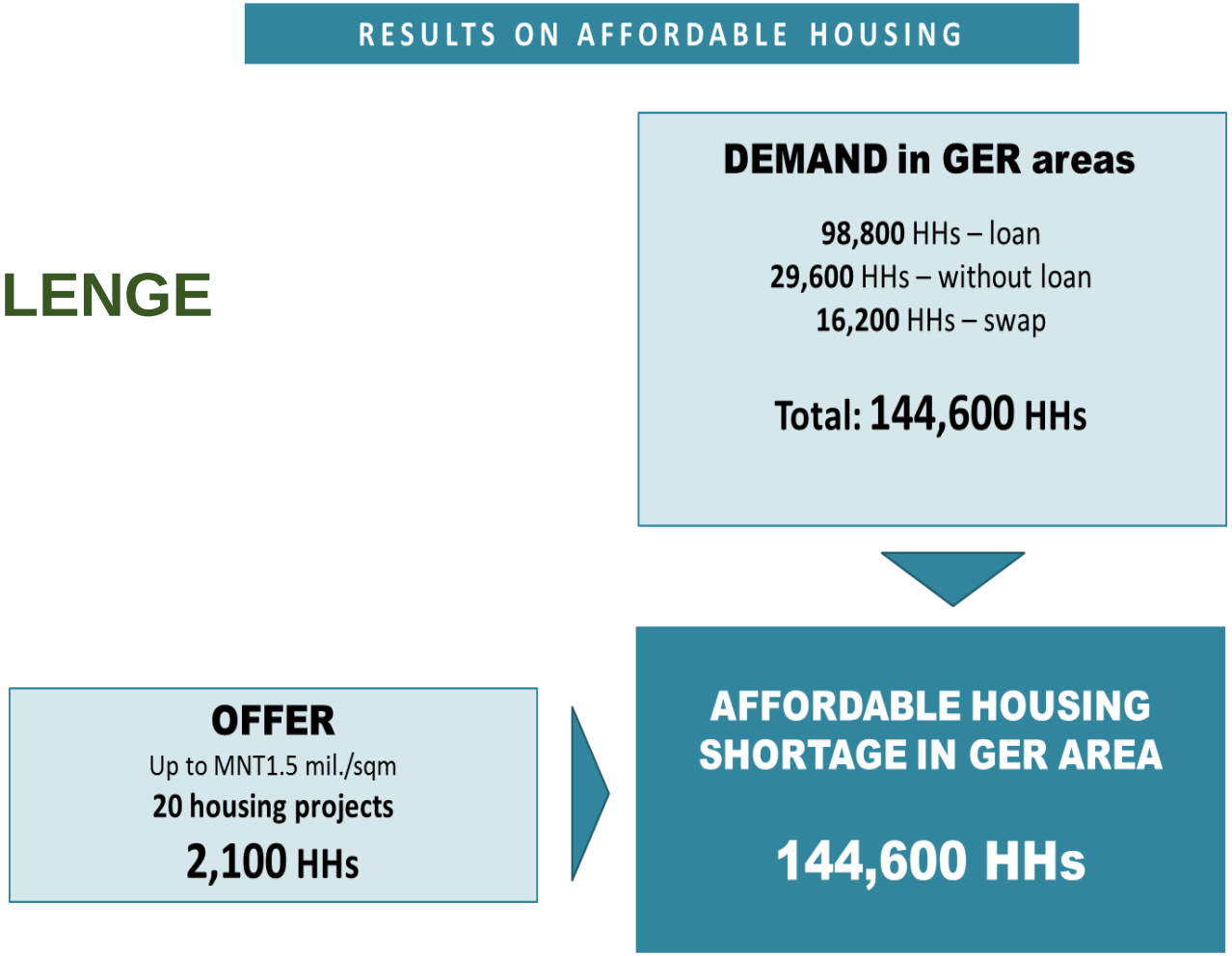
THE HOUSING CHALLENGE



- High and Medium real-estate market saturated
- 60% of households want to buy apartments with 8% mortgage loan at MNT1.2 million/m2 in average. Prefer to stay within their communities.

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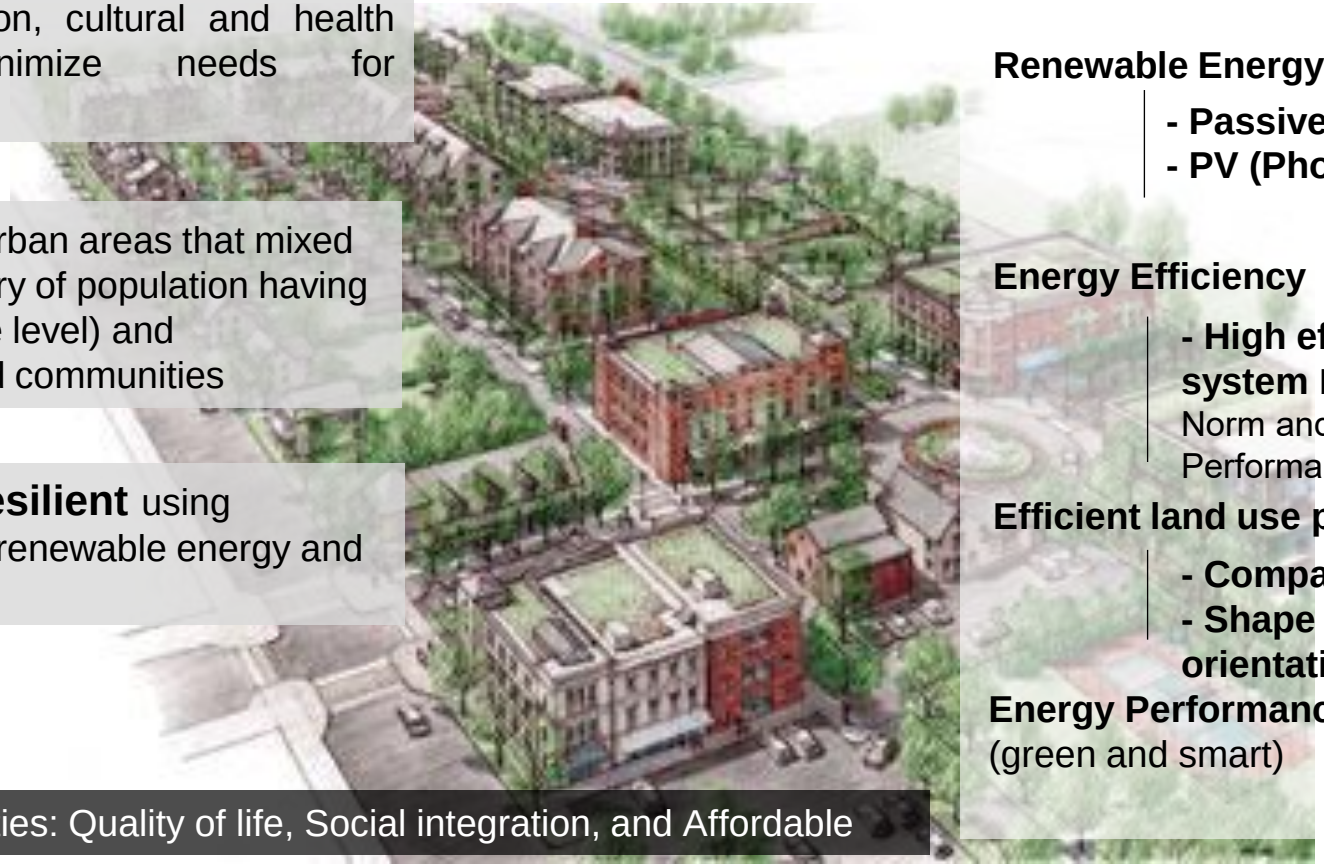
ECO-DISTRICT PRINCIPLES

Mixed land uses and functions (residential, commercial and recreation functions; ample public and green space; education, cultural and health facilities; minimize needs for transportation)

Social mix (urban areas that mixed different category of population having different income level) and vibrant/engaged communities

Green and resilient using implementable renewable energy and energy efficient



GREEN FEATURES

Renewable Energy

- **Passive Solar Design**
- **PV (Photo Voltaic) Panels**

Energy Efficiency

- **High efficiency isolation system** based on Mongolian Norm and Regulation “Thermal Performance of Buildings”

Efficient land use planning

- **Compact design**
- **Shape and building orientation**

Energy Performance Monitoring System (green and smart)

- Attractive for communities: Quality of life, Social integration, and Affordable
- Attractive for real estate developers: Reasonable Net Profit Value
- In line with City master and local plans, and urban regulation

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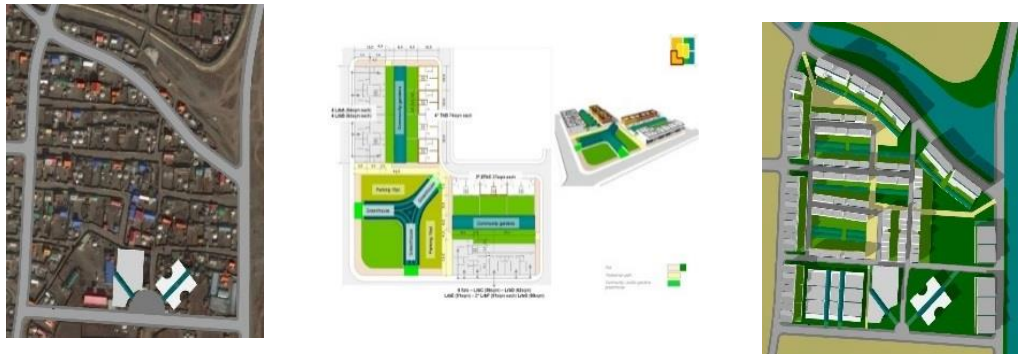
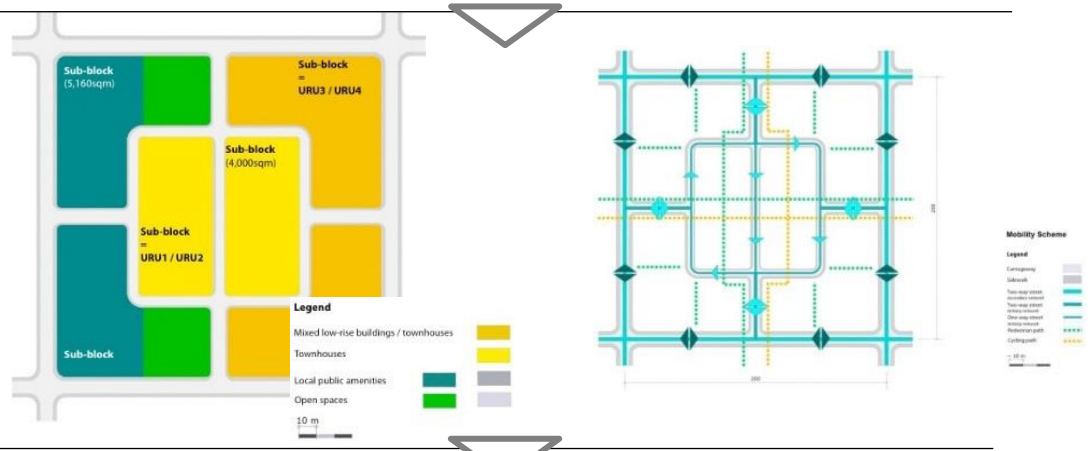
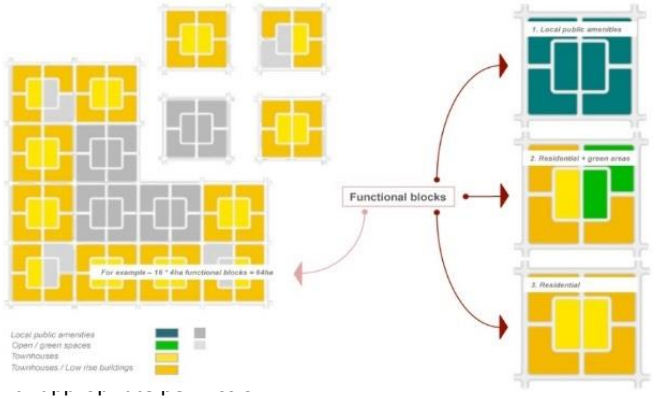
ECO-DISTRICT / BLOC DEVELOPMENT

Integrated planning and development process, and **complete solution** at the neighborhood level to build up **citywide sustainability** and **green development**







- **Combination** of public policy, catalytic investments from local government and utilities, private sector and communities participation
- **Bridge the gap** between green policy objectives and practical investments
- **Appropriate scale** for step by step implementation and to enhance neighborhood urban and environmental solutions

Block

DISTRICT

City

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ULAANBAATAR GREEN AFFORDABLE HOUSING AND RESILIENT URBAN RENEWAL PROJECT

Large scale demonstration project and complete solution, leveraging private sector investment, to deliver **affordable and green housing stock**, and establish policies, mechanisms, and standards for sustainable affordable housing and green urban development.

10,000 housing units (55% affordable, 15% social, and 30% market rate units) and redevelop **100 hectares** of *ger* areas into **ecodistricts** that are:

(i) mixed-use with ample public space and public facilities,
(ii) mixed-income with at least 65% of combined affordable and social housing units,
And
(iii) **Resilient, resource efficient, and maximizing the use of renewable energy**

Improve the regulatory and enforcement framework for climate responsive urban planning, green building, and affordable housing.

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ECO-DISTRICT DESIGN PARAMETERS

- Housing units should comprise **15% social housing, 55% affordable housing**, and **30% market rate** housing.
- **30% of land use is public space** (including 15% of open space and green areas)
- the ratio of m^2 of public amenities/facilities, commercial facilities, and entertainment areas per person correspond to average international standard, **respectively 1.2 m^2/persons, 1.5 m^2/persons, and 0.5 m^2/persons**.
- The average density of an eco-district should be about **300 p/ha** and housing building should comprise townhouses or low-rise building of a maximum of five to six floors.
- Each building should reach an energy efficiency performance guaranteeing an **energy consumption of 150 kilowatt hours per m^2 per year,** housing units should be equipped with indoor air filtration system, passive design, sensor in building, heating regulation system.
- **Universal and inclusive design,** building and structures should be **earthquake resistant.**
- Building and facilities should have **18% of their footprint covered with solar panels**.
- At least **10% of the eco-district surface should be covered with greenhouses** for urban farming (on the ground or on building or facilities rooftop).

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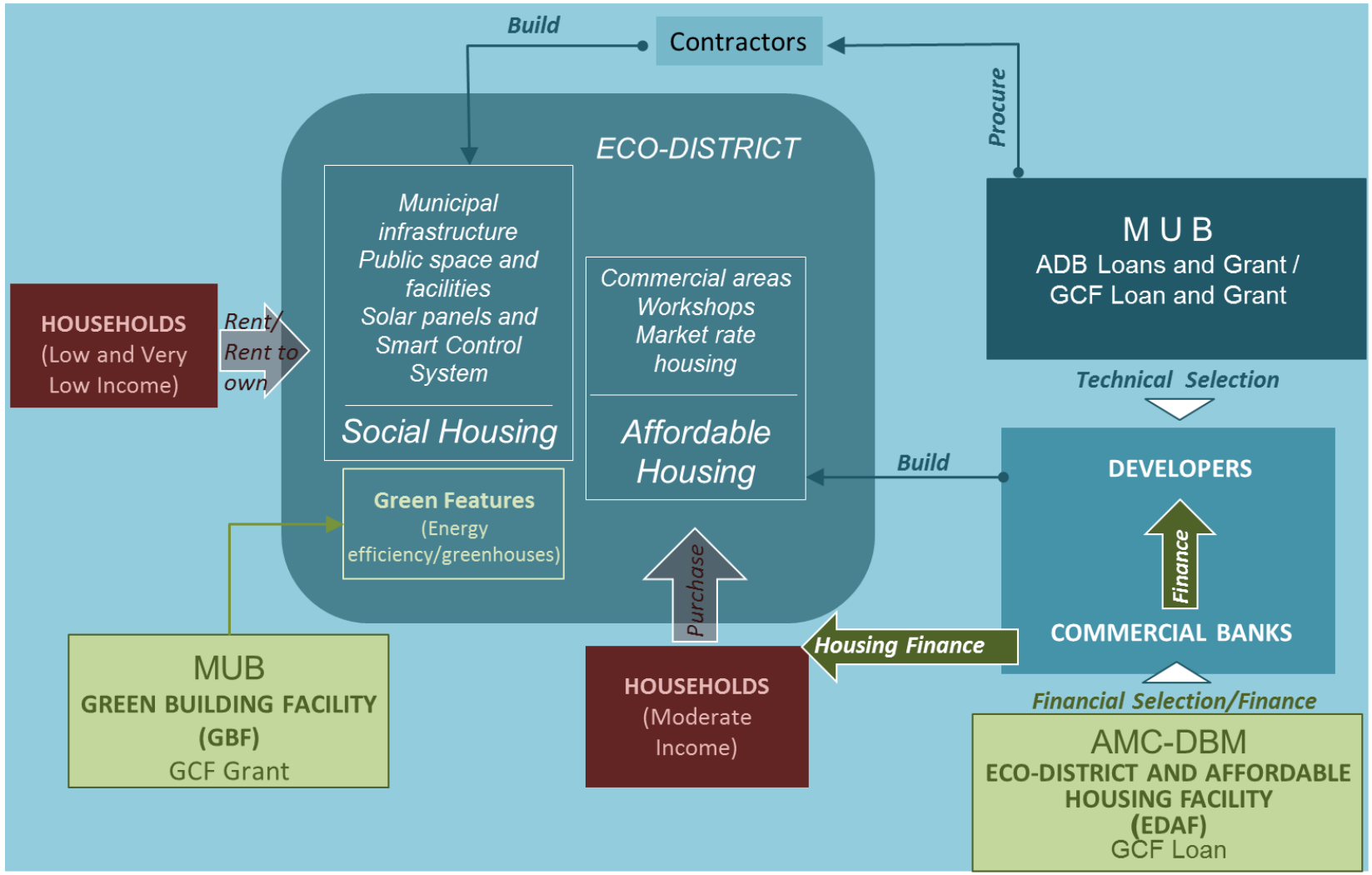
INTEGRATED FINANCING /DESIGN /INSTITUTIONAL MECHANISM



Source	Amount (USD million)
Asian Development Bank	80.0
Green Climate Fund	145.0
GCF (grant)	50.0
GCF (concessional loan)	95.0
HLT Fund (grant)	3.0
Commercial banks/DBM	111.4
Developers	131.8
Beneficiaries	63.9
Municipality of Ulaanbaatar	35.0
Total	570.1

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KEY MECHANISMS

- **Designed Based PPPP (Public Private People Partnership)** to insure green, resilient, inclusive and livable urban area using community consultation, financial, and institutional integrated mechanism that involve public sector, beneficiaries, commercial banks and real estate developers to deliver eco-district urban solution.

- **Financial intermediary** (financed by the Green Climate Fund) to promote a financial and institutional integrated mechanism, with revolving mechanism, to leverage private sector resources (Total cost: $570.1 million, including EDAF leveraging and private financing commercial banks, developers and beneficiaries, that is $307.1 million).

- **Green Building facility** (financed by the Green Climate Fund): performance-based grants to qualified private developers for climate change mitigation and adaptation features such as passive housing design, extra isolation system, and heating regulation system to bring down the energy consumption for heating from 395 kWh/m2 per year to 150 kWh/m2 per year, for a total reduction of 230 million kWh thermal energy input.

- **Effective community participation**, through (a) community participation, social, and gender action plans including skills training and livelihood improvement opportunities; and (b) community-based urban farming and solid waste management

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- **Voluntary Land Swapping Mechanism** that will provide housing solution to all residents for in situs redevelopment and through which the ger area population can move up to more climate resilient, low carbon, modern apartment buildings.

- Renewable energy in buildings, 71,000 m2 of 11MW solar PV on housing building's rooftops, that will generate 15.6 GWh per year

- Smart renewable energy and building performance control and monitoring system (financed by HLT fund) will establish an energy performance monitoring system, install and provide initial O&M for solar PV, pilot small scale grid lithium-ion battery storage plant, and pilot private sector management contract for solar panels operation and maintenance.

- Sector and Policy reform: Green building standard (including eco-efficient materials, equipment, passive solar house design, renewable energy, and ventilation systems) and associated regulations, energy efficient construction material and techniques, energy systems, tariff, efficient supply chains for renewable energy systems and energy efficiency, and comprehensive urban planning that combine climate resilience, social cohesion, and economic opportunities.
→$24 million technical assistance (including Detailed Design and PMO staff)

- Long term program with critical mass to remove market barrier, cost of material, increase domestic production, promote green finance, and insure linkages between constructor/developer/end-user and performant material/equipment producer

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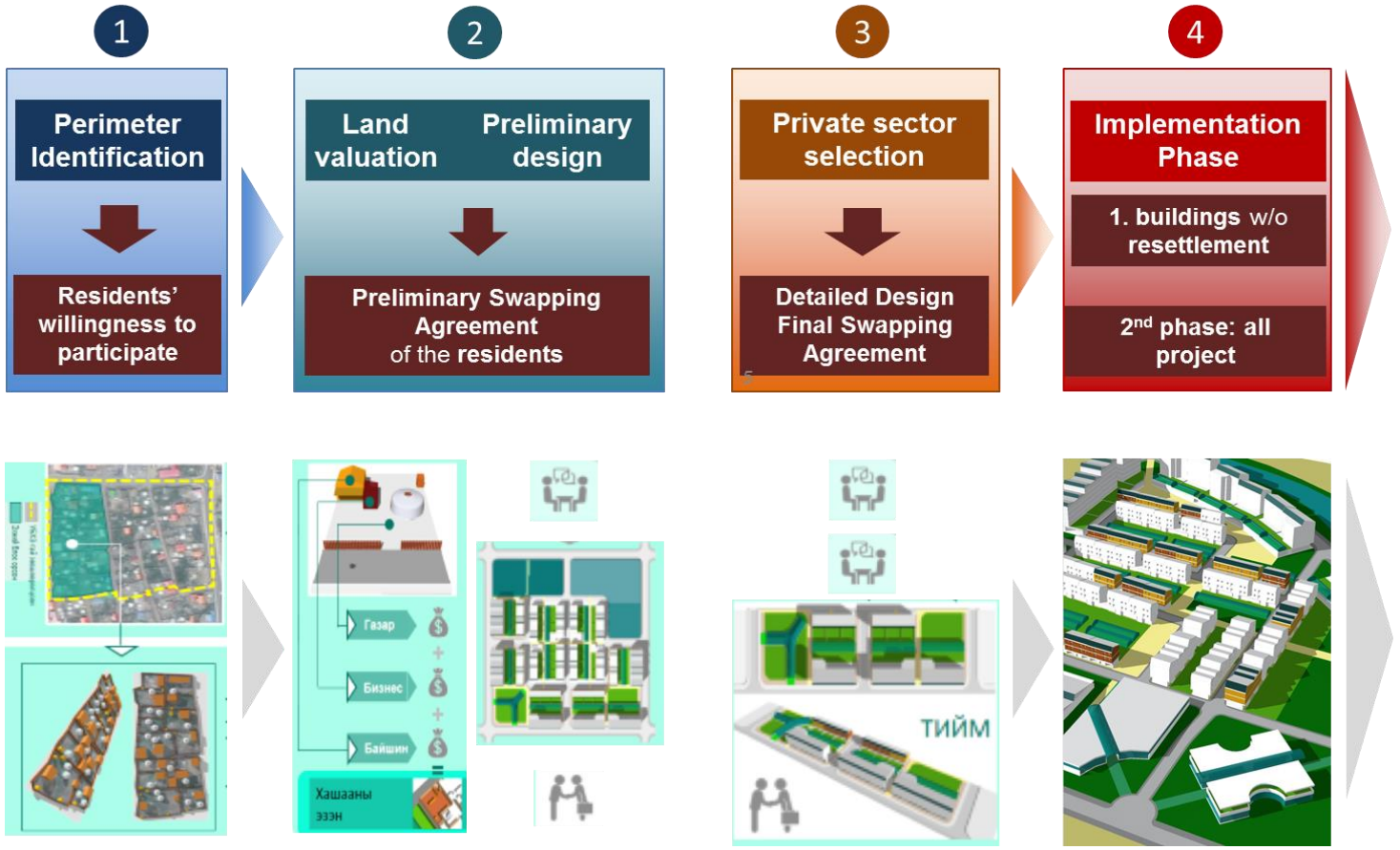
IMPLEMENTATION STEPS AND CRITERIA

Subprojects identification:

- Eco-district should be located in *ger* areas
- Close to main trunk Infrastructure
- Demand based

Eco-district development:

- 100% landowner willing to participate (voluntary resettlement)
- Financially feasible
- In line with master plan



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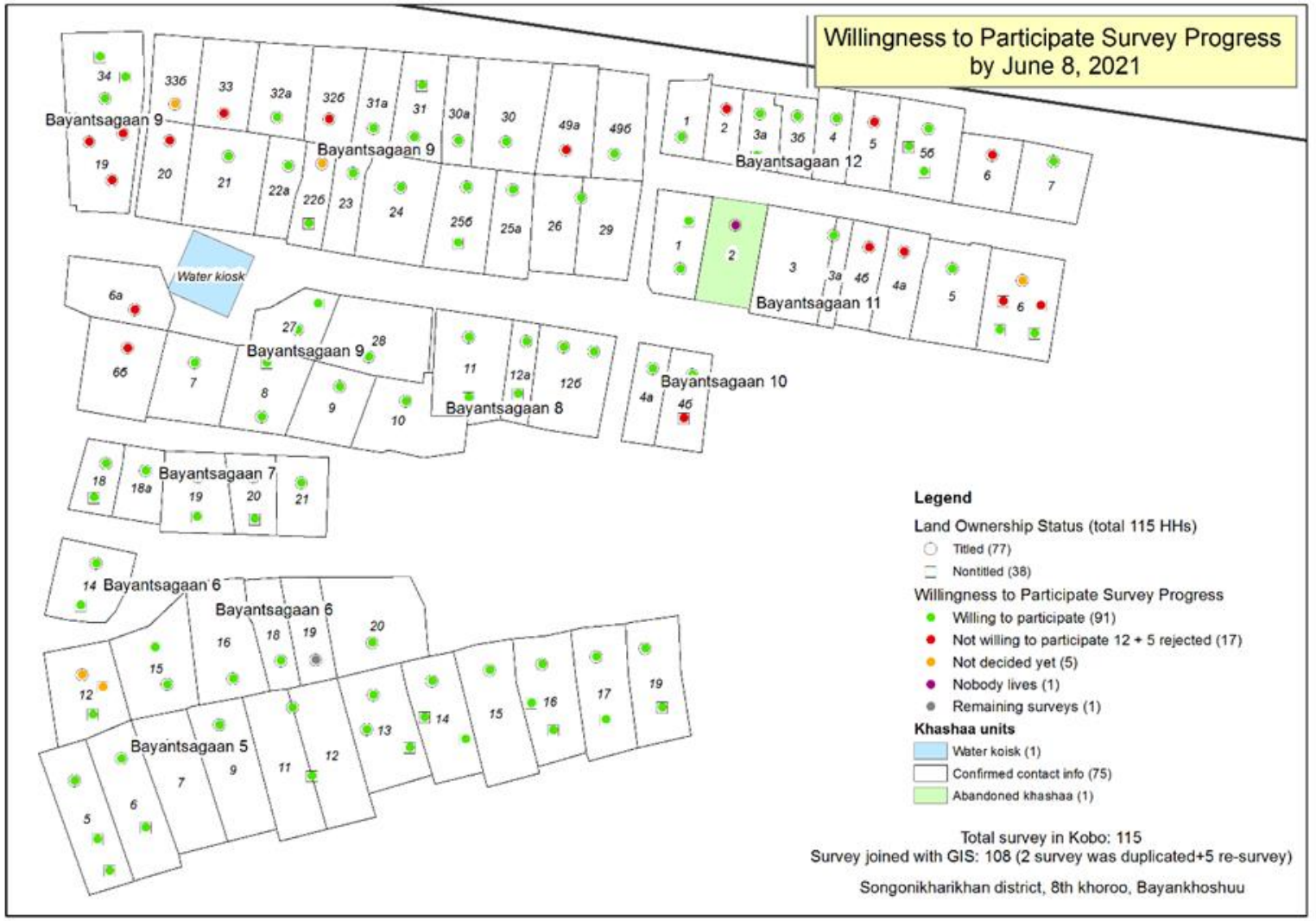
Bayankhoshuu - Willingness to Participate (WPS)



80% Willing

Planning is proceeding including NOSK site.

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GADIP-AHURP INTEGRATION AND SYNERGIES

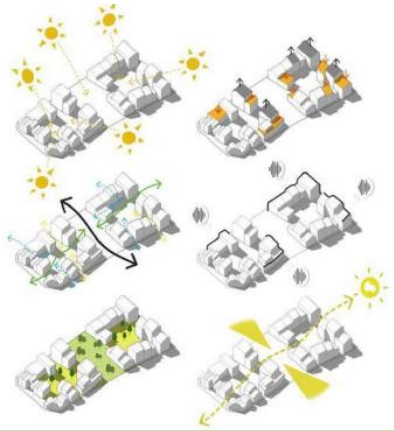
Proposed Development Stages

1. Develop **Area A** with first Social Housing (Approx. 30 units) and first Affordable Housing (Approx. 30 units) with related social social, economic and green amenities for titled andnon-titled residents of **Area B**.
2. Relocate **Area B** titled and non-titled residents to completed housing in **Area A**.
3. Develop **Area C** with first Market Rate Housing and related social, economic and green amenities.
4. Develop cleared **Area B** Social, Affordable and Market Rate Housing and related social, economic and green amenities.
5. Relocate **Area D** titled and non-titled residents to completed Social and Affordable Housing and related social, economic and green amenities in **Area B**.
6. Develop **Area D** with more Social, Affordable and Market Rate Housing and related social, economic and green amenities.
7. Continue development of **Area A** with more Social, Affordable and Market Rate Housing and related social, economic and green amenities as demand and resources permit.

Figure 22. Overall BKH Site Plan (B-15 & N-4 sites)

Eco-District Complete Community Concept

GREEN, ENERGY EFFICIENT, INCLUSIVE AND INTEGRATED DESIGN



Climate Impact and Benefits

Transformational impacts:

- Policies and capacity building conducive to energy efficiency and resilience in buildings (EDGE Standard, urban planning, green building code);
- Efficient supply chains for renewable energy systems;
- Energy efficient construction technics and materials;
- Green banking policies; and
- Climate responsive urban planning.

Climate change cross cutting impacts

Mitigation: GHG emission reductions, Direct: 8 million tCO2e and Total (including indirect – replications effect): 39.59 million tCO2e.

Adaptation: 100,000 total direct beneficiaries and 1,000,000 total direct and indirect beneficiaries from reduced climate change vulnerability;

Main Takeaways and Recommendations

- Importance of strategic development phase using in-depth climate and development assessment
- Use holistic framework to appraise development problems and formulate multi-sector and pluri-disciplinary approaches;
- Focus on development and climate strategies, mechanisms and finance solutions rather than infrastructure investments;
- Elaborate public, private, people solutions to leverage private sector investments and promote community participation; and
- Develop strong partnerships and long-term programs that align create synergies between government, development partners, civil society, and private sector initiatives.

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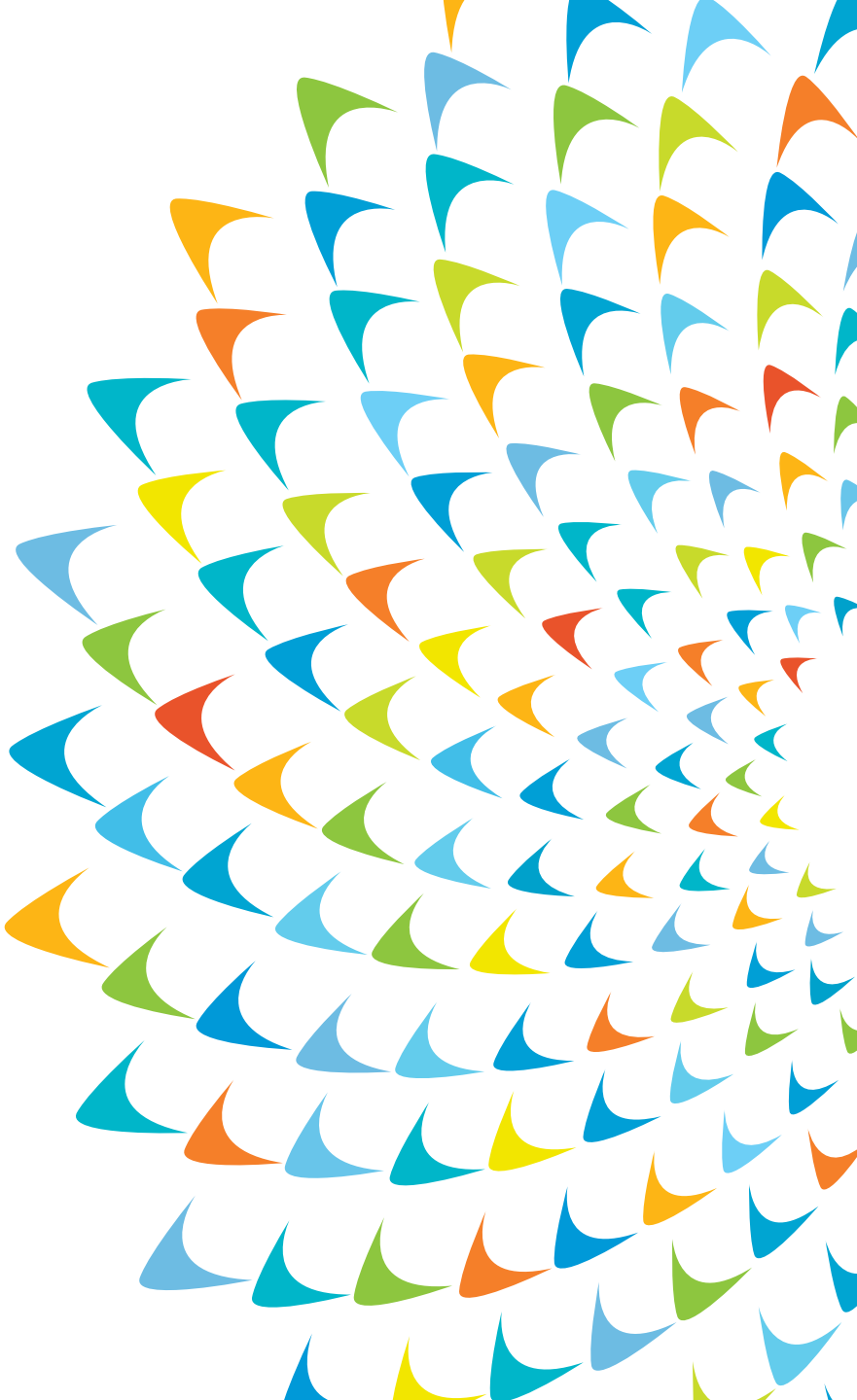

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