

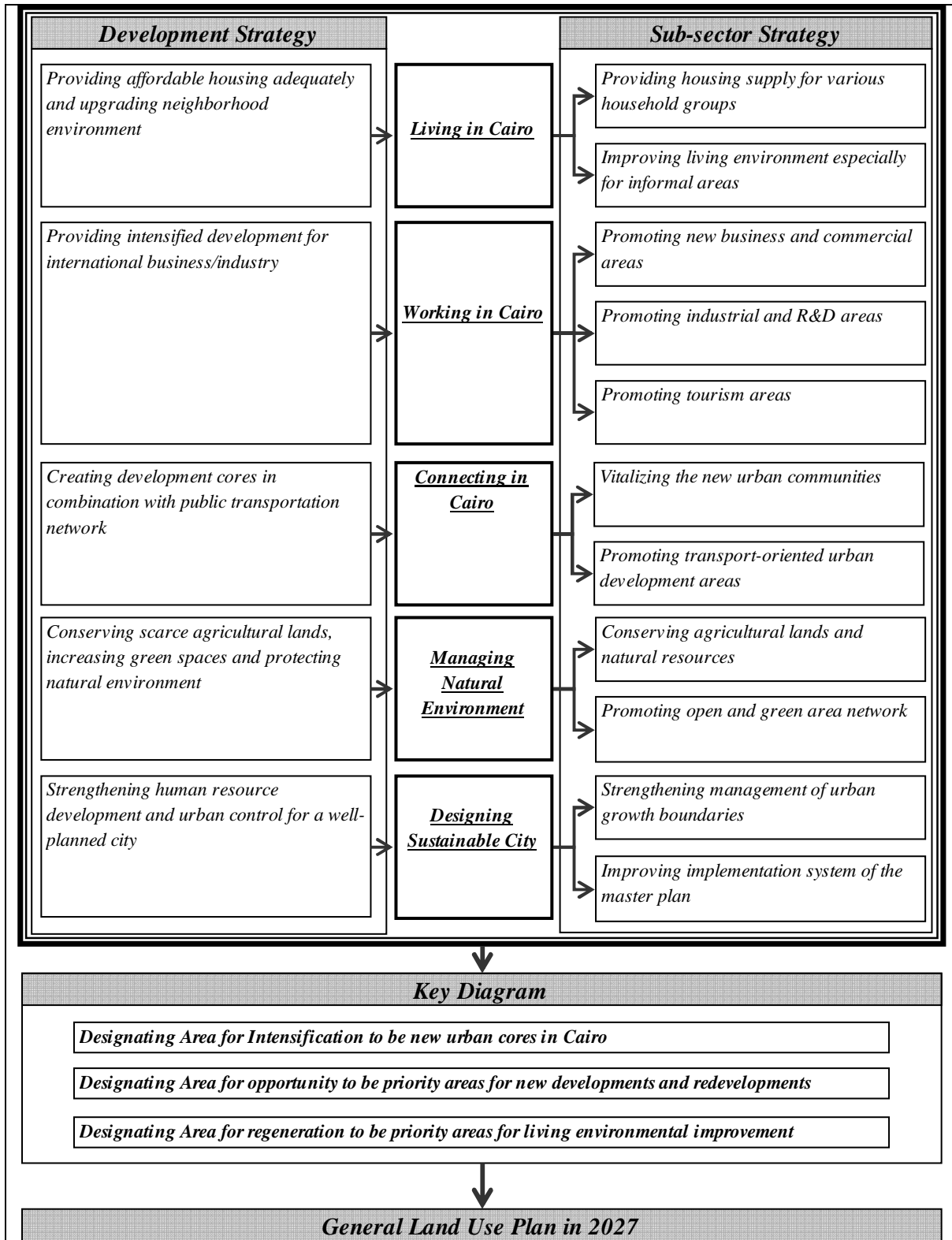
3.4 Sub-sector Strategy

3.4.1 Contents of Sub-sector Strategies

Following the proposed goals and objectives for the study area until 2027, the sub-sector strategies have been itemized to fulfill the requirements of the proposed development strategy. Correlation between the development strategy and sub-sector strategies was depicted in Figure 3.4.1.

Based on the proposed sub-sector strategies, the key diagram was formulated to indicate the future urban structure with the prioritized development areas, which consisted of: the areas for intensification, areas for opportunity, and areas for regeneration. The details of the key diagram will be specified in Section 3.5.

The general land use plan will come up in compliance with the sub-sector strategies and the key diagram.



Source: JICA study team

Figure 3.4.1 Structure of Sub-sector Strategies, Key Diagram, and General Land Use plan for the Study Area in 2027

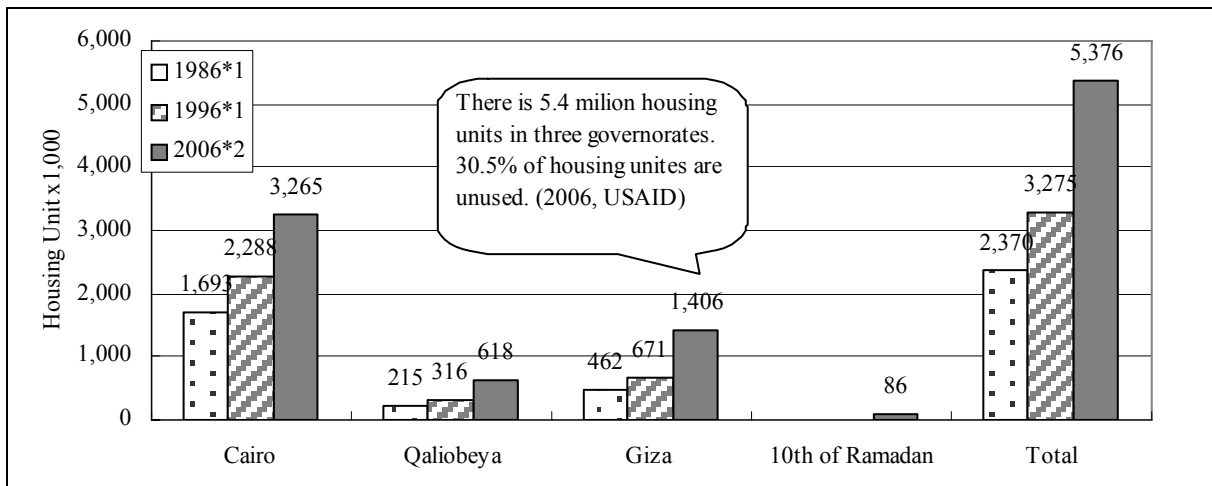
3.4.2 Living in Cairo (Living Environmental Improvement)

(1) Providing housing supply for various household groups

1) Housing stock

The housing stock in the study area is steadily increasing. The total stock was 2.4 million units in 1986 and increased to 3.3 million units in 1996 and 5.4 million units in 2006. The new housing units were amounted to 0.9 million between 1986 and 1996 and 2.1 million between 1996 and 2006. The annual growth rate was estimated at 5% higher than that of population growth at 2.22% in 1996-2006.

Housing unit per household was 1.38 in Cairo, 1.39 in Qaliobeya and 1.51 in Giza which are relatively high, presumably due to a large part of vacant units. The average rate of unused housing units is estimated to be 30.5%. In 6th of October NUC, it is reported that a vacancy rate is estimated at 35.4% (Housing Demand Survey by USAID, 2006). Indeed, the number of housing units shows the sufficient housing stock, whereas the relatively high vacancy rate.



Source*1: Ministry of Housing, Utilities and Urban Development

Source*2: Housing Demand Survey, USAID, 2006

Figure 3.4.2 Existing Housing Stock in the Study Area

Table 3.4.1 Existing Housing Stock in the Study Area

| Governorate | Growth Rate (% per year) | | Housing Unit Built (x1,000 per year) | | Housing Unit per Household | Vacancy Rate (%) |
|-----------------|-----------------------------|-----------------|---|----------------|----------------------------|--------------------|
| | 1986-1996*1 | 1996-2006*2 | 1986-1996*1 | 1996-2006*2 | 1996*3 | 2006*2 |
| Cairo | 3.06 | 3.62 | 59 | 98 | 1.38 | 29.56 |
| Qaliobeya | 3.93 | 4.81 | 10 | 30 | 1.39 | 33.91 |
| Giza | 3.80 | 4.25 | 21 | 74 | 1.51 | 27.83 |
| 10th of Ramadan | - | - | - | - | - | - |
| Study Area | 3.29 (total) | 4.08 (total) | 90 (total) | 202 (total) | 1.43 (average) | 30.52 (average) |

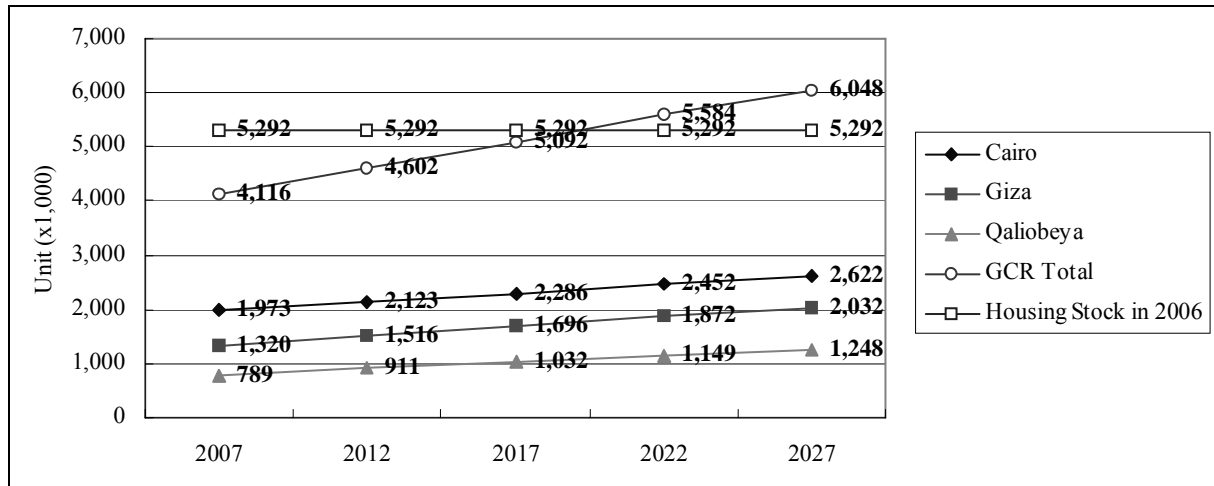
Source*1: Ministry of Housing, Utilities and Urban Development

Source*2: Housing Demand Survey, USAID, 2006

Source*3: Egypt Analysis of Housing Supply Mechanisms Final Report, World Bank, 2005

2) Housing demand

The housing demand in GCR is related to the population and a number of family members per household. Based on the population projection by JST and the family size (4.0), the housing demand in 2027 is 6.05 million housing units indicating that housing demand shall increase by 1.93 million units from the stock in 2007. Of this incremental demand, it is estimated that 1 million housing units will be in the main agglomeration, 338,000 units in village and small towns and 586,000 in new urban communities.



Source: JICA study team

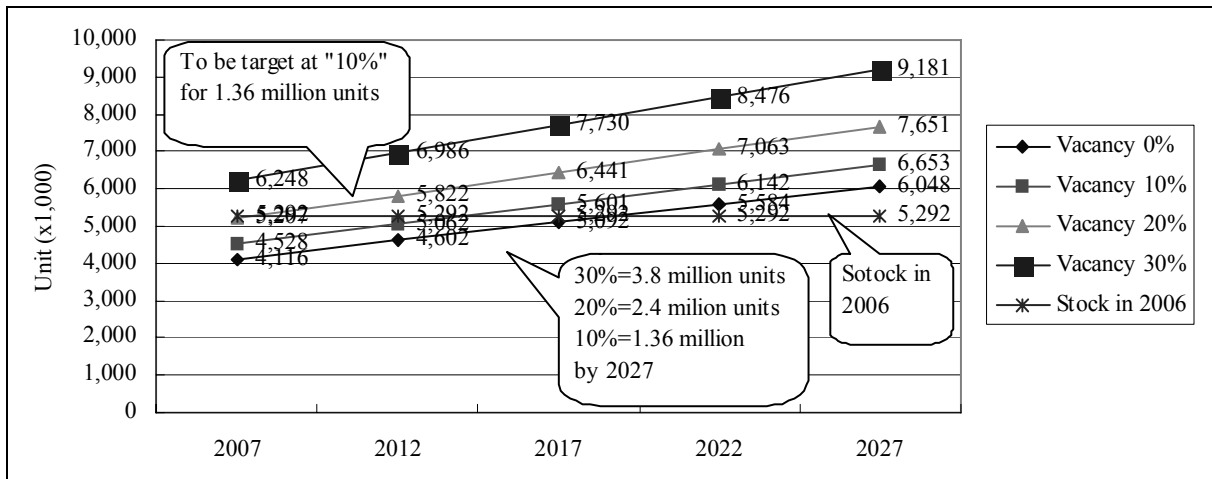
Figure 3.4.3 Projection for Housing Stock and Demand until 2027 in the Study Area

Table 3.4.2 Housing Demand in the Study Area until 2027 (1,000 units)

| Area | Governorate | 2007 | 2012 | 2017 | 2022 | 2027 | Increase 2007-2027 |
|---------------|---------------------|-------|-------|-------|-------|-------|-----------------------|
| Agglomeration | Cairo | 1,907 | 2,029 | 2,157 | 2,279 | 2,399 | 492 |
| | Giza | 856 | 965 | 1,053 | 1,132 | 1,204 | 348 |
| | Qaliobeya | 373 | 421 | 464 | 505 | 542 | 169 |
| | Total | 3,136 | 3,415 | 3,674 | 3,916 | 4,145 | 1,009 |
| Village | Cairo | 0 | 0 | 0 | 0 | 0 | 0 |
| | Giza | 410 | 452 | 485 | 514 | 541 | 131 |
| | Qaliobeya | 401 | 460 | 514 | 564 | 609 | 208 |
| | Total | 811 | 912 | 999 | 1,078 | 1,150 | 339 |
| NUCs | Cairo | 66 | 93 | 130 | 173 | 223 | 157 |
| | Giza | 53 | 99 | 158 | 227 | 288 | 235 |
| | Qaliobeya | 15 | 31 | 54 | 80 | 97 | 82 |
| | 10th of Ramadan NUC | 34 | 53 | 78 | 111 | 147 | 113 |
| | Total | 168 | 276 | 420 | 591 | 755 | 587 |
| GCR Total | Cairo | 1,973 | 2,122 | 2,287 | 2,452 | 2,622 | 649 |
| | Giza | 1,319 | 1,516 | 1,696 | 1,873 | 2,033 | 714 |
| | Qaliobeya | 789 | 912 | 1,032 | 1,149 | 1,248 | 459 |
| | 10th of Ramadan NUC | 34 | 53 | 78 | 111 | 147 | 113 |
| | Total | 4,115 | 4,603 | 5,093 | 5,585 | 6,050 | 1,935 |

Source: JICA Study Team, Unit: in thousand.

Generally, reducing the vacancy rate shall have the same effect as supplying new units. The following figure shows housing demand as per different vacancy rates. The total demand would be escalated to 9.18 million units in 2027 if the 30% vacancy rate (the same as the current vacancy rate in GCR) was to persist. In this case, 3.9 million housing units would be needed by 2027 for which 194,000 new housing units would be provided annually for the next twenty years. If the vacancy rate could be reduced to 10%¹ estimated 1.36 million housing units would be necessitated till 2027 and it would be 68,000 units annually.



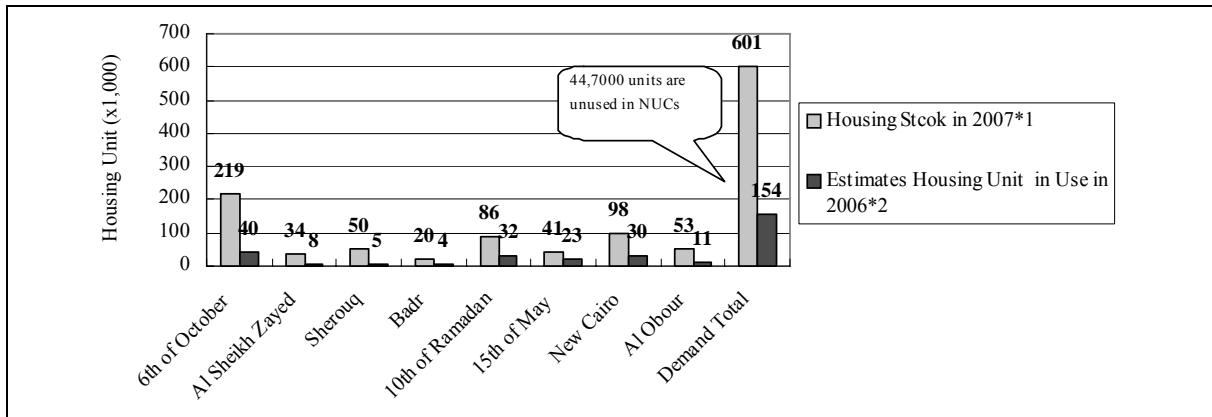
Source: JICA study team

Figure 3.4.4 Projection for Housing Demand and Vacancy Rate until 2027 in the Study Area

3) *Housing stock and housing demand in new urban communities*

There is a huge gap between the number of housing units that have been constructed and the number that are being used. The graph shows that there are 601,000 units that had been constructed by the end of March 2007, according to the Ministry of Housing, Utilities and Urban Development. However, it is estimated from Census 2006 information that only 154,000 units, equivalent to 25% of the total stock, are being lived in. This large gap, amounting to 449,000 units, may be partly due to the time lag between the construction, sale and occupancy. Also, the gap could be partly attributed to the housing units in NUCs that are bought not as an immediate residence, but for some future use, such as after retirement or for children.

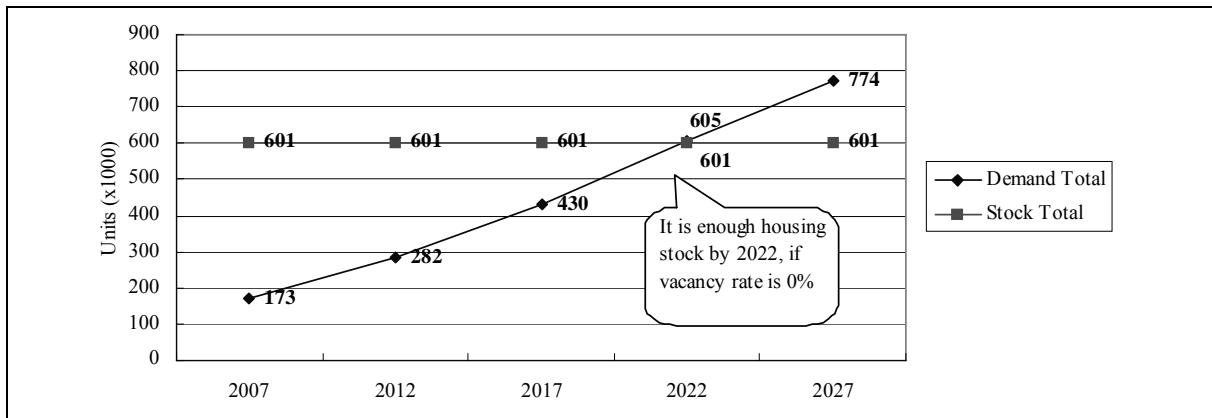
¹ For example, it is 9.5% - 10.0% vacancy rate in metropolitan area, 2007 in USA, US Census Bureau News (CB07-101).



Source*1: MOHUUD, 2007

Source*2: Census, CAPMAS, 2006

Figure 3.4.5 Gap between Housing Stock and Occupied Units Estimates from Census 2006 in NUCs



Source: JICA study team

Figure 3.4.6 Housing Stock and Demand in NUCs until 2027

Table 3.4.3 Housing Demand in New Urban Communities till 2027 (1,000 units)

| Governorate | 2007 | 2012 | 2017 | 2022 | 2027 | Increase 2007-27 | Annual Demand |
|-----------------|------|------|------|------|------|------------------|---------------|
| 6th of October | 43 | 80 | 128 | 183 | 233 | 190 | 9 |
| Al Sheikh Zayed | 12 | 21 | 34 | 49 | 62 | 51 | 3 |
| Al Shorouk | 7 | 23 | 48 | 75 | 116 | 109 | 5 |
| Badr | 5 | 6 | 7 | 8 | 9 | 5 | 0 |
| 10th of Ramadan | 35 | 54 | 80 | 113 | 150 | 115 | 6 |
| 15th of May | 24 | 26 | 28 | 30 | 34 | 10 | 1 |
| New Cairo | 32 | 41 | 49 | 63 | 70 | 38 | 2 |
| Al Obour | 16 | 31 | 55 | 82 | 99 | 84 | 4 |
| Total | 173 | 282 | 430 | 605 | 774 | 601 | 30 |

Source: JICA Study Team

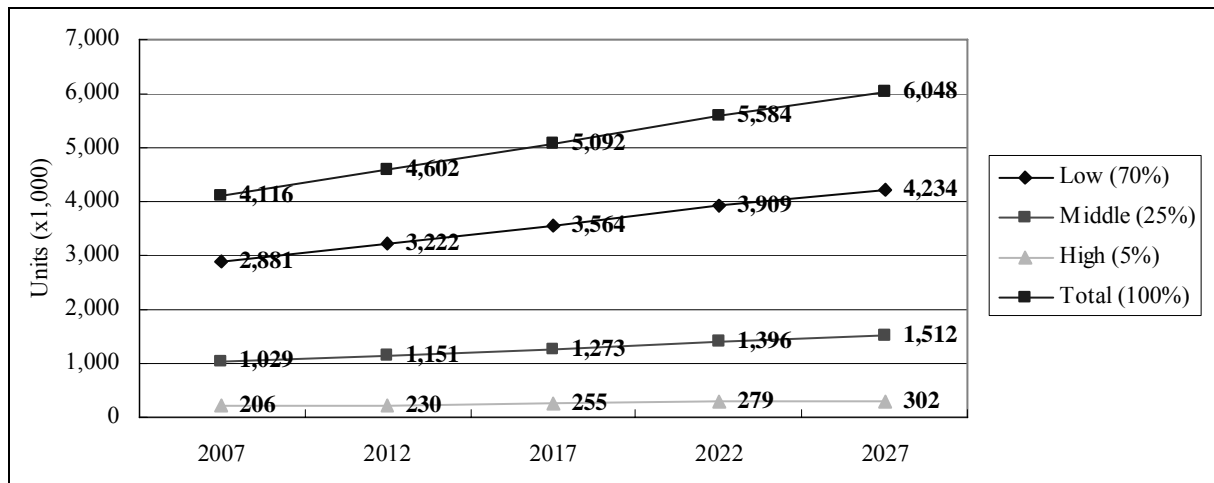
Table 3.4.4 Housing Demand Comparison by Vacancy Rate Escalations in NUCs

| Class | 2007 | 2012 | 2017 | 2022 | 2027 | Increase | Annual Demand |
|------------------|------|------|------|------|-------|----------|---------------|
| Vacancy Rate 0% | 173 | 282 | 430 | 605 | 774 | 601 | 30 |
| Vacancy Rate 10% | 190 | 310 | 473 | 665 | 851 | 661 | 33 |
| Vacancy Rate 20% | 207 | 338 | 516 | 726 | 928 | 721 | 36 |
| Vacancy Rate 30% | 225 | 367 | 559 | 786 | 1,006 | 781 | 39 |

Source: JICA Study Team

4) Housing supply

Mobilizing unused housing units and adjusting housing supply so as to meet specific demand by different income groups are major key factors of housing sector in GCR. The housing supply thresholds proposed by Ministry of Planning for different income groups are 70% for low income, 25% for middle income and 5% for high income group. It will translate to 1.35 million units for low income, 483,000 units for middle income and 97,000 units for high income groups by 2027.



Source: JICA study team

Figure 3.4.7 Housing Demand by Income Group with MOP Policy until 2027

If the vacancy rate remains at the present level of 30%, an estimated 2.50 million units will be necessitated by 2027. If the vacancy rate could be reduced 10 points to 20% by 2027, the required housing units could also be reduced to 2.3 million. Consequently, the vacancy rate should be taken in account for further housing supply and demand balance.

Table 3.4.5 Housing Demand with Vacancy Rate and Income Group in GCR

| Vacancy Rate | Income | 2007 | 2012 | 2017 | 2022 | 2027 | Increase 2007-27 |
|------------------|--------|-------|-------|-------|-------|-------|------------------|
| Vacancy rate 0% | Low | 2,881 | 3,222 | 3,564 | 3,909 | 4,234 | 1,352 |
| | Middle | 1,029 | 1,151 | 1,273 | 1,396 | 1,512 | 483 |
| | High | 206 | 230 | 255 | 279 | 302 | 97 |
| | Total | 4,116 | 4,602 | 5,092 | 5,584 | 6,048 | 1,932 |
| Vacancy rate 10% | Low | 3,170 | 3,544 | 3,921 | 4,299 | 4,657 | 1,487 |
| | Middle | 1,132 | 1,266 | 1,400 | 1,536 | 1,663 | 531 |
| | High | 226 | 253 | 280 | 307 | 333 | 106 |
| | Total | 4,528 | 5,062 | 5,601 | 6,142 | 6,653 | 2,125 |
| Vacancy rate 20% | Low | 3,458 | 3,866 | 4,277 | 4,690 | 5,080 | 1,623 |
| | Middle | 1,235 | 1,381 | 1,528 | 1,675 | 1,814 | 580 |
| | High | 247 | 276 | 306 | 335 | 363 | 116 |
| | Total | 4,940 | 5,523 | 6,110 | 6,701 | 7,258 | 2,318 |
| Vacancy rate 30% | Low | 3,746 | 4,188 | 4,634 | 5,081 | 5,504 | 1,758 |
| | Middle | 1,338 | 1,496 | 1,655 | 1,815 | 1,966 | 628 |
| | High | 268 | 299 | 331 | 363 | 393 | 1216 |
| | Total | 5,351 | 5,983 | 6,620 | 7,259 | 7,862 | 2,511 |

Source: JICA Study Team

4) Affordability of housing

In some of the recent low-income housing programs in various governorates, the cost of the housing unit (70m²) ranges from LE 40,000 to LE 45,000 apart from the cost of infrastructure and land. Usually, the land is owned by the governorate while infrastructure is provided at the minimum cost of LE 60 per square meter, making use of the existing utilities. The total cost of a single unit ranges from LE 45,000 to LE 50,000. (UNDP HDR2005)

The housing unit price to income ratio in Egypt is 4.9. For a housing unit mentioned above to be sold, the buyer need to get a monthly salary of more than LE 750, which according to our opinion survey would rank as a halfway in the income distribution. There should be more affordable price housing units for the low-income people to choose from so that the housing demand for such people would not be directed to informal housing which are cheaper in price, but in deteriorated living environment.

Table 3.4.6 Housing Supply Indicators

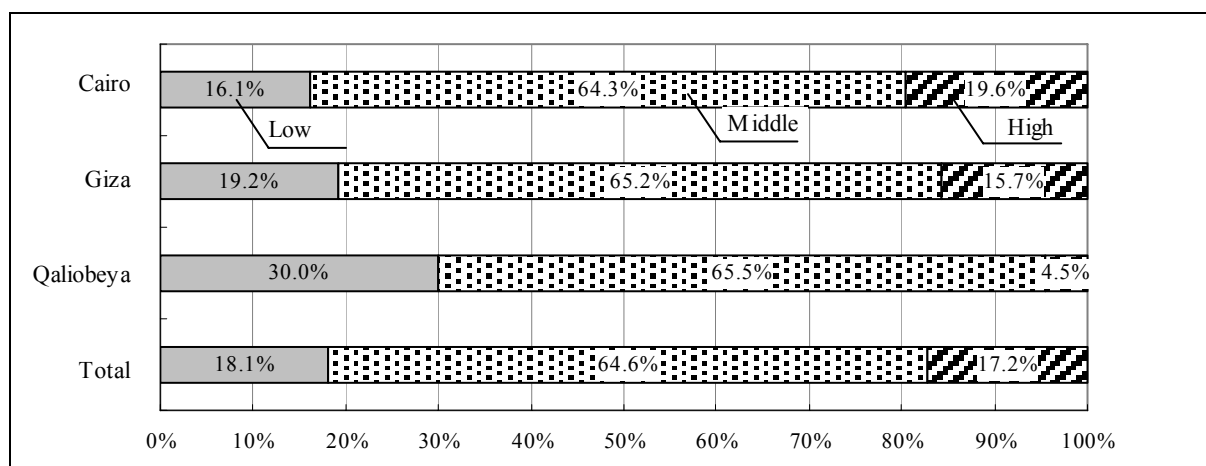
| Indicators | Indices |
|--|----------------------------|
| House price to income ratio | 4.9 (1998) |
| Rent to income ratio | 20% (1999) |
| Floor area per person (m ²) | 12 m ² (1993) |
| Ratio of mortgage loans to GDP | 7.4% (1993) |
| Land price to income ratio (price of developed land) | 3% (2000) |
| Informal housing stock | 30-60% (different sources) |
| Public housing stock | 29% (1993-2002) |

Source: Ministry of Housing, Utilities and Urban Development and World Bank

Table 3.4.7 Low Cost Housing in case of 6th of October NUC

| Housing type | Units Constructed | Share (%) | Unit Cost (LE) |
|---|-------------------|-----------|----------------|
| Youth housing, 100 m ² | 4,160 | 28.2 | 51,096 |
| Youth housing, 70 m ² | 2,949 | 20.0 | 44,920 |
| Youth housing, 63 m ² | 4,517 | 30.6 | 28,842 |
| Future housing, 63 m ² | 1,965 | 13.3 | 29,145 |
| Substitutes for informal housing, 53 m ² | 1,178 | 8.0 | 28,845 |
| Total | 14,769 | 100.0 | |

Source: New Urban Communities Authority, Sixth of October City Council, December 2006.



Source: Opinion poll survey for urban planning in GCR, JICA study team, 2007

Figure 3.4.8 Income Group Interviewed by the Opinion Survey

5) *Measures to be taken*

For the next two decades by 2027, a new updated housing map shall be drawn including following points.

- a) Reduce the vacancy rate (unused unit rate): Mobilize the housing units that are not used by the owner for temporal uses by other (sub-letting) should be encouraged. In general the Egyptian people feel awkward as to subletting because of the strong position of tenants, adjustment needs to be made in the regulatory framework for sub-letting and renting of real estates.
- b) Supportive measures for housing finance: It is surprising that most of real estates purchases are made on cash. For people with limited means for earning a livelihood, cash purchase practices will be an obstacle for buying a housing unit. Public support for housing loans and/or a mortgage loan mechanism needs to be introduced.
- c) Adequate provision of affordable housing: One common reason for not moving to NUCs is that the price of units is too high. So far, the provision of housing units has basically been controlled by supply. Demand conditions, such as affordability and attractiveness, were not given much consideration. It will be important to readjust the balance of supply and demand for housing units, particularly in NUCs, so that there will be adequate provision of affordable housing units. Utilizing PPP mechanism in this field will be helpful.

(2) *Improving living environment especially for informal areas*

Over the past 15 years, the government has made efforts for upgrading informal areas in the country, 325 informal areas were redeveloped in 14 governorates and 11 areas were completely resettled, whereas 632 areas are currently on-going, of which five are in Cairo. Priority was given to Upper Egypt governorates as well as Greater Cairo and Alexandria governorates. The upgrading includes provision of basic urban infrastructure such as electricity supply, potable water supply, sewerage services, and road pavement.

As depicted in Sub-Section 2.6.4, the issue of informal area is far-reaching and diverse in the study area. According to previous studies, there are 184 informal settlements within GCR, and the total population living there may be 3.4 to 4.5 million, or about one quarter of the total population.

1) *Ongoing improvement projects for informal areas in the study area*

GOPP identified existing informal areas at 81 locations in Cairo, 36 locations in Giza, and 32 locations in Qaliobeya. It classifies the informal areas into three categories including 1) officially constructed housing area, 2) unofficially constructed areas, and 3) other forms in permissible conditions.

In Greater Cairo, GOPP and Cairo Governorate implemented Mashiet Nasser Upgrading Pilot Project with the total target of 60,000 units (53-60 m²) with 300,000 inhabitants in an area of 70 ha.

Table 3.4.8 Criteria of Slum Area Upgrading by the Government

| Criterion | Indicator |
|-----------------------|---|
| Safety and Security | Status of buildings and construction |
| Environment Safety | Extent of environment pollution |
| Population Density | Number of beneficiaries |
| Economic Level | Income level / Poverty level / Human development / Unemployment rates / informal employment |
| Social Safety | Extent of crime and violence |
| Economic Value | Real-estate wealth / Investment opportunity cost |
| Social Equity | Local disparities in income and standard of living levels |
| Work Execution Status | Execution rates / Expected completion date |

Source: 5th Five-Year Plan for Socio-Economic Development

For the informal areas, GOPP has a classification as shown below, in which the informal areas are classified into seven (7) categories, and main actions and intervention policies are considered as summarized in the following table.

Table 3.4.9 Identification and Classification of GCR Informal Areas

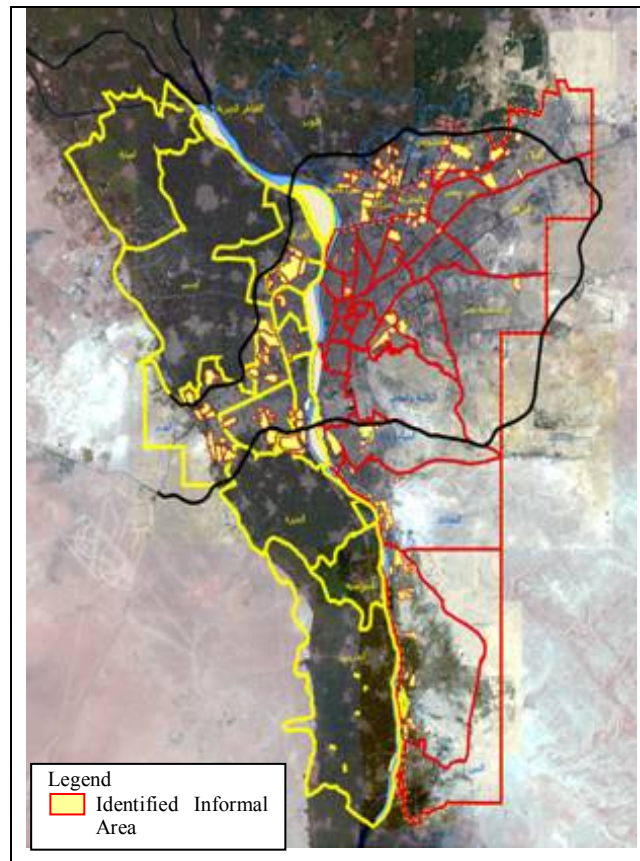
| Description of slums (the problems) | Main Action | Other intervention fields | Intervention program field (Mechanisms) | Main Classification (intervention policy) |
|---|--|---------------------------------------|---|--|
| Huts and shacks | Relocation/ Optimal use of land | Legal/ Administrative | Social / Economic | Areas of removal and reuse |
| Squatted, unplanned, severely deteriorated, well-located areas | Land investment after relocation/ Business Plan | Administrative | Economic / Legal / Social | |
| Unplanned areas located on desert or agricultural land on the fringes of the cities, liable to random extension | Precinct Planning / Legal Plan | Economic/ Environmental/ Social | Legal/ Administrative/ Urban | Belting & containment areas |
| Unplanned and unregistered areas, built on state lands, with no tenure assurance. | Tenure | Urban/ Social/ Environmental | Legal/ Economic/ Administrative | Redevelopment and partial rehabilitation areas |
| Unplanned and unregistered areas, located on agricultural land and may include unlicensed activities | Urban Control/ Control lines/ Re-planning/ Normalization of Planning LR | Social/ Environmental | Legal/ Urban/ Economic | |
| Unplanned areas representing poverty hubs (centers) (rural pockets in urban areas) | Economic & Community Development | Administrative/ Urban | Social/ Environmental/ Economic | |
| Environmentally Endangered Areas | Public Safety | Legal/ Urban/ Economic | Environmental/ Administrative/ Social | |

Source: GOPP

Accordingly, GOPP proposes “the paved belt²” to prevent the random expansion of the informal areas into the fringe of the main agglomeration. Among 81 informal areas in

² The proposed approach of “belting the informal areas” is to surround the identified informal areas by the paved roads and facilities along the paved roads so as to prevent the random extension.

Cairo, GOPP decides to relocate 13 informal areas. The following figure shows the informal communities for Paved Belts approach.



Source: GOPP

Figure 3.4.9 Location Map of Existing Informal Areas

2) *Integrated approach for improvement of informal areas*

As the issue of informal areas is a multi-faceted social, economic, cultural and urban planning issue, the basic approaches for the improvement of informal areas must follow the integrated urban upgrading approach through a comprehensive urban upgrading policy that integrates the urban poor in the economic development and social environment of the city:

- Basic approach focusing on the concept of self help and community empowerment so as to encourage the residents self motivated actions for better living environment,
- Increase access to jobs within or nearby the living quarters, or assure affordable means of transportation to and from work place
- Increase access to micro-finance and business support services so that day to day improvement of the informal areas could be financed on a sustainable basis, with emphasis on women and youth;

- Increase access to infrastructure and services, such as paved lanes and roads, potable water supply, solid waste collection and disposal, wastewater collection and treatment, public schools and medical services, etc.
- Possible combination with income generating activities such as tourism promotion or facility development
- Enable land ownership and property registration in informal settlements.
- Coordination with related policies such as housing for the low-income people,

3) Candidates for pilot informal areas

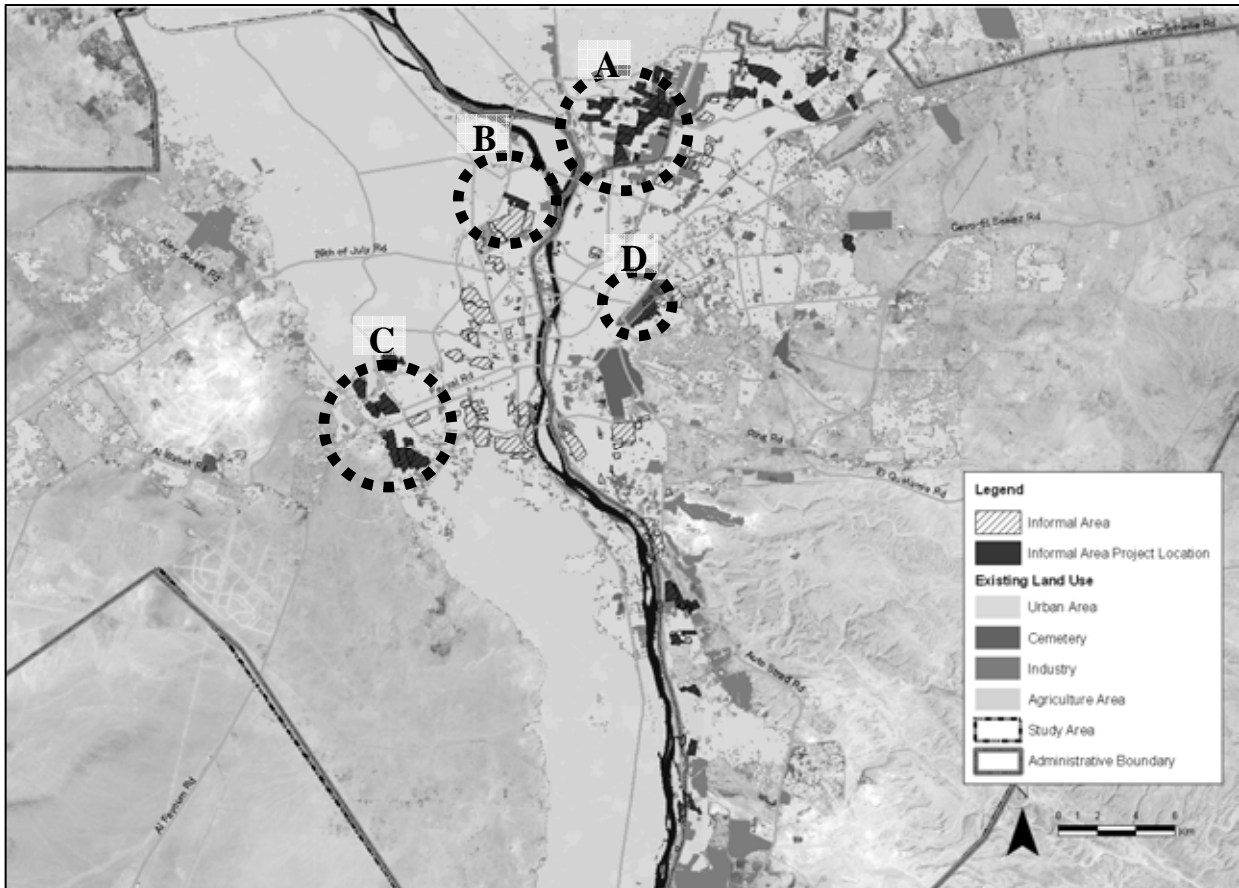
Based on the general approaches discussed above, possible prioritization of informal areas for improvement and rehabilitation will have to be done through information based decisions with surveys, satellite photo analysis and others. From the urban planning view point, the following four locations are considered imperative as having the potential for diffusing the effects of improvement to informal areas under similar conditions.

There are four sites identified as sites for the pilot improvement projects, and one for the overall informal areas within the study area, as summarized below. The study for those areas was carried out. Those areas were considered as imperative as having the potential for diffusing the effects of improvement to informal areas under similar conditions.

Table 3.4.10 Candidates for Pilot Informal Improvement Projects

| Name | Location | Features | Characteristics |
|---|--|--|---|
| A: Area adjacent to relocated factories (Shubra) | North of Cairo CBD, along Metro Line No.2. | Proximity to Cairo CBD Large factories that are to be relocated Along the planned Line 4 | Improvement of informal areas in parallel with the relocated factory site redevelopment |
| B: Area in adjacent to redevelopment area (Imbaba) | North of Mohandesin Sub-CBD along Metro Line No.3. | Proximity to Mohandesin CBD Proximity of a former airport strip On the Al Farag new road connecting to Sheikh Zayed and 6th of October | Improvement of informal areas in parallel with the airport strip redevelopment Integrate with Al Farag new road development and Metro Line 3. |
| C Area in connection with tourism site (Pyramids) | Giza Governorate | Near the Giza Pyramids, and planned GEM (Grand Egyptian Museum) Along the planned Metro Line 4 | Improvement of informal areas near the Pyramids and planned GEM In close collaboration with tourism promotion activities Stopping the expansion of informal areas onto the areas used for tourism |
| D Area within the City of the Dead (City of the Dead) | Cairo Governorate | Inside of the City of the Dead Endangering the historical heritages by the informal settlement | Improvement of informal areas inside the city of the Dead In close collaboration with heritage protection activities |
| E Informal Areas around Study Area | All over the Study Area | Gathering basic information on urban, social and communities within the informal areas | Inventory of all the informal areas by using the GIS, Satellite photos and surveys |

Source: JICA Study Team



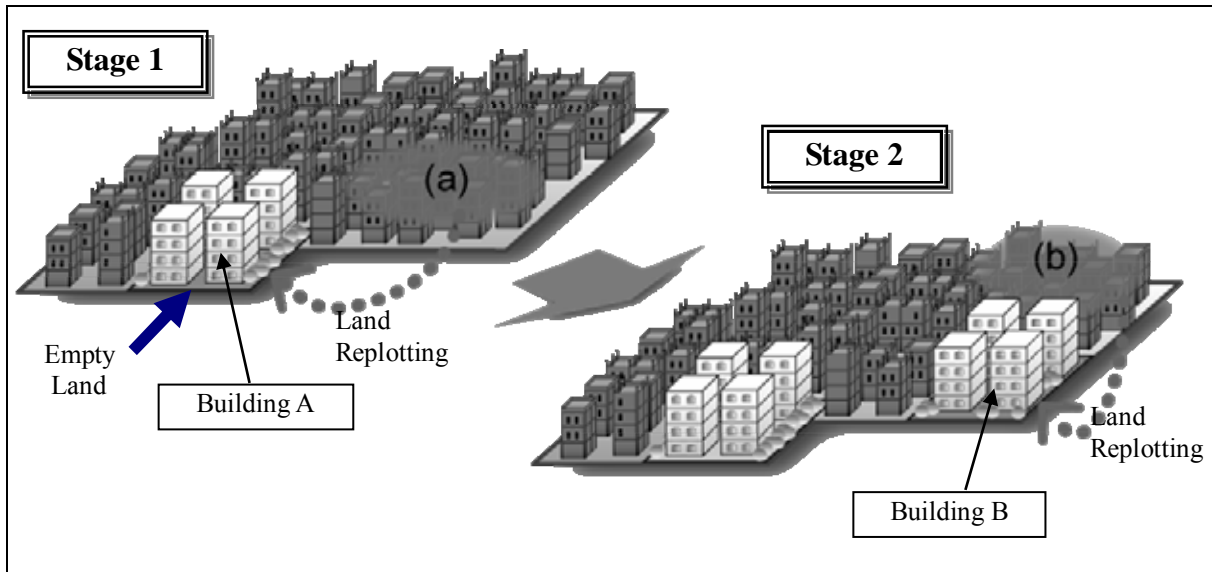
Source: JICA Study Team

Figure 3.4.10 Candidates for Pilot Informal Improvement Projects

4) Proposal for continuous improvement of informal areas

As the informal areas in the study area are large in areas in plenty in the population involved, no method that utilizes only the public funding source would be successful. The improvement method has to capitalize on the market oriented mechanism for land and property values and self-help efforts of the community stakeholders.

If the area has a open land to relocate the existing residents in the informal areas in the first place, the residents in specified area shall be either resettled into a building built on this open land, making the land they had left open for redevelopment. When this process is complete people living in other specified areas could be resettled, leaving behind lands that would be open for redevelopment. This way, the redevelopment procedures could be repeated continuously such as in a chain action.



Source: JICA study team

Figure 3.4.11 Sequences of “Chain Type” Urban Development

3.4.3 Working in Cairo (Socio-Economic Development)

(1) Promoting new business and commercial area

There are different types of urban centers with different functions, including commercial centers, industrial estates, government centers, and other special centers including university complex, medical centers, high-tech parks, sports stadiums, etc. Among those urban centers, commercial centers and industrial estates are the most relevant to promoting urban growth by providing the main services and generate job opportunities. In other countries, the governments have often made efforts to create new sub-centers, which provided sites for new business and commercial activities and thus reorganizing the urban form in the metropolitan areas.

In the study area, the lands for new business and commercial areas shall be required in the several aspects that will be crucial to sustaining the city as in the followings.

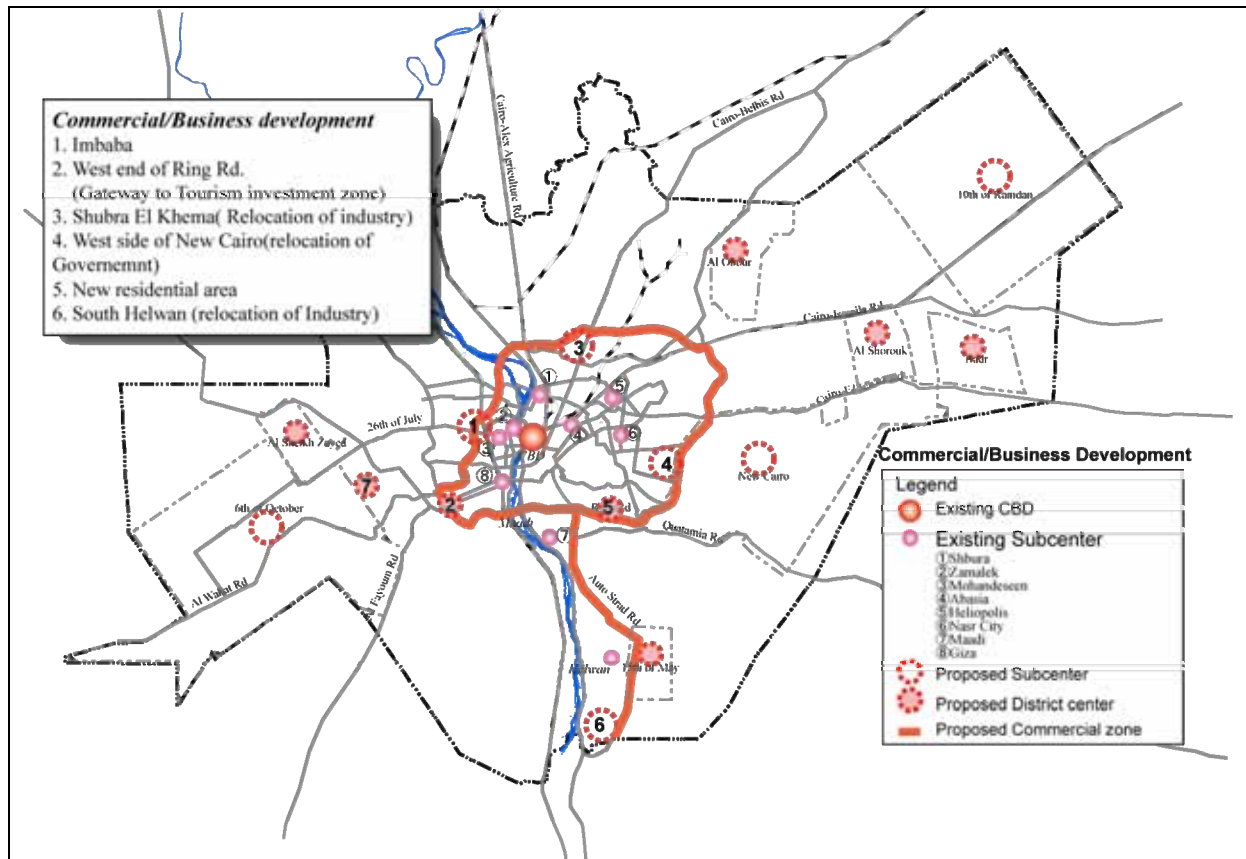
- 1) To retain the international competitiveness in the tertiary industry, particularly for business, financial, and information and technology sectors and
- 2) To reorganize the urban form by creating the urban centers in the planning zones.

To achieve these aspects, the following actions shall be required.

- 1) To upgrade the existing business and commercial centers, such as Cairo CBD, Nasr City, Maadi, Muhandisin, Shobra, Heliopolis, Giza, Shobra El Kheima
- 2) To create new business and commercial centers in the planning zones, such as Imbaba, New Government Area, New Cairo NUC, 6th of October, and 10th of Ramadan, Helwan, and Tourism Promotion Area, etc.

- 3) To create new business and commercial centers in the areas where future urbanization with population increase were expected in the planning period.

Thus, Figure 3.4.12 depicted the distribution of business and commercial areas in the study area on the basis of the above-mentioned directions.



Source: JICA study team

Figure 3.4.12 Proposed Business and Commercial Areas in the Study Area

- (2) Promoting industrial and R&D areas

The tertiary industry (services) will be a leading industry in the future of the study area, while the secondary industry of construction and manufacturing shall be the engine to sustain economic activities in the study area today and in the near future. Distribution of existing industrial areas and factories needs to be reorganized for achieving a favorable environment for new investment in the manufacturing sector and living environment for the people. For the planning purpose, four aspects were set up: namely the view points of regional context, urban form, living environment, and industrial promotion. Following the proposed four aspects, the necessary actions were formulated as below.

[Orientation and expected actions to reorganize industrial areas]

- 1) Regional context: To cope with the industrial development axes along the Alexandria-Cairo road and Cairo-Ismailia road in the North Egypt region.

- 1)-1 6th of October and 10th of Ramadan will be the focal points and they provide sites for industrial development in the study area, since both NUCs have already been developed to a certain extent and located in the regional industrial development axes of Cairo-Alexandria and Cairo-Ismailia roads. To recognize the existing industrial activities in both NUCs, 6th of October will be characterized for high-value added industry, while 10th of Ramadan will be a base for the heavy and basic industries. This will comply with the policy proposed by GAFI, which contemplated to promote both NUCs.
- 2) Urban form: To decentralize the urban activities from mono-centric to poly-centric
 - 2)-1 A further study will need to identify factories for relocating which generate a large number of job opportunities and impose pollution to neighborhoods in the main agglomeration.
 - 2)-2 New development of large factories is already prohibited or strictly regulated in the main agglomeration.
- 3) Living environment: To eliminate the pollution sources in the residential areas by relocating existing factories in the main agglomeration.
 - 3)-1 Twenty one highly-polluting large factories will be relocated from the main agglomeration to suburban sites as a priority program. Candidate sites for receiving their relocation will be selected in areas where similar industrial activities are in operation, as coordination with related production activities will ensure to fulfill the requirements for keeping productions of the 21 factories after the relocation.
 - 3)-2 Vacant lands after relocation of the 21 factories will be used for new functions that will meet the following requirements: (i) No further migration into neighborhoods, (ii) contribution to upgrade the living environment, and (iii) Contribution to human resource development to compensate the job opportunities provided in the 21 factories. On the basis of those three requirements, new function will basically consist of residential, commercial, public spaces such as a park and open spaces, and centers for human resource development.
 - 3)-3 Heavy industry and other industries with specific environmental measure will need to allocate far from main agglomeration or outside the outer ring road. 10th of Ramadan NUC will be a candidate site for such purpose.
 - 3)-4 A tannery in the south to the central business district will be relocated to areas adjacent to Badr NUC.
- 4) Industrial promotion: To provide new lands for small and medium enterprises (SMEs) and research and development (R&D).
 - 4)-1 New lands for R&D will be allocated in 6th of October and New Cairo NUCs, since 6th of October NUC will be a vessel for the high-value added industries, which shall require the enhanced technical capability. New Cairo NUC will be also a candidate site among the NUCs in the east of the study area for R&D

activities, as it has advantages in proximity to existing central business district, new government site and other urban areas in NUCs; accessibility to human resources from international universities; and well-planned living environment.

- 4)-2 New lands for SMEs will be developed in and around 6th of October and 10th of Ramadan. Accumulation of SMEs will be supportive to the industrial activities in each industrial area, while the collaboration will contribute to upgrade technical skills of SMEs.

On the circumstance mentioned above, the candidate sites and new function of 21 polluting factories were examined as shown in Table 3.4.11. A further study shall be required to determine the suitable sites for relocation and the new functions of vacant lands after the relocation. The future distribution of the industrial areas was depicted in Figure 3.4.13.

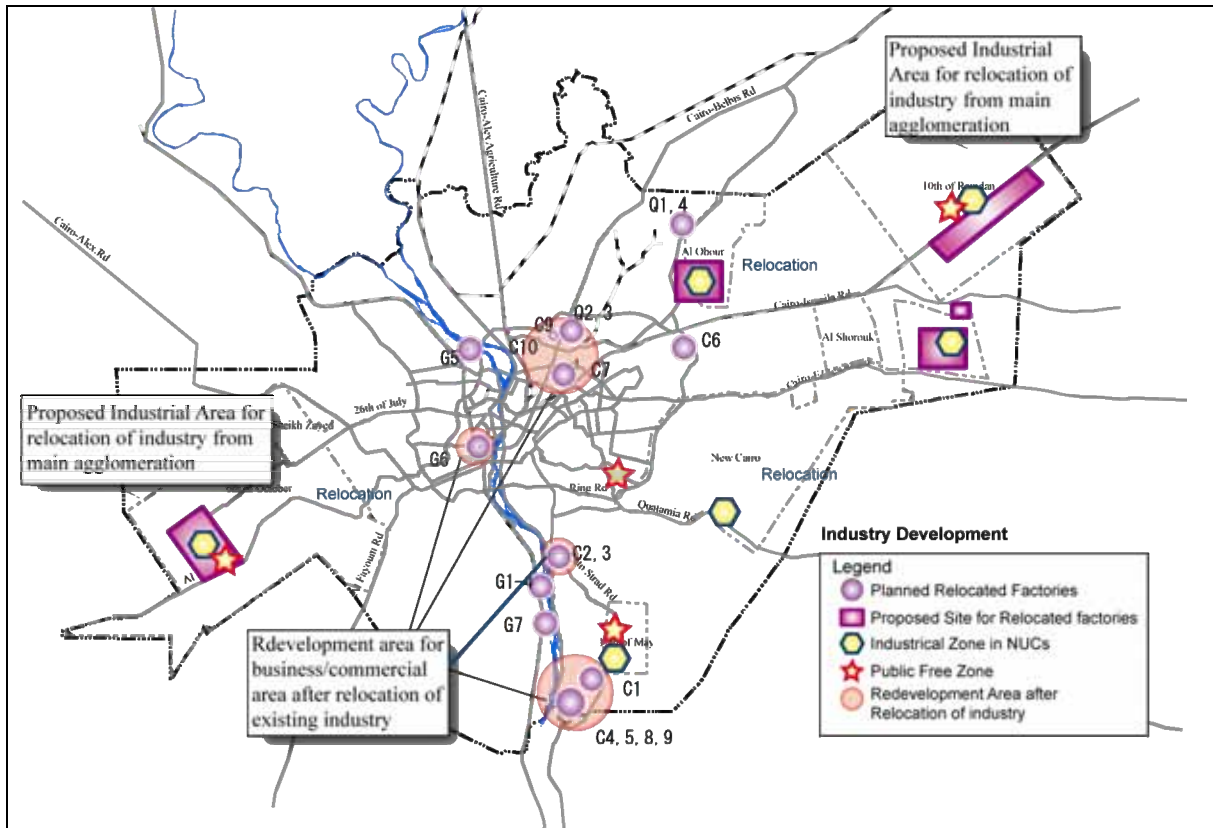
Table 3.4.11 Candidate Sites for Relocation and Alternative Function after Relocation for 21 Highly-Polluted Large Factories

| ID | Type of Production*1 | Candidate Site for Relocation | Expected Alternative Function after Relocation | | | |
|----|--|-------------------------------|--|---|---|-----------------------------------|
| | | | R | C | P | Others |
| C1 | Cement, bricks, gypsum and Leica granules | 10th of Ramadan | X | X | X | |
| C2 | Cement | 10th of Ramadan | X | | X | |
| C3 | Different types of cement | 10th of Ramadan | X | | X | |
| C4 | Coke, ammonia fertilizer, carbon dioxide - chemicals | Badr | X | | X | |
| C5 | Iron and Steel | 10th of Ramadan | X | | X | |
| C6 | Lacquers, furnace and plastic paintings - varnishes | Al Obour | X | X | X | |
| C7 | Paintings, varnishes, and print inks | Al Obour | X | X | X | |
| C8 | Tires and products | 10th of Ramadan | X | | X | |
| C9 | Casting, melting, and wiring for non-iron minerals | Badr | X | | X | |
| G1 | Alcohol, acetic acid, and east | Badr | | | X | Human resource development center |
| G2 | Solvents, organic & adhesive materials, oxygen, sodium sulfate | Al Obour | | | X | ditto |
| G3 | Sugar refining and packaging, molasses | Badr | | | X | ditto |
| G4 | Sugar refining and packaging, molasses | Badr | | | X | ditto |
| G5 | Steel castings and high pressure pipes | 10th of Ramadan | | | X | ditto |
| G6 | Tobaccos | Badr | X | | X | |
| G7 | Extracting and refining of vegetable oils, fodders | Badr | | | X | Human resource development center |
| Q1 | Sulfuric acid, phosphate fertilizer, phosphoric acid | 10th of Ramadan | X | X | X | |
| Q2 | Oil refining | Badr | X | X | X | |
| Q3 | Mixing and packaging of oils and chemicals | Badr | X | | X | Human resource development center |
| Q4 | Vegetable ghee & edible oil | Badr | X | | X | ditto |

Source *1: Study on Transferring Large Factories from Greater Cairo Region-Results of the First Stage, Ministry of Trade and Industry, 2006

Note 1) R-Residential, C-Commercial, P-Parks and open spaces

Note 2) "X" means function acceptable to be introduced. Detail study will be necessary to determine the alternative functions for each site.



Source: JICA study team

Figure 3.4.13 Proposed Reorganization of Industrial Areas in the Study Area

(3) Promoting tourism area

1) Existing tourism area

The study area has a plenty of historical resources that could attract international as well as domestic tourists. Egypt has seven sites registered in the UNESCO World Heritage list, and two of which are located in the Study Area. The one is Islamic Cairo and the other is Pyramid fields in Giza as summarized in the following table. Other existing historical resources were presented in Section 2.5.

Table 3.4.12 Cultural Heritages listed on World Heritages

| Name | Year Listed | Location | Brief Description |
|----------------------------|-------------|------------|---|
| Historic Cairo | 1979 | Cairo Gov. | One of the world's oldest Islamic cities, with its famous mosques, madrasas, hammams and fountains. Founded in the 10th century, it became the centre of the Islamic world, reaching its golden age in the 14th century |
| The Pyramid Fields in Giza | 1979 | Giza Gov. | Extraordinary funerary monuments established in the capital of the Old Kingdom of Egypt, including rock tombs, ornate mastabas, temples and pyramids. |

Source: UNESCO, World Heritages Web Site

2) *Enhancing tourism sites and network enhancement*

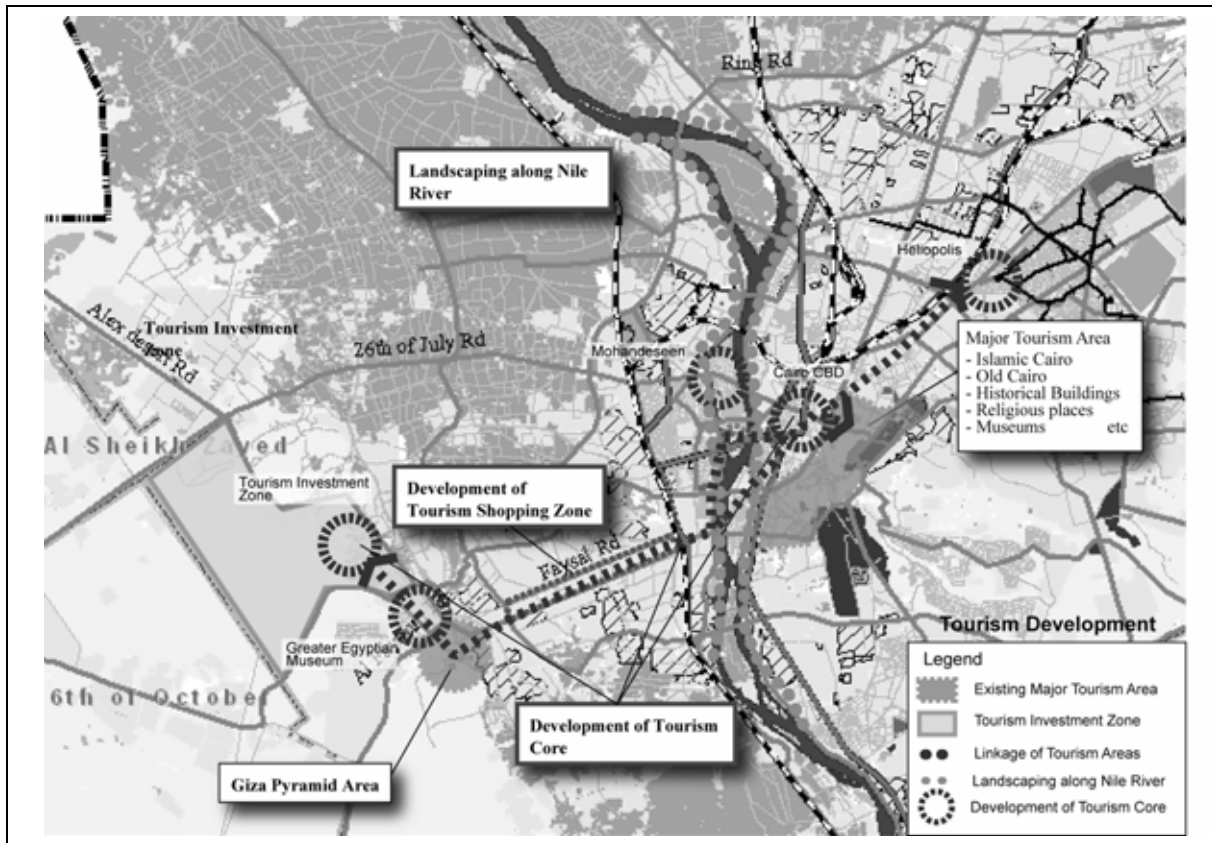
Tourism is a fast growing industry for Egypt, and is one of the few sectors that earn hard currency foreign exchange, and the study area is the gateway of foreign tourists to Egypt, and is one of the main services centers in Egypt for international tourism.

The following table shows a set of improvement of sites and enhancement of network schemes to improve the tourism for the study area.

Table 3.4.13 Development Concept for 2027

| Key Concept | Location | Description |
|---|---|--|
| Urban Core townscape heritage conservation and rehabilitation | Cairo CBD | European style buildings will be preserved particularly the facades of the buildings as continuous townscape |
| Urban townscape heritage conservation and rehabilitation | Heliopolis | Major European style buildings will be preserved particularly the facades of the buildings |
| Cultural Historical Quarter in Garden City | Part of Garden City where the Government Offices shall be relocated to suburban sites | Old European style buildings used by Government offices will be converted to five-star hotels and/or theatres, parks and high-end restaurants / shops. |
| Tourism Investment Zone | North of Pyramids in Giza | Location of new high-end hotels and tourism facilities will be promoted. |
| Tourism Promotion Area | Great Egyptian Museum (GEM) | Now under planning and designing, this GEM will be a new centre of Pyramid tourism |
| | Downtown Attaba Square Area | Modernization of existing heritage buildings such as the Grand Hotel in Attaba Square |
| | Island in Nile | Islands in the Nile represent good opportunities for tourism with environmental protection measures |
| | Wad Degla (Maadi) | This is well known as natural tourist area |
| Historical Heritage Preservation and Activation Zone | the Islamic Cairo | Historic areas of Cairo, including Islamic Cairo should have special planning zone for conservation and activation |
| | Coptic Cairo | Coptic Cairo needs to be covered by World Heritage either independently or in combination with Islamic Cairo (as a combined Historic Cairo) |
| | Qanater (Qaliobeya) | This has aqueducts and is a protected area, well known as tourist area for local tourists. |

Source: JICA Study Team



Source: JICA study team

Figure 3.4.14 Distribution of Tourism Promotion Areas

3) *Improvement of Islamic Cairo*

The Islamic Cairo is an urban heritage which is more closely related to the urban fabric of Cairo today. The historic city was registered in UNESCO World Heritage list in 1979, as mentioned earlier, but since then there have been discussion in status of the condition of Islamic Cairo. The UNESCO committee raised the issue that Islamic Cairo is not properly protected by the national urban planning framework, and repeatedly instructed Egyptian side to make some remedial actions need to be made. The latest decision in 2006³ instructed the following.

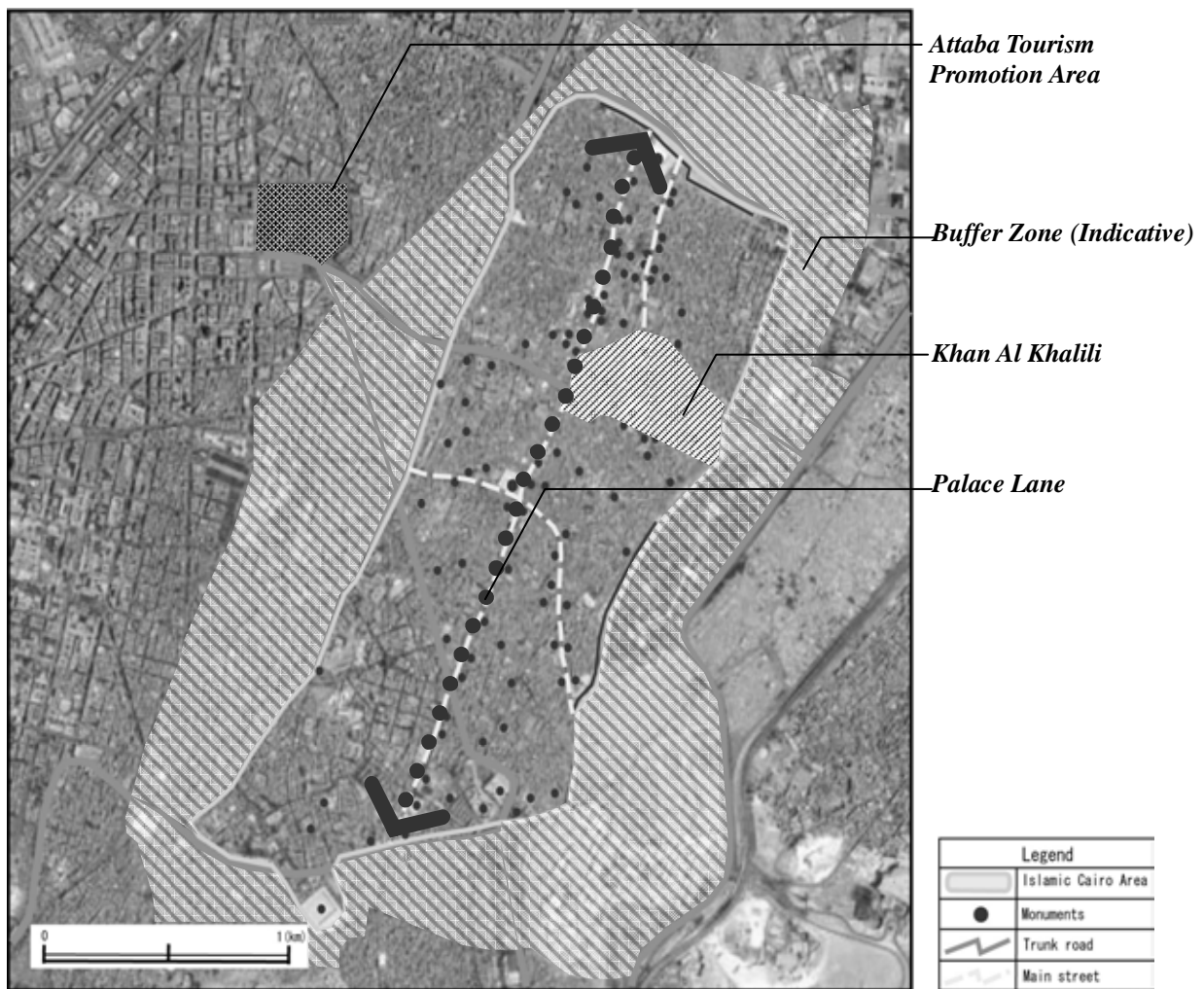
- a) Designate Islamic Cairo as a Special Planning District, with buffer zones, in accordance with the provision of the Operational Guidelines, and
- b) Prepare a comprehensive Urban Plan for the Conservation and Development of the Old City, whereby the conservation of historic buildings would be accompanied by appropriate development regulations,

It is recommended that a survey of the historical buildings be made to make the inventory of historical buildings, together with formulating the urban planning zone for special protection in the core zone, as well as a buffer zone around the core. Also

³ This instruction could be seen in the following Website. <http://whc.unesco.org/en/list/89/documents/>

linear and spot improvement at strategic location could be promoted. This shall include the following;

- Improvement /paving of the north-south Palace Walk
- Development of memorial facility of Naguib Mahfouz, the first Egyptian Nobel Prize Laureate raised in the Islamic Cairo,
- Development of Downtown Attaba Square Tourism Promotion Area where the existing old building shall be rehabilitated, and information center be facilitated.



Source: JICA study team

Figure 3.4.15 Schematic Planning Image of Historical Monuments

3.4.4 Connecting in Cairo

(1) Vitalizing the new urban communities

1) *Present condition*

GOE has made considerable efforts to develop the desert land to create new urban communities (NUCs). The number of already constructed housing units reaches to 600,000 in NUCs within the study area as of March 2007, which will be capable of accommodating approximately 2.4 million persons.

Looking at the planning figures of NUCs, the total development area is 1,400 km², while the total population is planned at 11 million. This would mean that gross population density will be 81 persons/ha. Despite the fact that the pace of population growth in GCR is accelerating and the national policy calls for lesser concentration of population in the metropolitan area, the targets for NUCs for a foreseeable future will have to be adjusted so that the concentrated investment shall make NUCs see maturity as urban areas soon.

2) *Revitalization of NUCs*

As discussed earlier, more than 75% of the total population of GCR is concentrated within the 20 km radius from the city center. This would indicate that most people prefer to live not further than 20 km radius from the city center in GCR. In this view point, the NUCs could be grouped into three clusters.

- a) 10th of Ramadan Cluster (10th of Ramadan, Al Shrouk, Badr): These NUCs are all in the direction of east to northeast of GCR, and are close to the International Airport. 10th of Ramadan is the largest NUC with an area of 398 km², where 124,000 of population and 1,252 factories are located. Badr NUC is intended for residential and industrial mixture, but yet there is large room for further development. Al Shrouk is planned as predominantly a residential town with 500,000 target population but is rather slow to build up. These three NUCs are mutually within 20 km of radius, and should be planned as one regional agglomeration. Accessibility to International Airport as well as the international ports is a basic advantage for this cluster. Inter-regional transportation facility such as the one proposed in CREATS needs to be facilitated to revitalize this cluster. MOT is planning to implement the East wing railway project under a PPP scheme.
- b) 6th of October Cluster (6th of October, Al Sheikh Zayed): The 6th of October is one of the oldest new towns in GCR at about 35 km west of the city center, with the population of about 262,000, which is the largest of all NUCs in GCR. Al Sheikh Zayed is a predominantly residential new town just east of 6th of October. These two NUCs are nearby and in the same direction, and shall form a regional cluster. With rapidly growing population there, the only regional road, July 26th Road is often congested during the peak hours. There are a few proposals for various types of rail transport involving these NUCs, which need to be considered in view of economic viability and sustainability.

- c) **New Cairo Sub-Cluster (New Cairo):** New Cairo is the only NUC in GCR which is within the 20 km radius from the city center. Thus New Cairo would be able to function as an extension of the existing agglomeration and absorb the growing population of GCR in conjunction with the agglomeration. The site for ministerial relocation was determined to be in an area adjunct to New Cairo, on the desert land between New Cairo and Nassr City. This shall also affect the planning of New Cairo. It would be imperative for New Cairo to have the transportation condition improved. At present New Cairo is connected with the city center area only by roads and connectivity with Nassr City by roads is weak. Public transport is very weak too with no urban railway connection. These shall cause limitations to the development of New Cairo in the future. The planning of New Cairo needs to be reconsidered by taking into consideration of the ministerial relocation and improvement of transportation improvement.

Table 3.4.14 Characteristics of Four Clusters

| Cluster | Advantage | Disadvantage | Vision | Issues |
|-------------------------|---|--|--|---|
| 10th of Ramadan Cluster | Proximity to international airport Proximity to regional arterial roads Large area available | Distance to Cairo, limited public transport | Promotion of high value added, high technology, export oriented industry Pursue self-sustained new town with residence and employment inside | Early implementation of East wing transport route |
| 6th of October Cluster | Proximity to regional arterial roads Large area available Rapidly growing population | Distance to Cairo, limited public transport | Promotion of ICT, export oriented, high value industry Pursue self-sustained new town with residence and employment inside | Early implementation of West wing transport route |
| New Cairo Sub-Cluster | Proximity to Cairo (15km) Proximity to international airport Proximity to regional arterial roads Large area available | Limited road connection, limited public transport Weak civic services functions | Pursue sub-center of Cairo by promoting new businesses, international commerce, service industry Provide ICT infrastructure to attract investment pursue open-Government and e-Business Center | Formulate activation plan as a Prioritized Development Corridor and try to harmonize the urban development and transport development Conduct Pre-F/S for urban railway connection to Cairo Conduct Pre-F/S for terminal zones |

Source: JICA study team

3) *Measures to be taken for enhancing development of new urban communities*

Promoting further population shift to NUCs will be crucial to maintaining the sustainable growth and promoting the overall urban development of the study area. In general Egyptian people are conservative in the selection of their living quarters and once settled, they do not casually move to new places, as indicated in the opinion poll survey.

The shift to NUCs was much slower than planned until the census of 1996, which showed a limited population shift to NUCs. The last 10 years, however, saw a clearly accelerated population shift to NUCs with an average annual growth rate of NUCs for

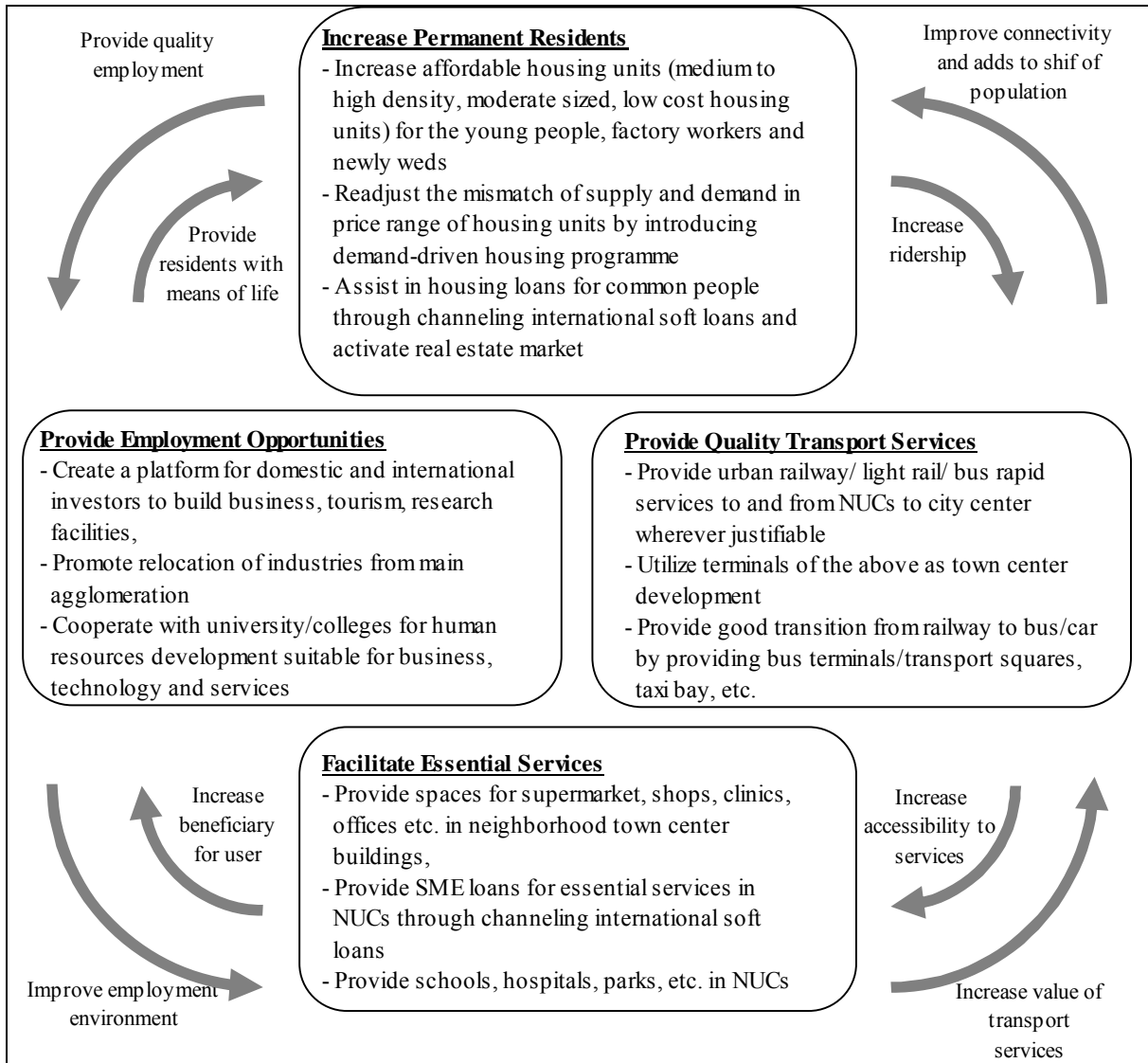
the decade was more than 10%. This belated, but substantial shift to NUCs needs to be further accelerated during the planning period up to 2027.

Encouraging population shift to NUCs will be multi-faceted. Figure 3.4.14 depicts this aspect.

- a) **Increasing permanent population:** The basic problem of the NUCs currently is the fact that there are plenty of housing units in NUCs, but the residents are not as many as to fill up all the available housing units. Increasing the resident population will be the immediate task for NUCs. As discussed earlier, the supply and demand gap has to be adjusted by specifically increasing affordable housing for the low income population. Supportive measures such as introduction of housing loans with public assistance may be effective.

In this regard, modifying the old rent law that stipulate a very low rent to a reasonable level shall encourage many people to shift from the main agglomeration to NUCs. Due to this old law, about 30% of the housing stock is unused because it would not place substantial cost to retain unused units, and thus people retain the units for some future use (such as for their children).

- b) **Provide quality transport services:** One of the major reasons for most of the residents to feel reluctant to move to NUCs is the lack of quality transport services. In general, the population concentration in GCR is almost entirely within 20 km radius, but most of NUCs are beyond this radius. This means that fast and convenient transportation needs to be provided to connect to NUCs so that the physical separation would not hinder the population shift. Also, multi-modal connections need to be planned well in NUCs so that, for example, an urban railway services have good connections with local bus services. This could be achieved if such considerations are put in the development strategies and planning drawings for NUCs.
- c) **Provide employment opportunities:** People need to commute to work places from their residence. It will be beneficial, therefore, that NUCs provide new employment opportunities inside them. As NUCs are potentially capable of attracting urban professional residents, formation of business centers within NUCs shall be promoted which could accommodate financial institution, international businesses, high-end retail and information technology related industries
- d) **Facilitate essential services:** For the people to make a decision to move to NUCs, provision of essential services will be crucial. Providing rentable spaces for general stores or small supermarkets, all sorts of clinics and shops will be essential. Public facilities such as schools, kindergarten, libraries will also be necessary. NUCs need to have good environment compared with the agglomeration, providing spacious parks will also be important.






Source: JICA study team

Figure 3.4.16 Measures to Vitalize NUCs

(2) Promoting transport-oriented urban development area

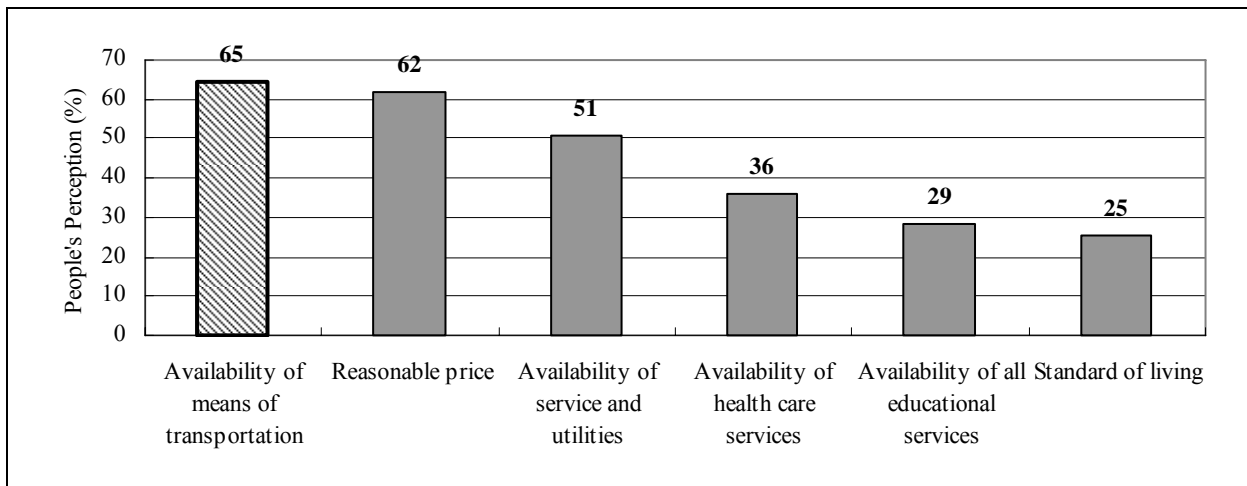
In the metropolitan areas in the world, the efforts have been made to create the transport-oriented urban development. It aimed at dissolving the traffic congestion in the central and specific area in the metropolitans and promoting the new urban development in the suburbs of its entity, since the convenient transportation was considered one of the most important issues to attract the people. Table 3.4.15 shows samples of the transport-oriented urban development in metropolitan areas in different countries.

Table 3.4.15 Example of Transport-Oriented Urban Development in Other Cities

| Project Name | Tsukuba Express Railway (Japan) | Dockland Lewisham Extension (England) | HCMC Integrated Urban & Railway Development (Vietnam) |
|---------------------|---|--|---|
| Project Description | 1) Length: 58.3km 2) Year of operation: 2006 3) Nos. of stations: 20 (7 underground) 4) Project size: 1.05 Tri. Yen (8,500M\$) | 1) Length: 3.8km incl. tunnel 1km 2) Year of operation: 2000 3) Project size: 200M £ | 1) Length: 19.1km (Line 1) 2) Nos. of stations: 14 3) Project size: 638M\$ |
| Location Map |  |  |  |

Source: JICA study team

In the study area, the opinion poll survey by JICA study team revealed that people recognized the convenient accessibility as the highest priority to shift to new urban communities. For instance, among 1,241 responded households, “shortage in means of transportation” was ranked at the first position (35.5%) in the disadvantage of NUCs. On the contrary, 65% of 161 households, who intended to move to NUCs, also raised the means of transportation as the first issue to be remedied (Figure 3.4.17).



Source: Opinion Poll Survey for Urban Planning in GCR, JICA Study Team, 2007

Note: Total respondents were 161 households who represented to intention to move to NUCs.

Figure 3.4.17 Conditions to be changed to shift to NUCs

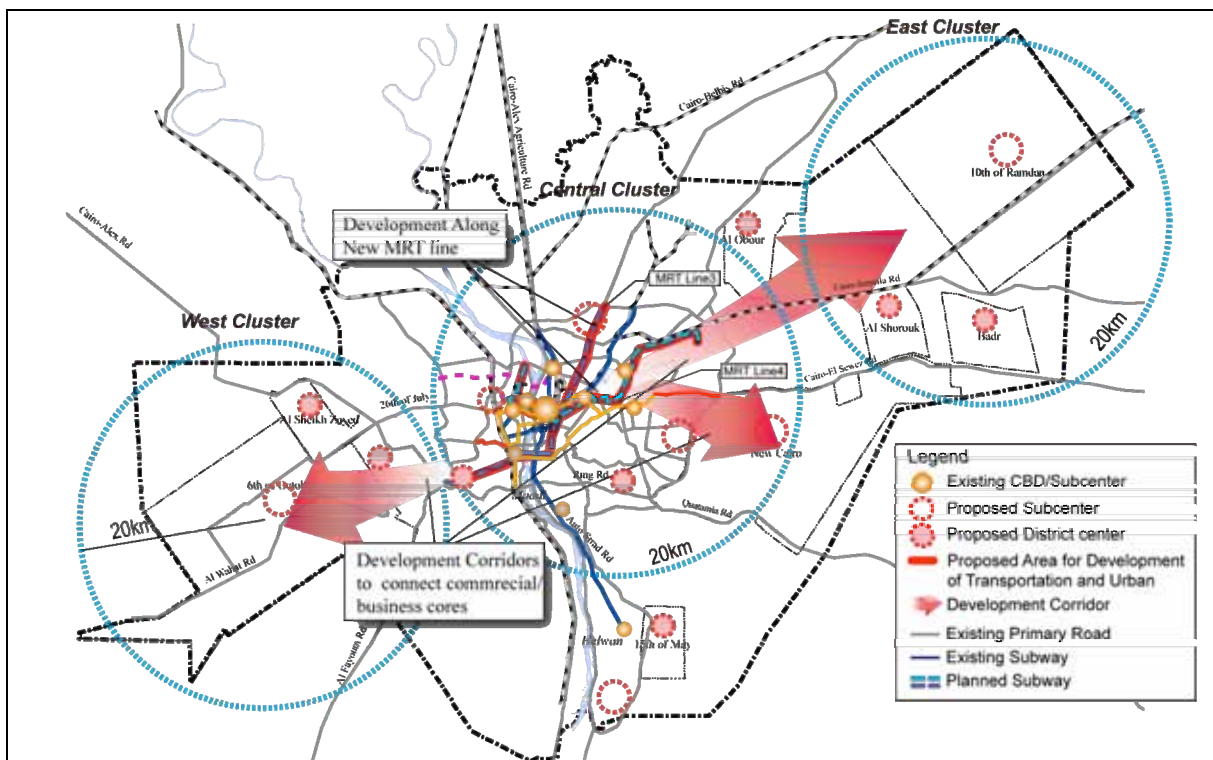
Thus, the improvement of transportation system shall need to be collaborated with urban development. Following the sub-sector strategies for “Working in Cairo”, focal areas of business, commercial, and industrial areas shall need to be interlinked by public transportation system to encourage the reorganization of urban form in the study area. In addition, the new

urban communities shall be included in this transport-oriented urban development program in order to mitigate the over-concentration in the main agglomeration, which was one of the key issues to be resolved for the study area.

Figure 3.4.18 depicts the future transport-oriented urban development or the so-called “Development Corridor”. Following the selected future urban growth pattern, the east and west urban clusters shall need to be highlighted for their developments, since NUCs interlinked by three development corridors have been developed rapidly in the latest decade until 2006, and will be a main vessel to cater incremental population in the study area. In addition, the new business and commercial areas shall need to be enhanced in the central urban cluster. New Cairo NUC will be the key area to be encouraged to take care of incremental population in the main agglomeration.

Among the urban corridors, there are three corridors that shall be highly prioritized to achieve the main challenges, goals, and objectives in the study area.

- 1) The western corridor to interlink the main agglomeration and the western urban cluster, which shall consist of 6th of October and Al Sheikh Zayed NUCs,
- 2) The eastern corridor to interlink the main agglomeration and the eastern urban cluster, which shall include 10th of Ramadan, Badr, and Al Shorouk NUCs, and
- 3) An intercity corridor to link the main agglomeration and New Cairo NUC.



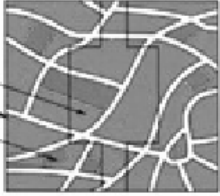
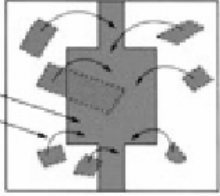
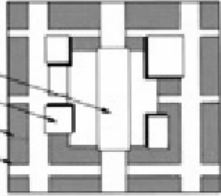
Source: JICA study team

Figure 3.4.18 Transport-Oriented Urban Development in the Study Area

It will be worthwhile to note that the development corridor will require the urban development control. Land acquisition shall be a main topic to ensure the proper

implementation of the project. For instance, the Tsukuba express railway in Japan had been given conditions that the government legislate a new law to stop the land transfer within the vicinity of the proposed railway. Thereafter, local governments purchase the lands along and/or adjacent to the project sites, and then carry out the land adjustment to ensure the lands for the station squares and their surroundings. Table 3.4.16 shows the outlines of land acquisition related to the transport-oriented urban development with the methods of land adjustment.

Table 3.4.16 Example of Land Acquisition for Transport-Oriented Urban Development

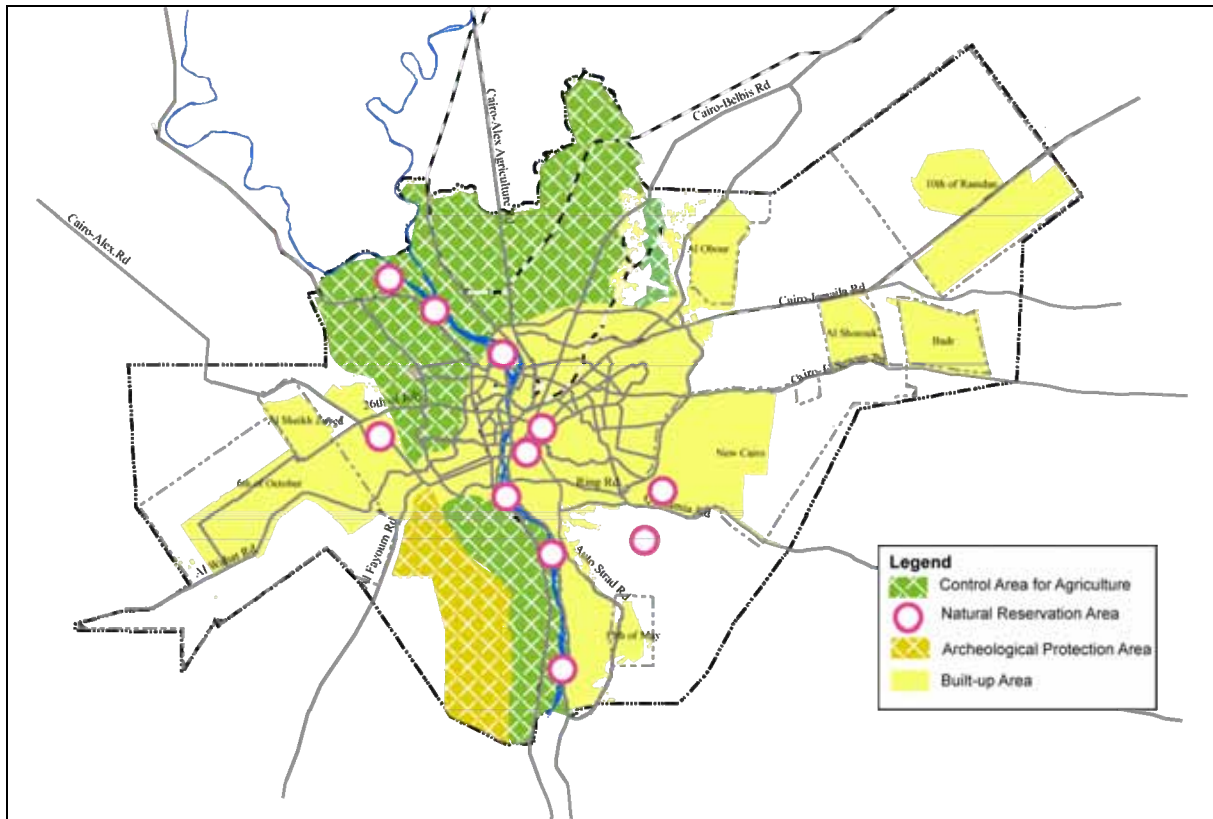
| Item | Description |
|--------------------|--|
| Process | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Phase I</p> </div> <div style="text-align: center;">  <p>Phase II</p> </div> <div style="text-align: center;">  <p>Phase III</p> </div> </div> |
| Tasks by Authority | <p>1) Local governments</p> <ul style="list-style-type: none"> - Providing equity, non-interest Loan, acquisition of land in advance - Facilitating land readjustment <p>2) Urban Renaissance Agency</p> <ul style="list-style-type: none"> - Accommodating 6 New Towns with total land area of 1,421ha and population of 120,000 - Implementing land adjustment for 17 sites with 3,000ha by investment of 1.2 tri. yen (9,700M\$) - Providing housing and public facilities with amount of 4.2 tri. yen (34,000M\$) |

Source: JICA study team

3.4.5 Managing Natural Environment (Conservation of Natural Resources)

(1) Conserving agricultural lands and natural resources

Agriculture green is observed in rural area outside the ring road and tends to decrease the area for informal development. Existing arable land needs to be protected from informal development in order to keep existing environment. Taking into account the existing protection areas, such as natural reservation areas and archeological protection areas, the environmental conservation areas for the study area is proposed as depicted in Figure 3.4.19. The proposed environmental conservation areas cover the scarce and precious agricultural lands.



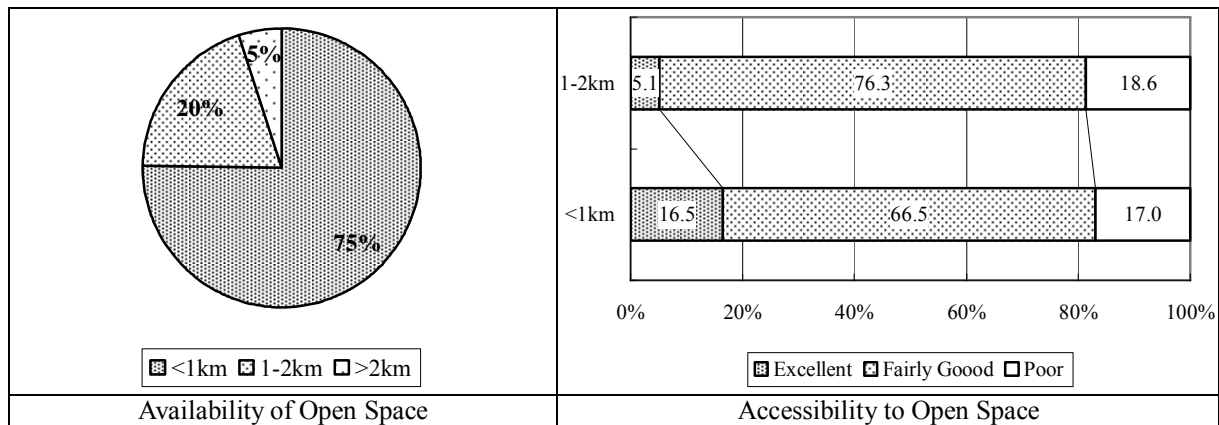
Source: JICA study team

Figure 3.4.19 Proposed Environmental Conservation Area in the Study Area in 2027

(2) Promoting open and green area network

An opinion poll survey revealed that people’s perception represented relatively low satisfaction with existing green areas. The provision of green areas in terms of land area per capita confirmed relatively lower than other major cities.

To create the green area network, the planning standard for green areas was drafted up on the basis of the opinion poll survey. Commonly in other major cities, the green areas were distributed in the form of hierarchy, which take into account the distance and land area. According to the people’s perception, the service distance of 1km and 2km shall be criteria to distribute the open spaces, since the people recognized the availability of the green areas within those distances (Figure 3.4.20).



Source: Opinion Poll Survey, JICA study team, 2007

Figure 3.4.20 Peoples' Perception for Open Space in their Neighborhood

Following the people's perception, the planning standard for green areas was drafted in Table 3.4.17, and the target amount of green areas were estimated in Table 3.4.18

Table 3.4.17 Example of Planning Standard for Open Spaces

| Type of Park | Coverage (km in radius) | Land Area (ha) | Function |
|-------------------|-------------------------|----------------|--|
| Neighborhood park | 1.0 | 2.0 | - Used by people within a neighborhood |
| District park | 2.0 | 4.0 | - Used by people within a walking distance |
| City park | | 10-50 | - Used by people to live across the city. - Used for rest, walking, and playing |
| Athletic park | | 15-75 | - Used by people to live across the city. - Used for athletics |

Source: JICA study team

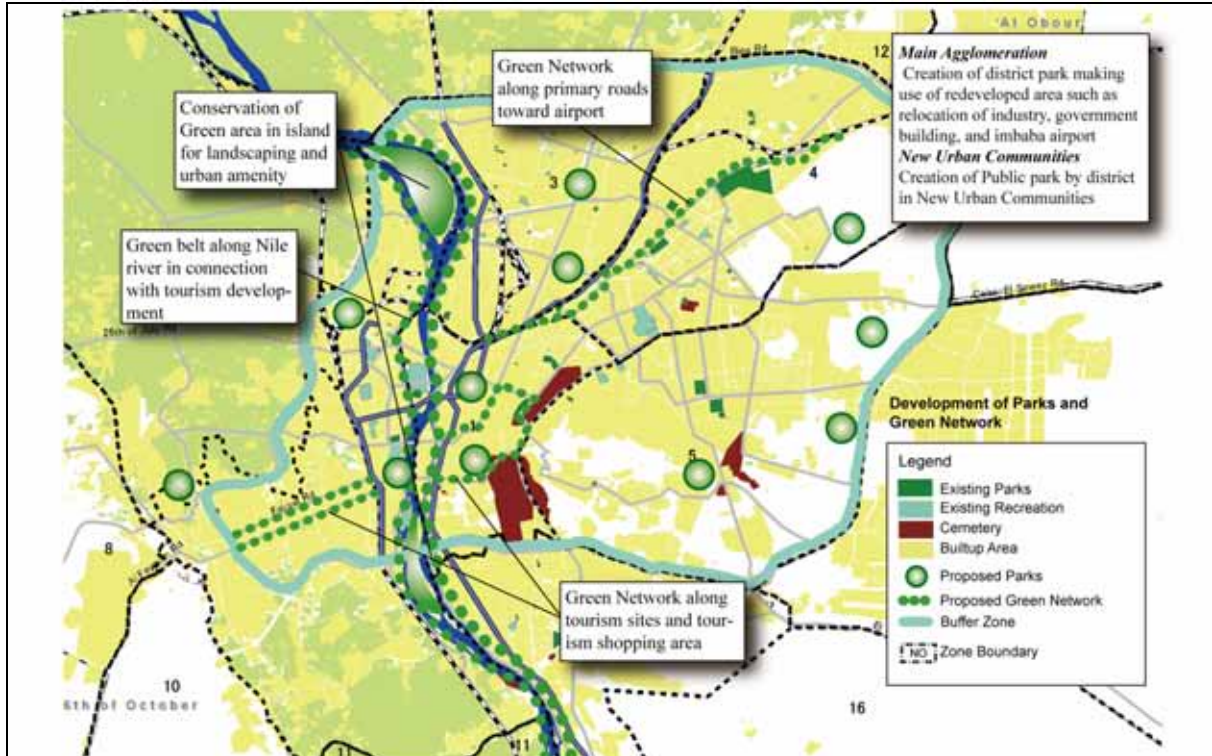
Existing green and recreation areas were dispersed over the study area. All possible resources must be mobilized and networked. In order to meet the targets, consideration must be given to the basic development direction comprising the following:

- 1) *Basic direction*
 - (a) Expansion of green areas with various types and functions;
 - (b) Creation of green network connected by footpaths and interlinked with Nile river; and
 - (c) Provision of relatively small-size green areas at the neighborhood level.

- 2) *Development orientation*
 - (a) Creation of green areas through regeneration of existing built-up areas, where inappropriate land uses will be relocated and new functions will be developed;
 - (b) Development of a "green way" for the public along the Nile River;
 - (c) Provision of sufficient green areas in new urban communities;

- (d) Creation of a hierarchy park system; and
- (e) Preservation of existing green areas and agricultural areas.

Figure 3.4.21 shows a proposed green area network in the study area in 2027.



Source: JICA study team

Figure 3.4.21 Proposed Green Area Network in the Study Area in 2027

3.4.6 Designing Sustainable City (Well-balanced Urban Development)

- (1) Strengthening management of urban growth boundary

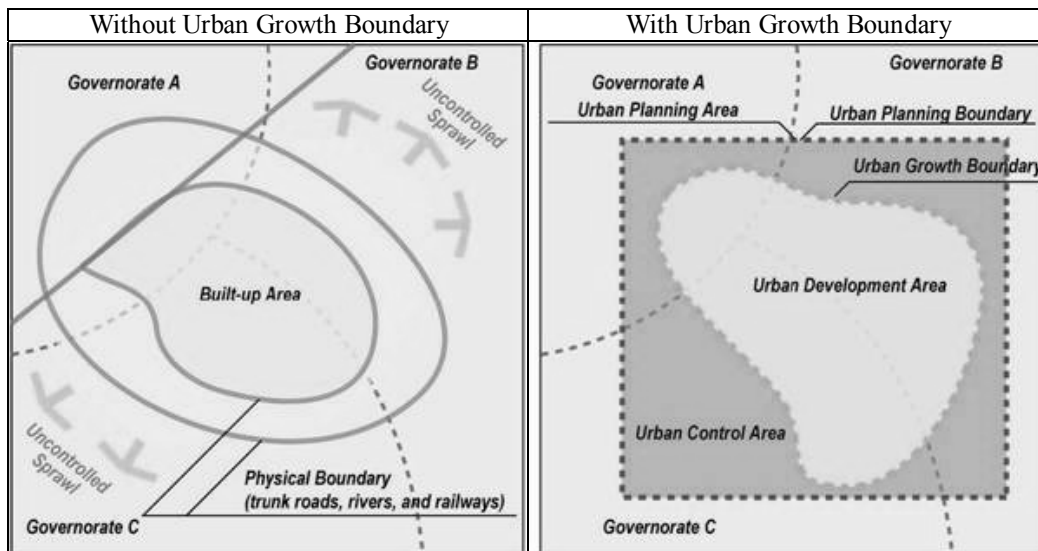
1) Definition of urban growth boundary

Many cities commonly experience difficulty for the planning and management of expanding urban areas. Resources are limited and requirements are high and different by area. In a number of countries, a system of urban growth boundaries (UGBs) is practiced to manage the urban areas (Figure 3.4.22). The major mandates of UGBs are as listed below.

- To stop the sprawl of urban areas,
- To protect and conserve precious green and agricultural areas,
- To concentrate public investment into urban areas within UGBs to provide efficient and compact urban areas inside UGBs with adequate infrastructure.

With regard to the UGBs, a few concepts need to be defined such as below.

- *City Planning Boundary* to designate an outright boundary within which urban planning shall be formulated. It may be the same as the boundary of the study area.
- *Urban Growth Boundary* to designate a boundary for the areas which shall be urbanized in the certain period or the target year of 2027. Within the urban growth boundary, the public investment will be made to promote efficient and compact urbanization with adequate infrastructure. In the study area, the boundary shall mainly consist of two categories: boundaries around the main agglomeration area and boundaries for new urban communities.
- *Urban Development Area* is defined as the areas within the UGB, where urbanization will be encouraged in accordance with the land use plan and other requirements of the applicable urban planning.
- *Urban Control Area* is defined as the areas outside the UGB. In the urban control area, any form of new urban development will be restricted, other than cases for rehabilitation of existing facilities.



Source: JICA study team

Figure 3.4.22 Schematic Image of Urban Growth Boundary

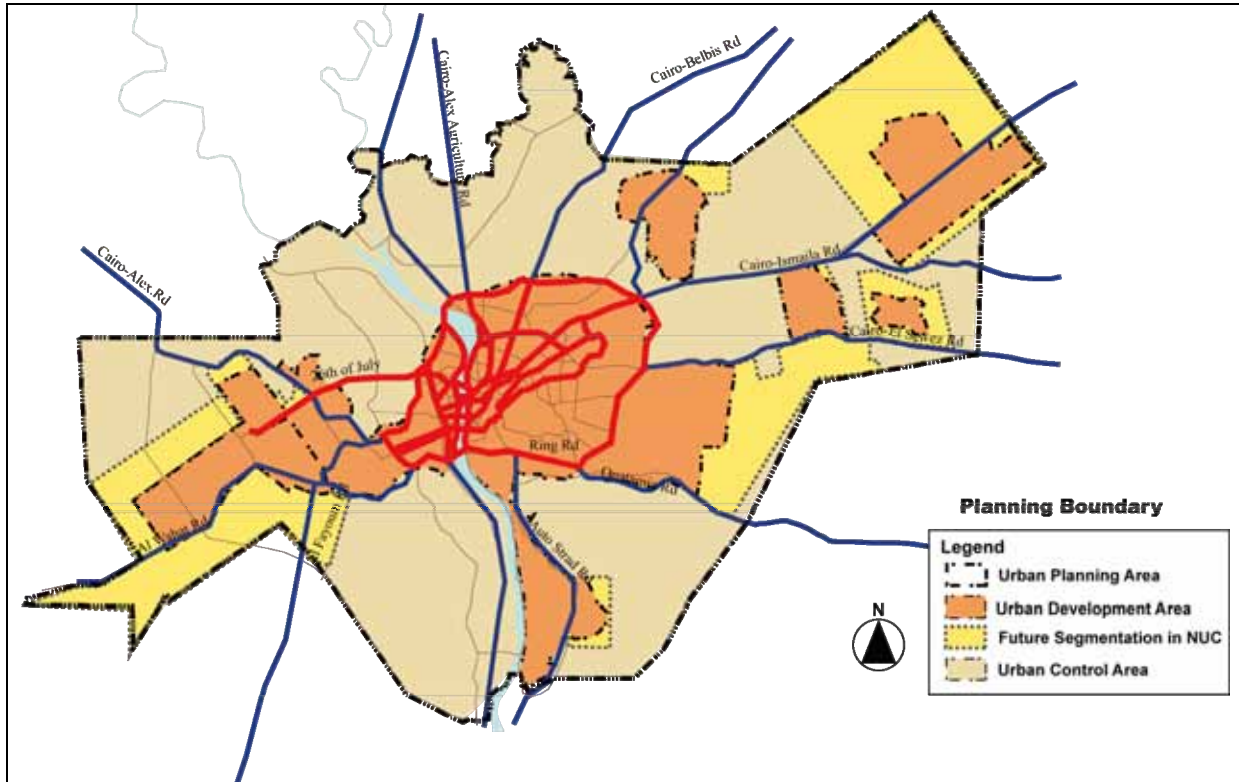
2) Designation of urban growth boundaries

Urban growth boundary has been designated so as to accommodate urban areas capable for population in 2027. It was designed to include main agglomeration, on-going and approved urban development projects, and urban areas designated in the 1997 master plan, while it excluded the preservation areas for historical and environmental assets.

Table 3.4.18 Land Area and Population Density within Urban Growth Boundary

| Category | Population (1,000) | | Land Area (ha) | | Population Density (person per ha) | |
|--------------------|-----------------------|--------------------|--------------------|--------------------|---------------------------------------|--------------------|
| | 2006 ¹⁾ | 2027 ²⁾ | 2006 ²⁾ | 2027 ²⁾ | 2006 ²⁾ | 2027 ²⁾ |
| Main agglomeration | 12,200 | 15,700 | 53,700 | 63,700 | 335 | 350 |
| NUC | 600 | 4,200 | 139,100 | 153,500 | 145 | 150-250 |
| Total | 12,8010 | 19,900 | 192,800 | 217,200 | - | - |

Source 1) Census, CAPMAS, 2006
Source 2) JICA study team



Source: JICA study team

Figure 3.4.23 Urban Growth Boundary, UDA, and UCA in the Study Area in 2027

(2) Improving implementation system of the master plan

An effective statutory urban planning system is a mandatory issue to ensure the implementation of the proposed master plan. The master plan is considered as a vision, which geographically specified the expected land use in the study area. It should be complemented by a reliable implementation system, which would require improvements on the following issues.

- 1) Hierarchy of statutory urban plans,
- 2) Planning standard for urban development,
- 3) Permission system for urban development,
- 4) Taxation system for urban development,

5) Organization to implement the master plan.

Detailed recommendations for each issue have been made in the following sections.

1) *Hierarchy of statutory urban plans*

Existing master plan proposes the goal to be achieved in the target year. Its contents are too large scale to implement in the permission and regulatory control of urban development. Plans at the planning zone level needs to be provided to realize the master plan. For instance, some districts in the study area have detailed land use plan of their entities.

The SDMP recommends a review of the statutory urban plans at three levels: (i) Strategic Development Plan; (ii) District Plan; and (iii) Detailed Plan (Table 3.4.19). The strategic plan should be aimed at representing goals and future urban growth patterns in the long-term. The district plan should specify the regulatory controls in greater detail at the planning zone level in the mid-term. The detailed plan should provide the layout and facility plans of specific areas, such priority projects and action areas. The district plan and detailed plan should be used as the basis for technical assessment of the planning permission system.

Table 3.4.19 Hierarchy of Statutory Urban Plan

| Type | Coverage | Purpose |
|----------------------------|---------------|--|
| Strategic Development Plan | Study Area | The plan shall show the long-term goals and direction of future growth pattern by the following outcomes; 1) goals in the long-term, say a 20 years period, 2) direction of urban growth pattern, 3) direction of land use structure, 4) urban growth boundary, 5) priority project to realize the expected urban growth pattern. |
| District Plan | Planning zone | The plan shall represent the socio-economic and physical plans in the mid-term by the following outcomes; 1) socio-economic framework, 2) urban growth boundary, 3) land use plan, 4) spatial requirements, such as building coverage ratio, floor area ratio, building height, parking needs and road width, 5) infrastructure requirement and its plan, and 6) priority projects and action areas. |
| Detailed Plan | Priority area | The plan shall represent the regulatory plan for the selected action areas and priority projects by the following outcomes; 1) layout plan, 2) land use, 3) land parcels, and 4) infrastructure and utility plans. |

Source: JICA study team

2) *Planning standard for urban development*

The land use plan needs to guide the future urban development in the study area. The function and form of buildings need to be controlled in accordance with the land use

plan. Even though its requirements are various by country, there are principally at least conditions; (i) permissible function of building, (ii) impermissible function, (iii) building height, (iv) building coverage ratio, (v) floor area ratio, (vi) parking needs and (vii) road width. Those conditions will be criteria to be assessed in the planning permission system.

Law No.3, 1983 “Urban Planning Law” and its executive instruction, and building code have stipulated standard for planning, however it is upscale and it could be applied to large scale development instead of existing built-up areas. Table 3.4.20 shows some planning standards for land subdivision. Sometime elements may not reflect common practice and needs, and shall be reviewed to adjust with actual situation. For instance, the quantity of land required by the laws puts the cost of housing beyond the means of lower-income households.

Table 3.4.20 Existing Planning Standards for Land Subdivision

| Items | Coverage | Standard | Actual Situation |
|-----------------------------------|--------------------------|---|---|
| Population Density ¹⁾ | Small Towns and Villages | <312 person/ha | > 500 person/ha |
| | New Towns | <238 person/ha | |
| Street Width ¹⁾ | Local Street | Min. 10 meters incl. sidewalk | |
| Minimum Lot Size ¹⁾ | All areas | Lot width is min. 10 m and a lot depth is less than 2 times of the width. | Lot width ranges from 3-6 m in informal areas. |
| Building Height ²⁾ | All areas | The code limits 1.5 times the width of road. | varies |
| Building Area Ratio ¹⁾ | All areas | 60% is allowed | 80-90% in existing urbanized areas, and 90-100% in informal areas |

Source: World Bank (2007), Urban Sector Update Arab Republic of Egypt.

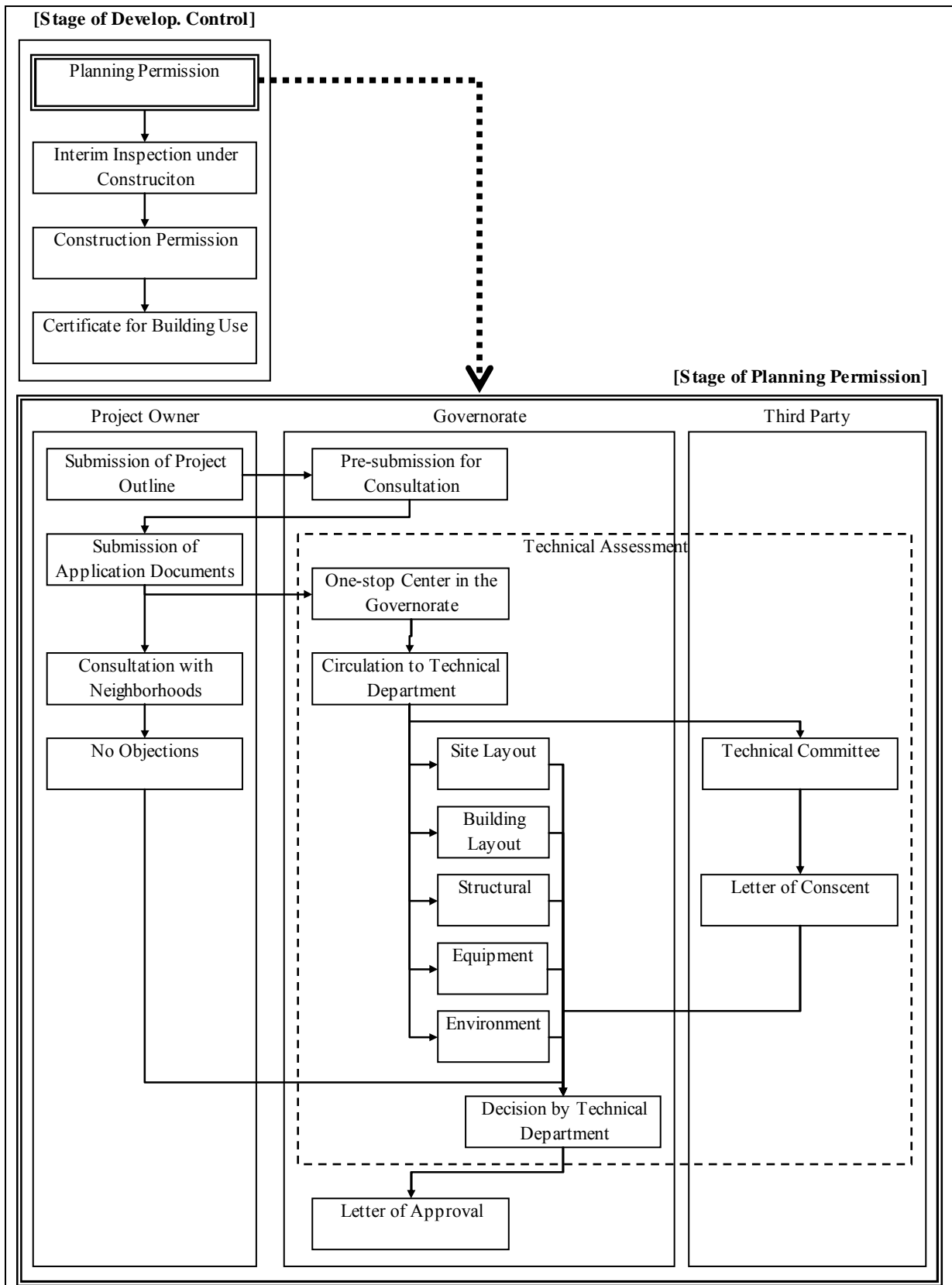
Note 1) Urban Planning Law No.3, 1983

Note 2) Construction Code

3) *Permission system for urban development*

Many cities practice the urban development control through the application of four stages; (i) planning permission, (ii) interim inspection under construction, (iii) construction permission after completion, and (iv) certificate of building use. Those application aims at conformity of proposed development with urban plans and technical requirements of buildings. In terms of urban planning, the planning permission shall be the most important process to ensure the proper use of land in compliance with the master plan.

An example of planning permission system was depicted in Figure 3.4.24. In many countries, the local government takes in charge of technical assessment with technical support by third parties, which include designated private companies, designated public organization, private insurance companies, and designated experts.



Source: JICA Study Team

Figure 3.4.24 Example of Planning Permission System

4) *Taxation system for urban development*

While the property taxes are applied to the properties' owners after completion of buildings, it is important for governments to expand the subjects for the property taxes in order to expand the budget for the land development.

Under the current taxation system, vacant land is excluded from taxation. Currently, the government does not have a system to recover their investment made for land development. In addition, land owners do not have any incentive to utilize the lands in the short term because there is no charge on land ownership. To activate investment for the development of land, property taxes for land ownership need to be established. Doing this will encourage land owners to utilize their land for development.

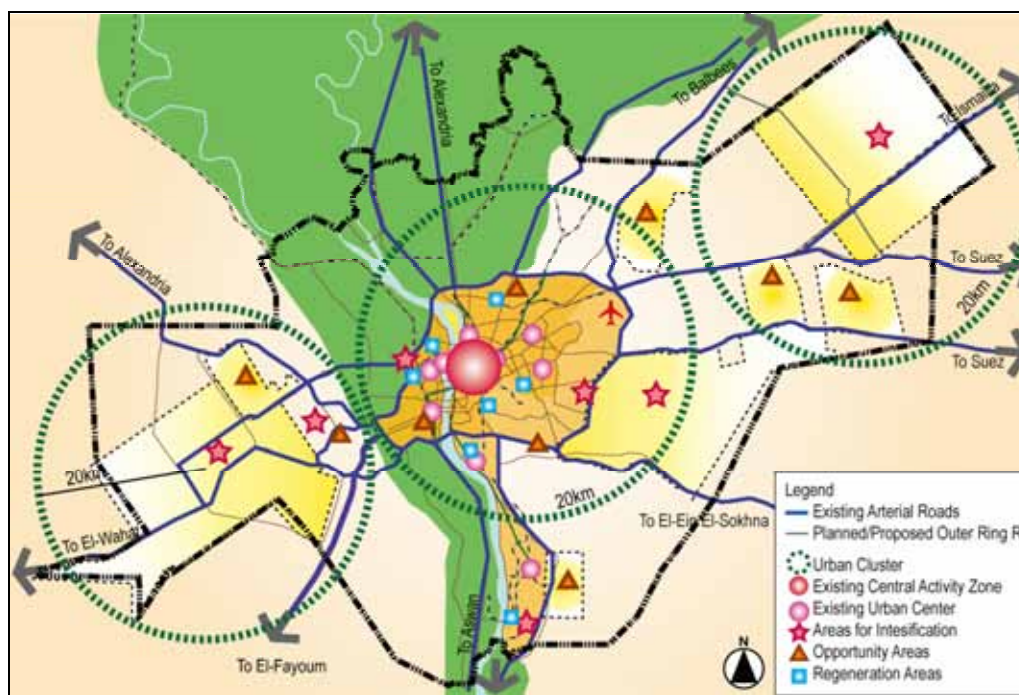
5) *Organization to implement the master plan*

Four administrative bodies exist in the study area, and ministries take responsibilities their own entities. Tasks of GOPP focus on to formulate the master plan of the study area, and there is no agency to assess, control and implement the proposed master plan, which needs to develop inter-governorate and regional projects. Hence, a new organization shall need to be established to implement the master plan.

3.5 Key Diagram in 2027

The strategy for achieving the challenges and objectives needs a multi-stranded approach that integrates commercial/business development, residential development, transport infrastructure and communications infrastructure, and promotes vigorous local communities. The strategy identifies Areas for Intensification (urban cores), Opportunity Areas (new developments and redevelopments), and Regeneration Areas (living improvement). This is facilitated by public transport improvements and public private partnership (PPP), augmenting the existing central activity area and urban centers.

- (1) Areas for Intensification: Areas which can be more intensified for development than existing land use for commercial and business premises, public offices as a multi-polarized urban core. It also accommodates international enterprises.
- (2) Opportunity Areas: Areas which need more provision of mixed land use, such as commercial, leisure, educational and medical facilities.
- (3) Regeneration Areas: Areas which currently suffer substantial social exclusion and economic deprivation, neighborhood renewal, better health, improved learning and skill, better employment and housing opportunities are especially important.



Source: JICA study team

Figure 3.5.1 Proposed Key Diagram for the Study Area in 2027

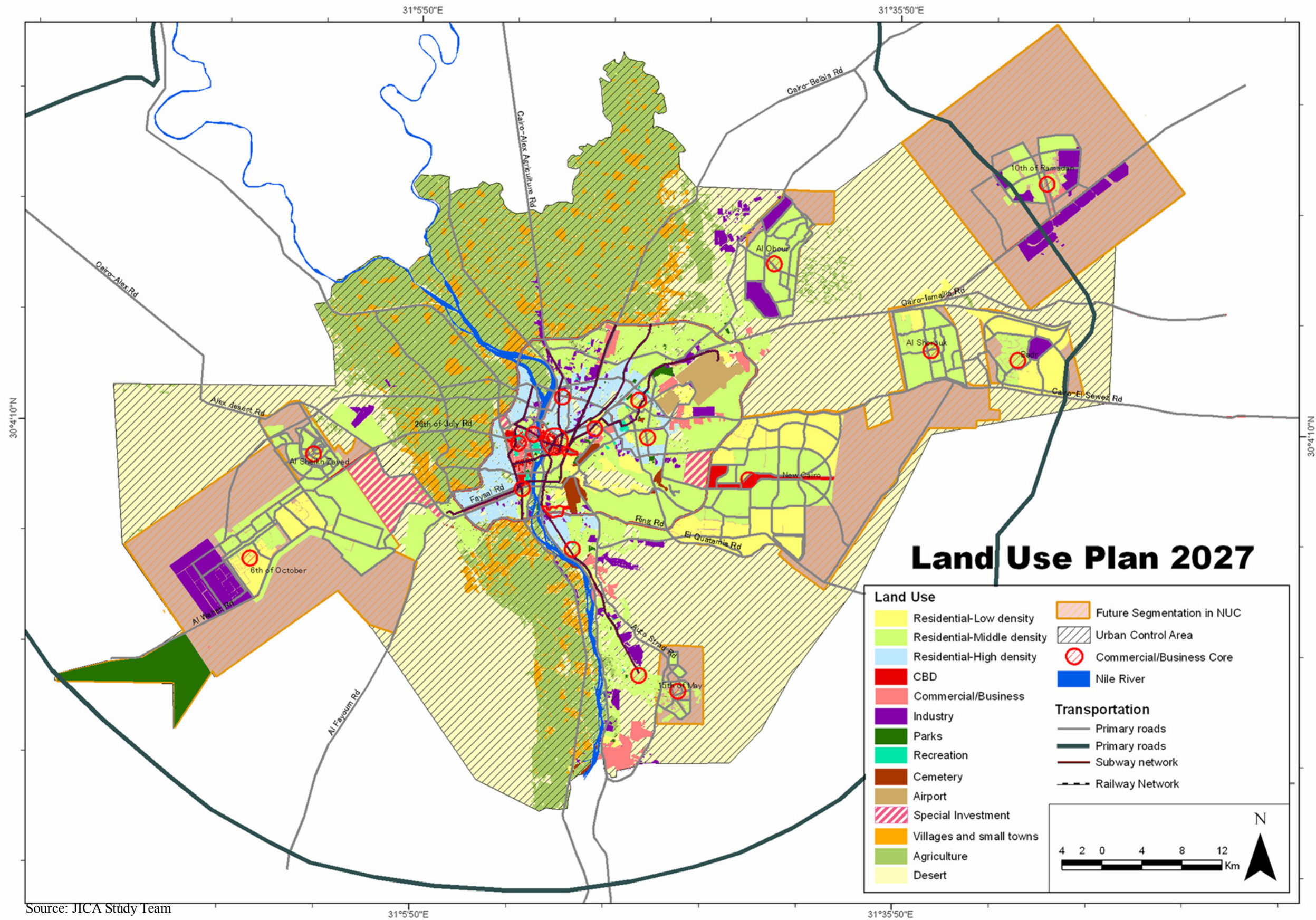
3.6 Proposed General Land Use Plan in 2027

Following the proposed sub-sector strategies, a general land use plan has been formulated for the target year of 2027 as shown in Figure 3.6.1. The proposed land use plan indicated 16 land use categories, of which definition was specified in Table 3.6.1.

Table 3.6.1 Definition of Land Use Category

| Land Use Category | | Definition |
|-------------------------------------|---------------------------|--|
| Residential | Low density | Low density residential area with less than 100 person per ha |
| | Middle density | Middle density residential area with less than 300 person per ha |
| | High density | High density residential area with more than 300 person per ha |
| Commercial | Neighborhood commercial | The area includes neighborhood commercial and business which serve the neighbors |
| | Central business district | The area includes major commercial and business functions as central business district |
| Green and Open space | Park | The area includes public park such as district park and neighborhood park. |
| | Recreation | The area includes semi-private or private recreation facilities including stadium and athletic field. |
| | Cemetery | The area includes major cemetery. |
| Airport | | The area includes civil airport. |
| Special Investment | | The area includes special investment zone such as government relocation, tourism investment, and housing investment. |
| Villages and small towns | | The area includes villages and small towns except main agglomeration. |
| Agriculture | | The area includes agriculture land. |
| Desert | | The area includes desert. |
| Area for future development in NUCs | | The area for future development within New Urban Communities. |
| Area for development control | | Area which is controlled for any development activities. Existing condition can be permitted to continue the same condition. |
| Nile river | | The area for Nile river |

Source: JICA study team



Source: JICA Study Team

Figure 3.6.1 Proposed General Land Use Plan in the Study Area in 2027

3.7 Identified Projects

Following the proposed sub-sector strategies, the 52 projects and programs have been identified to achieve the master plan for the study area until 2027 as shown in Table 3.7.1. The identified projects were classified into three categories in terms of implementation period and sectors of their natures. The implementation period consisted of three phases; a short term in the next five years; a mid term in the next ten years, and a long term in the next twenty years. The sector was categorized into four types including urban planning, living environment, infrastructure development, and institutional improvement.

Table 3.7.1 Identified Projects in Sub-sector Strategies (1/3)

| Sub-sector Strategy | ID | Project Name | Schedule | | | Type of Project | | | |
|---------------------|------|--|----------|-----|------|-----------------|--------|-------|-------|
| | | | Short | Mid | Long | Urban | Living | Infra | Insti |
| Living in Cairo | 1.1 | Provide affordable housings for low income group | | | | | X | | |
| | 1.2 | Activate housing market and housing stock | | | | | X | | |
| | 1.3 | Enhance housing loan/mortgage scheme | | | | | X | | |
| | 1.4 | Enhance property registration | | | | | X | | |
| | 1.5 | Create inventory of informal areas | | | | | X | | |
| | 1.6 | Promote improvement of prioritized informal areas at Shubra El Kheima, | | | | | X | | |
| | 1.7 | Identify the pollution sources in main agglomeration | | | | | X | | |
| | 1.8 | Relocate cemeteries in main agglomeration | | | | X | | | |
| | 1.9 | Designate new cemeteries outside main agglomeration | | | | X | | | |
| | 1.10 | Upgrade water distribution pipeline | | | | | | | X |
| | 1.11 | Expand water treatment plants | | | | | | | X |
| | 1.12 | Expand wastewater collection pipeline | | | | | | | X |
| | 1.13 | Expand wastewater treatment plants | | | | | | | X |
| | 1.14 | Upgrade solid waste management | | | | | | | X |
| | 1.15 | Designate new disposal site | | | | | | | X |
| Working in Cairo | 2.1 | Promote new sub-center in New Cairo NUC | | | | X | | | |
| | 2.2 | Promote new sub-center in 6th of October NUC | | | | X | | | |
| | 2.3 | Promote new sub-center in 10th of Ramadan NUC | | | | X | | | |
| | 2.4 | Promote new sub-center in South of Helwan | | | | X | X | | |
| | 2.5 | Promote new sub-center in Imbaba | | | | X | X | | |
| | 2.6 | Relocate government area from Cairo CBD | | | | X | | | |
| | 2.7 | Regenerate government area | | | | X | | | |

Source: JICA study team

Note: Urban-urban planning, Living-living environmental improvement, Infra-infrastructure, and Institutional improvement and capacity building related to urban planning sector.

Table 3.7.1 Identified Projects in Sub-sector Strategies (2/3)

| Sub-sector Strategy | ID | Project Name | Schedule | | | Type of Project | | | |
|------------------------------|------|--|----------|-----|------|-----------------|--------|-------|-------|
| | | | Short | Mid | Long | Urban | Living | Infra | Insti |
| Working in Cairo | 2.8 | Promote R&D area in New Cairo and 6th of October NUCs | | ■ | | X | | | |
| | 2.9 | Promote SME area in Al Shorouk and Badr NUC | | ■ | | X | | | |
| | 2.10 | Relocate highly polluted 21 factories from main agglomeration | ■ | ■ | ■ | | X | | |
| | 2.11 | Upgrade vacant lands after relocating 21 factories | | ■ | | X | X | | |
| | 2.12 | Relocate tannery from main agglomeration | ■ | ■ | | | X | | |
| | 2.13 | Relocate heavy industry to 10th of Ramadan NUC | | ■ | | | X | | |
| | 2.14 | Designate special planning district for world heritage asset incl. Islamic Cairo & Old Cairo | ■ | ■ | | X | | | |
| | 2.15 | Designate distinguished landscape areas | ■ | ■ | | X | | | |
| | 2.16 | Upgrade Cairo CBD for business, commercial, and tourism | | ■ | | X | | | |
| Connecting in Cairo | 3.1 | Promote development corridor to 10th of Ramadan NUC | | ■ | | X | | X | |
| | 3.2 | Promote development corridor to 6th of October NUC | ■ | ■ | | X | | X | |
| | 3.3 | Promote development corridor to New Cairo NUC | | ■ | | X | | X | |
| Managing Natural Environment | 4.1 | Formulate planning standard for parks and open spaces | ■ | ■ | | X | | | X |
| | 4.2 | Provide public parks at the city level | | ■ | | X | | | |
| | 4.3 | Provide pocket parks at community level | | | ■ | X | | | |
| | 4.4 | Create O&M system for public parks | | ■ | | X | | | X |
| | 4.5 | Upgrade greenery ways along Nile river | | ■ | | X | | | |
| | 4.6 | Preserve islands in Nile river | | ■ | | X | | | X |
| | 4.7 | Designate natural conservation area | | ■ | | X | | | X |
| Designing Sustainable City | 5.1 | Upgrade urban planning law and regulation | ■ | ■ | | X | | | X |
| | 5.2 | Upgrade hierarchy of urban plans | ■ | ■ | | X | | | X |
| | 5.3 | Formulate district plans | | ■ | | X | | | X |

Source: JICA study team

Note: Urban-urban planning, Living-living environmental improvement, Infra-infrastructure, and Institutional improvement and capacity building related to urban planning sector.

Table 3.7.1 Identified Projects in Sub-sector Strategies (3/3)

| Sub-sector Strategy | ID | Project Name | Schedule | | | Type of Project | | | |
|----------------------------|------|--|----------|-----|------|-----------------|--------|-------|-------|
| | | | Short | Mid | Long | Urban | Living | Infra | Insti |
| Designing Sustainable City | 5.4 | Formulate planning standard for urban management | | | | X | | | X |
| | 5.5 | Encourage planning permission system | | | | | | | X |
| | 5.6 | Delineate urban growth boundary | | | | X | | | X |
| | 5.7 | Establish property assessment taxes | | | | | | | X |
| | 5.8 | Establish coordination committee of Cairo, Giza, Qaliobeya, and Sharkia governorates | | | | | | | X |
| | 5.9 | Establish implementing agency for the master plan | | | | | | | X |
| | 5.10 | Encourage institutional capacity building for urban planning | | | | | | | X |

Source: JICA study team

Note: Urban-urban planning, Living-living environmental improvement, Infra-infrastructure, and Institutional improvement and capacity building related to urban planning sector.