

環境レビュー方針

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
|---------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 1 Permits and Explanation | (1) EIA and Environmental Permits | (a) Have EIA reports been already prepared in official process? | Y/N | (a) The original EIA report has been completed and submitted to EEAA on March 2010. The addendum EIA report is under preparation as of September, 2010. Addendum EIA is planned to be submitted to EEAA in early October. | |
| | | (b) Are the EIA reports written in the official or widely used language? | Y | (b) EIA reports are written both in Arabic and in English. Arabic is the national language in Egypt. | |
| | | (c) Have EIA reports been approved by authorities of the host country's government? | Y/N | (c) The original EIA report has been approved on 11th July 2010. The addendum EIA report is under preparation as of September, 2010. Addendum EIA is expected to be approved in November. | Addendum EIA の承認状況 |
| | | (d) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? | N | (d) The approval for original EIA includes some conditions. Conditions will be complied by NAT. As for addendum EIA, since the report has not been approved yet, it is not known whether the conditions are set or not . | Addendum EIA に係る付帯条件の有無および対応方針 |
| | | (e) Are the EIA reports available at all times for perusal by project stakeholders such as local residents, and is it allowed to make photocopy of it? | Y | (e) EIA reports will be available at the main office of NAT in Cairo, and its' web site, as well as JICA headquarter and its' website. It is allowed to make photocopy of them at JICA. | NAT での EIA のコピー取得可否 |
| | | (f) In addition to the above approvals, have other required environmental permits been obtained from the | Y | (f) In addition to the above approvals, it is required to obtain a permission from Supreme Council of Antiquities (SCA). | SCA から取得が必要とされる許認可の内容、タイミングおよび実施計画 |

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| | | appropriate regulatory authorities of the host country's government? | | | その他の許認可および責任機関 |
| | (2) Explanation to the Local stakeholders | (a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? | Y | (a) Brief description of the project and the potential impacts were explained to the local stakeholders through group consultation at the scoping stage and stakeholder consultation meeting, held on 28 th December, at draft-report-stage. There was no opposition against the project from the participants. | |
| | | (b) Have the dates and places of stakeholder consultation been informed to the local stakeholders prior to the consultation meeting? | Y | (b) Dates and places of stakeholder meeting were informed by individual invitation letter, press advertising, and notice board of the local city councils. | |
| | | (c) Have the project been explained to the public in the language which local stakeholders can understand? | Y | (c) Brief description of the project and its impacts were explained through stakeholder consultations in Arabic, which most of the local stakeholders can understand. | |
| | | (d) Have the minutes of stakeholder consultations been prepared? | Y | (d) Minutes of the stakeholder consultations were prepared and attached to the EIA report. | |
| | | (e) Have the comment from the stakeholders (such as local residents) been reflected to the project design? | Y | (e) Various opinions and suggestions were exchanged at the stakeholder meetings. Comments raised at the meetings were integrated in the final EIA reports as well as project design accordingly. | |
| | (3) Examination | (a) Have alternative plans of the project been examined with social | Y | (a) With the urbanization of Cairo, overdependence on roads and fast popularization of automobiles had been accelerated, | |

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| | of Alternatives | and environmental considerations? | | Besides, traffic congestion has been aggravated and vehicle pollution such as air pollution and noise has been escalated. Since the capacity of existing public transportations such as buses and railways is limited, and it is difficult to expand roads because of land shortages, construction of MRT 4 is required. Without this project, existing traffic congestion and vehicle pollution will not be alleviated. As for route selection, environmental and social aspects such as air pollution, land acquisition and resettlement, noise, and landscape have been examined as well as technical and economic aspects. (Details are described in 4, (1), (a)) | |
| 2 Pollution Control | (1) Air Quality | (a) Is there a possibility that emission from depot will cause air pollution in surrounding areas? | N | Air pollution in surrounding area caused by emission from depot will be negligible because the depot will be located in the desert area without any residential areas or sensitive receptors nearby. Moreover, indoor air quality shall be maintained and monitored in accordance with legally complying "Health Safety and Environmental Plans" in the operation phase. | |
| | (2) Water Quality | (a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? | Y | No earthmoving activities will be implemented during operation phase. The impact on water quality during construction and its mitigation measures are described in 5 (1) (a). | |
| | | (b) Do effluents from the project facilities, such as stations, comply with the country's effluent standards | Y | (b) The effluents from depot will contain copper hydroxide (Cu(OH) ₂), and its pH will be relatively high (about pH9). It will be treated adequately, such as management of pH and | デポからの排水の接続先. |

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| | | and ambient water quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards? | | concentration in waste water to comply with the effluent standard in Egypt. As for effluents from the stations, since it does not contain the pollutants with high concentrations to be specifically treated, it will be discharged to public sewage. Therefore no or negligible impacts are expected. | |
| | (3) Wastes | (a) Are wastes generated from the project facilities, such as stations and depot, properly treated and disposed of in accordance with the country's regulations? | Y | (a) Wastes generated from the Project facilities, such as stations and depot, are properly treated and disposed of in accordance with the Egyptian regulations such as Low 4/1994. Wastes will be collected by private collectors and be disposed to existing dumping site. | |
| | (4) Noise and Vibration | (a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards? | Y | (a) In the case of this Project, stations from No. 1 to No. 15 and tracks are underground. The track level from ground surface level is approximately 20-30 m depth, and the Project route is almost located under the road area. Depot and station No.16, which will be constructed at-grade and trench section, are in the desert area without any residential areas or sensitive receptors nearby. Therefore it is not expected that the noise from train service would cause the negative impact. As for Vibration, negligible impact from train service is expected, since the track level from ground surface level is approximately 20-30m depth and it is enough to damp the vibration level from the vibration-generating source (train service) to the receptors on the ground surface. | |
| | (5) Subsidence | (a) In the case of extraction of a large volume of groundwater, is there a | N | (a) No or negligible impact of subsidence is expected, judging from geotechnical aspect and construction aspect as follows; | |

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| | | possibility that the extraction of groundwater will cause subsidence? (especially in case of Undergrounds/Subways) | | <p>- N-value of cohesive soil along the Project route is over 10. Therefore, the possibility of the ground subsidence is expected to be quite low.</p> <p>-Tunnel Boring Machine (TBM) will be applied to construct the waterproof tunnel which will not cause the groundwater penetration into the tunnel.</p> <p>- The watertight outer wall will be installed around the station construction sites before starting excavation works in order to prevent the groundwater penetration into the sites. Whenever necessary, the outer wall will be deepened to impermeable layer, as well as soil improvement on the bottom of the excavation sites will be provided to prevent the inflow of groundwater from the bottom of the sites.</p> | |
| | (6) Soil Contamination | | N | There are no project components or activities which cause soil contamination. | |
| 3 Natural Environment | (1) Protected Areas | (a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas? | N | (a) The Project area does not include protected areas, and does not locate close to protected area. There is no possibility to affect the protected area due to Project. | |
| | (2) Ecosystem | (a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? | N | (a) The Project area is located in highly-urbanized metropolitan city. Therefore, there is no issue on ecosystem to be cautioned. | |

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| | | (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? | N | Ditto | |
| | | (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? | N/A | N/A | |
| | | (d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock? | N/A | N/A | |
| | | (e) Is there a possibility that installation of rail roads will have impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered? | N | Same as (a) | |
| | | (f) In cases the project site is located | N/A | N/A | |

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| | | at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments? | | | |
| | (3) Hydrology | (a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows? | N | <p>(a) The scale of underground aquifer in and around the project area is large enough compared with the scale of the underground structure designed in the Project. Therefore the structures constructed by the project will not block water off, and water can flow around the structures.</p> <p>There is a silt clay layer on top of the aquifer, but it is not completely in an artesian condition. Therefore, it is not expected that the water will be burst in other places due to construction of the tunnel and the stations.</p> <p>For the construction of the tunnel, Tunnel Boring Machine (TBM) will be applied to construct the waterproof tunnel which will not cause groundwater penetration into the tunnel. For construction of the stations, watertight outer wall will be installed around the station construction sites before starting excavation works in order to prevent the groundwater penetration into the sites. Whenever necessary, the outer wall will be deepened to impermeable layer, as well as soil improvement on the bottom of the excavation sites will be provided to prevent the inflow of groundwater from the bottom of the sites.</p> <p>Therefore, no or negligible impact on hydrology of surface and ground water flows is expected.</p> <p>Monitoring of groundwater level is proposed at the existing wells</p> | |

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| | | | | near the Project area during construction stage. | |
| | (4) Topography and Geology | (a) Is there a soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed? | N | (a) Existence of a soft ground is not reported along the Project route. And construction works of major facilities such as tracks and stations will be made underground. Therefore, no possibility of causing slope failures or landslides is expected. | |
| | | (b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides? | N | Ditto | |
| | | (c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff? | Y | (c) The surface areas where cut and cover method will be applied are limited to the stations' construction, therefore the possibility of soil runoff due to construction work will be negligible. | |
| 4 Social Environment | (1) Resettlement | (a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? | Y | (a) It is expected that 11 households (47 people), 14 shops and 5 street stalls will be relocated due to Project implementation. Necessary efforts to minimize the impacts due to resettlement have been made in the Project design. In the alternative analysis of the route at the Giza square, the alignment along the Pyramids road was chosen, because the impact of land acquisition and resettlement will be less in the case of Pyramids | |

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| | | | | road compared with the other alignment case. Moreover, in order to minimize the magnitude of resettlement, the metro line 4 is planned to be constructed under the existing road area wherever possible, as well as TBM method without open-cut work is planned to be applied between the stations. | |
| | | (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? | Y | (b) At the 2nd stakeholder meeting at disclosure stage of draft EIA report held on 28 th December 2009, overall explanation was provided on resettlement and compensation. Moreover, additional consultation meeting is planned to be held in October, and compensation policy will be explained to the stakeholders. | 10月実施予定の住民協議に係る議事録を入手、住民意見のRPFへの反映状況 |
| | | (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? | Y | (c) Resettlement Policy Framework (RPF) is under preparation based on results of the socio-economic survey conducted during Feasibility Study. People who are eligible for compensation or/and assistance are, owners and occupants (including those who do not have legal title) of lands and structures, public properties, shop owners, employees, tenants, and owners of street stalls. Land and structures will be compensated at full replacement cost. Non owners such as tenants and employees will be provided cash or the other kinds of assistance to restore their livelihoods and living standards. | Entitlement Matrix 最終案 |
| | | (d) Are the compensations going to be paid prior to the resettlement? | Y | (d) Compensation will be paid before resettlement. | |
| | | (e) Are the compensation policies prepared in document, and in case the scale of resettlement is large, has | Y | (e) A report of RPF, in which compensation policies are described, is under preparation, and will be prepared by November. | |

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| | | the resettlement plan been disclosed? | | | |
| | | (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? | Y | (f) People who are less than poverty line will be provided special assistance in addition to compensation for lands or assets. | Special assistance の具体的内容 |
| | | (g) Are agreements with the affected people obtained prior to resettlement? | Y | (g) There was no objection against the project implementation in past stakeholder consultations. | 10月実施予定の住民協議に係る議事録を入手、特段の反対意見の有無 |
| | | (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? | Y | (h) Overall responsible agency for land acquisition and resettlement of the project is NAT. NAT will prepare the necessary budget. Cairo and Giza governorate will execute land acquisition and resettlement, while NAT will execute additional assistance. | NAT、カイロ県、ギザ県が実施する具体的作業 用地取得・住民移転に係る費用 |
| | | (i) Are any plans developed to monitor the impacts of resettlement? | Y | (i) Monitoring is planned to be implemented in terms of progress of resettlement, implementation of assistance, grievance redress, etc. | モニタリングの項目、頻度、実施者 |
| | | (j) Is the grievance redress mechanism established? | Y | (j) The grievance redress mechanism will be established. Details are under consideration as of September 2010. | 具体的な苦情処理体制、手順 |
| | (2) Living and Livelihood | (a) Where railways are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated | Y | (a) Based on the findings of stakeholder meetings, there is negligible possibility to affect negatively the existing traffic means such as taxi and minibus along the Project route. Some possibility of uncontrolled land use change is expected due to | |

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| | | workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts? | | the new stations of the Project, although this change is considered as secondary effect. Close coordination with such authorities as local governorates is proposed for proper land use planning and development near the new stations. | |
| | | (b) Is there any possibility that the project will adversely affect the living conditions of inhabitants other than the affected inhabitants? Are adequate measures considered to reduce the impacts, if necessary? | Y | (b) No impact is expected, since the metro will be constructed underground and does not affect the land use at-grade. | |
| | | (c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary? | Y | (c) The health care system including prevention of communicable diseases will be planned for workers' camps by contractor(s) based on the recommendations of EIA. | |
| | | (d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., by causing increases in traffic congestion and traffic accidents)? | Y | (d) There is some possibility of blocking the traffic flow by attracting unplanned and informal public transportation such as minibuses and taxis in large numbers near the new stations. In order to reduce the possible impact on the traffic flow, parking areas for buses and cars near the new stations will be planned | |

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| | | | | in cooperation with relevant authorities (Ministry of Interior, Governorate, etc) whenever necessary. | |
| | | (e) Is there any possibility that railways will impede the movement of inhabitants? | Y | Same as (b). | |
| | | (f) Is there any possibility that structures associated with railways (such as bridges) will cause a sun shading and radio interference? | N | (f) Since major facilities such as tracks and stations will be constructed underground, no possibility of sun shading or radio interference is expected. | |
| | | (g) Is there any possibility that the project cause physical community division? | N | (g) Since most of the project alignment will be underground, and the depot area which is the only section constructed at-grade is located in a desert, no impact of physical community division is expected. | |
| | | (h) Is there any possibility that the project will bring misdistribution of benefit and damage among the local communities? | N | (h) Although project implementation will cause PAPs, they will be compensated appropriately. On the other hand, the project produces the local communities the convenience of transportation and enhances inter-regional exchange widely. Therefore the possibility of bringing misdistribution of benefit and damage among the local communities due to the project is limited. | |
| | | (i) Is there any possibility that local conflict will be caused because of the project? | N | (i) Since the possibility of bringing misdistribution of benefit and damage among the local communities due to the project is limited, the possibility of local conflict will be minor | |

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| | (3) Heritage | (a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws? | N | (a) This project is designed to avoid existing archaeological properties. During the feasibility study, archaeological asset study has been conducted, and the conceivable countermeasures and the actions have been prepared. Further investigation is planned around the AI Remayah Squire station, where probability of discovery of archeological properties underground is higher, by non-destructive method and/ or borings before construction stage. | |
| | (4) Landscape | (a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken? | N | (a) Negligible impact on landscape is expected due to the Project, since the major facilities such as tracks and stations will be constructed underground | |
| | (5) Ethnic Minorities and Indigenous Peoples | (a) Is there any ethnic minorities and indigenous people at the project site? | N | (a) There is no ethnic minority and indigenous people in the project area. | |
| | | (b) If there are, are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? | N/A | N/A | |
| | | (c) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected? | N/A | N/A | |

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| | | (d) Have Indigenous People Plan (IPP) been already prepared and disclosed? | N/A | N/A | |
| | | (e) Have agreements reached with Indigenous Peoples' communities? | N/A | N/A | |
| | (6) Working Conditions | (a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? | N | (a) The Project proponent will fulfill the requirements to protect working conditions according to Low 4/1994. | |
| | | (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? | Y | (b) The HSE unit of ECM will provide the safety considerations to prevent the individuals, such as first-aid kit, emergency light, fire fighting system, etc. | |
| | | (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? | Y | (c) Staff training will be provided by HSE unit in ECM, regarding emergency response, fire protection, sanitary, etc. | |

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| | | (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents? | Y | (d) Traffic police for the stations and the specific security for depot will be arranged appropriately. | |
| 5 Others | (1) Impacts during Construction | (a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? | Y | <p>Adequate measures will be planned and provided to reduce the negative impacts of environmental pollution during construction stage as described below.</p> <p><u>Noise & vibration</u>: All generators and pumps will be positioned so as to minimize noise and vibration disturbance, and where necessary, acoustic enclosures will be provided. Localized noise barriers which are usually movable wall for enclosing the points of generators or high duty compressors will be erected as necessary.</p> <p><u>Turbid water</u>: Turbid water will be generated by shielding and cut-and-cover works. Treatment plants for turbid water will be installed.</p> <p><u>Dust, exhaust gases</u>: Installing a safety fence along the site boundaries and spraying water during cut-and-cover works will mitigate dust diffusing.</p> <p><u>Wastes</u>: The excavated soil from station construction is loaded to trucks, which transfer it to the assigned disposal areas. The generated soil waste resulting from TBM operation will be treated in the mud treatment station to separate the bentonite from the soil before being disposed in the assigned disposal area. Solid and hazardous waste will be treated according to</p> | |

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| | | | | Egyptian regulation and standard. | |
| | | (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? | Y | (b) The Project area is located in metropolitan city with high urbanization. Therefore, there are no issues of ecosystem to be cautioned on construction activities. | |
| | | (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts? | Y | (c) Adequate measures will be planned and provided to reduce the negative impacts of social environment during construction stage, such as road decking to reduce traffic jam at stations' construction sites, temporary pedestrian paths, etc. | |
| | | (d) If the construction activities might cause traffic congestion, are adequate measures considered to reduce such impacts? | Y | (d) There will be possibility to affect the road traffic near the construction sites of stations where cut and cover method will be applied during the construction stage. Road decking at the construction sites of stations will be applied to reduce the negative impacts on traffic conditions. Moreover, negative impacts on roads and traffic conditions during the construction phase will be mitigated through i) minimizing the scale and duration of the temporary lane occupation of the road, and ii) using alternative routes to bypass affected section to reduce the traffic volume load at the construction sites. | |
| | | (e) Are adequate measures considered to reduce accidents during construction? | Y | (e) There is a possibility of accident due to the operation of heavy equipment and heavy vehicles during the construction stage. Constructors provide a safety training to workers in order to avoid any risks caused by operational mistakes as well as to promote consciousness of importance about the role of safety equipments such as safety helmets. | |

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| | (2) Monitoring | (a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? | Y | (a) Environmental monitoring plan is proposed for pre-construction, construction and OM stages of the Project, based on the impact prediction and mitigation measures proposed. | |
| | | (b) What are the items, methods and frequencies of the monitoring program? | Y | (b) Items, methods and frequencies of the monitoring is summarized in attachment. | |
| | | (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? | Y | (c) Institutional arrangement to carry out the monitoring plan is proposed including entities concerned and roles of each entity. | 工事中および供用時のモニタリング実施機関、部署、人員、機材の整備状況、予算等 |
| | | (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities? | N | (d) There is no regulatory requirement in Egypt such as reporting system of monitoring results. | |
| | | (e) Will the results of monitoring be disclosed to local stakeholders? | | (e) There is no regulatory requirement of disclosing monitoring results. | モニタリング結果の公開可否、可能な場合はその範囲 JICA による公開可否 |
| | Reference to Checklist of Other Sectors | (a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas | N | (a) The Project does not have relevance to forest or forestry since the Project locates in the urban area where any primal nature is not observed. | |

Attachment: The summary of Environmental Monitoring Plan in EIA

1) Construction stage

| Monitoring Parameters | Monitoring location | Monitoring duration /Frequency | Party implementing the measure |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------|-----------------------------------------------|
| Air Quality TSP, PM10, CO, NOx, SOx | Next to Constructed Station/ Facilities | 24 hours /Every Month | Construction Contractor, supervised by NAT |
| Noise intensity | Next to Constructed Station/ Facilities | 24 hours /Every Month | Construction Contractor, supervised by NAT |
| Vibrations | Next to Constructed Station/ Facilities | 24 hours /Every Month | Construction Contractor, supervised by NAT |
| Groundwater Levels | All monitoring wells | Before construction Monthly | Construction Contractor, supervised by NAT |
| | Group one (G1) wells | During Construction | |
| | Group two (G2) wells | Monthly | |
| Groundwater Quality BOD, COD, TDS, Chlorides, Nitrates, total Phosphate, Oil & Grease, Bacteriological parameters | All monitoring wells | Annually | Construction Contractor, supervised by NAT |
| | Group one (G1) and Group three (G3) | Monthly during construction | |

2)Operation stage

| Monitoring Measures | Monitoring location | Monitoring duration /Frequency | Party implementing the measure |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------------------------------------------|
| Air Quality CO, CO2, NOx, PM10,TSP,SOx | Outside each station | 24h or 1hr /Every 3 months | - Third party (e.g. Research Centers or Universities) |
| Noise Intensity | Next to identified sensitive receptor | 24h /Every months | - HSE Department - Third party (e.g. Research Centers or Universities) |
| Groundwater Levels and Surface and groundwater quality - BOD, COD, TDS, Chlorides, Nitrates, total Phosphate, Oil &Grease - Bacteriological parameters | monitoring wells | After construction | Third party (Research Centers or Universities) |
| Heat Stress-Temperature | Station and Depot | Every day / periodic check | Third party (Research Centers or Universities) |
| Solid and hazardous waste - Volumes of waste for re-use, recycle and/or final disposal - Treatment procedures and final fate of solid wastes | Station and Depot | Every day / periodic check | HSE Department (Environment Unit) |
| Workforce Health and Safety -Inspection on use of health and safety gear - Medical treatment of workers in case of Injuries and/or illnesses - Checking first aid kits and safety gear. | Station and Depot | Every day / periodic check | HSE Department |

**「エジプト国カイロ地下鉄4号線整備事業準備調査」
環境社会配慮審査会助言(スコーピング案)への対応**

| NO. | 審査会助言内容 | 見解・対応 |
|----------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 大気質 | | |
| 1 | 現地測定局のデータと比較可能な計測方法で大気汚染の測定調査を行うことが望ましい。 | 現地測定局のデータと比較可能な測定方法により大気汚染の測定調査を実施した。また、採用された計測方法はEIAレポートのAnnex3中で整理しています。 |
| 2 | 窒素酸化物の測定にあたっては、二酸化窒素濃度も含めることが望ましい。 | 大気質の現地測定では、二酸化窒素濃度を含め5項目を測定しました。 |
| 代替案 | | |
| 3 | 既往調査も踏まえて、代替案の選定根拠と妥当性を示すことが望ましい。 | カイロ都市交通のマスタープランである、CREATS(Cairo Regional Area Transportation Study, 2000)及びSDMP(The Strategic Urban Development Master Plan Study for a sustainable Development of the Greater Cairo Region in the Arab Republic of Egypt, 2008)の概要、及びそれに基づき本事業の代替案を設定したことにつき、FS Report No.1(3-2~3-3 ページ)及びFS Report No.2(3-2~3-14 ページ)に整理しました。 |
| 4 | スコーピング案の評定の根拠を明示することが望ましい。 | 評定の根拠をFS Report No.3/4(9-21~9-24 ページ)で整理しています。【添付資料1 参照】 |
| スコーピング案 | | |
| 5 | 計画、工事、供用段階に分けて評定結果を明記することが望ましい。 | 事業段階ごとの評定結果を、FS Report No.3/4(9-25~9-26 ページ)で整理しています。【添付資料1 参照】 |
| 6 | 影響項目の評価結果が代替案毎に比較できるように記載することが望ましい。 | Giza Square のルート検討では、公害、環境影響、社会影響の項目ごとに、各代替案の比較内容を記載しました。なお、比較検討の結果、環境影響では、各代替案の評価に差はなかったため、公害(大気・騒音)、社会影響(用地取得・住民移転・交通渋滞)、および2号線との接続等の点において優位であるPyramid Roadを選択しました。(FS Report No.2(3-3~3-10 ページ)) Gyza Flyover Route の検討では、現地踏査にて複数の代替ルート上の自然環境の状況に差異がないことが確認されたことから、工事中の公害(大気・騒音)及び社会環境(用地取得・住民移転)の観点から検討しました。その結果、用地取得・住民移転の影響の優位性、及びEl Malek El Saleh から El Giza 間の施工の実施可能性も含め、優位となる当初線形を選択しています。(FS Report No.2(3-11~3-14 ページ)) なお、The Crossing section Pyramids Road with Alexandria Desert Road の検討では、社会影響(用地取得・住民移転)の観点に注目し、施工可能性を踏まえて優位となる線形を選択しました。当該区間はトンネル区間であるため供用時における自然環境・公害に関しては特に考慮項目としておりません。(FS Report No.2(3-14~3-15 ページ)) |
| 7 | 大気汚染、地球温暖化、周辺住民の生活、地域経済、自動車事故の減少等、正の影響が見込まれる項目はプラスの評定をすることが望ま | スコーピング段階の供用時の評定で、大気汚染、地球温暖化、地域経済、自動車事故の減少については正の影響が見込まれるため、プラスの評定をしています。FS Report No.3/4(9-21~9-24 ページ)で整理しています。【添付資料1 参照】 |

| NO. | 審査会助言内容 | 見解・対応 |
|---------------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | しい。 | |
| 8 | 地下水流出及び地下水脈変化の有無、これらの事象がある場合の水文・水況への影響を検討することが望ましい。 | <p>本 4 号線事業予定地を含むカイロ地域は、添付資料 2【カイロ地下鉄 4 号線工事範囲における地質および地下水の状況】のとおり、ナイル川沿いのすり鉢状の堆積砂層を地盤としており、この堆積砂層には常にナイル川から地下水が供給されています。我が国における地下水脈(山岳地域で地下に浸透した地下水位流)とは性質が異なります。</p> <p>表層土の下にはナイルクレイと呼ばれるゆるいシルト質の粘性土層が存在しますが、完全な不透水層ではないことから地下水面はこの粘性土層上面付近とみられ下層の砂質土層が大きな被圧を受けていることはありません。また、地下路線部の建設はトンネル内に地下水を引き込むことのないシールド工法を採用するとともに、駅舎建設のための開削工事も地表面から施工する地中連続壁を本体利用し逆巻き施工すること、状況に応じて底盤部の止水工や不透水層まで根入を伸ばして、駅構造構築範囲を囲った後に掘削を開始する予定であることから、地下水流出・地下水脈が問題となる変化を引き起こすことはないと考えます。また仮に駅構造構築により局所的な地下水のダムアップが発生したとしても、平均動水勾配が 1/10000 以下であるため、問題ないと判断いたしました。したがって地下水への影響は問題にならない範囲であると考えられますが、施工前、施工中には観測井戸を設置し一般的に必要な水位変動、水質等の観測を行いながら施工することとなります。</p> <p>なお、現在工事中的カイロ地下鉄 3 号線においても水位観測が行われておりますが、これまでのところ周囲の建物等への影響は確認されておりません。</p> <p>また、カイロにおける井戸利用状況は、ナイル川左岸北側の地方部にて利用が確認されていますが、事業計画予定地周辺を含む都心部に井戸利用情報はありません。(RIGW 1989 EIA レポート 85 ページ)</p> |
| 9 | 事業地周辺の開発に伴う土地利用の影響を検討することが望ましい。 | <p>駅の新設等に伴う二次的な周辺土地利用の変化について、スコーピング段階の評定の中で検討し、FS Report No.3/4 9-21 ページで整理しています。【添付資料 1 参照】 駅新設による予期せぬ二次的な土地利用の変化が想定されるため、新駅周辺土地利用に関して、供用後の運営維持管理機関であるエジプト地下鉄会社 (ECM: Egyptian Company for Metro) が自治体との協調しながら整備していくこととなります。(FS Report 3/4 9-32 ~ 9-33 ページ、及び EIA レポート 213 ~ 214 ページ)</p> |
| 10 | 工事中の交通渋滞に関し、影響評価の前提とした工法を明示することが望ましい。 | <p>駅舎建設は覆工版を用いた開削工法を想定しています。駅舎建設の覆工板による交通渋滞対策を、FS Report No. 3/4 9-35 ページ及び EIA レポート 206 ページで明示しています。また、地下路線部はシールド工法を想定しており、地上部の交通に影響を与えません。地上部の改変がないことを EIA レポート 185 ページで明示しています。</p> |
| 現地ステークホルダー協議 | | |
| 11 | スコーピングとドラフト段階の住民協議の方法をより詳細に示すことが望ましい。 | <p>スコーピング段階とドラフト EIA 段階のステークホルダー協議の実施方法(協議の対象者、実施日、協議内容の概要)を、FS Report No.3/4 9-38 ~ 9-41 ページで整理しています。また、その詳細は、EIA レポート 8 章(263 ~ 293 ページ)及び Annex17、18、19 に整理しています。</p> <p>【スコーピング段階】</p> <p>参加者: 政府関連機関、路上キオスクオーナー、NGO 等</p> <p>実施日: 2009 年 5 月 ~ 8 月</p> <p>形式: 個別協議</p> |

| NO. | 審査会助言内容 | 見解・対応 |
|---------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>協議内容： 事業概要の説明、スコーピング(案)の結果、環境社会配慮の調査方法及び調査上の課題、住民移転に係る意見交換</p> <p>【ドラフト報告書段階】</p> <p>参加者： 関連機関、NGO、地元住民等(111人)</p> <p>実施日： 2009年12月28日</p> <p>形式： 住民集会</p> <p>協議内容： 全体事業計画案の内容の説明、EIAの結果報告、住民移転に係る意見交換</p> |
| EIA 調査 TOR 案 | | |
| 12 | <p>地下鉄工事により粘土層に穴を開ける可能性がある場合は、地盤沈下防止のための調査を行うことが望ましい。</p> | <p>Phase1での地質調査結果から、路線周辺の粘性土層のN値は概ね10以上を示しており、現段階で地盤沈下発生の可能性は極めて低いと予想されます(通常、粘性土層で地盤沈下が懸念されるN値は2以下程度とされている)。また、掘削工事においては、地下水低下に伴う地盤沈下に配慮し、適切な対策(駅部は遮水壁、駅間はシールド工法等)を採用します。さらに、今後BD段階や工事前に地質調査等を実施し、問題となるような粘性土層が確認された場合は、追加詳細調査及び解析の実施等の対応を検討する予定です。</p> |
| 13 | <p>EIAの水準ならびに実施期間や時期についての妥当性を示すことが望ましい。</p> | <p>実施期間につきましては、対象項目の基準等と比較可能な十分な期間設定とし、かつローカルコンサルタントの人員投入を増やすことで、期間内で効率的に調査を進めました。(詳細は、EIAレポート Annex3、4に記載)。調査時期に関しましては、エジプト(カイロ)では、雨季乾季などの季節的な変化は顕著ではないことから、道路利用状況等の周辺の影響要因が日常的な日としました。</p> |

協力準備調査報告書公開先：JICA図書館ポータルサイト(<http://lvzopac.jica.go.jp/external/library>)「目録検索」より、タイトル欄「cairo line 4」のキーワード入力で検索可能。

9.3.4 Examination of potential environmental impact and scoping

Potential impacts on the environment during the pre-construction, construction and operation stages of the project were initially identified by using the environmental scoping list and matrixes as shown in Table 9.14, Table 9.15, and Table 9.16 below.

Table 9.14 Results of environmental scoping

| Item | Project Stage | Eva'on | Evaluation Basis |
|-------------------------------------------------------|---------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Social Environment | | | |
| Involuntary Resettlement | P | B- | Most of the sections of the project alignment are designed as underground structures beneath the exiting trunk roads, and other sections such as at-grade and viaduct structures are also designed along the existing trunk roads. It is expected that involuntary resettlement and land acquisition will be confined i) within the station construction areas where the method of cut-and-cover work will be employed, and ii) within the areas for other associated facilities to be installed on the surface if any. Although the magnitude of resettlement and land acquisition is not expected to be significant according to the project characteristics as abovementioned, further examination will be necessary. |
| | C,O | D | There is no project component or activity which would cause involuntary resettlement and land acquisition additionally in the construction and operation stages. |
| Daily life of people in surrounding areas | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Some impact is expected on the people in surrounding area due to noise and vibration caused by the construction activities. |
| | O | B- B+ | The people resettled due to the project would be obliged to change their daily lives. On the other hand, some positive effect on the daily life of people is expected through the enhancement/ improvement by the project of the regional transportation condition.. |
| Local economy such as employment and livelihood, etc. | P | D | No impact is expected in pre-construction stage. |
| | C | B+ | Some positive effect on the local economy is expected because of possible increment of business/ employment opportunity generated by construction activities of the project. |
| | O | B+ | Some positive effect on the local economy is expected because of possible increment of business/ employment opportunity generated by the project operation. Further it is expected to improve the regional traffic condition through provision by the project of a convenient transportation mode. |
| Land use | P | D | No impact is expected in pre-construction stage. |
| | C | D | Extent of changing the land use condition during the construction stage is expected to be negligible, since i) the most of project alignment will be located underground, and ii) the at-grade/ viaduct sections will be located along the existing trunk roads. |
| | O | C- | There is no project component or activity which would cause the change of land use condition during the operation stage. However, it is undeniable that the project will cause some secondary changes in land use, due to the operation of new stations. The negative extent of these secondary changes of land use will need to be examined further. |
| Physical community division | P | D | No impact is expected in pre-construction stage. |
| | C,O | C- | Extent of impact by physical community division would be small or negligible in general, since the project alignment of both underground and at-grade/ viaduct sections will mostly be located along the existing trunk roads. However, since a part of the at-grade sections would possibly be designed as cutting-and-embankment earth works, it will be necessary to further examine the possibility of physical community division along such sections. |

| Item | Project Stage | Eva'on | Evaluation Basis |
|---------------------------------------------|---------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing social infrastructure and services | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Some negative impacts on the existing traffic conditions are expected, including air pollution, noise/ vibration, and increased risk of traffic accidents due to the traffic congestion caused by the construction activities, although the expected impacts will be temporary during the construction stage. The above would also cause temporary impacts on sensitive receptors such as schools and hospitals during the construction stage. |
| | O | B+ | It is expected to improve the regional infrastructure through the project providing a convenient transportation mode. |
| The poor, indigenous, and ethnic people | P | C- | A part of the project alignment would possibly pass through the areas of social minorities (e.g. Coptic group) and/ or the areas where illegal occupants exist. Further examination and special considerations would be necessary in case that land acquisition and resettlement would be unavoidable in such areas due to the project. |
| | C,O | D | There is no project component or activity which would cause negative impacts additionally in construction and operation stages. |
| Misdistribution of benefit and damage | P,C,O | B- | Inequality among the stakeholders might be expected, since some would receive a benefit from the project and others would be affected negatively by the project. |
| Local conflict of interest | P,C,O | B- | It might be expected that inequality among stakeholders and inequalities in the distribution of benefit/ damage would cause local conflicts of interest. |
| Water use and water right | P,C,O | D | No impact on water use or water right is expected due to the project implementation. |
| Sanitation | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Some negative impacts on the local sanitary condition are expected, due to the mobilization of construction work force and/ or workers' site camps, although the expected impacts will be temporary during the construction stage. |
| | O | D | The facilities associated with Metro Line 4 will be operated according to the Egyptian regulations and guidelines related to maintaining sanitary conditions. Therefore, it is not expected to bring about serious impacts on sanitation in the operation stage. |
| Hazards (Risk), Infectious diseases | P | D | No impact is expected in pre-construction stage. |
| | C | B- | There is a increased risk of infectious diseases among the construction work force and/ or in the workers' site camps, although the risk increment will be temporary during the construction stage. |
| | O | D | The facilities associated with Metro Line 4 will be operated according to the Egyptian regulations and guidelines related to maintaining the sanitary conditions. Therefore, it is not expected to bring about a serious risk of infectious diseases in the operation stage. |
| Accidents | P | D | No impact is expected in the pre-construction stage. |
| | C | B- | Increased risk of accidents is expected due to the operation of heavy equipment and heavy vehicles during the construction stage. |
| | O | B- B+ | Increased risk of accidents is expected due to the train services in the operation stage, especially on the at-grade sections. On the other hand, it is expected that the risk of traffic accidents would be reduced due to the modal shift of transportation from passenger cars/ buses to the new metro. |
| Traffic condition | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Due to the cut-and-cover works for station construction on the existing roads, as well as due to the generation/ attraction of heavy vehicles at the construction site, some negative aspects are expected such as traffic accidents or traffic jams, although these expected impacts will be temporary during the construction stage. |
| | O | B+ | It is expected that the risk of traffic accidents or frequency of traffic jam would be reduced due to the modal shift of transportation from |

| Item | Project Stage | Eva'on | Evaluation Basis |
|------------------------------------------|---------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | passenger cars/ buses to the new metro. |
| Natural Environment and Pollution | | | |
| Topography and geological features | P,C,O | D | It is not expected that the Project will cause significant changes or impacts on topography and geological features, since the most of the project alignment will be located underground. |
| Soil erosion | P,C,O | D | It is not expected that the Project will cause soil erosion, since most of the project alignment will be located underground. |
| Groundwater | C | C- | Some impacts on groundwater quality would be caused by the turbid water generated by shield tunnelling works for the route and cut-and-cover works for station construction. The probability and magnitude of impacts are unknown, so that further examination will be necessary. |
| | P,O | D | It is not expected that the project will cause serious impacts on groundwater artery/ quality in pre-construction and operation stages. |
| Hydrological situation | P,C,O | D | There is no project component or activity which would cause significant changes or impacts on hydrological conditions in and around the project area. |
| Coastal zone | P,C,O | D | There are no coastal zones in and around the project area. |
| Flora, fauna, and biodiversity | P,C,O | D | Negative impacts are not expected on the flora, fauna and biodiversity to be protected, since most of the project alignment will be located in developed urban and desert areas. |
| Meteorology | P,C,O | D | It is not expected that the project will cause significant changes in the regional meteorological conditions. |
| Landscape | P,C | D | It is not expected that the project will cause significant changes or impacts in the landscape during the pre-construction and construction stage. |
| | O | B- | Some change of landscape is expected due to the appearance of at-grade/ viaduct track sections and associated stations. |
| Global warming | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Probability of increased GHG emission is expected due to the operation of heavy vehicles as well as traffic jams incidental to the construction works, although this impact will be temporary during the construction stage. |
| | O | B+ | It is expected that the GHG emission will be reduced due to the modal shift of transportation from passenger cars/ buses to the new metro. |
| Air pollution | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Some negative impacts on air quality are expected due to operation of heavy equipment/ vehicles as well as traffic jams incidental to construction works, although the expected impacts will be temporary during the construction stage |
| | O | B+ | It is expected that emission of air pollutants will be reduced due to the modal shift of transportation from passenger cars/ buses to the new metro. |
| Water pollution | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Some impacts on water quality would be caused by the turbid water generated from construction yards of cut-and-cover works as well as by the effluent generated from workers' camp sites, although the expected impacts will be temporary during construction stage. |
| | O | D | The facilities associated with Metro Line 4 will be operated according to the Egyptian regulations and guidelines related to proper management of wastewater or effluent. Therefore, it is not expected to bring about serious impacts on water quality in operation stage. |
| Soil contamination | C | C- | There are no project components or activities which cause soil contamination. However, in case the soil at the construction sites is already contaminated by other reasons, the construction activity of the project may cause negative impacts. |
| | P,O | D | There are no project components or activities which will cause soil |

| Item | Project Stage | Eva'on | Evaluation Basis |
|--------------------------|---------------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | | contamination in pre-construction and operation stages. |
| Waste | P | D | No impact is expected in pre-construction stage. |
| | C | B- | It is expected that the Project will generate construction waste in the construction stage. |
| | O | D | The waste generated from the facilities associated with Metro Line 4 will be managed according to the relevant Egyptian regulations and guidelines, thus it is not expected to cause serious impacts. |
| Noise and vibration | P | D | No impact is expected in pre-construction stage. |
| | C | B- | Some impacts of noise and vibration are expected due to the operation of heavy equipment/ vehicles, although the expected impacts will be temporary during the construction stage. |
| | O | B- | Some impacts of noise and vibration are expected due to train services in the operation stage, especially in the at-grade/ viaduct sections. |
| Ground subsidence | C | C- | The probability of ground subsidence is undeniable and dependent on the construction method to be employed, as well as on ground conditions. Further examination will be necessary according to the construction plan and findings on ground conditions. |
| | P,O | D | There are no project components or activities which may cause ground subsidence in pre-construction and operation stages. |
| Offensive odour | P,C,O | D | There are no project components or activities which may cause offensive odours. |
| Bottom sediment | P,C,O | D | There are no project components or activities which may cause negative impacts on bottom sediment. |
| Cultural Heritage | | | |
| Cultural heritage | P,C | C- | The possibility exists that buried/ undiscovered cultural assets may be found along the project alignment, since the Greater Cairo region is well-known as the site of a rich cultural heritage, including such assets as the Giza Pyramids. Further examination will be necessary of i) actions to be taken before the start of construction, and ii) countermeasures to be taken in case of unexpected discovery/ detection of cultural assets during construction stage. |
| | O | D | There are no project components or activities which may cause negative impacts on cultural heritage in operation stage. |

Legend of Project Stage

- P: Pre-construction stage
- C: Construction stage
- O: Operation stage

Legend of Evaluation

- A-: Serious impact is expected.
- B-: Some impact is expected.
- C-: Extent of impact is unknown. Further examination would be necessary. Impact may become clear as study progresses.
- D: No or negligible impact is expected. Further examination is unnecessary in EIA study.
- A+: Positive effect is expected.
- B+: Positive effect is expected to a certain extent.

Source: JICA Study Team

Table 9.15 Scoping Matrix (1/2)

| Name of Cooperation Project | | JICA Preparatory Study on Greater Cairo Metro Line 4 | | | | | | | | | | | | |
|-----------------------------|----------------|--------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------|--------------------------------------------|----------------------------|----------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------|----|
| | Likely Impacts | Overall Rating | Planning Phase | | Construction Phase | | | | | Operation Phase | | | | |
| | | | Land acquisition | Change of Land use plan, Control of various activities by regulations for the construction | Setting a Camp for Construction Employees | Alteration to ground by cut land, filling, drilling, tunnel, etc. | Operation of Construction Equipment and Vehicles | Construction of Stations, Rail, other related facilities. | Limitation of transit in construction area | Increase of Through Trains | Appearance/ Occupancy of Stations, Rail, other related building structures | Operation of associated facilities | Boarding/ Alighting of passengers Generation/ Attraction of people | |
| Social Environment | No | Involuntary Resettlement | B- | B- | D | D | D | D | D | D | D | D | D | D |
| | 2 | Daily life of people in surrounding areas | B- B+ | D | D | D | D | B- | B- | D | D | D | B+ | B+ |
| | 3 | Local economy such as employment and livelihood, etc. | B+ | D | D | B+ | D | B+ | B+ | D | D | D | B+ | B+ |
| | 4 | Land use and utilization of local resources | C- | D | D | D | D | D | D | D | D | D | C- | C- |
| | 5 | Physical Community Division | C- | D | D | D | D | D | D | D | C- | C- | D | D |
| | 6 | Existing social infrastructures and services | B- B+ | D | D | D | D | B- | B- | D | B+ | D | B+ | D |
| | 7 | The poor, indigenous and ethnic people | C- | C- | C- | D | D | D | D | D | D | D | D | D |
| | 8 | Misdistribution of benefit and damage | B- | B- | B- | D | D | D | B- | B- | B- | D | B- | D |
| | 9 | Local conflict of interests | B- | B- | B- | D | D | D | B- | B- | B- | D | B- | D |
| | 10 | Water Usage or Water Rights and Rights of Common | D | D | D | D | D | D | D | D | D | D | D | D |
| | 11 | Sanitation | B- | D | D | B- | D | D | D | D | D | D | D | D |
| | 12 | Hazards (Risk) Infectious diseases such as HIV/AIDS | B- | D | D | B- | D | D | D | D | D | D | D | D |
| | 13 | Accidents | B- B+ | D | D | D | D | B- | B- | D | B- B+ | D | D | D |
| | 14 | Traffic Condition | B- B+ | D | D | D | B- | B- | B- | D | B+ | D | D | D |

Rating:

A-: Serious impact is expected.

A+: Positive effect is expected

B-: Some impact is expected.

B+: Positive effect is expected to a certain extent.

C-: Extent of impact is unknown (Examination is needed. Impacts may become clear as study progresses.)

D: No impact is expected. IEE/EIA is not necessary.

Reference:

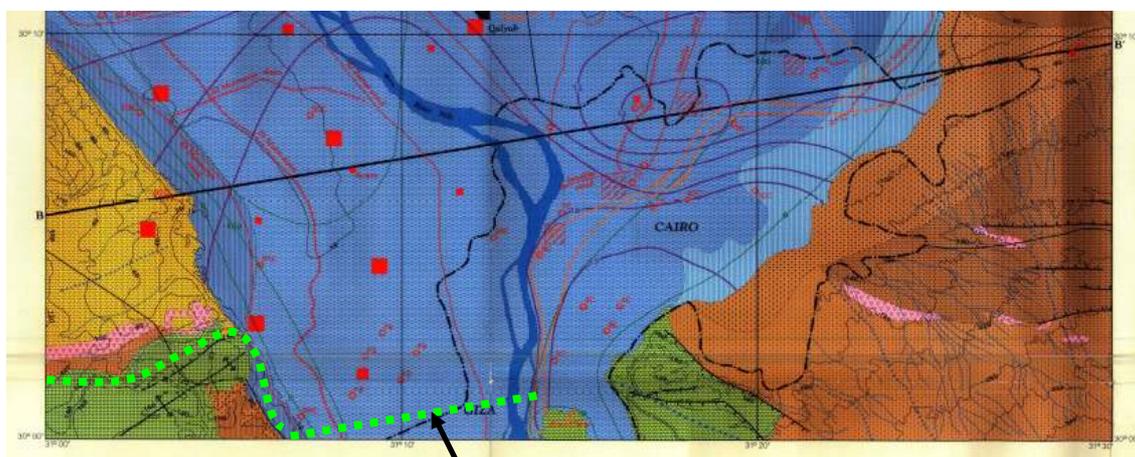
1) Japan International Cooperation Agency (1992) "IV Railways: Environmental Guidelines for Infrastructure Projects", Tokyo, Japan.

2) Norman Lee and Clive George (2002) "Environmental Assessment in Developing and Transitional Countries", JOHN WILEY & SONS, LTD., London, England.

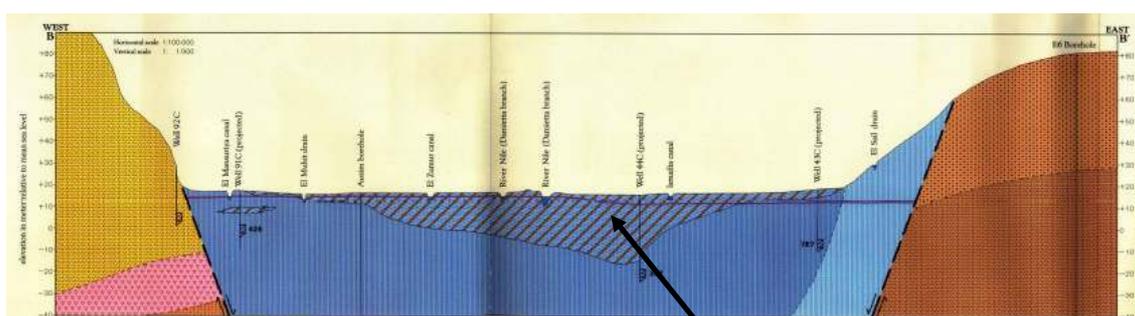
Source: JICA Study Team

カイロ地下鉄4号線工事範囲における地質および地下水の状況

カイロはナイル河がナイル渓谷からナイルデルタ地帯へ流れ込む扇の要に位置しています。本4号線のフェーズ1区間は東側のムカッタム台地の端から始まり、ナイルを横断し西側のギザ台地に至るルートとなっています。石灰岩が基盤となるこの両台地に挟まれたナイル氾濫源は、断面図にあるようにナイルによって削られたすり鉢状の谷に、流れによって運ばれた砂が最深部80m近くの厚さに堆積している状態となっています。この氾濫源全体にナイルの水が満たされている状態にあるため、地下水位は常時ナイルの水面にほぼ近い状態となっております。(GL.-3m~4m) 特にアスワンハイダムが構築されて以降、ナイル川水位の年間変動は2m以下となっており、地下水位の変動もこれ以下であると考えられます。現地の地質調査会社の報告によれば年間変動1m以内であるといわれております。(本F/Sにおいて水紋調査は実施しておりません。)



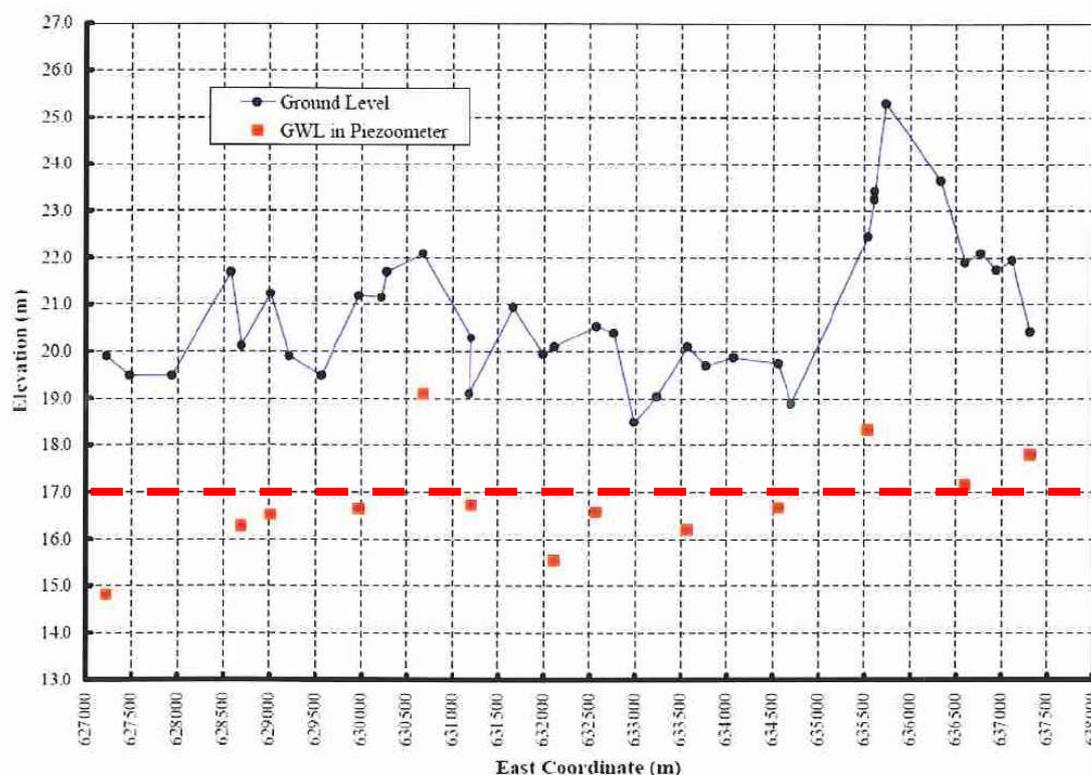
Line4 平面図



断面図 ナイルクレイ

またこの氾濫源は古代よりのナイルの氾濫と河道の変動が繰り返されており、砂層の上にナイルクレイと言われる河床泥が緩く堆積したクレイシルト層が全体的に存在します。地質学的には粘性土層に分類されますが、含水比が高く砂層を嚙んでいる箇所が多いため、地下水面はこの粘性土層の上面付近と見られます。(下図参照) したがって下部の砂質土

層も大きな被圧は受けていない状況です。



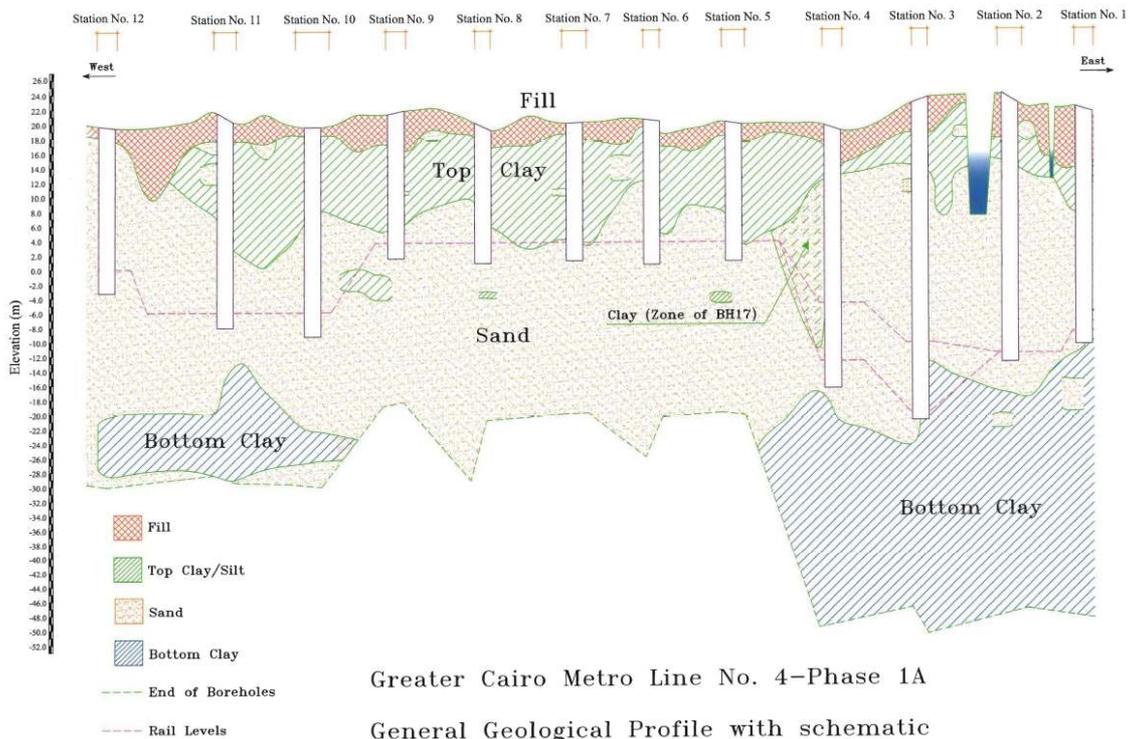
ピエゾメーターテストの結果

※ナイル河の水位は標高約 17m

地下鉄 4 号線（フェーズ 1）計画において、トンネルは概ね砂層を通ることとなります。駅はナイル河両岸付近が最も深く軌道レベルで GL. -35m 程度となります。それ以外の一般部は概ね 20m～25m の深さとなります。

駅構造物の構築は原則 RC 地中連続壁の本体利用を考えており、底盤部は必要に応じて遮水用地盤改良を行うか、下部粘性土層まで根入れを行うため、基本的に掘削時に周囲の地下水を低下させることはありません。

またトンネルの構築はシールド工法を提案しており、施工中の漏水はほとんどありません。また完成後の漏水については日本の実績では多いケースでも 0.5l/min/100m 程度であり、カイロにおけるこれまでの実績でも漏水はほとんど発生していないことから、現地生産のセグメントを用いたとしても地下水位に問題となる変動を与えることは無いと考えられます。



地層縦断およびトンネル、駅深さ

カイロ地下鉄 4 号線整備事業(フェーズ 1)(第 1 期)
環境社会配慮ワーキンググループ資料

| | 質問・コメント | 回答 |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| | 配布資料の内容・位置づけ | |
| 1 | Addendum EIA Report は、Original EIA Report に対してどのような位置づけであるのか。これは工国の法制度上の要求事項であるのか。また、Original Report に対して時間差があつて（遅れて）提出されるのは、どのような背景があるのか。(田中委員) | Addendum EIA Report は、EIA Report 作成後に軌道の一部変更が行われたため、変更箇所環境影響について作成されるものです。Addendum EIA は事業実施機関（NAT）より承認機関（EEAA）に提出され、レビューを受けています。 |
| 2 | 環境レビュー方針に記述された項目に関する評価内容と、スコーピングマトリックス（9-21～26）で整理された評価内容について、十分に整合を図ること。例えば、Landscape の項で、環境レビュー方針では Negligible impact on landscape is expected due to the Project と記述されて、評価も「N」（no）となっているが、表 9.16（9-26）では Landscape の項は Operation Phase2 で「B-」、総合評価でも「B-」となっており、差異がみられる。(田中委員) | 協力準備調査のスコーピングマトリックスが Phase2 を含むのに対し、環境レビュー方針は Phase1 のみを対象としていることから差が生じています。 |
| 3 | 同様に、Noise and Vibration の項について、環境レビュー方針では、本プロジェクトでは軌道及び駅（1～15 番駅）は地下 20～30m で敷設されるために Therefore it is not expected that the noise from train service would cause the negative impact と表記され、騒音問題は発生しないとある。しかし、スコーピングマトリックスの表 9.14（9-24）の Noise and Vibration の項では、Operation 段階で Some impacts of noise and vibration are expected due to train services とあり、評価は「B-」となっている。この点について、整合のとれた説明を加筆することが必要である。(田中委員) | |
| | 過去の経験の本事業への反映 | |

| | 質問・コメント | 回答 |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4 | <p>(1) マスタープランに基づき進められている計画の一部である</p> <p>1～3号線の供用時との比較も含め、4号線の供用時における環境への影響及び社会への影響を、どのように予測しているか。</p> <p>1) これまで整備された1、2号線に関して工事期及び供用後に起こった環境社会影響について、3号線ではどのように改善を試み、さらに4号線でも踏襲あるいはさらなる改善があるのか。</p> <p>特に、工事期では通常の典型7公害のほか社会的な影響(工事による渋滞、人の移住等)。工事に必要な資材の調達と調達先への環境影響、建設廃棄物の処理も。</p> <p>供用時では環境及び社会的な影響(交通へのインパクト・効果: CO2削減効果、実際の交通量の変化、移住者の生活等)。</p> <p>上記にも書いた1～3号線の供用時との比較も含め、4号線の供用時における環境への影響及び社会への影響を、どのように予測しているか。(岡山委員)</p> | <p>これまでの地下鉄整備事業においては工事中のモニタリング及びその結果を把握するようなシステムは構築されていませんでした。</p> <p>しかしながら、3号線工事において施工管理のために実施されている地下水位調査の結果、地下水位の著しい変位は確認されていない点等は、4号線の環境影響評価に活用されているものと考えられます。</p> <p>4号線では、EIAを実施する事により、環境影響の緩和策やモニタリング体制を明確にするとともに事業実施機関内に環境社会配慮を担当する新たな部署の設立が検討されています。</p> <p>工事資材の調達や建設廃棄物の処理に関する環境配慮については施工業者の責任の下で実施されることとなります。</p> |
| | 供用時の環境影響(水質) | |
| 5 | <p>Water Qualityの項で Depot からの排水には二酸化銅Cu(OH)₂が含まれるとの記述があるが、この金属含有廃水はどのようなメカニズム(要因)で発生するのか。また、このDepot排水には、他の重金属類は含有されないのか。(田中委員)</p> | <p>協力準備調査(補足調査)の実施中に、電化方式が架空電車線方式から第三軌条方式に変更されており、デポからの排水に重金属が含まれることはないことを確認しました。</p> <p>架空電車線方式を採用する場合、配電線(銅または銅合金)がパンタグラフにより磨耗することで発生する銅粉が車両に付着し、車両基地での車両洗浄時に流出する可能性を踏まえて、記載されていたものです。</p> <p>第三軌条方式では、第三軌条(配電用のレール)はアルミニウムとステンレスで作られるため、重金属が流出することはないと考えられます。</p> <p>確認結果に基づき、環境レビュー方針を修正</p> |

| | 質問・コメント | 回答 |
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| | | いたしました。 |
| 6 | Operation stageにおける 駅舎からの排水 は、public sewageに放流されると書かれていますが、下水処理場を備えたpublic sewageと理解していいのでしょうか。 また、全ての駅舎がこのシステムに接続されると理解していいのでしょうか。(山本委員) | カイロ首都圏の排水は下水処理場で処理され、処理水は専用灌漑水路を経て砂漠緑化に使用されています。駅舎からの排水はこのシステムに接続されています。 |
| | 供用時の環境影響（水象・地下水） | |
| 7 | ナイル川の横断に際して、何メートル下を通るのか、どういう影響を考えているか。(谷本委員、9/3 全体会合) | ナイル川の渡河部分のトンネルは平均的に上部が河床(横断面の最深部)から 7.0m 深い位置になる予定です。トンネルの位置は、河床レベル調査、地質調査ボーリングを行うとともに、過去の河床レベルデータを把握した上で、検討されたものであり、河床への影響は予見されていません。 |
| 8 | Natural Environment (3) Hydrology 住民の水利用に対する影響はないとしているが、現時点で井戸利用がない(ナイル川左岸北側では利用されている:スコーピング案対応No.8)ことをもって、将来も含めた住民の水利用への影響なしと判断してよいのか。(高橋委員) | カイロの水利用のほとんどはナイル川河水を水源としており、住民の将来の地下水利用が急増する可能性は極めて低いと考えられます。 |
| 9 | 地下水依存率が高い都市であるが、生活水確保に影響がでないか。(岡山委員) | |
| | 供用時の環境影響（生態系） | |
| 10 | Natural Environment (2)Ecosystemについて、プロジェクトサイトは都市化された地域であり、問題ないとの対応である。しかし、EIAでは、サイトには砂漠およびNile川と島部も含まれ、水鳥をはじめとする動植物が確認されており、影響を受けやすいため注意を払うべきとしている。一方で、El Roda島の 生態系 は影響を受けやすいものの、当該ルート上は都市化しているなどの理由で生物影響はないとしている。影響範囲をルート上のみ限定し、既に都市化しているとの理由だけで問題なしとしてよいものか。Confirmation of | EIA レポートによると、プロジェクトサイトに存在する水鳥等の動植物に希少種は存在しません。El Roda 島については生態系の影響を受けやすいという記述があるものの、すでに都市化が進んでおり生態系は変化している、とも記述されています。現在既に都市化されているという状況下で、地上部に駅が建設されることによる生物種の生息域の変化はなく、ナイル川の水鳥等の生息地に直接影響を与えるような工事はありません。 上記について環境レビュー方針に追記いたしました。 |

| | 質問・コメント | 回答 |
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| | Environmental Considerationも含め、丁寧な説明が必要である。(Others (1)Impacts during Construction (b)も同様)(高橋委員) | |
| | 供用時の環境影響(振動) | |
| 11 | 振動 を工事中のみに限定していることの妥当性について改めて検討すること。(村山委員) | 軌道は平均的に地表から30m程度の深さに設置されるため、供用時の地表への振動の影響はnegligibleと判断されます。また、必要に応じて、振動軽減のための技術的な対応が検討されます。 |
| | 供用時の環境影響(高圧電線による影響) | |
| 12 | 高電圧施設および送電線の配置・居住施設からあまり離れていない配置となっているため、安全性や電磁波による影響に可能な限り配慮すること。(村山委員) | 高圧電力の引込みは既存送電線から直接行われ、変電所も既存送電線に隣接して建設される予定であり、現状より新たに影響が拡大することはないと考えております。環境レビュー方針の記載を修正いたしました。 |
| | 工事中の影響 | |
| 13 | 工事中に 有害廃棄物 が発生した場合の処理方法や廃棄先について確認すること。(村山委員) | 本事業においては有害廃棄物の発生は想定されていません。 有害廃棄物が確認された際には、地方自治体及び環境担当機関(EEAA)に連絡し、確認状況に応じて処理方法に関して指示を仰ぐこととなります。一般的には、土壌への流出処理を施した指定用地への廃棄などが想定されます。 |
| 14 | 工事排水処理 は。(現況としての生活排水の流れと処理は?)(岡山委員) | 工事排水は場内で一次処理(水質検査を含む)した後、下水道へ放流されます。下水道設備が無い場合には、河川放流基準に準じて一次処理した後、河川、運河等または地盤面へ放水されると考えられます。 (生活排水については質問・コメント6をご参照下さい。) |
| | 文化遺産 | |

| | 質問・コメント | 回答 |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 | 歴史的建造物への影響や遺跡等の発掘の可能性 土地柄、万が一何らかの歴史的なものに当たってしまった場合には、即刻計画を変更すべき。その予測と柔軟な対応。(岡山委員) | F/Sにおいて、地中の文化財についての簡易調査を実施し、重要かつ大規模な文化財が発見される可能性が極めて低いことを確認しています。今後、事業対象地域の中では生活遺産(土器片等)が存在する可能性が高いとされる地域についての調査を行うこととしています。文化財が発見された場合、考古学最高評議会に連絡し、指示を仰ぐこととなっています。 |
| | 情報公開 | |
| 16 | P1、1-(1)-(e) EIA レポートは NAT 本部と JICA で閲覧可能とあるが、これらはステイクホルダー、とくに地元住民がアクセスしやすい場所にあるのか?(松行委員) | NAT 本部はカイロ中心部にあり、ステイクホルダー(地元住民)によるアクセスは容易と考えられます。 |
| | ステイクホルダー協議 | |
| 17 | 12/28 のステイクホルダー協議で反対意見がなかったとあるが、以下の点について確認したい。 ・12/28(月)10:30~実施されているが、これはステイクホルダーが参加しやすい日時なのか?とくに、仕事をしている地域住民が参加しやすい日時なのか? ・参加者リストが A19-12~23 にあるが、この中で地域住民として参加した人は何人なのか?civil society というくくりで、地域住民と NGO 関係者が一緒にリストアップされているが、分けて標記すべきである。また、地域住民の中で、非自発的移住の対象となる 11 世帯、14 店舗、5 屋台の関係者はすべて参加していたのか? ・タクシーやミニバスなどが影響を受けると 4-(2)-(a)であれが、そのような人は参加しなかったのか? ・コメントや質問はすべて専門家によるものだが、地域住民が質問などをしやすい雰囲気だったのか?(参加者における、関連機関や専門家の割合が大きすぎるように思える) | ・ステイクホルダー協議の開催日は事業実施機関が選定した通常の平日です。宗教的なイベント等はなくステイクホルダーからの実施日に関する不満等は確認されていません。 ・ステイクホルダー協議時の出席者名簿に記載された所属先からと、civil society22 名のうち NGO 関係者は 5 名と推測されます。 ・移転対象者が全て参加していたかについては、出席者の住所が全て記載されているわけではないため、確認できません。 ・同様に、タクシー、ミニバスの関係者が出席していたかについては、出席者の所属先等がすべて記載されているわけではないため、確認できません。 ・説明会は地域住民の理解を深め、質問等も行いやすいよう、アラビア語で行われました。 ステイクホルダー協議においては、用地取得、住民移転は可能な限り回避され、必要な場合はエジプト法および JICA ガイドライン |

| | 質問・コメント | 回答 |
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| | (松行委員) | |
| 18 | <p>(3) ステークホルダー会議が実施されている</p> <p>1) その詳細な手法(単なる説明会になっていないか: 誰をどのように呼び、どのような手法で行われ、どのような協議が行われ、どのような意見が得られたか)。(岡山委員)</p> | <p>に基づき補償が行われること等が説明されました。10月中旬に行われるステークホルダー協議において、補償対象、補償方針等の説明が行われる予定であり、その内容を確認いたします。</p> |
| 19 | <p>P9、4-(1)-(b) 12/28のステイクホルダー協議において、移住と補償について全体的な説明をしたとある。A19-58の4枚目のスライド、a19-59の1枚目のスライドがそれに相当すると思うが、薄くて読めない。具体的にどのような説明を行ったのか?(松行委員)</p> | |
| 20 | <p>1.(2).e ステークホルダー会合におけるどのようなコメントがどう反映されたかは、既にJICAとして確認済みと思うが、環境レビュー自体を将来公表するのであれば、主要な議論の内容については例示するなど少し説明を加えておいた方が良くはないか(現在のconfirmationの内容は不十分では)(武貞委員)</p> | <p>ステークホルダー会合における主なコメントと対応は以下のようなものが挙げられます。</p> <ul style="list-style-type: none"> ・「地下鉄2号線の建設時に移転対象となった露店商は直前まで移転の話を聞かされていなかった。」 (対応)2010年10月中旬に住民移転に係るステークホルダー協議を行うこととなったほか、移転対象住民に移転に関する情報が適切に行われるよう留意する。 ・「駐車スペースを駅のそばに設置すべきである。」 (対応)バス、タクシーを含む駅周辺の交通手段との調整は運営・維持管理機関(ECM)より関係機関と協議される。 ・「特にお年寄りの利用のため、駅にはエスカレーターを設置することを提案する。」 (対応)駅には可能な限り、エスカレーター、エレベータ等を設置する。 ・「地下水位のモニタリング用の井戸を深さごとに設定すべきである。」 (対応) <p>工事中の地下水位はG1、G2、G3の観測井によりモニタリングされる。</p> |

| | 質問・コメント | 回答 |
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| | 用地取得・住民移転 | |
| 21 | 4.(1). c, e RPF (Resettlement Policy Framework) は現在策定中であり、今後レビューの予定とあるが、それは今回のものとは別の環境レビューとして扱われるのか (すなわち、RPF に対するレビュー / 確認作業は助言委員会との関係ではどうなるのでしょうか) (武貞委員) | RPF は現在策定中であり、JICA による事業のアプレイザル前に最終ドラフトが提示される予定となっています。RPF の骨子は配布資料(協力準備調査(補足調査)報告書環境社会配慮)に含まれており、助言委員会に対しては、これに基づく助言をお願いする次第です。 |
| 22 | P8、4-(1)-(a) 非自発的移住の影響を 最小化するための工夫 がプロジェクトデザインにおいてなされているとあるが、具体的にどのような工夫がなされているのか? (松行委員) | 住民移転の最小化のため、以下のような方策が取られることとなっています。 <ul style="list-style-type: none"> ・既存道路の地下を利用し、代替ルート案検討も踏まえ、可能な限り地上改変の少ないルート選定としています。 ・工法として、駅間は TBM 工法を採用し、地上部改変工事は駅部のみとしています。 ・必要に応じて上下 2 層式のプラットホームを採用しています。 ・駅出入口を歩道に設ける等の工夫をしています。 |
| 23 | 社会経済影響の程度 (補足調査 2.5.4) 補足調査において、station12 以降の記述がないので確認すること。(村山委員) | Station12 ~ 16 のすべての出入口は歩道または公共スペースに設置されます。 |
| 24 | 4.(1). b, c 立ち退き (補償) 対象者すべてに、つまり Non-owner にも説明が行き渡っているか要確認。例えば大家や使用者にだけ伝えて事足れりとするのではなく、店子や従業員にも実施機関が直接コンタクトしているかどうかを確認すべき(武貞委員) | 現地法制度上、用地取得に関する Decree が発行される前に事業実施機関が移転対象住民とコンタクトを取ることができない中、新聞広告により、広く周知がされるように工夫されています。2010 年 10 月に予定されているステークホルダー協議においても、影響を受ける住民の参加が確保できるよう、最善策が検討された結果、新聞広告及び露店商と関係を持つ NGO 等への郵送による連絡により、広くステークホルダーに周知がされるよう、工夫されています。 |
| 25 | 2)4 号線なので、事業そのものへの反対は (これまでのものが受け入れられているならば) 少ないと考えられる。すると反対は、まさにこの事業によって移住を迫られるような利害関係者からあがるはず。非正規住民を含めて、これらの住民とどのような議論が行われ、またどのような条件の提示をし、どのように合意がなされたのか。(岡山委員) | |

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| 26 | 4.(1). g. (明確な)「反対意見」に限定せず、「懸念や不安の声」についても聞き届けているか要確認。懸念や不安が表明されていた場合は、どう対応するのか(したのか)についても要確認。(武貞委員) | 2010年10月中旬に予定されている協議議事録を入手の上、被影響住民の意向および協議事項のRPFへの反映状況を確認します。 |
| 27 | 2010年10月開催の協議の内容を移転政策の枠組み(RPF)に適切に反映すること。また、影響住民の間で本プロジェクトに対する意向を丁寧に確認すること。(村山委員) | 協議議事録を入手の上、被影響住民の意向および協議事項のRPFへの反映状況を確認します。 |
| 28 | Entitlement Matrix(補足調査の表2-4)において、実施担当者が不明な箇所あるため、明確にすること。(村山委員) | 事前配布いたしました補足調査のうち、p2-16およびp2-17に責任機関の記載漏れがあります。p2-16については地方自治体(Governorate)および事業実施機関(NAT)、p2-17については事業実施機関が責任機関となります。 |
| 29 | 極貧層(Very Poor)への対応については、正規居住者のみを対象にしているようにも読めるが、非正規居住者と同定された者に対しても同様の措置を取ることを確認すること。また、これらの層への特別な支援の具体的な内容を明確にすること。(村山委員) | Very Poorは合法、非合法にかかわらず、生計安定化支援または職業転換支援を受ける対象となります。 |
| 30 | 補償/支援の判定を行う評価委員会(Assessment Committee)のメンバー構成や運営方法については、公正を期すこと。(村山委員) | Assessment Committeeの構成は、エジプト国内法制度により定められており、地方自治体、環境担当機関、公共測量機関、事業実施機関となっています。JICA環境社会配慮ガイドラインに基づく補償内容を確保ため、別途事業実施機関による査定を行うこととなっています。 |
| 31 | 被影響住民に対する代替地の必要の有無、また必要な場合の確保の状況について明確にすること。(村山委員) | 移転対象者数が少ないため、大規模な移転地の確保は必要としていません。代替地については必要に応じて確保されるものと考えられます。 |
| 32 | 4.(1).g 実際何らかのアグリーメントを個別に締結するのか。する場合、どのような内容のものをいつまでに必要と考えるのか。(武貞委員) | 現地法に基づく手続きでは、補償費用の算出結果を開示し、不服がある被影響住民は地方自治体等へ不服を申し立てます。不服がない場合は、所有権譲渡に関する書類にサインす |

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| | | ることになっています。 |
| 33 | 4.(1).i. モニタリング項目は要確認とのことであるが、今後、5.(2).b で言及のあるアタッチメントにそれらの項目が追加されるということか。もしそうなら 5.(2).b においても要確認事項として改めて記載するべきでは。また、EIA レポートの Annex16-12～14 にあるモニタリング項目がエジプト政府が想定している内容なのか。(もしそうだとしたら、PAPs へのインタビュー数で、10%のサンプリングとされていますが、全体数が少ない場合はそのサンプリング数にこだわる必要はない、という点をコメントします)(武貞委員) | 住民移転にかかるモニタリング項目は 5.2.(b)で言及している Attachment に追加されますので、その旨、環境レビュー方針に追記いたします。 EIA Report に掲載されているモニタリング項目は、エジプト政府の承認機関が承認したものです。 |
| 34 | 4.(1). i. モニタリングの過程においては、可能な限り(頻繁かつ直接)立ち退き(補償)対象者から意見聴取することが望ましい(異議申し立て制度だけに依存せず、積極的に問題の芽を見いだすべき)(武貞委員) | モニタリングにおいては被影響住民からの意見聴取が行われる予定です。 |
| 35 | 4.(2). h, i. 補償対象者と非対象者の線引きによって、コミュニティ内での対立や紛争が生じる可能性はないとは言えない。特に補償対象者に近接する非対象者がある場合には、線引きに関する事前の説明を丁寧に行いかつ、事業開始後に当初想定されていなかった悪影響が「非対象者」のプロパティに生じていないかをモニタリングの過程で確認、必要に応じて当初の線引きを越えて補償等の手当をとることが望ましい(武貞委員) | コミュニティ内での対立や紛争の可能性がないとは言えないと考えています。当初想定されていなかった被影響住民への補償については事業実施機関と協議いたします。 |
| 36 | RPF実施のための具体的な 予算規模 に関する情報が一部不明確であるため、可能な限り明確にしたうえで、費用負担の方法について確認しておくこと。(村山委員) | 用地取得・住民移転に必要な予算は事業費の一部として確認いたします。 |
| | モニタリング | |

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| 37 | 地下水に関して、対象地の地下水存在状況や地質、駅整備やトンネル施工に伴う工法等から、本プロジェクトの工事段階及び供用段階では地下水位に大きな影響は発生しないとの評価であるが、提示された Environment Monitoring Plan では、井戸により地下水位モニタリングを行い、その状況を監視している。これに関して、観測井戸の適正な配置に留意するとともに、供用後の水位監視における観測頻度について明記すること。(田中委員) | 地下水関連のモニタリングについては、頻度は月に1度、期間はトンネル工事等の地下水に影響を与える可能性のある工事の実施中及び同工事終了後3カ月程度と考えています。したがって、工事終了時期によっては供用後にモニタリングが行われる可能性もあります。 上記に従い、環境レビュー方針の Attachment を修正いたしました。 |
| 38 | Natural Environment (3)Hydrology 地表水および地下水位への影響のモニタリングは、どうなっているか。Attachment では、地下水位モニタリングを G1 観測井では工事中に実施としているが、その期間および頻度等が不明である。また、G2 観測井では毎月としているが、この期間は工事中か。2)供用後(運用段階)での観測井についても、期間および頻度が不明である。常時ということか。(Others (2)Monitoring (b)も同様)(高橋委員) | |
| 39 | 工事中の地下水レベルのモニタリングのうち G1 の観測井については、モニタリングの頻度は月ごとという理解でよいか。(村山委員) | |
| 40 | 供用時の観測井でのモニタリング期間および頻度について明確にすること。(村山委員) | |
| 41 | Environment Monitoring Plan における供用段階のモニタリングに関して、各項目(大気、騒音、地下水位等)の監視期間の考え方がありようであれば、明記することが望ましい。(田中委員) | 各項目のモニタリング期間の考え方について確認します。 |
| 42 | EIA 7.6 Monitoring Plan では、Terrestrial life もモニタリング項目となっているが、他方、環境レビュー方針 Others (2)Monitoring (b) (Attachment) では都市化により生態系影響なしとして実施項目に入っていない。この相違はなぜか。(高橋委員) | 質問・コメント 10 への回答のとおり、生態系への影響は negligible と考えられることから、環境レビュー方針の Attachment のモニタリング項目に含めておりません。 |

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| 43 | 気温、廃棄物、労働安全・衛生における定期的なモニタリング結果の反映方法を明確にすること。(村山委員) | 工事中のモニタリングは事業実施機関が、供用後のモニタリングは運営・維持管理機関が行い、必要な対応が実施されます。操業段階の気温、労働安全、衛生管理につきましては、運用中の地下鉄路線においても、運営・維持管理機関により対応されています。 |
| 44 | モニタリング計画の一部の項目において実施機関が不明確な場合があるので、可能な限り特定に努めること。(村山委員) | モニタリング計画の実施機関については特定に努めます。 |
| 45 | モニタリング結果の公開方法についてどのような形式が可能か確認すること。(村山委員) | エジプト法令上、モニタリング結果の公開に関する規定はありません。公開の可否を含めて実施機関と協議します。 |
| | 苦情処理システム | |
| 46 | 苦情処理システム ・正規居住や事業者の補償のみならず、非正規の居住者や事業者への支援も含むこと。 ・システムの実施体制や運用方法について、より具体化すること。特に、補償/支援の支払い後も対応できるような枠組みの提示すること。(村山委員) | 苦情処理機関は地方自治体および事業実施機関に設置されます。事業実施機関に設置される苦情処理機関は、すべての被影響住民から事業実施期間中、苦情を受け付ける予定です。苦情に対する友好的な解決策が見つからない場合、エジプト法に基づき裁判が行われます。苦情処理機関の仕組みについては事業実施機関より被影響住民に通知されます。 |
| | その他 | |
| 47 | そもそもマスタープランではなぜ地下鉄の優先順位が高くなっているのか。地上の鉄道、MRT、トラム等のほうが工事費は安く、ユーザーにとっても利便性は変わらないはず。(岡山委員) | 対象地域はすでに都市化しており、地上の交通システムの開発はきわめて困難であり、初期段階よりエジプト政府側も否定的だったと聞いています。 |
| 48 | 交通渋滞緩和、道路依存率低減が目的であるならば、その目的に対しての予測される影響の明示を。トリップ量・率のシフト。(岡山委員) | 事業実施に伴うモーダルシフトに関しましては、事業実施効果として把握される事項と考えますので、環境レビュー方針には含めていません。 (なお、F/Sにおいて、カイロ市内の輸送手段における地下鉄の割合は、2008年の12.2%から2027年には17.8%まで増加する見込みとなっています。) |

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| 49 | <p>Social Environment (2) Living and Livelihood (h) 地下鉄は地域社会にとって便利で交流が活発になるとしているが、料金設定は多くの住民が利用しやすいものとなる予定か。(高橋委員)</p> | <p>乗車料金については、利用者の利便性等の観点から検討される事項と考えますので、環境レビュー方針には含めていません。 (4号線の乗車料金は1~3号線と同レベルに設定される予定です。現在、地下鉄の乗車料金は一律1ポンド(約0.18ドル)となっており、運行している1号線、2号線は合計200万人/日の乗客数を記録しています。)</p> |

環境レビュー方針

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
|---------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| 1 Permits and Explanation | (1) EIA and Environmental Permits | (a) Have EIA reports been already prepared in official process? | Y/N | (a) The original EIA report has been completed and submitted to EEAA on March 2010. The addendum EIA report is under preparation as of September, 2010. Addendum EIA is planned to be submitted to EEAA in early October. | |
| | | (b) Are the EIA reports written in the official or widely used language? | Y | (b) EIA reports are written both in Arabic and in English. Arabic is the national language in Egypt. | |
| | | (c) Have EIA reports been approved by authorities of the host country's government? | Y/N | (c) The original EIA report has been approved on 11th July 2010. The addendum EIA report is under preparation as of September, 2010. Addendum EIA is expected to be approved in November. | Addendum EIA の承認状況 |
| | | (d) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? | N | (d) The approval for original EIA includes some conditions. Conditions will be complied by NAT. As for addendum EIA, since the report has not been approved yet, it is not known whether the conditions are set or not. | Addendum EIA に係る付帯条件の有無および対応方針 |
| | | (e) Are the EIA reports available at all times for perusal by project stakeholders such as local residents, and is it allowed to make photocopy of it? | Y | (e) EIA reports will be available at the main office of NAT in Cairo, and its' web site, as well as JICA headquarter and its' website. It is allowed to make photocopy of them at JICA. | NAT での EIA のコピー取得可否 |
| | | (f) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of | Y | (f) In addition to the above approvals, it is required to obtain a permission from Supreme Council of Antiquities (SCA). | SCA から取得が必要とされる許認可の内容、タイミングおよび実施計画 その他の許認可および責任 |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | the host country's government? | | | 機関 |
| | (2) Explanation to the Local stakeholders | (a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? | Y | (a) Brief description of the project and the potential impacts were explained to the local stakeholders through group consultation at the scoping stage and stakeholder consultation meeting, held on 28 th December, at draft-report-stage. There was no opposition against the project from the participants. | |
| | | (b) Have the dates and places of stakeholder consultation been informed to the local stakeholders prior to the consultation meeting? | Y | (b) Dates and places of stakeholder meeting were informed by individual invitation letter, press advertising, and notice board of the local city councils. | |
| | | (c) Have the project been explained to the public in the language which local stakeholders can understand? | Y | (c) Brief description of the project and its impacts were explained through stakeholder consultations in Arabic, which most of the local stakeholders can understand. | |
| | | (d) Have the minutes of stakeholder consultations been prepared? | Y | (d) Minutes of the stakeholder consultations were prepared and attached to the EIA report. | |
| | | (e) Have the comment from the stakeholders (such as local residents) been reflected to the project design? | Y | (e) Various opinions and suggestions were exchanged at the stakeholder meetings. Comments raised at the meetings were integrated in the final EIA reports as well as project design accordingly. | |
| | (3) Examination | (a) Have alternative plans of the project been examined with social | Y | (a) With the urbanization of Cairo, overdependence on roads and fast popularization of automobiles had been accelerated, | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
|---------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| | of Alternatives | and environmental considerations? | | Besides, traffic congestion has been aggravated and vehicle pollution such as air pollution and noise has been escalated. Since the capacity of existing public transportations such as buses and railways is limited, and it is difficult to expand roads because of land shortages, construction of MRT 4 is required. Without this project, existing traffic congestion and vehicle pollution will not be alleviated. As for route selection, environmental and social aspects such as air pollution, land acquisition and resettlement, noise, and landscape have been examined as well as technical and economic aspects. (Details are described in 4, (1), (a)) | |
| 2 Pollution Control | (1) Air Quality | (a) Is there a possibility that emission from depot will cause air pollution in surrounding areas? | N | Air pollution in surrounding area caused by emission from depot will be negligible because the depot will be located in the desert area without any residential areas or sensitive receptors nearby. Moreover, indoor air quality shall be maintained and monitored in accordance with legally complying "Health Safety and Environmental Plans" in the operation phase. | |
| | | (a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? | Y | No earthmoving activities will be implemented during operation phase. The impact on water quality during construction and its mitigation measures are described in 5 (1) (a). | |
| | (2) Water Quality | (b) Do effluents from the project facilities, such as stations, comply with the country's effluent standards | Y | (b) The effluents from depot and stations will not contain the pollutants with high concentrations to be specifically treated. Therefore no or negligible impacts are expected. | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | and ambient water quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards? | | | |
| | (3) Wastes | (a) Are wastes generated from the project facilities, such as stations and depot, properly treated and disposed of in accordance with the country's regulations? | Y | (a) Wastes generated from the Project facilities, such as stations and depot, are properly treated and disposed of in accordance with the Egyptian regulations such as Law 4/1994. Wastes will be collected by private collectors and be disposed to existing dumping site. | |
| | (4) Noise and Vibration | (a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards? | Y | (a) In the case of this Project, stations from No. 1 to No. 15 and tracks are underground. The track level from ground surface level is approximately 20-30 m depth, and the Project route is almost located under the road area. Depot and station No.16, which will be constructed at-grade and trench section, are in the desert area without any residential areas or sensitive receptors nearby. Therefore it is not expected that the noise from train service would cause the negative impact. As for Vibration, negligible impact from train service is expected, since the track level from ground surface level is approximately 20-30m depth and it is enough to damp the vibration level from the vibration-generating source (train service) to the receptors on the ground surface. | |
| | (5) Subsidence | (a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of | N | (a) No or negligible impact of subsidence is expected, judging from geotechnical aspect and construction aspect as follows; - N-value of cohesive soil along the Project route is over 10. | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | groundwater will cause subsidence? (especially in case of Undergrounds/Subways) | | Therefore, the possibility of the ground subsidence is expected to be quite low. -Tunnel Boring Machine (TBM) will be applied to construct the waterproof tunnel which will not cause the groundwater penetration into the tunnel. - The watertight outer wall will be installed around the station construction sites before starting excavation works in order to prevent the groundwater penetration into the sites. Whenever necessary, the outer wall will be deepened to impermeable layer, as well as soil improvement on the bottom of the excavation sites will be provided to prevent the inflow of groundwater from the bottom of the sites. | |
| | (6) Soil Contamination | | N | There are no project components or activities which cause soil contamination. | |
| 3 Natural Environment | (1) Protected Areas | (a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas? | N | (a) The Project area does not include protected areas, and does not locate close to protected area. There is no possibility to affect the protected area due to Project. | |
| | (2) Ecosystem | (a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? | N | (a) There is no ecologically valuable habitats in the Project Area. While the Project area is highly-urbanized, construction activity will not affect ecosystem of surround area. Therefore, there is no major issue on ecosystem to be cautioned. | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? | N | Ditto | |
| | | (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? | N/A | N/A | |
| | | (d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accident of wildlife and livestock? | N/A | N/A | |
| | | (e) Is there a possibility that installation of rail roads will have impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered? | N | Same as (a) | |
| | | (f) In cases the project site is located | N/A | N/A | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments? | | | |
| | (3) Hydrology | (a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows? | N | <p>(a) The scale of underground aquifer in and around the project area is large enough compared with the scale of the underground structure designed in the Project. Therefore the structures constructed by the project will not block water off, and water can flow around the structures.</p> <p>There is a silt clay layer on top of the aquifer, but it is not completely in an artesian condition. Therefore, it is not expected that the water will be burst in other places due to construction of the tunnel and the stations.</p> <p>For the construction of the tunnel, Tunnel Boring Machine (TBM) will be applied to construct the waterproof tunnel which will not cause groundwater penetration into the tunnel. For construction of the stations, watertight outer wall will be installed around the station construction sites before starting excavation works in order to prevent the groundwater penetration into the sites.</p> <p>Whenever necessary, the outer wall will be deepened to impermeable layer, as well as soil improvement on the bottom of the excavation sites will be provided to prevent the inflow of groundwater from the bottom of the sites.</p> <p>Therefore, no or negligible impact on hydrology of surface and ground water flows is expected.</p> <p>Monitoring of groundwater level is proposed at the existing wells</p> | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | | | near the Project area during construction stage. | |
| | (4) Topography and Geology | (a) Is there a soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed? | N | (a) Existence of a soft ground is not reported along the Project route. And construction works of major facilities such as tracks and stations will be made underground. Therefore, no possibility of causing slope failures or landslides is expected. | |
| | | (b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides? | N | Ditto | |
| | | (c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff? | Y | (c) The surface areas where cut and cover method will be applied are limited to the stations' construction, therefore the possibility of soil runoff due to construction work will be negligible. | |
| 4 Social Environment | (1) Resettlement | (a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? | Y | (a) It is expected that 11 households (47 people), 20 shops and 31 street stalls will be relocated due to Project implementation. Necessary efforts to minimize the impacts due to resettlement have been made in the Project design. In the alternative analysis of the route at the Giza square, the alignment along the Pyramids road was chosen, because the impact of land acquisition and resettlement will be less in the case of Pyramids road compared | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | | | with the other alignment case. Moreover, in order to minimize the magnitude of resettlement, the metro line 4 is planned to be constructed under the existing road area wherever possible, as well as TBM method without open-cut work is planned to be applied between the stations. | |
| | | (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? | Y | (b) At the 2nd stakeholder meeting at disclosure stage of draft EIA report held on 28 th December 2009, overall explanation was provided on resettlement and compensation. Moreover, additional consultation meeting is planned to be held in October, and compensation policy will be explained to the stakeholders. | 10月実施予定の住民協議に係る議事録を入手、住民意見のRPFへの反映状況 |
| | | (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? | Y | (c) Resettlement Policy Framework (RPF) is under preparation based on results of the socio-economic survey conducted during Feasibility Study. People who are eligible for compensation or/and assistance are, owners and occupants (including those who do not have legal title) of lands and structures, public properties, shop owners, employees, tenants, and owners of street stalls. Land and structures will be compensated at full replacement cost. Non owners such as tenants and employees will be provided cash or the other kinds of assistance to restore their livelihoods and living standards. | Entitlement Matrix 最終案 用地取得、住民移転に必要な予算規模 |
| | | (d) Are the compensations going to be paid prior to the resettlement? | Y | (d) Compensation will be paid before resettlement. | |
| | | (e) Are the compensation policies prepared in document, and in case the scale of resettlement is large, has | Y | (e) A report of RPF, in which compensation policies are described, is under preparation, and will be prepared by November. | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | the resettlement plan been disclosed? | | | |
| | | (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? | Y | (f) People who are less than poverty line will be provided special assistance in addition to compensation for lands or assets. | Special assistance の具体的内容 |
| | | (g) Are agreements with the affected people obtained prior to resettlement? | Y | (g) There was no objection against the project implementation in past stakeholder consultations. | 10 月実施予定の住民協議に係る議事録を入手、特段の反対意見の有無、懸念事項への対応案。 |
| | | (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? | Y | (h) Overall responsible agency for land acquisition and resettlement of the project is NAT. NAT will prepare the necessary budget. Cairo and Giza governorate will execute land acquisition and resettlement, while NAT will execute additional assistance. | NAT、カイロ県、ギザ県が実施する具体的作業 |
| | | (i) Are any plans developed to monitor the impacts of resettlement? | Y | (i) Monitoring is planned to be implemented in terms of progress of resettlement, implementation of assistance, grievance redress, etc. | モニタリングの項目、頻度、実施者 |
| | | (j) Is the grievance redress mechanism established? | Y | (j) The grievance redress mechanism will be established. Details are under consideration as of September 2010. | 具体的な苦情処理体制、手順 |
| | (2) Living and Livelihood | (a) Where railways are newly installed, is there a possibility that the project will affect the existing means | Y | (a) Based on the findings of stakeholder meetings, there is negligible possibility to affect negatively the existing traffic means such as taxi and minibus along the Project route. Some | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts? | | possibility of uncontrolled land use change is expected due to the new stations of the Project, although this change is considered as secondary effect. Close coordination with such authorities as local governorates is proposed for proper land use planning and development near the new stations. | |
| | | (b) Is there any possibility that the project will adversely affect the living conditions of inhabitants other than the affected inhabitants? Are adequate measures considered to reduce the impacts, if necessary? | Y | (b) No impact is expected, since the metro will be constructed underground and does not affect the land use at-grade. | |
| | | (c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary? | Y | (c) The health care system including prevention of communicable diseases will be planned for workers' camps by contractor(s) based on the recommendations of EIA. | |
| | | (d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., by causing increases in traffic | Y | (d) There is some possibility of blocking the traffic flow by attracting unplanned and informal public transportation such as minibuses and taxis in large numbers near the new stations. In order to reduce the possible impact on the traffic flow, parking | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
|----------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| | | congestion and traffic accidents)? | | areas for buses and cars near the new stations will be planned in cooperation with relevant authorities (Ministry of Interior, Governorate, etc) whenever necessary. | |
| | | (e) Is there any possibility that railways will impede the movement of inhabitants? | Y | Same as (b). | |
| | | (f) Is there any possibility that structures associated with railways (such as bridges) will cause a sun shading and radio interference? | N | (f) Since major facilities such as tracks and stations will be constructed underground, no possibility of sun shading or radio interference is expected. | |
| | | (g) Is there any possibility that the project cause physical community division? | N | (g) Since most of the project alignment will be underground, and the depot area which is the only section constructed at-grade is located in a desert, no impact of physical community division is expected. | |
| | | (h) Is there any possibility that the project will bring misdistribution of benefit and damage among the local communities? | N | (h) Although project implementation will cause PAPs, they will be compensated appropriately. On the other hand, the project produces the local communities the convenience of transportation and enhances inter-regional exchange widely. Therefore the possibility of bringing misdistribution of benefit and damage among the local communities due to the project is limited. | |
| | | (i) Is there any possibility that local conflict will be caused because of the project? | N | (i) Since the possibility of bringing misdistribution of benefit and damage among the local communities due to the project is limited, the possibility of local conflict will be minor | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | (3) Heritage | (a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws? | N | (a) This project is designed to avoid existing archaeological properties. During the feasibility study, archaeological asset study has been conducted, and the conceivable countermeasures and the actions have been prepared. Further investigation is planned around the AI Remayah Squire station, where probability of discovery of archeological properties underground is higher, by non-destructive method and/ or borings before construction stage. | |
| | (4) Landscape | (a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken? | N | (a) Negligible impact on landscape is expected due to the Project, since the major facilities such as tracks and stations will be constructed underground | |
| | (5) Ethnic Minorities and Indigenous Peoples | (a) Is there any ethnic minorities and indigenous people at the project site? | N | (a) There is no ethnic minority and indigenous people in the project area. | |
| | | (b) If there are, are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? | N/A | N/A | |
| | | (c) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected? | N/A | N/A | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
|----------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| | | (d) Have Indigenous People Plan (IPP) been already prepared and disclosed? | N/A | N/A | |
| | | (e) Have agreements reached with Indigenous Peoples' communities? | N/A | N/A | |
| | (6) Working Conditions | (a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? | N | (a) The Project proponent will fulfill the requirements to protect working conditions according to Law 4/1994. | |
| | | (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? | Y | (b) The HSE unit of ECM will provide the safety considerations to prevent the individuals, such as first-aid kit, emergency light, fire fighting system, etc. | |
| | | (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? | Y | (c) Staff training will be provided by HSE unit in ECM, regarding emergency response, fire protection, sanitary, etc. | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents? | Y | (d) Traffic police for the stations and the specific security for depot will be arranged appropriately. | |
| 5 Others | (1) Impacts during Construction | (a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? | Y | <p>Adequate measures will be planned and provided to reduce the negative impacts of environmental pollution during construction stage as described below.</p> <p><u>Noise & vibration</u>: All generators and pumps will be positioned so as to minimize noise and vibration disturbance, and where necessary, acoustic enclosures will be provided. Localized noise barriers which are usually movable wall for enclosing the points of generators or high duty compressors will be erected as necessary.</p> <p><u>Turbid water</u>: Turbid water will be generated by shielding and cut-and-cover works. Treatment plants for turbid water will be installed.</p> <p><u>Dust, exhaust gases</u>: Installing a safety fence along the site boundaries and spraying water during cut-and-cover works will mitigate dust diffusing.</p> <p><u>Wastes</u>: The excavated soil from station construction is loaded to trucks, which transfer it to the assigned disposal areas. The generated soil waste resulting from TBM operation will be treated in the mud treatment station to separate the bentonite from the soil before being disposed in the assigned disposal area. Solid and hazardous waste will be treated according to Egyptian</p> | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | | | | regulation and standard. | |
| | | (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? | Y | (b) The Project area is located in metropolitan city with high urbanization. Therefore, there are no issues of ecosystem to be cautioned on construction activities. | |
| | | (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts? | Y | (c) Adequate measures will be planned and provided to reduce the negative impacts of social environment during construction stage, such as road decking to reduce traffic jam at stations' construction sites, temporary pedestrian paths, etc. | |
| | | (d) If the construction activities might cause traffic congestion, are adequate measures considered to reduce such impacts? | Y | (d) There will be possibility to affect the road traffic near the construction sites of stations where cut and cover method will be applied during the construction stage. Road decking at the construction sites of stations will be applied to reduce the negative impacts on traffic conditions. Moreover, negative impacts on roads and traffic conditions during the construction phase will be mitigated through i) minimizing the scale and duration of the temporary lane occupation of the road, and ii) using alternative routes to bypass affected section to reduce the traffic volume load at the construction sites. | |
| | | (e) Are adequate measures considered to reduce accidents during construction? | Y | (e) There is a possibility of accident due to the operation of heavy equipment and heavy vehicles during the construction stage. Constructors provide a safety training to workers in order to avoid any risks caused by operational mistakes as well as to promote consciousness of importance about the role of safety equipments such as safety helmets. | |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | (2) Monitoring | (a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? | Y | (a) Environmental monitoring plan is proposed for pre-construction, construction and OM stages of the Project, based on the impact prediction and mitigation measures proposed. | |
| | | (b) What are the items, methods and frequencies of the monitoring program? | Y | (b) Items, methods and frequencies of the monitoring is summarized in attachment.. | 用地取得および住民移転に関するモニタリング方針 観測井戸の水位モニタリングの観測頻度 モニタリング期間およびモニタリング期間の考え方 |
| | | (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? | Y | (c) Institutional arrangement to carry out the monitoring plan is proposed including entities concerned and roles of each entity. | 工事中および供用時のモニタリング実施機関、部署、人員、機材の整備状況、予算等 |
| | | (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities? | N | (d) There is no regulatory requirement in Egypt such as reporting system of monitoring results. | |
| | | (e) Will the results of monitoring be disclosed to local stakeholders? | | (e) There is no regulatory requirement of disclosing monitoring results. | モニタリング結果の公開可否、可能な場合はその範囲 JICA による公開可否 |

| Category | Environmental Item | Main Check Items | Yes: Y No: N | Confirmation of Environmental Considerations (Reasons, Mitigation Measures) | 要確認事項 |
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| | Reference to Checklist of Other Sectors | (a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation). | N | (a) The Project does not have relevance to forest or forestry since the Project locates in the urban area where any primal nature is not observed. | |
| | | (b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities). | Y | (b) High Voltage Station will be located next to the existing high voltage line. Therefore incremental electromagnetic field impacts are considered to be negligible. | |
| 6 Note | Note on Using Environmental Checklist | (a) If necessary, the impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming). | N | (a) Although, there is a possibility increased GHG emission due to the operation of heavy vehicles as well as traffic jams incidental to the construction works, this impact will be temporary. On the other hand, it is expected that the GHG emission will be reduced due to the modal shift of transportation from passenger cars/buses to the new metro. Therefore, no impacts are expected on transboundary or global issues, considering the Project characteristics and scale comprehensively. | |

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Attachment : The summary of Environmental Monitoring Plan

1) Construction stage

| Monitoring Parameters | Monitoring location | Monitoring duration /Frequency | Party implementing the measure |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Air Qualit TSP, PM10, CO, NOx, SOx | Next to Constructed Station/ Facilities | 24 hours /Every Month | Construction Contractor, supervised by NAT |
| Noise intensity | Next to Constructed Station/ Facilities | 24 hours /Every Month | Construction Contractor, supervised by NAT |
| Vibrations | Next to Constructed Station/ Facilities | 24 hours /Every Month | Construction Contractor, supervised by NAT |
| Groundwater Levels | All monitoring wells | Before construction /Monthly | Construction Contractor, supervised by NAT |
| | Group one (G1) wells | During Construction up to 3 months after the activity which may affects water level /Monthly | |
| | Group two (G2) wells | | |
| Groundwater Quality BOD, COD, TDS, Chlorides, Nitrates, total Phosphate, Oil & Grease, Bacteriological parameters | All monitoring wells | Annually | Construction Contractor, supervised by NAT |
| | Group one (G1) and Group three (G3) | During construction up to 3 months after the activity which may affects water quality /Monthly | |

2)Operation stage

| Monitoring Measures | Monitoring location | Monitoring duration /Frequency | Party implementing the measure |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Air Quality CO, CO2, NOx, PM10,TSP,SOx | Outside each station | 24h or 1hr /Quarterly up to 3 months after beginning of operation | - Third party (e.g. Research Centers or Universities) |
| Noise Intensity | Next to identified sensitive receptor | 24h /Monthly up to 3 months after beginning of operation | - HSE Department - Third party (e.g. Research Centers or Universities) |
| Groundwater Levels and Surface and groundwater quality - BOD, COD, TDS, Chlorides, Nitrates, total Phosphate, Oil &Grease - Bacteriological parameters | monitoring wells | After construction / Monthly up to 3 months after beginning of operation | Third party (Research Centers or Universities) |
| Heat Stress-Temperature | Station and Depot | Every day / periodic check up to 3 months after beginning of operation | Third party (Research Centers or Universities) |
| Solid and hazardous waste - Volumes of waste for re-use, recycle and/or final disposal - Treatment procedures and final fate of solid wastes | Station and Depot | Every day / periodic check up to 3 months after beginning of operation | HSE Department (Environment Unit) |
| Workforce Health and Safety -Inspection on use of health and safety gear - Medical treatment of workers in case of Injuries and/or illnesses - Checking first aid kits and safety gear. | Station and Depot | Every day / periodic check up to 3 months after beginning of operation | HSE Department |

カイロ地下鉄4号線 環境社会配慮助言委員会WG会合（10月13日）用コメント（兼助言案）

本日開催予定の助言委員会WG会合に出席できないため、以下のとおり書面にてコメント申し上げます。事前に提出した質問／確認事項に対するJICA側の回答／説明を受けてあらためて作成したものです。各項目の冒頭の番号は、JICA側でとりまとめの際に付した連番です。

16.

1.(2).e ステークホルダー会合におけるどのようなコメントがどう反映されたかは、既にJICAとして確認済みと思うが、環境レビュー自体を将来公表するのであれば、主要な議論の内容については例示するなど少し説明を加えておいた方が良いのではないかと（現在のconfirmationの内容は不十分では）

→ 説明了解しました。（特に助言の必要はなし）

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17

4.(1). c, e RPF (Resettlement Policy Framework) は現在策定中であり、今後レビューの予定とあるが、それは今回のものとは別の環境レビューとして扱われるのか（すなわち、RPFに対するレビュー／確認作業は助言委員会との関係ではどうなるのでしょうか）

→ 説明了解しました。一方、今後JICAのアプレイザル前に最終ドラフトが提示されるということは、今後JICAがアプレイザルにおいて、これまで先方が説明してきた骨子と相違があるのかどうかという観点から再確認をされると考えます。したがって、環境レビュー方針の要確認事項において、「RPFの内容について、これまでの方針等からの変更の有無を確認する」という項目が要確認事項として追加されるべきと考えます。

具体的助言案としては、以下のとおりです。

| |
|------------------------------------------------------------|
| 「今後提示されるRPFについてこれまでに確認済みの方針からの変更点の有無を確認することを、要確認事項に明記するべき」 |
|------------------------------------------------------------|

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18

4.(1).g 実際に何らかのアグリーメントを個別に締結するのか。する場合、どのような内容のものをいつまでに必要と考えるのか。

→ 説明了解しました。（特に助言の必要はありません）

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19

4.(1).i. モニタリング項目は要確認とのことであるが、今後、5.(2).b で言及のあるアタッチメントにこれらの項目が追加されるということか。もしそうなら 5.(2).b においても要確認事項として改めて記載すべきでは。また、EIAレポートのAnnex16-12～14にあるモニタリング項目がエジプト政府が想

定している内容なのか。(もしそうだとしたら、PAPsへのインタビュー数で、10%のサンプリングとされていますが、全体数が少ない場合はそのサンプリング数にこだわる必要はない、という点をコメントします)

→ 説明了解しました。環境レビューにおいて用地取得や住民移転に関するモニタリング方針を確認するということですので、サンプル数については今回のように補償対象者が少ない場合は、可能な限り全数調査をめざし、10%という枠にこだわる必要がないことを実施機関に協議/確認いただければと存じます。助言案として明記するレベルにはないと思いますが、要望いたします。

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20

4.(1). b, c 立ち退き(補償)対象者すべてに、つまりNon-ownerにも説明が行き渡っているか要確認。例えば大家や使用者にだけ伝えて事足りるとするのではなく、店子や従業員にも実施機関が直接コンタクトしているかどうかを確認すべき

→ 説明了解しました。一方、用地取得に関するDecreeが出るまで、移転対象住民と実施機関の間のコンタクトがとれないということは、用地取得が「決定」してからでなければ、対象者全員が確実に知ったとは言えない、ということの意味すると理解します。ステークホルダー協議には、可能な限りの周知はしたので、参加してくれていれば、ということだと思いますが、やはり被対象者については、確実に自らが対象であるということを知ったうえで、ステークホルダー協議への参加の有無の決断等がなされるべきと考えます。したがって、環境レビュー方針の要確認事項に対して以下の助言を行いたいと考えます。

以下助言案

| |
|-----------------------------------------------------------------|
| 「立ち退きの対象の <u>すべての</u> 人々に、立ち退き対象であること、補償の方法等について説明を行ったかどうか確認する」 |
|-----------------------------------------------------------------|

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21

4.(1). g. (明確な)「反対意見」に限定せず、「懸念や不安の声」についても聞き届けているか要確認。懸念や不安が表明されていた場合は、どう対応するのか(したのか)についても要確認。

→ 説明了解しました。(既に反映されており特に助言の必要はなしと考えます)

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22

4.(1). i. モニタリングの過程においては、可能な限り(頻繁かつ直接)立ち退き(補償)対象者から意見聴取することが望ましい(異議申し立て制度だけに依存せず、積極的に問題の芽を見いだすべき)

→ 説明了解しました。項目19への対応もあわせて今後留意いただければと思います。

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23

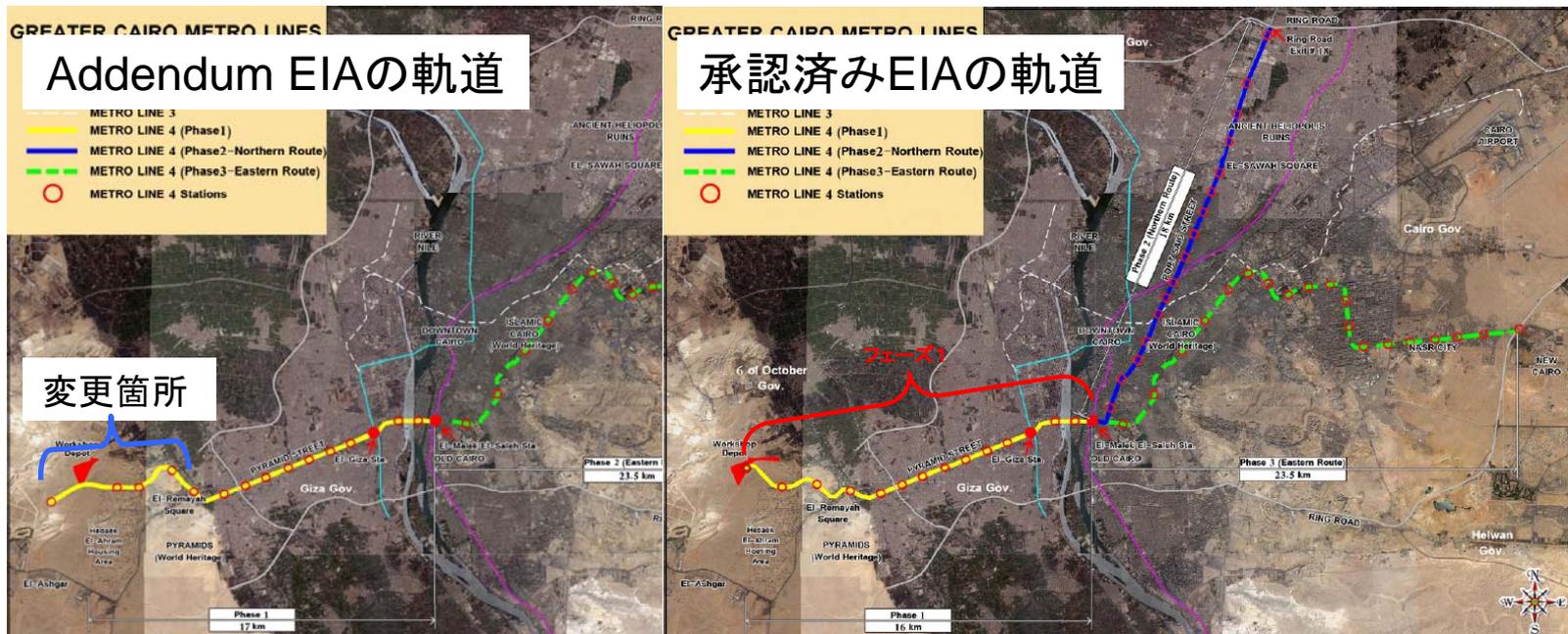
4.(2). h, i. 補償対象者と非対象者の線引きによって、コミュニティ内での対立や紛争が生じる可能性はないとは言えない。特に補償対象者に近接する非対象者がある場合には、線引きに関する事前の説明を丁寧に行いかつ、事業開始後に当初想定されていなかった悪影響が「非対象者」のプロパティに生じていないかをモニタリングの過程で確認、必要に応じて当初の線引きを越えて補償等の手当をとることが望ましい

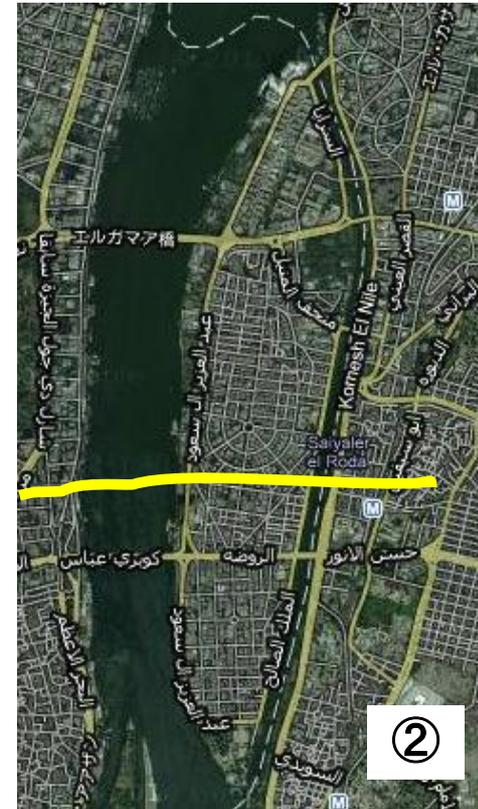
→ 説明了解しました。想定外の影響への補償については、その可能性を十分に考慮し必要な措置をとるよう、実施機関との協議を要望します。

以 上

Environmental Impact Assessment

- 根拠法令: 環境法(1994年法律第4号)
JICA環境社会配慮ガイドライン(2010年4月)
- EIA: 2010年7月11日 環境庁(ECAA)により承認済み
Addendum EIA-ドラフト作成済(2010年10月承認取得予定)
(駅位置および軌道の変更に伴う補足調査)





Google mapを用いて作成 (2010年10月)



El Roda Island