

Country Name	Digital Topographic Mapping Project for Urban Infrastructure Development
Republic of Cote d'Ivoire	

I. Project Outline

Background	The Greater Abidjan covered the area of 750 km ² in total, consisting of the city of Abidjan, the former capital of the country, and its environs. In the area, trunk and sub roads were developed in 1970s when the annual economic growth recorded 8%. However, the political and military crisis in 1990's had impeded maintenance of the existing infrastructure and investment on new infrastructures. As a result, the existing infrastructure to be replaced or rehabilitated considerably deteriorated. In addition, the rapid population growth brought about a dramatic increase in the population by 200% (3 million) for the decade and caused the significant shortage of infrastructure to accommodate the rapidly growing population. Under those situations, urban planning and development based on highly accurate data were urgent issues.										
Objectives of the Project	<ol style="list-style-type: none"> Expected goals through the proposed plan¹: Urban infrastructure development has been promoted in the Greater Abidjan. Expected utilization of the proposed plan: The digital topographic map and the orthophoto map produced by the Project have been utilized for preparation of urban plan in the Greater Abidjan. 										
Activities of the Project	<ol style="list-style-type: none"> Project site: The City of Abidjan and the surrounding area Main activities: 1) Reviewing the existing data for topographic mapping and establishing technical specification, 2) Aerial photography and site survey, 3) Digital plotting, digital editing and symbolization, 4) Geographic Information System (GIS) data structurization, 5) Creation of digital image, 6) Technical transfer, 7) Seminar/workshops for data utilization, etc. Inputs (to carry out above activities) <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Ivorian Side</td> </tr> <tr> <td>(1) Experts from Japan: 11 persons</td> <td>(1) Staff allocated: 11 persons</td> </tr> <tr> <td>(2) Equipment by cooperation agency in Japan: sprinter, handy GPS, handy camera, PC, etc.</td> <td>(2) Land and facilities: office space in Center of Cartography and Remote Sensing for Japanese experts</td> </tr> <tr> <td>(3) Equipment by JICA: GPS observation equipment, software for topographic map, etc.</td> <td></td> </tr> </table> 			Japanese Side	Ivorian Side	(1) Experts from Japan: 11 persons	(1) Staff allocated: 11 persons	(2) Equipment by cooperation agency in Japan: sprinter, handy GPS, handy camera, PC, etc.	(2) Land and facilities: office space in Center of Cartography and Remote Sensing for Japanese experts	(3) Equipment by JICA: GPS observation equipment, software for topographic map, etc.	
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Project Period	October 2013 – October 2015	Project Cost	(ex-ante) 600 million yen (actual) 635 million yen								
Implementing Agency	Geographic Information and Digital Centre (CIGN) (Center of Cartography and Remote Sensing was reorganized to CIGN in 2016).										
Cooperation Agency in Japan	Asia Air Survey Co., Ltd.										

II. Result of the Evaluation

<Special Perspectives Considered in the Ex-Post Evaluation>

- This project set "Preparation of urban plan using the digital topographic map or/and the orthophoto map, and its approval by the Government of Cote d'Ivoire." as one of the indicators in the Expected Goals through the Proposed Plan. As indicated in the indicator, after the project, some urban plans were prepared using the digital topographic map and the orthophoto map produced by this project and approved by the Government of Cote d'Ivoire. However, it should be considered that the other development planning project "Project for the Development of Urban Master Plan in Greater Abidjan" (2013-2015) also contributed to achieving the indicator because the Expected Goals through the Proposed Plan of the project included the same indicator.

1 Relevance
<Consistency with the Development Policy of Cote d'Ivoire at the Time of Ex-Ante Evaluation and Project Completion> The project was consistent with the development policy of Cote d'Ivoire of "The National Development Plan" (2012-2015) declaring preparation of public facilities map and road infrastructure map as a prioritized project for urgent reconstruction at the time of ex-ante evaluation and at the time of project completion.
<Consistency with the Development Needs of Cote d'Ivoire at the Time of Ex-Ante Evaluation and Project Completion> The project was consistent with Cote d'Ivoire's development needs of execution of urban planning and development on the basis of highly accurate data in order to replace and rehabilitate the deteriorated infrastructure in Abidjan.
<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation> The project was consistent with Japan's ODA policy for Cote d'Ivoire (2013), which was under consideration at the time of ex-ante evaluation, prioritizing "acceleration of economic growth" including urban infrastructure in Abidjan as one of the two priority areas.
<Evaluation Result> In light of the above, the relevance of the project is high.
2 Effectiveness/Impact
<Status of Achievement for the Objectives at the time of Project Completion> The objectives of the project were achieved by the time of project completion. A series of items related to the digital topographic map of Abidjan city and its surrounding was produced, such as a set of aerial photos, a set of 1:5,000 scale digital orthophoto data, a set of result

¹ The degree of achievement of expected goals is not to be assessed in principle at the time of ex-post evaluation, since it is defined as the medium-to-long-term goals which will be attained as a result of crystallizing the proposed plan ("output" of the project).

of ground control point survey (data), a set of result of aerial triangulation (data), a set of 1:2,500 scale digital topographic maps (data), a set of 1:2,500 scale digital topographic data, and a set of technical specification (Cartographic Symbolology and Application Rules) (Output 1). The capacity development of counterpart personnel was carried out, and they acquired the expertise in the technical target areas at a certain level, including aerial photography, ground control point survey, aerial triangulation, and etc. (Output 2). On top of these, some suggestions for organizational enhancement were proposed, such as updating of the digital topographic map and orthophoto map produced by the project, reinforcement of the communication infrastructure for WebGIS, and so on (Output 3).

<Utilization Status of the Proposed Plan at the time of Ex-post Evaluation>

The proposed plan has been utilized at the time of ex-post evaluation. The digital topographic map and the orthophoto map developed by the project have been sold to the various organizations, including the government authorities of the National Office of Technical and Development Studies (BNETD) and the Directorate of Infrastructure and Transport of BNETD (BNETD-DIT) and the Côte d'Ivoire Water Utility (SODECI) and the development partner such as the African Development Bank (AfDB).

However, as a budget for updating the maps has not been allocated to CIGN, CIGN has yet to update the maps even at once since the project completion.

Following the suggestions proposed as Output 3, the communication infrastructure for WebGIS was reinforced in order to make it possible for anyone to see and buy WebGIS on the internet. Also, in order for the Government of Cote d'Ivoire to formulate its development plans, tourist map, hazard map, road management data, and data for the development of airports and harbors were created. Yet, technical trainings and seminars on GIS have not been provided to the staff of CIGN because, according to CIGN, the staff has pragmatic experiences and sufficient qualifications.

<Status of Achievement for Expected Goals through the Proposed Plan at the time of Ex-post Evaluation>

The expected goals through the proposed plans has been achieved. Urban plans using the digital topographic map or the orthophoto map were prepared through projects implemented by different organizations such as JICA and Prime Minister's Office, and they were approved by the Government of Cote d'Ivoire. Also, development projects using the digital topographic map and the orthophoto map were formulated and have been under implementation.

<Other Impacts at the time of Ex-post Evaluation>

No other positive and negative impacts were observed at the time of ex-post evaluation.

<Evaluation Result>

In light of the above, the effectiveness/impact of the project is high.

Status of Achievement of Utilization Status of the Proposed Plan and Expected Goals through the Proposed Plan

Aim	Indicators	Results						
Utilization Status of the Proposed Plan: The digital topographic map and the orthophoto map produced by the Project have been utilized for preparation of urban plan in the Greater Abidjan.	1) Sales performance of the digital topographic map and the orthophoto map to related organizations and other donors (Plan name, Project name)	(Ex-post Evaluation) Achieved <ul style="list-style-type: none"> The digital topographic map and the orthophoto map developed by the project have been sold to a wide range of organizations. CIGN did not have any information related to plan/project formulated by using the digital topographic map. [Selling places of the digital topographic map and the orthophoto map] <table border="1"> <thead> <tr> <th>Item</th> <th>Selling places</th> </tr> </thead> <tbody> <tr> <td>The digital topographic map</td> <td>PFO Africa, Cabinet MERLIN, Cabinet TERRABO, BNETD, SODECI, African Development Bank, Gauff Consultant Afrique</td> </tr> <tr> <td>The orthophoto map</td> <td>BNETD-DIT</td> </tr> </tbody> </table>	Item	Selling places	The digital topographic map	PFO Africa, Cabinet MERLIN, Cabinet TERRABO, BNETD, SODECI, African Development Bank, Gauff Consultant Afrique	The orthophoto map	BNETD-DIT
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Expected Goals through the Proposed Plan: Urban infrastructure development has been promoted in the Greater Abidjan.	1) Preparation of urban plan using the digital topographic map or/and the orthophoto map, and its approval by the Government of Cote d'Ivoire.	(Ex-post Evaluation) Achieved <ul style="list-style-type: none"> Urban plans using the digital topographic map or the orthophoto map were prepared through the following projects, and they were approved by the Government of Cote d'Ivoire. <ul style="list-style-type: none"> <The digital topographic map> <ul style="list-style-type: none"> ➢ JICA "Project for the Development of Urban Master Plan in Greater Abidjan" (2013-2015) ➢ Prime Minister's Office "Emergency Plan of the Municipality of Abobo" (2016) <The orthophoto map> <ul style="list-style-type: none"> ➢ The World Bank "Urban Development Project" (2018) 						
	2) Achievement of development projects in each sector such as road, water and sewage, and other infrastructure developments, using the digital topographic map and the orthophoto map	(Ex-post Evaluation) Achieved <ul style="list-style-type: none"> The development projects using the digital topographic map and the orthophoto map were formulated and have been under the following situation: <ul style="list-style-type: none"> ➢ JICA grant aid "The Project for the Construction of Cote d'Ivoire-Japan friendship intersection" (2015): under construction ➢ JICA ODA loan "The Project for the Construction of Three Intersections in Abidjan" (2018-2020): under a bid evaluation ➢ AfDB "The Project for the Construction of 4th Bridge" (2018-2021): under implementation 						

Source: Final Report Summary, interview and questionnaire with CIGN

3 Efficiency

Although the project period was within the plan (ratio against the plan: 100%), the project cost slightly exceeded the plan (ratio against the plan: 106%). The outputs were produced as planned. Therefore, the efficiency of the project is fair.

4 Sustainability

<Policy Aspect>

“The National Development Plan” (2016-2020) sets the prioritized areas including development of infrastructures harmoniously distributed on the national territory and preservation of the environment. As the project aimed at producing the digital topographic map and the orthophoto map for preparation of urban plan in the Greater Abidjan, it has been backed up by the national policy.

<Institutional Aspect>

There has been a change in the institutional setting for operating, maintaining, and updating the digital topographic map and the orthophoto map developed by the project. Although CCT was the organization which plays the role at the stage of project implementation, it was transformed to CIGN after the project completion. Thus, CIGN has taken the role at the time of ex-post evaluation. 40 staff members have been deployed there. According to CIGN, the number of staff members has been sufficient because they have relevant expertise and have performed their roles without any major problems.

<Technical Aspect>

As mentioned above, as the staff members of CIGN have relevant degree and experiences, they have sustained the necessary knowledge and skills for operating, maintaining, and updating the digital topographic map and the orthophoto map developed by the project. In addition, they have an internal training system on the maps, except for GIS, for a technical transfer within the organization.

Some of the manuals (Leveling and Aerial photography) produced by the project still have been utilized to develop an urban plan, while the rest of the manuals (The GPS observation, Installation of aerial signal markings, and Pricking) are unlikely used as CIGN has not recognized them. Also, the technical specification (Cartographic Symbolology and Application Rules) produced by the project has been continuously used to reflect symbols on a map.

<Financial Aspect>

The CIGN had not received a budget from the Government of Côte d'Ivoire for a long time. However, the National Office for Technical Studies and Development where CIGN belongs postulates and obtains contracts whose remuneration ensures its operation, thereby CIGN is able to operate and maintain the digital topographic map and the orthophoto map developed by the project with the budget, which can be confirmed by the above-mentioned status of the project’s effectiveness/impact and sustainability. However, to update the maps needs a further budget, and even though CIGN has made the requests to Ministry of Economy and Finance, the budget has not been allocated yet even at once since the project completion. The situation is likely to be continued in the upcoming few years.

<Evaluation Result>

Therefore, the sustainability of the project effects is fair.

5 Summary of the Evaluation

The digital topographic map and the orthophoto map developed by the project have been utilized by different organizations such as JICA, AfDB, and the government authorities of Cote d’Ivoire. As for sustainability, although the budget for operating and maintaining the maps has been allocated, the one for updating the map has yet to be allocated since the project completion. As for efficiency, the project cost slightly exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

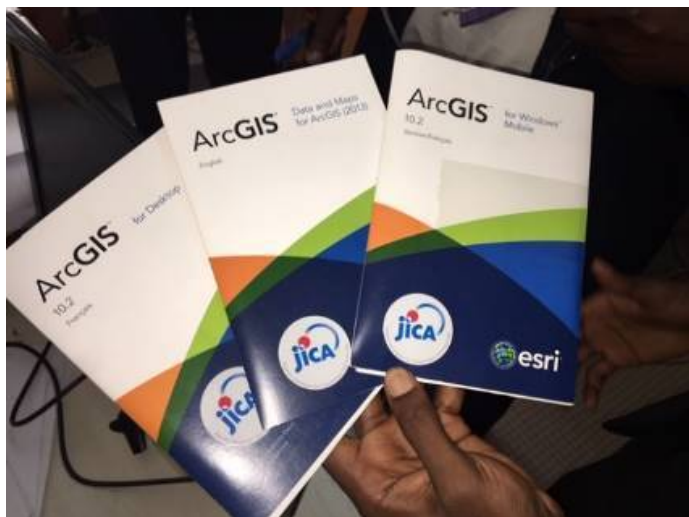
III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

- Due to the lack of budget of CIGN, the digital topographic map and the orthophoto map generated by the project have not been revised, even once since the completion of the project. The relevance of maps will decrease over time if they are not updated. However, the update plan and its budget requested from CIGN to Ministry of Economy and Finance indicate CIGN’s will to update and sustain the project effects. Therefore, in order to enhance the sustainability of the project, it is recommended that CIGN diversify its sources of funding and seek the assistance of donors (UNDP, AfDB, etc.) or other partners to carry out the implementation of maps updating.

Lessons Learned for JICA:

- Even though it is ideal to update the maps produced by the project every three year, CIGN has not been able to update the maps due to lack of its budget. It is recommended that JICA closely monitor the process of securing the budget at the time when the budget distribution is carried out.



Mapping software and user licenses offered by JICA



Map printer offered by JICA