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## **Report on the Development Account Project on the Use of Mobile Technology for Statistical Data Collection in Africa**

### **I. Summary**

1. The present report deals with strengthening the capacity of African countries to use mobile technologies to collect data for effective policy and decision-making, and highlights the main results from phase I of the project and their implications for phase II. The Economic Commission for Africa (ECA) is invited to recommend to member States to adopt the use of mobile technology in statistical processes, to recommend to Governments to make budgets available to develop the use of mobile technology in statistical processes, and to express its views on phase II of the project.

### **II. Background**

2. ECA is implementing a project on the use of mobile technologies to collect data. The project is a Development Account-funded project implemented in two phases so that the results of phase I can be incorporated into the findings for the roll of the methodologies to phase II countries. The Development Account is a capacity development programme of the United Nations Secretariat, aiming at enhancing capacities of developing countries in the priority areas of the United Nations Development Agenda. The main objective of the project is to improve the capacity of countries in using mobile technology to make statistical data available and accessible to support evidence-based policymaking. It is implemented through a series of pilot projects involving five countries in phase I, and an additional five in phase II.

3. The pilot projects are designed to be executed by each country's National Statistical Office (NSO), in collaboration with a National Training and Research Institute (NTRI) designated by the NSO. The NTRI, in collaboration with the NSO, is expected to undertake applied research to adapt and develop appropriate concepts, systems and methodologies for the use of mobile technologies in data collection, and the integration of the collected data into standard statistical processes. In many parts of the world, innovation is generated by training and research institutes, which is not often the case in Africa. This project is therefore trying to bring NSOs and NTRIs to work together from the onset of the activities to ensure acceptability and sustainability. It allows ECA member States to deal with the challenge of ensuring that the concepts and systems being introduced can be localized and therefore support the system.

NTRIs are also expected to develop their own research projects based on the results, thereby ensuring sustainability of the capacities being developed.

4. Another aspect of the project is the “citizen as data collector”. The objective is to develop procedures and tools that enable citizens, untrained in statistics, to submit data on their activities for statistical production. This concept was not exploited in phase I.

5. As part of a situation analysis of target countries to select the pilot countries for the project, a workshop was held in Praia, Cabo Verde, 18-19 March 2014. It was jointly organized by ECA, PARIS21, the African Development Bank and the African Union Commission. In addition, an independent consultant administered a survey of several countries to determine their readiness, and recommended five pilot countries. These five countries were selected on the basis of set criteria that included their level of commitment and readiness to do the project, relevance to their work, mobile penetration, security level/sustainable institutions in the countries, region and language, among other criteria. The consultant’s proposal was presented to a joint meeting of the technical and steering committee that was held during the regional workshop.

6. The Gambia and Tunisia were selected from West and North Africa, respectively, on the basis of presentations by their respective NSOs during the workshop and meeting. The presentations demonstrated the suitability of the countries for the project, and expressed strong commitments. Cameroon (Central Africa) and Kenya (East Africa) were selected on the recommendation of the consultant in the situation analysis report and confirmation was obtained from the countries on their willingness and readiness to participate. Even though the Zimbabwe National Statistics Agency (ZIMSTAT) did not participate in the workshop, Zimbabwe was selected on the basis of presentations by the head of the Zimbabwe non-governmental organization (NGO) Research and Information Services, which made a case for an innovative application that applied the concept of “citizen as data collector”. The NSO was contacted afterwards and agreed to work with the NGO as the NTRI. However, this project could not be realized, as the NGO ran into problems with the Government of Zimbabwe pertaining to its registration. Instead, with the approval of ECA, ZIMSTAT implemented an alternative project on the collection of consumer price survey data without any NTRI. Finally, the Embassy of Ireland in Ethiopia has kindly supported the project in Ethiopia, so one more country has been added to the five funded by the Development Account project.

### **III. Project objectives**

7. The main objectives of the pilot project are to:

- (a) Strengthen the capacity of countries to collect data with mobile technology;
- (b) Experiment with self–enumeration using mobile devices to collect data and determine the suitability of such data for the production of statistics; and
- (c) Strengthen working relationships between NSOs and NTRIs in statistical development.

### **IV. Project activities**

#### **A. Expert group meeting**

8. An ad hoc expert group meeting was organized as a pre-event meeting of the Joint ECA-African Union Commission Statistical Commission for Africa and Committee of Directors-General of National Statistics Offices (StatCom-Africa/CoDG) in December 2014, to discuss challenges that the pilot countries would be expected to encounter in the use of mobile technology for data collection. This ad hoc expert group meeting also contributed to enhancing an ongoing working document based on the recommendations and lessons learned from African experiences in introducing mobile devices in data collection. Since no guidelines exist to assist African countries in the best way to implement this new tool of data collection,

the ultimate aim of this meeting was to have a comprehensive document to guide the implementation of mobile devices in data collection and statistical production in the member States of the region.

## **B. Training**

9. During the expert group meeting, a presentation on CSEntry, which is an Android version of CSPro (Census and Survey Processing System), was done and pilot countries expressed interest in having training on how to customize CSEntry to their data collection applications, since many of them already had experience using CSPro. One person from the NSO and one from the NTRI for each of the six pilot countries came to Addis Ababa for a one-week training session in February 2015.

## **C. Mission to country**

10. Missions were organized in each pilot country to agree on project implementation modalities, to clarify the roles and expectations of all actors, and to finalize the project's monitoring and evaluation framework. The missions were done with one ECA staff member from headquarters and one from the subregional offices to ensure that they played a pivotal role in the implementation of the project.

## **D. National workshops**

11. Each pilot country organized a national workshop to bring together all local implementing partners to identify and agree on the modalities of implementation, and to clarify the roles and expectations. Pilot countries also developed and compiled user manuals and guidelines to guide the field work. These manuals were used to train enumerators on how to use the device to collect and report. Closing workshops involving all stakeholders and some media were also organized at the end of the project to bring awareness of the results of the project.

## **E. Upgrade of facilities**

12. Research has been carried out to develop and retain expertise in the countries. All the NSOs in pilot countries, except Tunisia, have worked closely with the NTRIs to develop the application. NSOs have installed and upgraded their computer servers and software to receive data from the field data collection and integrate it into statistical processes.

## **F. Field data collection**

13. Upon development on their in-house application, most pilot countries ran testing of data collection before the actual field data collection. The tests in most cases revealed some dysfunctions of the application that were corrected before the field data collection. All pilot countries in phase I have developed consumer price index survey applications for their field data collection.

## **G. Regional conference**

14. A regional workshop and conference on the use of mobile technology for statistical processes was held in Addis Ababa in October 2015, for pilot countries to share the experience gained and lessons learned with practitioners and academics in the field. The conference was preceded by a one-day workshop on the lessons learned from phase I of the pilot project. NSOs and NTRIs from six pilot countries were invited to share their experiences related to the implementation of the Development Account project. International organizations working on

the mobile data collection (e.g. PARIS21, the World Bank and Global Pulse Lab) also participated as presenters of plenary sessions. Also, a call for papers was announced prior to the conference and authors of selected papers (regional researchers from academia and non-participating countries' NSOs) were invited to present their research on the topic. The conference was an opportunity to share knowledge and experiences not only within NSOs and NTRIs of countries participating in the Development Account project, but also throughout the network of regional stakeholders. Among the papers presented at the conference, five were selected to be published in the *African Statistical Journal* of the African Development Bank as a special issue on "mobile data collection in Africa" which was expected to reach a wider audience. The rest might be published later in a subsequent issue.

## **H. Midterm evaluation**

15. In June 2016, an independent midterm evaluation of phase I of the Development Account project was implemented. It has been carried out by an international evaluator and national data collectors who were collecting detailed country data for the international evaluator to collate into a comprehensive midterm evaluation report for phase I of the project.

## **V. Phase I results**

16. The Development Account project has had several impacts at the country level. It has demonstrated for all pilot countries that the advantages of collecting data with mobile devices improve the quality of the data collected in the following ways:

(a) Reduced data entry errors: Applications developed by pilot countries provide user-friendly data entry interface with data validation capability, preventing entering price data that is out of the expected range;

(b) Reduced workload: Unlike paper-based price collection, mobile device applications require the price collector to capture the data just once using the tablet, and then data is forwarded to the intended supervisor. No error-prone merging or tedious sorting is required after data collection, as the system handles all of these;

(c) Real-time data collection and transmission: Once price data is captured, it is immediately available to both the supervisor and the users at headquarters;

(d) Easy way to detect anomalies: While being verified by a supervisor, price data that is out of range is highlighted by the system for easy detection. The supervisor can either approve or reject price data or even correct mistakes. The system provides an audit trail of the changes;

(e) Detailed item specification: A description of the item in detail, a picture of the item and unit of measure make it easier for the price collector to capture data;

(f) Improved price collector accountability: The software captures time and the current Global Positioning System coordinates of the device.

17. Overall, phase I of the Development Account project was successfully carried out by all six countries. They have all developed in-house capacity and gained skills and confidence to use mobile technology in data collection. However, in many pilot countries, financial resources remain the main obstacle for the sustainability of the data collection with mobile devices beyond the project.

## **VI. Evaluation criteria of the midterm evaluation**

18. The midterm evaluation formulated a set of broad strategic questions, with relevant subquestions, to provide information on the extent to which the project has been implemented. Organized around five components ("project implementation dimensions"), the evaluation sought to determine:

(a) **Relevance:** The extent to which the objectives pursued by the Development Account project are consistent with the country context, needs and priorities of the member States and institutions;

(b) **Effectiveness:** The extent to which the Development Account project is on track to attain its intended targets, and whether these targets have been transformed into the results anticipated at the project's design stage;

(c) **Efficiency:** The extent to which the Development Account project, implemented at the country level, transformed the available resources into the expected results in terms of quantity, quality, and timeliness. The evaluation assessed the extent to which the software developed during the project is user-friendly and complete;

(d) **Impact:** The extent to which the results achieved through the Development Account project have contributed (or will contribute) to increasing the quality and reducing the time needed to collect and report country-level statistics. It also assessed the extent to which the project has improved the quality of data in NSOs;

(e) **Sustainability:** The extent to which the positive results of the Development Account project will continue after it is completed. The evaluation specifically looked at the capacity of the NSOs and NTRIs to continue to use and improve the software.

## **VII. Results from the midterm evaluation**

(a) **Relevance:** All participating countries had their long-term development plans that required timely provision of more statistics with better quality. For example, in the case of the Gambia, the project was particularly relevant as the Government aimed to boost the economic development by incorporating information and communications technologies. The project was also found very pertinent in Zimbabwe, where in-house staff capacity already existed but needed support in providing training and purchasing equipment. In Tunisia, particularly, however, respondents felt at times that the NSO chose the Ecole Supérieure de la Statistique et de l'Analyse de l'Information (ESSAI) as its NTRI more to meet an administrative requirement of the agreement with ECA than to develop a real technological partnership. And indeed, this NTRI's lack of participation at the design phase of the project, and the absence of a specific budget assigned to ESSAI, weakened its commitment to the project;

(b) **Effectiveness:** Across all six countries, in terms of reporting, the ECA coordination team developed a monitoring and evaluation mechanism to guide the implementation of the Development Account project. As a result, there is evidence to support the rate of implementation. Reporting can range from essential short-term/midterm reports (e.g. national situation analyses, national workshop reports, hardware procurement) to ECA focal points reporting to Development Account project headquarters every one to two months on project status in the countries according to the workplan. In all countries, the NSOs were able to develop and pilot geo-enabled mobile data collection systems for the consumer price survey, successfully enhancing the reliability of the data, as they can track the authenticity of the data collected. But since it was a pilot project with a limited budget, the NSOs were not always able to test the software at the national level. Under the effectiveness criteria, then, the project is deemed satisfactory because it achieved most of its intended results by the end of its first phase;

(c) **Efficiency:** In general, the project was highly efficient across the six countries. The project was highly valued by the interviewees because it facilitated the processes used by the NSO to collect, process and report on price information. The project built the capacity of both the NTRIs and the NSOs, which was a key achievement. The software seemed to have integrated geo-referencing information and was said to be very user-friendly. It is actually being used to collect and report on price information;

(d) **Impacts:** The impacts observed during the evaluation included the reduction in data entry errors and workload, and the real-time data collection and transmission. Most importantly the time needed to generate critical information related to prices was cut by about 20–40 per cent, depending on the country. The increased buy-in across a range of stakeholders

(enumerator, within-NSO, and across Government organizations) are also notable impacts of the project;

(e) Sustainability: Countries secured varying degrees of sustainability. Consumer price index data collection will be done 100 per cent via mobile technology in Tunisia, but in other countries, continuation of the project activities is not guaranteed, mostly due to lack of funding. However, countries that developed their in-house mobile technology capacities, such as in Zimbabwe, will likely have less financial burden.

## **VIII. Recommendations for phase II**

(a) At the last meeting of the steering committee for the Development Account project, held in Addis Ababa on 16 October 2015, it was agreed that ECA would determine phase II countries based on the demand of countries, potential results and possible partnership with phase I countries, in consultation with the respective phase I countries. Taking into consideration the countries that have expressed interest, the pairing identified during the meeting of the steering committee and the selection matrix done by the international consultant, phase II countries were selected as follows: Mali from West Africa, Uganda from East Africa, Egypt from North Africa, Gabon from Central Africa and Lesotho from Southern Africa;

(b) The design of the project in two phases is aimed at extending its benefits beyond the immediate project countries. The lessons learned from phase I – as well as the concepts, systems and methodologies – will be transferred to countries that were not involved in the original development, including countries that are not strictly pilot countries. The focus of phase II should therefore be on the transfer of results and on reaching to other countries;

(c) Besides, the concept of “citizen as data collector” or self-enumerator has not been exploited in phase I. Therefore, phase II should focus more on the concept of citizen as data collector. The pilots can start with few operators and extend to more as the systems and processes are refined based on the experience of the participating self-enumerators. Few trained statisticians could visit the self-enumerators to continue to refine the processes and undertake quality control;

(d) Finally, since consumer price index surveys have been extensively used for the pilots in phase I, phase II pilot countries are encouraged to focus on different domains.

## **IX. Points for discussion**

19. The Commission is invited to:

(a) Recommend to member States to adopt the use of mobile technology in statistical processes;

(b) Recommend to Governments to make budget available to develop the use of mobile technology in statistical processes;

(c) Express its views on phase II of the Development Account project for strengthening the capacity of African countries to use mobile technologies to collect data for effective policy and decision-making.