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INTEGRATING GIS TOOLS WITH M&E FOR SUCCESSFUL PROGRAM MANAGEMENT& IMPLEMENTATION

SABA ZEHRA*, SHEEBA AFSAR* AND YASMEEN ANIS**
ssabazehra@gmail.com and sheebanaeem@hotmail.com
* Municipal Services Delivery Program andDepartment of Geography, University of Karachi.

ABSTRACT

Monitoring and evaluation (M&E) of activities are an integral aspect of many development projects. Monitoring and evaluation of projects is a powerful management tool that helps improving program performance, data visib.. ility and project accountability. The process of collecting relevant data and measuring progress toward project goals is monitoring, while evaluation is the periodic assessment of changes in desirable results which can be attributed to a project's interventions.

The aim of this research is to present the answers to the following research questions: How GIS can be integrated with M&E tools for successful project Monitoring & Evaluation and how through building a database in a GIS frame and optimizing the use of spatially distributed information can help Project Managers in decision making as this integration will enable project managers to make more informed decisions.

we can say that Monitoring and Evaluation serve as an effective management tool which enhance the potential of attaining desirable outcomes of any given project, and if a GIS-based map output would be added to M&E, then the effectiveness and communication of outcomes to management, stakeholders and end-users can be dramatically improved.

Key words: Database, Communication, GIS and tools.

INTRODUCTION

Aid agencies are generally required to comply with the project reporting requirements for the satisfaction of a broad stakeholders' range. The reporting process is believed to be informed by the monitoring and evaluation (M&E) information systems (IS) (Crawford &Bryce, 2003). Monitoring and evaluation (M&E) of activities are an integral aspect of many development projects. Monitoring and evaluation of projects is a powerful management tool that helps improving program performance, data visibility and project accountability. The process of collecting relevant data and measuring progress toward project goals is monitoring, while evaluation is the periodic assessment of changes in desirable results which can be attributed to a project's interventions. According to Rossignol*iet. al.,* (2015), the role of M&E systems has globally increased in the field of development cooperation in the last decades. International as well as regional organizations, local governments and non-governmental

organizations have mostly adopted the M&E tools so as to improve transparency, efficiency, and effectiveness. Just as organizations need supply chain system, human resources, financial systems, etc., a good performance feedback systems is also needed by them for the smooth execution of projects. Lately, the domain of M&E has been evolved to a more result-oriented approach from traditional implementation-based approach. Programs or policies may be successfully implemented by the governments and organizations; however, the question arises whether the intended outcomes have been attained or not. Such as, health programs cannot be simply implemented by only assuming that the program is successfully implemented. In actual, the desired outcome of implementation of these programs is improvements in public health. The results-based M&E system necessitates decision makers and program managers to assess if and how goals and objectives of the programs are being accomplished over time. M&E is a substantial management tool that has a key focus on effectiveness and sustainability of any development project. M&E ideally should provide a continual data stream and feedback throughout the project. In the project's initial phase, M&E can help in development and clarification of the project's goals and objectives. In the operational phase of the project, M&E can promote increased accountability and greater transparency within organizations. During project execution, feedbacks from M&E enable adjustments in project's plans which can increase the potential of achieving successful outcomes (Figure 1).

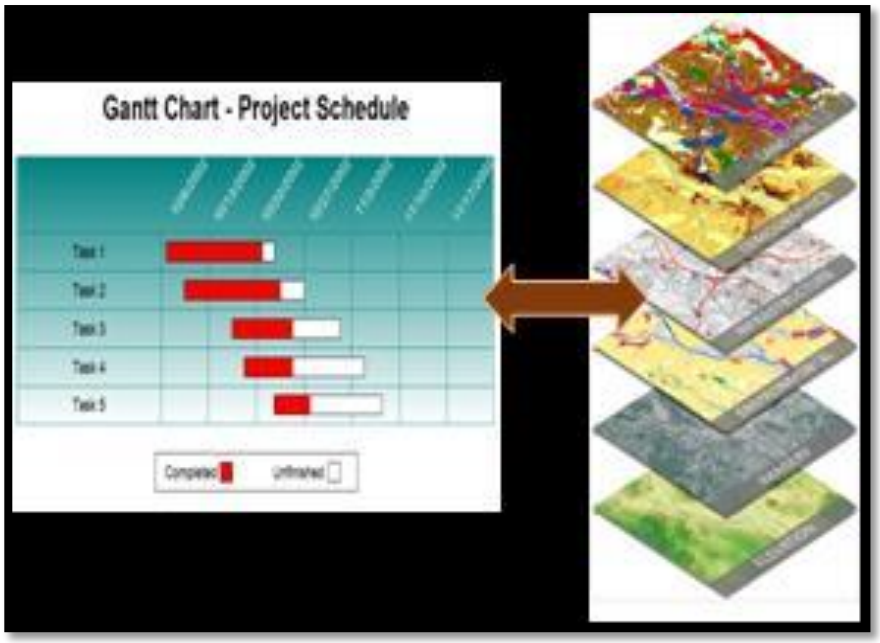

Figure 1: Project schedule

In the past five years, a substantial growth has been witnessed in the utilization of GIS for monitoring and evaluation of projects, especially the health endeavors because of the capacity of GIS and an increase in high-quality spatial data infrastructure(Global Health Council, 2014).As per Igbo (2013), M&E, on its own, can enhance the potential of attaining desirable results for any given project, and if we would integrate a GIS-based map output to M&E, then the effectiveness and communication of project outcomes to project stakeholders would be dramatically improved. Though there is a fundamental difference between M&E and GIS as M&E is temporally focused, while GIS is spatially oriented. M&E measures periodic changes and outcomes whereas GIS identifies the location where the changes and outcomes of a project are happening. Aggregation of M&E techniques and GIS into one tool can help illustrating useful information, which will be beneficial for successful project management implementation. For instance, while project management of a construction project, the project manager can integrate the spatial, structural features of the project site (captured in GIS typically) with the dynamics of M&E indicators. The main objective of this research study is to present how the integration of Geographic Information System with M&E can lead to better results of a project. It is hypothesized in the study that integration of GIS with project monitoring and evaluation information system can mitigate poor project performance and validate transparency and accountability within a project.

AIMS & OBJECTIVES

The aim of this research is to present the answers to the following research questions:

- How GIS can be integrated with M&E tools for successful project Monitoring & Evaluation.
- How through building a database in a GIS frame and optimizing the use of spatially distributed information can help Project Managers in decision making as this integration will enable project managers to make more informed decisions.

LITERATURE REVIEW

Monitoring and evaluation (M&E) are intimately linked terms. According to UNDP (2000), “monitoring and evaluation differ, yet are closely related”. Monitoring is internally focused, a continuous data capturing and analysis procedure for the purpose of control, with a key focus on the efficiency of project, while evaluation is externally focused, a periodic assessment process carried out for the purpose of learning (World Bank, 1996), with a

focus on effectiveness of the project. Monitoring is management driven, whereas evaluation is stakeholder-driven process. Mapping can be defined as a substantial tool for recording information for operational management, program planning and logistics. Mapping is beneficial as well for preparing monitoring activities, particularly sample surveys, and for presenting and disseminating information. In the recent years, tremendous growth has been observed in the utilization of Geographic Information System for planning, monitoring and evaluation of projects (particularly global health) due to the availability of data, accessibility of open source user friendly mapping software, etc. The project of US Army Corps of Engineers "Utilizing GIS in US-Mexico Border Fence Construction" can be cited as a good example of Project Management and GIS integration (Figure2).

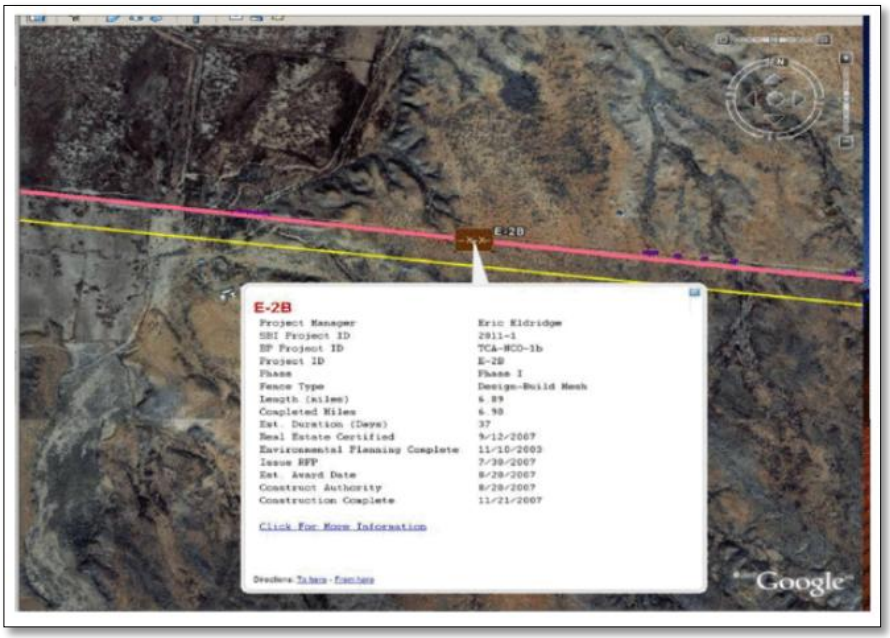

Figure 2: Project Management and GIS integration

US Army Corps utilized the ArcGIS architecture to manage, analyze geospatial data and produce maps and reports for multi-agency use. Data was collected using GPS, and then the construction reports were updated on Google Earth (GE) on the basis of the collected data. US Army Corps made use of the USACE secure Google Earth capability with ArcGIS Server application. Miles constructed within federal, state and private ownership, and miles constructed per day were mapped. And the real time project management system data were extracted for earned value of a GE environment. Moreover, the integration also helps communicating issues related to project with respect to the terrain of the project site like the

correlation of cost of fence construction to conditions of the terrain. Integration also enables proximity of different land use, tribal lands, cities, levees, congressional district boundaries to fence (Figure 3 and 4).

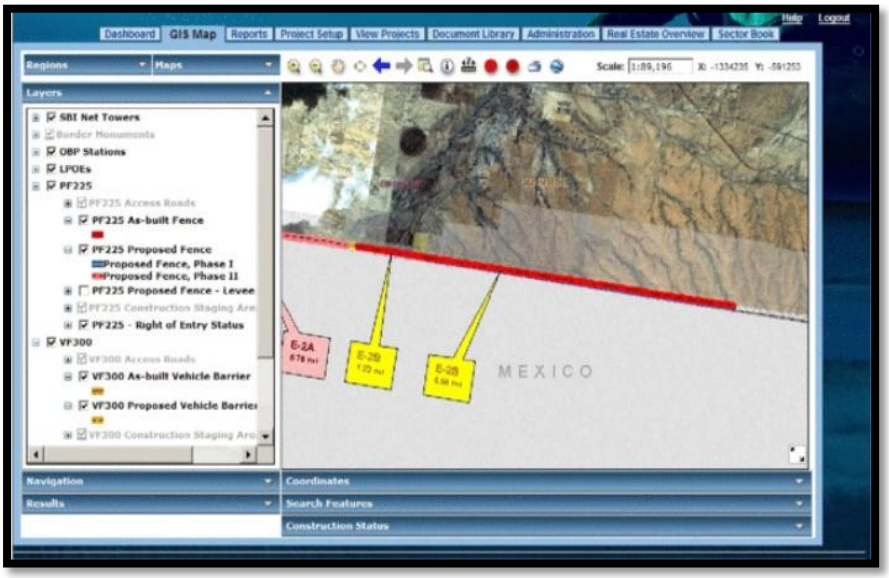

Figure 2: Proximity of different land use

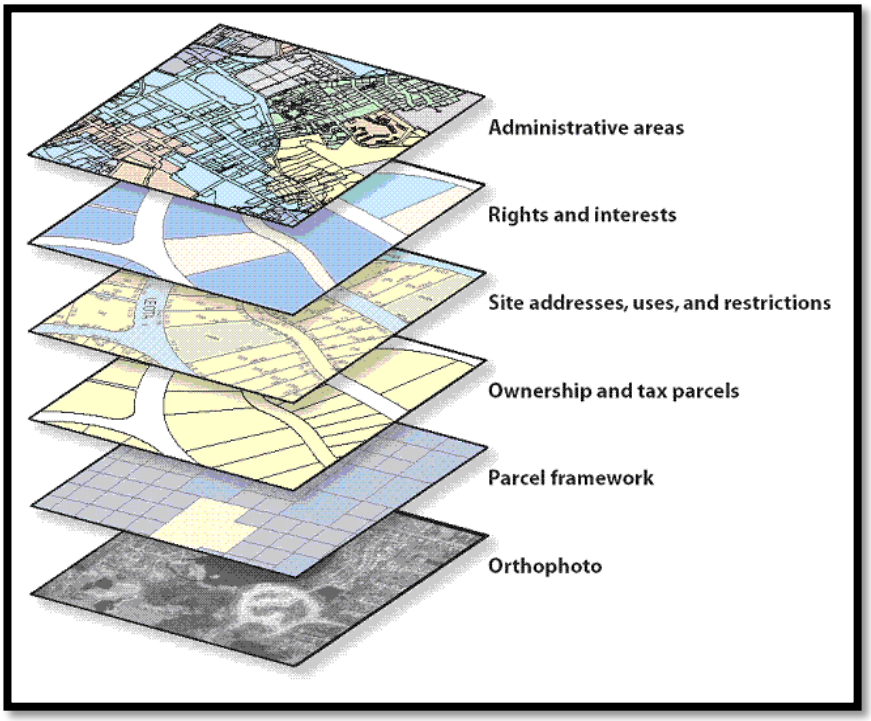

Figure 4: Proximity of different land use

DISCUSSION

The development of GIS integrated M&E involves best practices, along with innovative new approaches for continuous improved performance in every domain of a project. For instance, the progress of health programs can be monitored and evaluated for improving commodity availability for clients. Similarly, aid agencies can also monitor their funded projects through GIS for improved performance and accountability. Generally the implementation of aid projects takes place through a donor's "implementing partner" or by under a bilateral agreement with the donor country. Now, almost all of the donor agencies require and provide funding to the partner non-governmental organizations to have project monitoring and evaluation system. If this project monitoring and evaluation system would be integrated with a geographic information system, then it can increase the performance of accountability mechanism.

The Figure 5 shows the current foreign aid projects in Sindh. The data related to foreign aid projects in Sindh was obtained from http://www.sindhpnd.gov.pk. The map was then produced in the ArcGIS. Any implementing partner of a project could easily comprehend from the map that which districts in Sindh are densely populated, what is the incidence of poverty different districts and which foreign aid projects are currently targeted for a district for the sustainable development of that district. It will also help to avoid redundancy in the interventions. Geographic information enables the map production to illustrate spatial information in a manner that could help with communication interpretation. From the map, it is comprehensible that any program data can be examined in regard to its spatial distribution, association and proximity with different geographical features. Geographic Information System offers the basis for analyzing the performance data in a spatial context, therefore providing the capability to compare different districts.

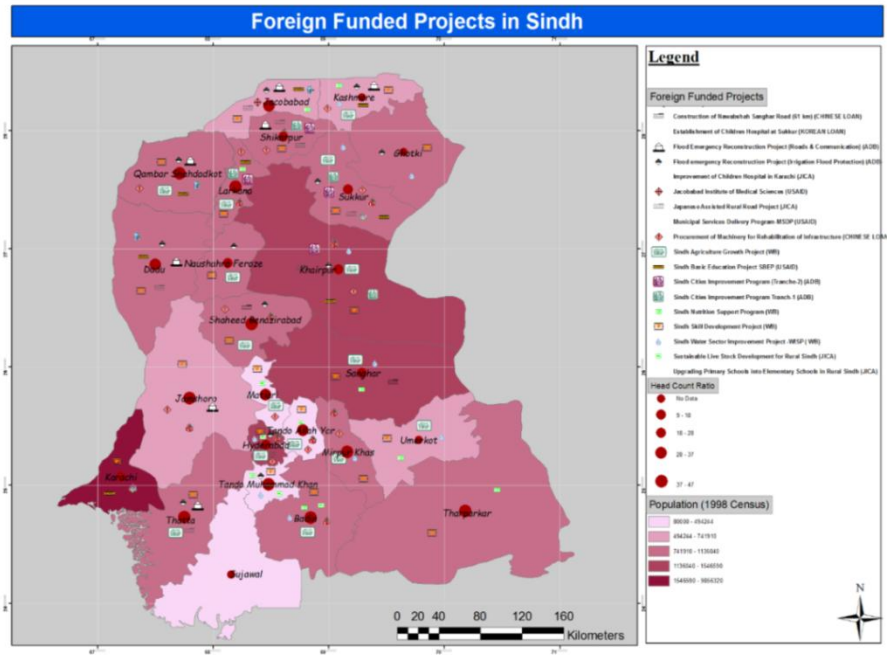

Figure 3: The Current Foreign Aid Projects in Sindh

Project Evaluation

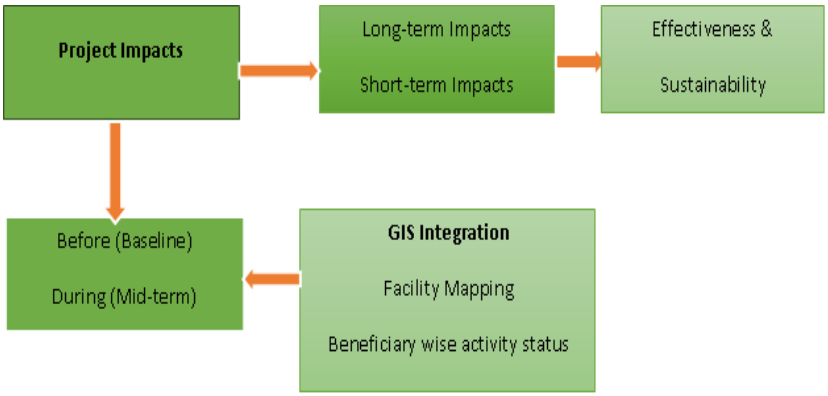

Figure 4: Project Evaluation & Assessment

Source: Author

The 3-stage model can be used in project evaluation and assessment. The 3-stage model follows a “past, present, future” format. Through integrating GIS in the M&E system, a series of three maps can be produced Figure 5:

- A "current" or "existing" map, which demonstrates the existing status of reporting entity, for example, bridges, food distribution center, school, health care center, overhead reservoirs, etc.
- A "past" map, which shows the progress of project (work completed since the last report). It can also involve the baseline studies/ reports.
- A "future" map, which illustrates the set targets or intervention be done in the future for instance, repairs, new installations, construction of new schools, training, etc.

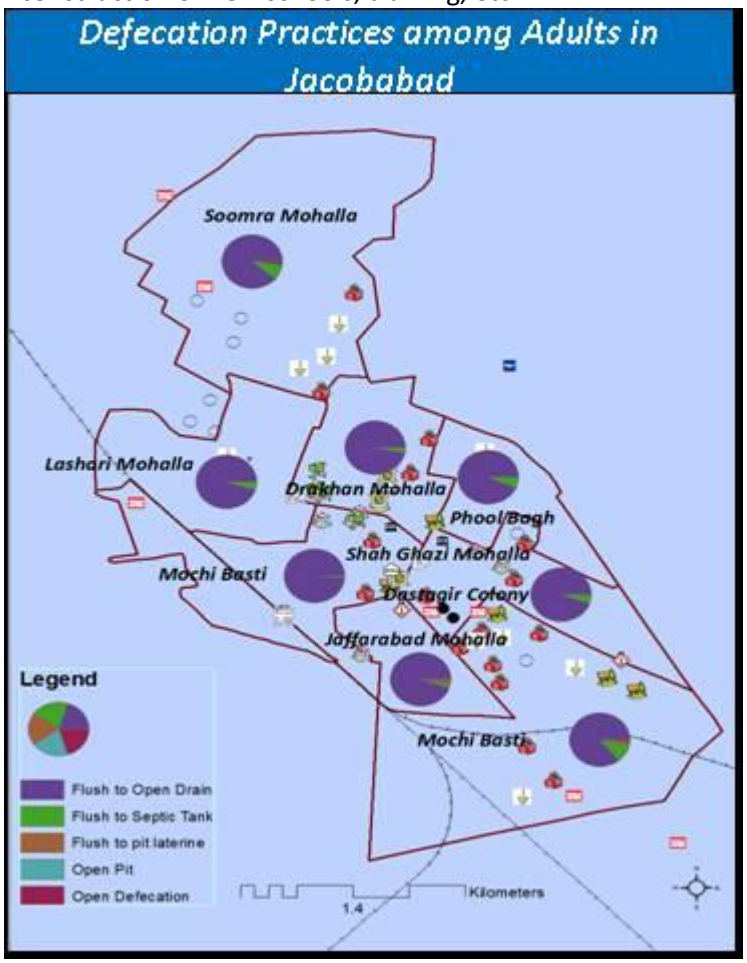

Figure 6: Jacobabad Current Defecation Practice" among Adults

The Figure 7 is of Jacobabad City, which shows the "current defecation practice" among adults. The data were obtained from "baseline study on WASH Services and hygiene behavior in Jacobabad City, 2015". The "future map" could be based on the improved practices of defecation among

adults, and the interventions proposed for changing behavior. Map models can display the outcomes of the interventions made in the targeted region.

CONCLUSION

In a nutshell, we can say that Monitoring and Evaluation serve as an effective management tool which enhance the potential ofattaining desirable outcomes of any given project, and if a GIS-based map output would be added to M&E, then the effectiveness and communication of outcomes to management, stakeholders and end-users can be dramatically improved. However, it is recommended that in order to implement and integrate GIS technology successfully, a project manager should carefully consider and plan for the project needs beforestartingacquisition of system, database & application development.There must be cooperation among project stakeholder while developing an M&E system.

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