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## GIS as an Efficient Tool to Manage Educational Services and Infrastructure in Kuwait

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### ABSTRACT

The State of Kuwait Ministry of Education (MoE) has clearly defined land use standards for the location of public schools, and an inventory of reserved lands for future facilities. Unless, there is a geographical efficient tool to manage and plan the education system in a rapidly developing country such as Kuwait there will be huge deficit in such services. Geographic Information Systems (GIS) was used to fill in this gap and effectively evaluate and analyze their facilities and unoccupied lands to ensure they continue to meet the population and future needs of Kuwaiti students. This paper utilized the GIS to inventory, map, and analyze MoE facilities and unoccupied land reservations with a goal of improved planning and decision making. Unfortunately, the initial spatial analysis of the data showed huge percent of districts that have no schools failing to meet the minimum standard of the MoE including kindergartens, primary schools, intermediate schools for girls, intermediate schools for boys, secondary schools for girls and secondary schools for boys at 72%, 71%, 48%, 43%, 54%, and 55% respectively. Such critical results will enable the decision makers to prioritize the immediate action of relocation the schools or widen the services and accessibility. Moreover, the analysis of the data showed a critical and immediate need to reserve land for five districts where they are heavily populated and lacked reserved land. However, based on long term land use plans, there is an urgent need to relocate some land and reserve others to meet the future urbanization plans and population growth.

### KEYWORDS

Kuwait; Education; GIS; Infrastructure; Land Use Planning; Land Reservation

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### References

- [1] Central Intelligence Agency, " World Fact Book," 2012. <https://www.cia.gov/library/publications/the-world-factbook/geos//ku.html>
- [2] D. J. Maguire, M. F. Goodchild and D. W. Rhind, " Geographical Information Systems: Principles and Applications," Longman, Harlow, 1991.
- [3] S. J. Hite, " GIS-Generated School Mapping Materials of Two Counties in Hungary Prepared for Francoise Caillods," International Institute for Educational Planning, Paris, 2006.
- [4] H. W. Calkins, " Local Government GIS Development Guides," 1996. [http://www.archives.nysed.gov/a/records/mr\\_pubGIS03.shtml](http://www.archives.nysed.gov/a/records/mr_pubGIS03.shtml)
- [5] R. Laurini and D. Thompson, " Fundamentals of Spatial Information Systems," Academic Press, London, 1992.
- [6] I. Heywood, S. Cornelius and S. Carver, " An Introduction to Geographical Information Systems (Third Edition)," Pearson Education Limited, Harlow, 2006.

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- [7] H. El-Gamily, A. Al-Othman and S. Al-Fulaij, " The National Educational Atlas For Services and Infrastructure-Phase 1," Final Report, Kuwait Institute for Scientific Research, Safat, 2011.
- [8] R. J. Shavelson, L. M. McDonnell and J. O. Rand, " What Are Educational Indicators and Indicator Systems?" Practical Assessment, Research and Evaluation, Vol. 2, No. 11, 1991.
- [9] C. Acedo, M. Uemura, C. J. Thomas, Y. Nagashima and K. L. Ngow, " Education Indicators for East Asia and Pacific," World Bank Report, Washington DC, 1999.