

## **Abstract**

Urban planning needs to be regulated by laws and in the Sudan there are adequate laws, but the problem lies in inspection of the buildings constriction as stated in the law which based on direct field work, that needs many financial and human resources, as the matter of lack of these resources the problems of urban planning increase the spread of urban planning problems, such as trespassing on public area and roads. Digital techniques of Remote Sensing and GIS provide speed, efficiency, high reliability and low cost had offered possibilities to control urban growth in sustainable manner., In this study modern systems had been proposed to achieve high efficiency and low cost to execute the laws and regulation of urban planning, to detect irregularities of buildings within and outside of the widget and the residential areas using GIS and satellite imageries. Techniques of GIS and remote sensing had been applied in this study to measure buildings constructed out of plot(s) boundaries and empty open space, and trespassing or irregularities can be monitored and detected, but techniques of GIS and remote sensing had been failed to determine the percentage of built up area within the boundary of the plot together the rebound between houses, need a higher resolution satellite imageries. The study found the buildings out of plot boundaries can be measured, and material by which building had been built out of border can be determined, and digital techniques has the capability to control physical planning development to help the protection of lands and supply of required services.

## مُلَخَّصُ البَحْث

التخطيط (الحضري) العمراني يحتاج الى قوانين تنظمه، وفي هذا الجانب توجد في السودان قوانين كافية ولكن تكمن المشكلة في مراقبة تنفيذ المباني حسب ما هو منصوص في القانون حيث تعتمد على العمل الميداني المباشر الذي يحتاج لكثير من الموارد المالية والبشرية التي مما يؤدي الى عدم توفرها إلى زيادة انتشار مشاكل التخطيط العمراني مثل التعدي على الميادين العامة والطرق. الاستشعار عن بعد ونظم المعلومات الجغرافية وفرت التقنيات الرقمية ذات السرعة والفعالية والوثوقية العالية والتكلفة القليلة التي وفرت الإمكانيات المطلوبة للسيطرة على النمو الحضري بصورة مستمرة، مما جعل هناك امكانية لمراقبة النمو العمراني. تم إقتراح الأنظمة الرقمية لتحقيق الكفاءة العالية والتكلفة المنخفضة لتنفيذ القوانين ولتنظيم التخطيط العمراني، ولتحديد المخالفات للمباني داخل وخارج القطعة السكنية والميادين العامة باستخدام نظم المعلومات الجغرافية وصور الأقمار الاصطناعية باستخدام تقنيات نظم المعلومات الجغرافية والاستشعار عن بعد في هذه الدراسة تم قياس المباني التي شيدت خارج حدود القطعة السكنية والميادين العامة و أمكن رصد وكشف التعدي و المخالفات، ولكن تقنيات نظم المعلومات الجغرافية والاستشعار عن بعد فشلت في تحديد النسبة المئوية للمساحة المشيدة داخل حدود قطعة الأرض والارتداد بين المنازل، لأنها تحتاج لصور أقمار إصطناعية عالية الدقة. وجدت الدراسة انه قياس المباني وتحديد المواد التي قد بنيت بها خارج حدود قطعة الأرض، كما أن والتقنيات الرقمية لديها القدرة في التحكم في التخطيط للنمو العمراني والمساعدة في حماية الأراضي وتقديم الخدمات المطلوبة.

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***Researcher***

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## **Abbreviations**

GIS    Geographical Information Systems

RS     Remote Sensing

DN    Digital Number

IR     Infrared

UV    Ultraviolet