



**Economic Comparison to Develop Historical Street in
Traditional and Sustainable Techniques
Rainbow Street in Amman City – Case Study**

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DEDICATION

To **Mum** and **Dad**, My Blessing Precious Two,

To my supportive beloved **Husband** and **Daughter**,

To my Brothers and the whole family

This work wouldn't be accomplished without you.

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Economic Comparison to Develop Historical Street in Traditional and Sustainable Techniques

Rainbow Street in Amman City – Case Study

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Abstract

As a developing country, Jordan suffers from poverty and a lack of energy resources. For these reasons, the focus was turned on the attraction points of public income such as tourist attractions. In addition, the focus on alternative energy resources (renewable energy) became an attracting alternative for traditional energy resources due to the high feasibility obtained economically and environmentally. For this reason, Rainbow Street (one of the most popular streets in Amman for locals and tourists) was selected in this study as a research area to present it in a better architectural way and implementing cheap sustainable systems for buildings located on this street. The aim of this study was to present several sustainable alternatives for the selected area of the study. To achieve the objectives of the study, an economic analysis was performed to check the feasibility of implementing the suggested sustainable improvements. Results of this study showed an expected profit by implementing the improvements in all the buildings with IRR value of 6.9%. However, when removing buildings 6 and 9 from the project (the buildings with negative IRR value) an increase in total IRR of the project can be noticed, with an IRR of 8.37%. The initial cost for the improvements of all buildings was calculated to be \$606,100. Upon using sensitivity analysis in this study, several alternative buildings were selected for improvements with a budget of \$250,000. Results of this study recommends using alternative 1 (Improvements on buildings 1, 3, and 4) to achieve the highest economical profit. The resulting IRR for this alternative was the highest with IRR of 10.36%. Another finding from this study was the importance of forcing such sustainable improvements on new buildings by changing the current building codes.

Keywords: Sustainable, Rainbow Street, Economical, Architectural, Re-design.

مقارنة اقتصادية لتطوير الشوارع التاريخية بالتقنيات التقليدية والمستدامة

شارع الرينبو - مدينة عمان

بقلم : هلا الهنداوي

بإشراف : د. تيسير رواشدة

نبذة مختصرة

تقوم العجلة العالمية حالياً بالتسابق على استخدام الطاقه البديله وايجاد حلول منطقيه تعمل على التوفير من كلف الطاقه التقليديه.حيث يعتبر الاردن من الدول الرائدة في الشرق الاوسط و العالم العربي لاستخدام الطاقه المتجدده لحاجته الملحه للتقليل من كلف الطاقه الاحفوريه, ومن هنا جاءت هذه الدراسة لتشجيع اصحاب المحلات و المباني التجاريه و امانه عمان الكبرى والبلديات للتركيز على استخدام موارد الطاقه البديله (الطاقه المتجدده) لخفض الكلف التشغيليه على هذه المشاريع, حيث تم اختيار شارع الرينبو كمنطقة للدراسة في هذا البحث وتقديمها بطريقة معمارية افضل بتنفيذ انظمة الاستدامة الرخيصة على المباني الموجودة فيها لاعتباريه الشارع تجاريا و سياحيا في عمان.

وللتأكيد على ان تطبيق عناصر و متطلبات الطاقه البديله ذات فاعليه اقتصاديه, قمنا باجراء تحليل اقتصادي للتحقق من جدوى تنفيذ التحسينات المستدامة المقترحة, تبين ان نتائج هذه الدراسة تعود بمعدل عائد داخلي (Internal Rate Of Return) بنسبة 6.9% للجزء الاول من شارع الرينبو (حدود الدراسة). و لرفع هذه النسبه بحيث تكون ذات نسبه اعلى, تمت ازالة بعض المباني من الدراسة ذات القيمه السالبه لمعدل العائد الداخلي بحيث تصبح هذه النسبه 8.37%. وتم حساب التكلفة الاولى التقديرية لاستخدام عناصر الطاقه المتجدده و تطبيقاتها لتحسين جميع المباني بتكلفة 606100 دولار، و من ثم تحديد ميزانيه للمشروع مقدارها 250000 دولار، وعليه تم اختيار عدد من البدائل بحيث يكون المعدل العائد الداخلي اعلى نسبه لمجموعه المباني الموجوده، وكان البديل الامثل هو تنفيذ المبنى الاول و الثالث و الرابع الذي كان هو اعلى معدل للعائد الداخلي بنسبة 10.36%. ومن اهم نتائج هذه الدراسة ، استخدام تطبيقات الاستدامه و الحسابات الاقتصاديه في مشاريع الطاقه البديليه ، وان لا تكون تطبيقات نظريه بدون تطبيق او حساب فعلي لها ، و فرض قوانين للبناء في الاردن (البلديات وامانة عمان ووزاره الاشغال العامه) .