Abdulaziz A. Alshaikh, Department of Geography, King Saud University, P. O. Box 75361 Riyadh 11578, Saudi Arabia, E-mail: alshaikhaziz@hotmail.com “Geography Departments in Some Universities in the GCC States: A Study of their Programs and Academic Status.”

The paper deals with a number of geography departments in some universities of the Gulf Cooperation Counsel. Twelve departments were selected and some data were gathered about these departments that cover the faculty, staff, students, curriculums, as well as the information regarding research and teaching facilities these departments offer. Universities and all academic establishments in the GCC states have come a long way and have witnessed tremendous changes in so far as to the number of students and faculty, as well as research and community participations in so many fields of learning. The paper will study the changes and the contributions of geography departments in ten important universities in the six Gulf States: Saudi Arabia, Bahrain, Kuwait, Qatar, United Arab Emirates, and Oman. The total number of faculties in these departments amount to about 300 and the total number of students exceeds 6000.
Abstract: In this article the Wadi Hanifah from environmental point of view has been analyzed in a rather a close way. The development strategy of the Wadi has been put forth by the High Commission for the Development of Riyadh, ADA

The Challenge: Wadi Hanifah is a unique natural and geographical feature in the dry central highlands of Saudi Arabia. With a catchment area of 4,500 square kilometers and a 120-kilometer-long main watercourse, the Wadi offers landscapes that are astonishingly diverse and extreme. Part of the desert watershed traverses the western portion of Metropolitan Riyadh, one of the fastest growing cities in the world. Beyond the high-rise towers of urban Riyadh, the Wadi region includes large industrialized farms, date palm plantations, two significant archaeological sites, and Bedouin villages.

With its palm groves and cool waters, Wadi Hanifah played a vital role in the establishment of Riyadh as a center for trade and travel in the midst of the desert landscape. But in recent years, the rapid expansion and urbanization of the Saudi capital turned parts of the Wadi into a wasteland. Some areas were quarried and mined for construction materials to build the growing city. Others are dumping grounds for rubbish. Residential subdivisions, infrastructure, and expressways encroach upon the Wadi. Pollution, poor water quality, and water-related diseases proliferate due to inadequate infrastructure and lack of development controls.

By contrast, the Wadi also has lush green areas due to the daily discharge of ground water, rain water, and treated waste water from Riyadh. Some waters, especially in the south, are relatively clean and support a diverse biological community that includes fish and aquatic birds. Yet the people of Riyadh have little appreciation or understanding of the surrounding ecosystem or the consequences of their activities on its recuperative capacity.

The Mandate: In 2001 the High Commission for the Development of Riyadh commissioned the Joint Venture of Moriyama & Teshima Planners Limited (Canada) and Buro Happold (UK) to develop a Comprehensive Development Plan for Wadi Hanifah. The aim was to address uncontrolled expansion of the City and continued misuse
of the valuable Wadi and create tangible, sustainable improvements in the health of the Wadi environment and the quality of life of Riyadh's people. The City had already undertaken numerous studies that were never implemented. This time it wanted more than just a master plan, it wanted real results - detailed designs and drawings that could actually be built, that would begin the long process of restoring the Wadi to health.

The Approach: Moriyama & Teshima and Buro Happold were selected based upon their holistic and multi-disciplinary approach that focussed on the environment, not as the sum of discrete elements but as a system of interrelated and interdependent processes fundamental to the health and prosperity of the region. The team's
commitment was to work with nature in order to achieve the most enduring and cost-effective solutions.

The Process:
The process started with the detailed study of the Wadi's landform and its dynamic nature. The team of landscape architects, engineers, and scientists visited the site twelve times. They explored the Wadi by helicopter, car, and foot taking over 1600 digital photographs and six hours of digital video. Six high-
resolution
satellite
photographs
documented
the entire
Wadi site
with detailed
accuracy -
for the very
first time.

Key Principles of The Comprehensive Development Plan

1. Vision - The Living Wadi: The Vision sees Wadi Hanifah as clean, green, safe and healthy. The Living Wadi is Riyadh’s new urban waterfront. An oasis parkland, it traverses the full length of the city and extends into surrounding rural areas.
No longer does the city turn its back on the Wadi. The Living Wadi is fully integrated into the life of Riyadh, providing a sustainable setting where residential neighbourhoods, farming, recreation, cultural activities, and tourism would co-exist in harmony.

2. Integration of people and systems within the natural environment: The Development Plan seeks a better fit between the natural landscape, the people of
Riyadh, and the infrastructure systems that support contemporar y life. The approach is a practical one, acknowledgi ng the diverse needs for tourism, increased agriculture, recreational and leisure opportunities, and more housing are all needs that can be met in a way that repairs and sustains the natural environment.
3. Ecological Sustainability: The Development Plan envisions the Wadi watershed as one comprehensively considered, integrated system of ground water, stormwater, and treatment plant resources. The principal of ecological sustainability for this desert environment means that the people of Riyadh must make better use of locally available natural resources. The Wadi must be made capable of constant regeneration so that the Living Wadi can be passed on to future generations.

Key Recommendations

1. The New Wadi Hanifah Reserve Directorate: The Wadi Hanifah lands fall under the jurisdiction of an assortment of authorities: the Ministry of Agriculture, Ministry of Municipal and Rural Affairs, Municipality of Riyadh, Presidency of Meteorology & Environment, Riyadh Water and Sewage Department, and the Police Force. The Comprehensive Development Plan recommends the formation of a new management structure - the Wadi Hanifah Reserve Directorate - to assume responsibility and management of the Wadi Hanifah and its tributaries. The Wadi Hanifah Reserve Directorate would guide the type, scale and pace of restoration and development throughout the watershed, coordinate with overlapping jurisdictions, establish standards for environmental quality, monitor conditions, enforce protection measures, create an environmental database, and provide public education.

2. Naturalized Landscapes: Strategies for improving the health of the Wadi are based upon natural features and processes that are part of the desert's self-regenerating eco-
One of the major recommendations is to reprofile and regrade the main watercourse to return it to a more natural state which would facilitate flood control and discourage invasive native grasses. A series of naturalized landscapes would be created on publicy-owned wastelands along the water's edge with water features and indigenous trees, grasses, and shrubs. These naturalized landscapes would stabilize riverbanks and deter the migration of contaminants from urbanized areas.
Landscape design guidelines are based upon water conservation principles, including water-harvesting techniques such as micro-catchments to capture local rainfall and minimize dependence on irrigation sources. Plantings of local genetic stock of indigenous plants would increase survival rates of self-propagating species and minimize maintenance. Naturalized landscapes are also part of the strategy to protect the Wadi’s many animals which have significant species status.

Compared to other major cities in the developed world, Riyadh is sorely lacking in public open space. Naturalized landscapes would provide a welcome contrast to the bustling city. A system of trails will link these natural landscapes to interpretation centres, cultural and heritage sites, and commercial ventures along the length of the Wadi. Encouraging people to venture into the Wadi’s natural landscapes will help to educate them about nature and raise consciousness about the importance of ecological sustainability.

3. Water Resource Management Riyadh's rapidly increasing population relies upon desalinated water for its very sustenance, a solution that is costly and not always readily available. Bioremediation of the urban waste water flowing in the Wadi provides a more cost-effective long-term solution to the need for fresh clean water. The reprofiled and regraded main watercourse would support bioremediation. Lined with rocks, stepped with weirs and planted with streambed and stream bank vegetation, the naturalized channel would provide superior conditions for neutralizing pathogens and absorbing excessive nutrients throughout the riparian corridor.

Bioremediation of nutrient and bacterial loads entering the Wadi from treatment plants, ground water and stormwater would be achieved by
enhancement of aquatic and adjacent riparian habitats to support a more complex and robust food web ecology. By increasing available oxygen and carbon and creating microhabitats for diverse species, the overall system would provide the building blocks for a complex food web that includes fish cultivated as an alternate protein source for local residents.
A newly created eight-meter-deep lake would act as a reservoir to collect clean water from the Wadi and pipe into Riyadh. By 2021, one million cubic meters of recyclable water daily should be available in the Wadi channel, achievable for the most part through bioremediation.

4. Cultural Connections:
Tourism is just beginning to be developed in Saudi Arabia, which has been slow to recognize the potential for generating additional revenues in its increasingly faltering economy. The Comprehensive Development Plan recommends the development of existing distinctive sites within the Wadi to attract regional and international visitors. Two historic settlements, now archaeological sites, would be developed with hotels and conference centers. A family-oriented recreation and entertainment center would be located at the northern end of the Wadi. And the lush ecological wetlands south of Riyadh offer ideal conditions for ecotourism. All these developments would be structured to encourage private sector investment.

Outcome: The Comprehensive Development Plan for the Wadi Hanifah has been wholeheartedly embraced by the City of Riyadh.

Links:
+ Saudi Arabia Information Resource Site
+ Buro Happold
Construction started in the Fall of 2003 on the first phase which includes flood performance restoration, improvements to the surface flow channels, bioremediation of water flows and water impoundment, landscaping, and associated roads and infrastructure improvements. Restoration and conservation of 45 kilometers of the Wadi's main watercourse is anticipated to be complete within 48 months.

A transition body has been established to oversee construction and create a public awareness programme. Moriyama & Teshima and Buro Happold are continuing their involvement throughout construction.
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Abdulaziz A. Alshaikh, Department of Geography, King Saud University, Riyadh, Saudi Arabia 11451 AASHAIKH@KSU.EDU.SA The Distribution Patterns of Services and Amenities in Saudi Arabia.

This study analyzes data in relation to the services and amenities within each administrative province of the thirteen provinces in the Kingdom of Saudi Arabia. The main question entertained in this paper: what is the spatial pattern associated with particular services and amenities in the Kingdom provinces? There are other related questions, such as: is there a relationship between the number of population of the province and the services?, is there a relationship between the number of population of the province and amenities? There are number of variables that will be used in this study, some of these are: the educational and health services as well as some amenity services, namely electric, water, telephone, and sewage. Location quotient will be used to determine the provinces that rightly served, those over-served and those under-served.
Services and Amenities in Housing

Saudi Arabia: A Case Study

Table 1 shows (and the graph) that most of the houses in Saudi Arabia are of concrete materials or 61% and that 29% of them are constructed from bricks.

We can observe from the table that most of the mud houses, more than 51%, found in Riyadh Province (or Adm. District). Najran Province, although it has only about 2% of the mud houses, it has the highest L.Q. of all the 13 provinces in the kingdom 501, followed by Riyadh about 235 L.Q. of mud houses. Asir and Qaseem have 215 and 172 L.Q. of mud houses respectively.

Table 2 (and the graph) shows the houses by type, about 32% of the total houses in all the provinces in Saudi Arabia of the traditional type, 30% apartment, 16% villas, about 12% other types, and the remaining percentage about 9% consists of a floor in a house or in a villa.

There is a concentration of tradtional houses in Jizan Province about 239 L.Q. value, followed by Al-Baha, Hail, and Asir with L.Q. values 155, 146, 143 respectively. The L.Q. values have a weak negative correlation with urbanization –0.3. L.Q. values of apartment has a positive correlation with urbanization 0.6.

Table 3 shows the ownership of houses Makkah has the highest percentage of home ownership 25% followed by Riyadh about 18%. While Sharqiah and Asir have 12% and 11% respectively. As for L.Q. for this variable Jizan Prov. has the highest nearly 187 followed by Al-Baha 120. As for the relationship between the home ownership and percent urban there is a week negative correl .5-.

Table 4 shows the types of water services that are available for houses: nearly 66% of the houses have public water pipe lines and nearly 28% get their water needs through tankers.

The table shows the distribution of houses by Adm. districts of Saudi Arabia that are not served by water utility and served by Tankers. Mekkah district has the highest 27% followed by Asir about 22%. As for the L.Q. values for this variable, Al-Baha has the highest about 317 followed by Asir Najran, Northern Dist., Aljouf, and Hail 276, 260, 181, 174, 164 respectively. As for the correlation with urbanization there is a negative relation between these two variables of -.6. Being that the more urbanized the district the less will be its houses served by tankers for water supplies.
Table 5 shows types of electric services within the houses. Most of homes in all the 13 Amin. districts in Saudi Arabia have public electric utility services, nearly 87%, and the remaining percentage of homes either use private electric generator or do not have electric services of any kind.

As for the distribution of nearly 8% of no electric service between the districts, we find the L.Q. of high values in districts with lower percentage of urbanization like Hail has 240, Asir 198, Tabuk about 195, and Jizan about 188. The correlation between this variable and the rate of urbanization is - .07.

Table 6 shows the sewage services in homes within the houses 36% of them have public utility lines while 54% have septic tanks, the remaining nearly 10% do not have sewage service of any kind.

As for the distribution of nearly 10% of no sewage service between the districts, we find the L.Q. of high values in districts with lower percentage of urbanization like Jazan has 286, Asir 219, Najran 212, and Hail about 202. The correlation between this variable and the rate of urbanization is -.07. We would expect high values of sewage service in highly urbanized districts like Riyadh, Mekkah, Sharqiah, and Qaseem.

Table 7 shows the type of fuel used in cooking within the houses, the vast majority, nearly 92%, of them uses liquid gas for that purpose, while about 4% uses electricity for cooking, the remaining percentage of homes uses either keruseen or wood.

If we calculate the values of L.Q. for electricity which represents merely 4% of all homes that used it for cooking will notice a high value for Sharqiah Province of 345 L.Q. and Tabuk about 177. As for Sharqiah it might be related to the lower rate of electricity.

Other variables would be analyzed that are of significant to housing in the provinces of the country, i.e. population densities, rate of urbanization, other variables related to health and educational services will be analyzed in the paper when completed.
The paper deals with a number of geography departments in some universities of the Gulf Cooperation Counsel. Twelve departments were selected and some data were gathered about these departments that cover the faculty, staff, students, curriculums, as well as the information regarding research and teaching facilities these departments offer. Universities and all academic establishments in the GCC states have come a long way and have witnessed tremendous changes in so far as to the number of students and faculty, as well as research and community participations in so many fields of learning. The paper will study the changes and the contributions of geography departments in ten important universities in the six Gulf States: Saudi Arabia, Bahrain, Kuwait, Qatar, United Arab Emirates, and Oman. The total number of faculties in these departments amount to about 300 and the total number of students exceeds 6000.
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Abdulaziz A. Alshaikh, Department of Geography, King Saud University,
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“The development of the central city of Riyadh, Saudi Arabia: spatial and
economic aspects.”

The paper deals with development of the central cities in general and
with the development of the central city of Riyadh, Saudi Arabia in
particular. It is a well known fact that the central city competes with the rest
of the city, mainly from economical point of view, the CBD is the real heart,
if not the only one, of the city, and it is the focal point where most of the
urban activities have something to do with it. On the other hand, some went
to state an opposite view, they thought that the CBD is no longer has the
function that it used to have and there is a big question mark regarding the
millions that would be spent to develop the inner cities. A third position
states a middle ground and that is: the CBD is in the process of judgment
and it is yet to be a verdict about it. The literatures regarding this subject are
reviewed, and numerous examples were given from other major cities in
Saudi Arabia, Europe, and from some American cities. It is expected that
this paper will reach some sound conclusions regarding the whole spectrum
of developing the inner cities.
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Abdulaziz A. Alshaikh, Department of Geography, King Saud University, P. O. Box 75361 Riyadh 11578, Saudi Arabia, E-mail: alshaikhaziz@hotmail.com “The Environment of the city of Riyadh, Saudi Arabia: Spatial Appraisal.”

The paper deals with environment of the city of Riyadh, the capital city of Saudi Arabia. This city by far is the largest agglomeration of urban population, exceeding four millions at present time. It is well-known facts that as cities grow in area, population, and economic diversity their environment changes directly or indirectly. The change of environment is a reflection of concentration of industry, growth of transport network, and the increase reliance on private automobile as a means of transportation. The city of Riyadh has the characteristics of major urban centers but it has its own unique historical development and spatial growth. This paper will review the spatial expansion of the city through four decades, from 1950 to 1999. By far the fastest growth of the city has been within the last 10 to 15 years. The environment of the city, from a spatial point of view, will be examined and analyzed. Data are obtained from the Arriyadh High Commission, and some satellite images will be examined in so far as the changing rates of air pollutions is concerned. It is expected that a spatial pattern will immerge in relation to the concentration of industry and population.
Abstract Paper presented to the 96th Annual Meeting of the AAG-Pittsburgh, Pen
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Neighborhoods of the Central District of Riyadh: their housing and demographic characteristics.

This study analyzes data in relation to the housing characteristics within five spatial statistical units that contain 21 neighborhoods within the Central District of Riyadh, Saudi Arabia. Data were obtained from the Urban Information Center at the High Commission for the Development of Riyadh. The main objective of this paper is to analyze the housing characteristics and their relationships with the demographic characteristics of the population of these neighborhoods. Among the questions raised in this paper: is there a spatial pattern of housings according to their type, size, and values? There are other related questions such as: is there a relationship between the population density of the neighborhood and the number of housing units? Literature included in this paper deals with the spatial patterns of central areas of cities and the historical importance of these centers, as well as issues related to the population and residential growth within the central area of Riyadh. One of the significant findings of this paper is the important relationship found between the residential density and the number of residential buildings in the central area of the city.