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The Role of Benina Airport in the Development of Eastern Part of Libya

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Abstract

The rationale for the choice of the problem of this study is based on the following points: the airport has undergone four historical development periods and the second period (1952- 1969) was the most important one, in which Benina and the other Libyan airports witnessed an unprecedented prosperity, where the State started to implement a series of economic and social plans. Through the study of population growth around the area of Benina, it was found that the airport did not contribute to the growth of the city as is customary known in most airports in the world. It has been shown through the studying of the compositional structure of the airport facilities and components that most of the departments of the airport suffer from worn out and lack of maintenance. The findings of the study showed also that the airport is currently suffering from a host of problems that had a negative impact on the efficiency of its operation; the most important of that is the noise brought about by the warplanes which cause great nuisance to residents living near a residential area of the airport, leading to ear and hearing problems for 32% of the total respondents surveyed in the study. In addition to the environmental effects on housing near the airport, this had led 33.5% of the total sample studied individuals to complain of disruptions in phone calls and cracks in the walls of houses. Thus, , in order to achieve the desired objectives perfectly, the officials and those interested in the field of airports and air transport in general must put the following important recommendations into consideration:- (1) More attention must be paid to the application of environmental legislation, in order to preserve the environment around the airport from the dangers arising from the mismanagement of Benina International Airport. (2) The officials of the civil aviation administration must separate between civil and military airplanes , in order to avoid problems arising from the joint use, which claimed the lives of passengers of flight No. 1103 heading to Tripoli in 1992. (3) The rehabilitation of the airport with the latest cutting-edge technology and means of moving belts and surveillance equipment and vehicles transporting passengers with sophisticated luggage and other modern technologies that help to accelerate the development of passenger traffic at the airport. (4) The management authority must unify security agencies operating within the airport, and determine the whereabouts and the allocation of special uniforms for each of them.

Key words :-

Airport, noise (acoustic pollution), population, housing, environment

Introduction

Transport is the backbone of economic life nowadays, especially Air transport, which has become a necessity in this time, in which the movement has been active domestically and internationally, and time has become an important element in economic life. Airports are the most important key ports in the city and they are parts of the elements of the system, which includes air planes and thus has become the ultimate tool for linking the sprawling globe super-fast. Recently, The airports are not considered just as ground space facilities and apparatus with a view to their use for check-in/check-out and move planes, but they have evolved into a cultural interface and a public facility effective economically and politically within the wheel of the gross national product.

Given the importance of airports and their influence by their surrounding environment and the direct impact they have on environment, the geographers are interested in studying them for their significance and their economic and social role in developing the country. They play a vital role in connecting countries to one another and linking the parts of a country, especially large amplitude, as is the case of Libya, in addition, they contribute and support the section of tourism and create job opportunities for residents who live near of the airport. It has been estimated that Libya is a cradle of the oldest civilizations and has deep impact in man's emergence and its development since prehistory until the present time. This was not coincidental as Libya is characterized by a unique geographical location, which mediates the North of the African continent, and the Southern Mediterranean, making it a focal point between East , West, North and South. It is granted mild climate and diversity of natural landscape ranging from mountains , plains , deserts and beaches. Such features assisted making Libya tourist attraction. Thus, the tourism industry will not succeed without the creation of an integrated network of land , sea and air transportation.

Based on the above, the main focus of this study is on the geographical and natural factors and human influence in the choice of location of the airport, as well as the study of the historical development of Benina International Airport. besides, in this paper we study and analyze the evolution of air traffic and the allocated portion of geographical analysis in order to recognize the environmental impacts resulting from the management of the airport on the population and housings close to it, and the problems that currently present in the airport. In addition, in this study we attempt to figure out the level of services provided by the airport and the degree of satisfaction on it. Finally, the researchers of the study offered the most important research findings and recommendations that would improve the airport's efficiency and performance.

The Study Population and Sample Size

The researchers relied on more than one method in this study including questionnaires. The procedure of questionnaire requires a field study that was conducted later. It is one of the most important tools for data collection, and the data were collected in the field through the distribution of questionnaire to the members of the targeted samples of the study. The first was addressed to the residents of Benina area , especially the residential areas very close to the airport and located under the line of direct flight, such as the neighborhood of Campo Al-Ajajj, Qattara Valley project and the Benina residential area. This is done in order to identify the environmental impacts on the management of Benina International Airport and its effects on the population and housing near the airport. As the number of households in the area of Benina airport, is about 1900 families, according to the preliminary results of the general census of the population of the year 2006. Thus, the researchers have targeted more than 10% of heads of households, to determine the size of the sample, and relied on the method of systematic random sample of the population of the study.

The choice of the total number of respondents in the study area was 200 individuals. The questionnaire contained a series of questions divided into, questions regarding the general characteristics of the population of the study area, such as demographic and social aspects for members of the study population, while the other part is related to the extent of disturbing the population of aircraft noise, while the latter part has dealt with health effects resulting from the noise (acoustic pollution) and its impact on the population, then the effect of noise on housing near the airport. The questionnaire had been conducted on Tuesday, 03/08/2012 and lasted for a week since then.

The second questionnaire was addressed to passengers on flights at the airport and has varied questions - some related to the social and economic characteristics of passengers, and the purpose of the trip, the second part of the questionnaire was directed to the level of services provided by the airport for travelers and the degree of satisfaction among them. For this purpose, the distribution of the questionnaire was to all those in the hall of departing passengers (domestic and international) of Benina International Airport. The practical part of study was conducted in February, in line with the mid- term holiday of the school year, in order to identify the nature of the air traffic at the airport, and the type of movement, the purpose of the trip, as well as to get to know the level of services provided by the airport for travelers, and the degree of satisfaction reported, the study has lasted four weeks starting on Monday 1/2/2012 to Sunday 28/2/2012. The minimum size of the sample was determined according to the equation made by Jaouani et al., 1989 (Jaouni, 1998, P.90) As follows:-

The terms:-

$$n = \frac{z^2 \ \propto/2}{4e^2} = \frac{(1.96)^2}{4(0.05)^2} = \frac{(1.96)^2}{(0.01)}$$

n: refers to the size of the sample
z: to indicate the limits of the confidence coefficient, which is determined in the light of the level of confidence in force in the study (95%) , which is 1.96 (fixed).
α: the level of significance.
e: The margin of error allowed in the sample.
n = 384 (*)
In order to reduce the error rate, the researchers increased the sample size to 450 questionnaires; divided into 225 questionnaires for travelers to international travel, and 225 questionnaires to local trips.
*Fred jaouni, et al., principles of statistics, publications, Murad library, Sanaa, Yemen, 1998, p. 90.

Assessment of Previous Studies in General

In this study the researchers examined more than 24 previous studies varied in themes and different scientific disciplines, which are devoid of any geographic outlook. The focus was mainly on the engineering side of the airports, including a study by Halima Abu-Baker (2004), which focused on highlighting the architectural aspect of Benina International Airport (Abubaker, 2004, P 6), and another study by Ahmed Al sharif and others (2007), which dealt with the economic feasibility for the development and internal planning for Benina Airport (Al-Sharif,2007, p. 8).

With regard to the effects of airports in the regions where they are located, Radwan (1986.) studied the impact of Benina International Airport on the two cities of Benghazi and Benina, where she demonstrated the geographical characteristics of the site of the airport , the role played by it and the road network that reaches the airport with the city and the areas served, besides, the problems that faced by the airport (Radwan,1986, p. 3, and p6).

Concerning the environmental effects of Airports, Khalifa Bin Nasser Al Thani (2008) demonstrated the environmental effects resulting from the Doha International Airport and the damages caused either to the population or to the surrounding environment(Al-Thani,2008 ,p. 35, and , p. 38.). Moreover, two researchers from the University of Tripoli in cooperation with the Civil Aviation went over the noise caused by Tripoli International Airport and its impact on human health(Ghashir,1985).

Concerning the services provided by the airlines, there was a study conducted by Ali Zinada Al Ghamdi (1995) for evaluating the services provided by the Saudi Arabian Airways, for knowing the strengths and weaknesses of the services provided by the company for travelers(Al-Ghamdi,1995).

As regards the problems of air cargo within airports, an analytical study of this service at international airports in Saudi Arabia by Salem Al-Faydi (2000) was conducted. His study

focused on the administrative aspects of this service at airports, while neglecting the geographic side(Al-Faydi,2000,p. 5 and p. 7).

In terms of the assessment of the current conditions of Libyan airports and air traffic problems, the Civil Aviation Authority decided to study and examine the current situation of international and local airports in depth. Saleh Al-Nemer (2007) conducted a study on privatization of the air transport sector and demonstrated the obstacles facing the air transport movement in Libya(Al-Nemer,2007,p. 1and p. 8).

Some of the international studies dealt with assessing current situations of air traffic and the problems facing the Arab world air traffic. For instance, a study presented by Ayman M. Salem (2007) on the evolution of the air transport system in Egypt and organizational structures and compositional domestic airports in Egypt and its impact on the tourism movement(Salem,2007,p. 8 and p. 10).

for the geographical studies that discussed the subject of airports and air traffic is very few compared to other studies, whereas Farouk Ezzedine's study (1970) is considered the first nucleus of the Arabic geographical studies that dealt with the study of the Cairo international airport geographical detailed analysis, where the study concentrated on natural and anthropogenic factors, that contributed to the emergence of the airport and air traffic, and the status of Cairo airport between Egypt and the Arabs, besides, its contribution to the tourism movement in Egypt (Ezzedine,1970).

For the geographical studies that dealt with geographical air transport in Libya, a study conducted by Al-sholah Khalifa (2001), who discussed the historical development of the air traffic at airports, and aviation relationship with international organizations of aviation(Jawashi,2001,p. 4 and p.7). Another study presented by Weisbrod it al., (1993), provided a framework (model) for understanding economic impacts and planning for development around new or expanded airports. However, the intensive airport-related development is a new spatial phenomenon worldwide(Weisbrod,1993).

Thus, Stangel M. (2011) emphasized that the growth of air transportation and airports in Poland in the last few years is related to the economic development and progress towards contemporary standards. The passenger terminal becomes surrounded by a range of additional functions, such as commerce, dining, specialized services, conference centres, hotels as well as zones of commercial activity. Airports are increasingly being seen as catalysts for local economic development(Srangel,2011). The case study of planned airport development area in Benina Airport is quite different. The Benina Airport developments envision a less dense mix of services related to the passenger terminal. Current planning documents and policies envisage a less infrastructure development with building new commercial areas located along the transportation corridors linking the airport with Benghazi centre.

Geographic Factors Affecting the Emergence and Development of the Airport

1- Absolute location

Benina Airport is astronomically located in the intersection between latitude 20 -16-15 East and longitude 32-05-51 North as shown in (Figure 1).

2- Relative location

The airport is located in the area of Benina at about 20 km East of the city of Benghazi, where the Airport is limited by Al-rajma, which are separated from the airport, only a short distance of about 4 kilometres, and bounded from the West area with Benina residential area and Campo Al-jajj neighbourhood.

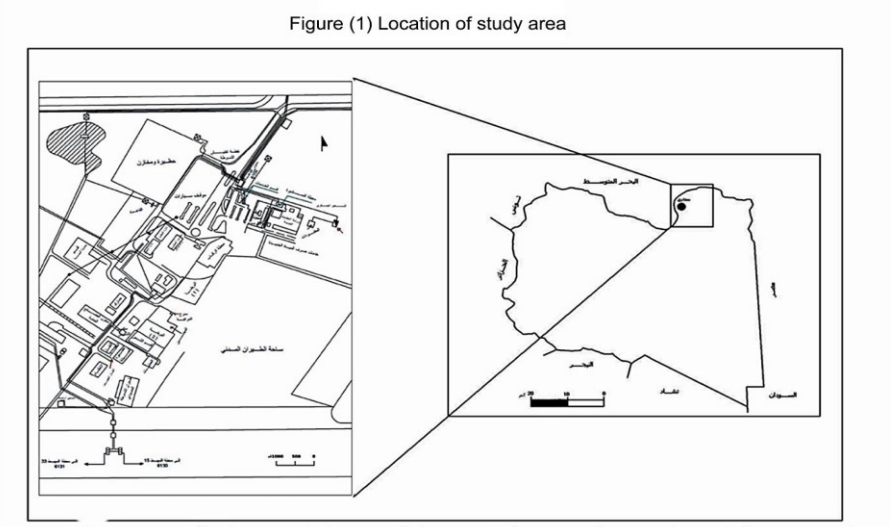
The airport is bordered from the North by air defence base, and to the South via El-Abiar Benghazi road. The process of selecting the airport site is of important processes that require knowledge and experience, for choosing the most suitable sites, which is at the same time capable of expansion, and the evolution of the airport traffic and the size of aircrafts.

The Geological and Geomorphologic Structure of the Study Precinct

The airport is located in Benina area within the region of Benghazi plain, which consists entirely of sedimentary rocks of marine origin, and carbonate rocks from the Miocene era(Jawda,1973,p. 102).As for the surface configurations of the study area, we find that most of them belong to the third and fourth eras (Abdullah,2003,p. 38).

This is a significant factor in securing the appropriate place for the selection of the airport site, and through the identification of geomorphologic region, so that the choice of airport site in the area of a flat surface suitable for the establishment of land passages, on which the aircraft can move easily during the ascent or descent, taking into account the dimension sufficient for the mountains or ridges or plateaus, as well as taking into account protecting the airport area form the invasion of sand and floods, and remoteness from urban buildings. Further, we should be cautious of the presence of terrestrial infrastructure caves, or the cavernous valleys and esoteric drilling, so that the corridors that the aircraft arises over can bear the pressure upon landing, and do not expose to the collapse or smash or crack (Ayman,2007,p. 57).

Figure (1) Location of study area



Source: National Atlas of the Jamahirya ,secretary of planning, Survey Department P.32

As for the second phenomenon spreading in the area of the airport in the form of the presence of some valleys in the area ofthe airport, including the Valley of Hazmaria, which is located East of the airstrip, and Campo Al-ajajj, which is located North of the runway, and the Valley of Qattarah, which is located South of the airport, and it must be noted that some of these valleys may hinder the possibility of expansion of the airport, including the Valley of Hazmaria-which limits the expansion of the airport on the East side(Al-Sharif,2007,p. 57).

Human Characteristics

The Development and Population Growth in Areas Served by Benina Airport

The study of population is important, where the population is used as an indicator in studies of the economics of air traffic, the more the population increased, the greater the demand for air traffic.

Table (1) shows the evolution of population growth in the areas served by Benina International Airport during the four censuses (1973- 1984- 1995 – 2006). The table shows that population growth rates have shown a clear divergence, where the population growth rate recorded the highest rate during the period between (1973 – 1984) amounted to about 5.1%, and this is due to political, social and economic transformations experienced by the country, and which in turn reflected the population growth during this period, then this rate fell during the period between (1984-1995), with about 3.7%.

While the period between the two censuses (1995 -2006) recorded the lowest rate of population growth in the areas served by the airport, which was only 1.6%; this can be explained in terms of a combination of factors and reasons the country suffered during the nineties such as stopping the development projects in the country at large.

Concerning the size of the population, it was about 583, 252 inhabitants in 1973 and then increased to 912, 846 inhabitants according to census of 1984, and then the population size continued to rise up to 1,289,943 inhabitants according to Census of 1995, Then, the census of 2006 has shown a significant increase in the size of the population of about 1,511,381 inhabitants.

Table (1) The evolution of population size and growth in the areas served by the airport during in the period (1973- 2006)

Population				Population growth rate		
1973	1984	1995	2006	1973-1984	1984-1995	1995-2006
583252	912,846	1,289,943	1,511,381	5.1	3.7	1.6

Source: General census of the population, (1973-1984-1995), and preliminary results of the census of 2006.

Urban Growth Around the Airport Area

Through the field study of Benina housing area, despite its proximity to the airport, it does not constitute an obstacle for the air safety of the airport, there is no urban encroachment around the airport area, but closeness of the residential areas to the airport has resulted in several problems that will be dealt with later. In brief, there is no vertical or horizontal urban growth around the airport area, Benina area does not suffer from urban encroachment around the airport and had no high buildings pose a threat to air safety. It must be noted that there are a variety of reasons prompted the civil aviation department in Libya to choose a new position for the implementation of a project to build a new Benina International Airport. Some of these reasons are as follows:

1. The separation of civil and military air traffic at the airport.
2. The current airport's inability to keep pace with traffic, and the current terminals that are worn out.
3. Position of the new airport away from the residential area of Benina in order to avoid the problem of repeated assaults on the airport and its organs.
4. Position of the new airport parallel to corridors ,and the advantage of proximity and ease of entrances to it.

Putting the new airport in a large area amounted to 500 hectares that could be easily expanded in the future (Civil Aviation ,2012).

It should be noted, however, that in a study by Civil Aviation (2012) of the spatial characteristics of the airport, the results have shown that the current airport's position, is appropriate in terms of distance, ease of access and contact, also contributed to the emergence and development of the airport to the city of Benghazi and roads connecting the airport to the cities it serves. The actual area exploited by the new Benina airport is about 500 hectares, and the ownership of the airport for civil aviation is still questionable (Civil Aviation ,2012),

therefore, it is necessary to clarify the legal position of the ownership of the land before embarking on the development process and the consequent costs or the introduction of a new airport building. It has become an axiom of contemporary development thought to provide good and sophisticated infrastructure and well-developed in quantitative and qualitative terms.

This is becoming a significant degree and urgent need imposed by the desire to achieve high rates of growth and development, and this fact has become understood by all developed and developing countries alike. The airport is one of the important components of the infrastructure, but is descry bed often as one of the main driving force for the wheel of economic development and increase efficiency and improve performance. This confirms that the physical and the human factors have already contributed to the emergence and development of the airport.

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The Civil Aviation Authority began in Libya to establish a new International Benina Airport, at a cost of $ 600 million Libyan dinars, including a new passenger terminal to accommodate five million passengers per year, 18-gate airport to accommodate nine large aircrafts, and there is a parking square at the airport for planes and conductive paths and new ways, besides a new station for air freight, with a new passenger terminal area expands to 7 hectares including departure and arrival halls for travelers. A Canadian company called Lavalin was appointed to carry out the execution of the new airport project with a French company for design. The new air traffic control tower at the airport opened under the auspices of the United Libyan Company (Al-Bory).

Stages of the origins and evolution of Benina International Airport

The study of historical development of any airport is of important task, because it leads to a proper understanding of the emergence of the airport, and its evolution through historical stages that the airport experienced to reach its current state, where the airports since their inception in Libya were modest, and mere airstrips easy to design and easy to prepare for aircraft use, and then evolved over the years, until they became today edifices for civilization, economic, investment and huge services. Those airstrips turned from easy planning and design, to strips of different lengths and installations, depending on the degree of the airport and the quality of the aircraft used the airport.

First Period: Growing Stage (pre-oil)

The history of the establishment of Benina airport is attributed to the thirties of the twentieth century, where the Italian government demolished the old buildings in the area of Benina in 1934 and began to initiate the construction of a new airport in 1935, which is now known as Benina Airport, the subject-matter of this study.

This was a special aviation airport for Italian military at that time, and the Italian government has completed the process of building this airport in 1937. The Italians were the first to have created the airports in Libya for military purposes (Bolegemah,1998,p. 175).

The British entered the area of Benina in 1943 , and conquered the airport, and demolished the airport tower which was established by the Italians, whom they built a new existing tower for air traffic control. The British smashed water tanks in the study area and the British administration was the first to have made several attempts to improve the economic situation, and the reform of some administrative buildings and basic services such as electricity, water and some roads. During this period air contact has been reconnected, until embarked on a search for oil (The National Planning Council,1966,p. 93). The country's economy was suffering from a large deficit, and the local production was not enough even to cover the domestic demand.

The second period (1952- 1969) after oil

The fifth decade of the last century has witnessed the obtaining of the country's independence in1951, and perhaps the most important events that were seen in this stage, is the Government of the Kingdom of Libya which has received the airport management from the British administration, and also witnessed some of the construction work at the airport, including the construction of an airstrip in 1955.

In the period from 04/01/1965 till 31/03/1966, the Government of the Kingdom of Libya issued the third annual report on the activities of economic and social development in the country at large. The report included a plan of action proposed for execution of Benina Airport, because of its importance of trade, as it serves a large part of the eastern region of the country. Probably one of the most important works that have been executed during this period, was the re-paving of the runway, which was established in 1955, its maintenance, and making some improvements to it. Also, a new airstrip for aircraft of type (DC 8) and parking places for aircrafts were established in 1963 (Libyan Arab Republic,1975).

It must be noted that the iniquitous embargo imposed on Libya, according to UN Security Council Resolution 718 of 1992, which led to the suspension of international flights within the country, definitely resulted in heavy losses in all sectors of the State.

Third Period: Economic Planning Phase (1970 to 1999)

This phase is characterized by adopting the Libyan State style of economic planning, which have focused on the transport sector, due to the effective role-played by the sector in advancing the economic development of the country, so the Coup d'état of September 1969 started to prepare a set of transformation plans, aimed as they see at building a solid economic base independent of oil income.

The 1970s were amongst the most important periods of the significant achievements that the airport witnessed and other Libyan airports; this period has viewed an update for some major airports such as Tripoli International Airport, and development of Benina, and Sebha airports(Al-Sharif).

The Fourth Period from (2000-2009)

In the late 1990s and early 21st century some modifications have been made within its premises and conducted some maintenance of facilities, including expansion of the passenger hall of the 1990s and expanding parking of vehicles. Now, the State is implementing a new project of Benina airport inside the ground of the previous airport, in order to keep pace with the development of air traffic in the airport (Ezzedine,1970).

spatial process

Aircraft movement trans Benina International Airport during the period (2002- 2009).

Figure (2) shows the movement of aircraft transiting Benina International airport in the period from 2002 to 2009, we noted that the movement of aircraft in transit has witnessed a fluctuating development between increases and decreases, probably due to increasing of navigational services that pass through, and thus , contributing to increased rates of air safety, and an increase in the absorption of air routes for aircrafts. The number of aircrafts transiting reached the highest level in 2009, running to 23, 743 transient aircraft, while this number reached its lowest level in the year 2002, amounting to 15,937 transient aircraft.

Looking at (Figure3) one can note that the movement of the aircraft began to rise gradually between (1960- 1964) , where the number of aircrafts reachedto20,000, then started to fall down until reaching to less than 5000 in 1978.

During the year 2000, passenger traffic recorded a remarkable increase, whereas their number amounting to15,870 passengers in 2009, or an increase of 70%, due to the lifting of the air embargo on Libya, which contributed to an increase in passenger numbers.

This period has experienced a boom in the Libyan economy, and also because of the airport site, where most airlines prefer to deal with Benina Airport rather than to deal with Tripoli airport(Libyan Arab Jamahiriya,2009,P.91).

The Evolution of Passenger's traffic in Benina International Airport in the Period from 1960 - 2009

If we look at the evolution of the general movement of passengers arriving and departing domestic and International Benina Airport in the period1960 - 2009, which is illustrated in Figure(4), one notes that passenger traffic is sometimes witnessing an erratic growth upward and other downward in some years, as mentioned earlier, because of political and economic pitfalls experienced by the country during the past five decades.

The number of passengers run to the highest level in the year 2005, reaching 1,298,985 passengers, while the number of passenger departures and arrivals for both domestic and International flights lowest level in the year1960, where it reached10, 645 passengers.

The period (1975- 1992) has witnessed a remarkable growth in air traffic in the country at large, which resulted insignificant pressure on the Libyan airports all over the country. Thus, the State has to establish new domestic airports such as Hoon, Brak , Ghat and Misratah. The Libyan State also supported the Libyan Air Fleet to keep abreast of developments in air traffic.

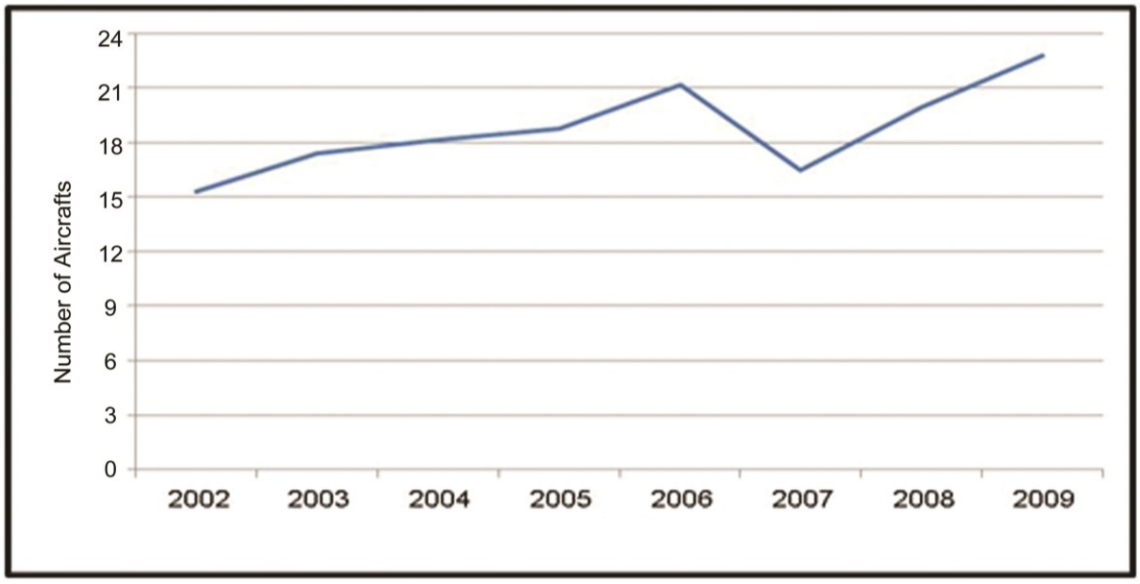
Air Freight

Air cargo is one of the most important sources of income in the airports; it is considered one of the fastest, most accurate shipment types and flexibility in implementation, owing to the multiplicity of options available and the varying rates of service for shipments between airlines. Thus, air freight contributes to the growth of air traffic within airports, from here one can define "air cargo as being transferring cargo and mail of various kinds from one station to other through air ports (Mohammed,2007,p. 56) .

The Importance of Air Cargo Services

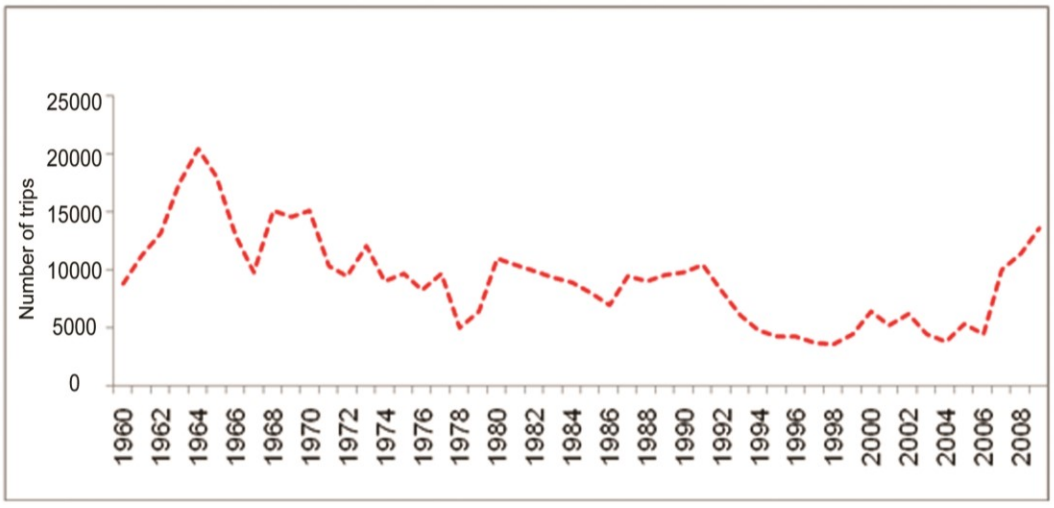
1. Air cargo traffic helps the arrival of goods in a timely manner and with the required speed, which would entail reducing the costs of storage, distribution and sale price for the consumer.
2. Air cargo movement leads traffic in the long run to increase passenger traffic at the airport, and the growth of air traffic at uncrowned airports.
3. As a result of the increase in cargo traffic at airports, an increase in the revenues of the airport will occur, through landing and parking fees, in addition to refuelling and other services.
4. The development of air cargo traffic at airports is an important factor in driving economic growth in the State ,and will result in the provision of new job opportunities(Mohammed,2007,p. 56).

Figure (2) Aircraft's transit Benina International Airport during 2002



Source: prepared by the researchers, depending on the overall management of the international airport data Benina, Documentation and Information Office, 2002-2009, unpublished

Figure (3)The evolution of the general movement of the aircraft of Benina International Airport during the period 1960 - 2009



Source:

1) - Farouk Ezzedine, Transport Geography in Libya, Cairo University, Faculty of Arts, Department of Geography, 1976, Unpublished PhD Thesis, (56,57,58,60,61 tables, supplements years (1960-1973).

2) - Libyan Arab Jamahiriya, the Civil Aviation Authority, and public administration to Benina International Airport, Documentation and Information Office, for the years (1999-2009).

The Evolution of the General Movement of Goods in Benina International Airport during the Period 1960- 2009

Figure (5) explains the historical development of the general movement of goods shipped and unloaded at the airport during the period from 1960 to 2009. It is noted that the movement of general cargo handled at the airport has witnessed a growth fluctuating between increases and decreases similar to a large extent with the movement of aircraft and passengers as a result of political and economic pitfalls experienced by the country. The movement of goods has reached its highest level in 2009, where it amounted to 6,803,081 tons, while this amount has reached its lowest level in 1962, where it recorded only 1.11 tons as can be seen from figure (5).

The movement of goods traded by Benina airport continued in increase during the years 2006-2007-2008-2009 and the movement of goods amounted to its peak during the year 2009 with an increase of more than 8% higher than 2008 as a result of the evolution of the global economy, where the rate of gross domestic production Africa helped oil-exporting countries, such as Libya from the continuing rise in oil prices, resulting in high terms of trade(Ezzedine,1976,P.96)

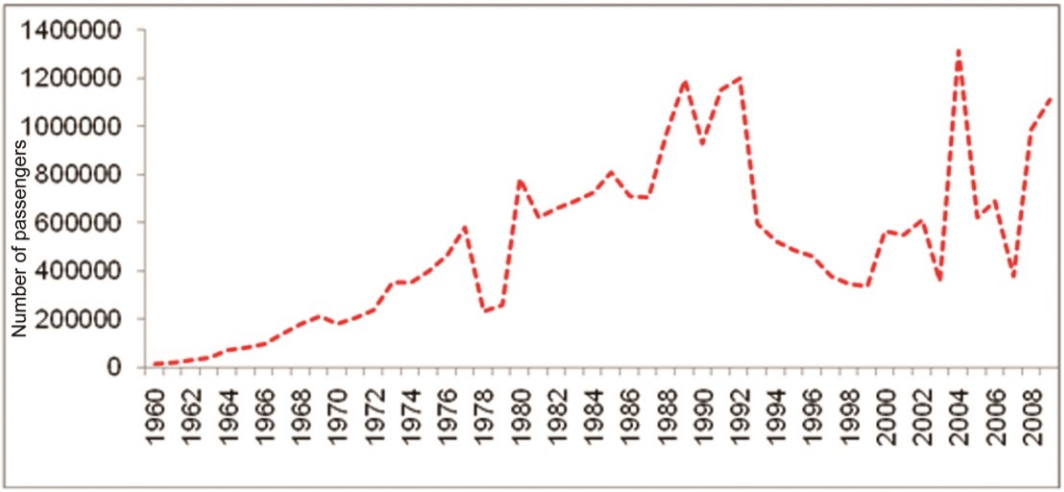
The Evolution of Mail Movement of Benina International Airport in the Period 1969-2009

If we trace the historical milestones of development of the annual movement of air-mail ,which charged and discharged from domestic and international Benina airport between 1969-2009 as illustrated by figure (6). This figure shows that the movement of air mail growth has fluctuated between increase and decrease as a result of their vulnerability to political and economic conditions of the country, the quantity of air mail has reached its highest level in 2003, amounting to 104, 851 tones, while this quantity reached to lowest level in 1985, with 696 tons.

The Spatial Interaction of Benina International Airport during 2009

The study of spatial interaction is one of the most geographic concepts used in the science of geography, through which one may identify the size of spatial interaction of Benina Airport and other airports. Thus, in this part of this research we will deal with airlines operating at the airport, either national or foreign during the year 2009, the national airlines, and the size of its fleet, the study of economic indicators to measure the intensity of the interaction of the airport during the year 2009, on the basis of the number of seats (a monthly mileage) and the number of passengers monthly mileage on both international and domestic, besides, a study of the geographic regions for passengers, air cargo and air mail on both international and domestic.

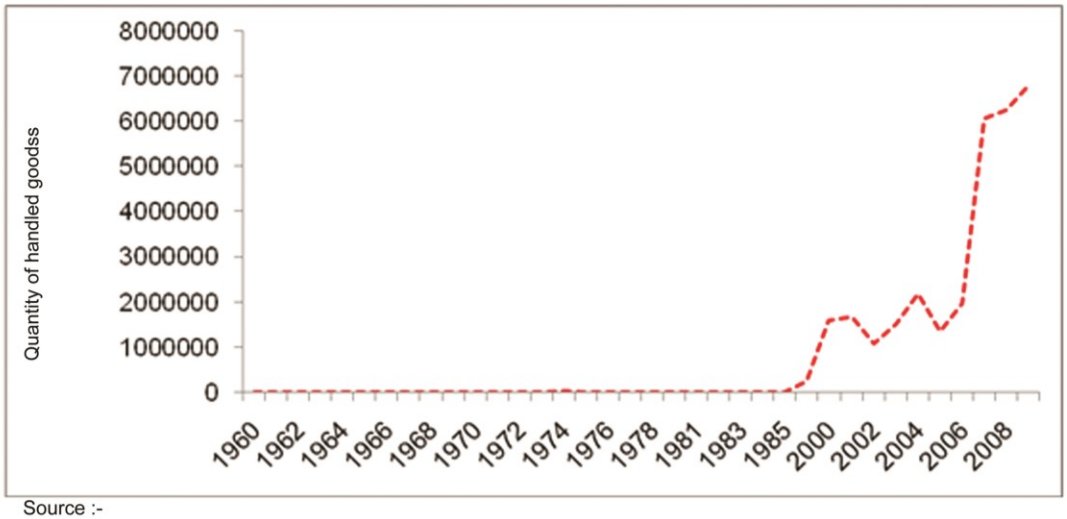
Figure (4) The evolution of passenger traffic of Benina International Airport during the period 1960 - 2009



Source :-

1) - Farouk Ezzedine, Transport Geography in Libya, Cairo University, Faculty of Arts, Department of Geography, 1976, Unpublished PhD Thesis, 56,57,58,60,61 tables, supplements years (1960-1973).
2) - Libyan Arab Jamahiriya, The Civil Aviation Authority and Public Administration to Benina International Airport, Documentation and Information Office, for the years (1999-2009).

Figure (5) The evolution of the general movement of goods of Benina International Airport during the period 1960 – 2009.



Source :-

1) - Faroukl Ezzedine, Transport Geography in Libya, Cairo University, Faculty of Arts, Department of Geography, 1976, Unpublished PhD Thesis, 56,57,58,60,61 tables, supplements years (1960-1973).
2) - Libyan Arab Jamahiriya, The Civil Aviation Authority and Public Administration to Benina International Airport, (Documentation and Information Office), for the years (1999-2009).

Airlines Operating at Benina International Airport in 2009

Benina airport employs about 10 national companies serve the movement of domestic and international air transportation for the year 2009- only the Libyan Airways, State-owned, the rest of the companies are private, and works at the airport around 7 foreign firms serving international flights out of the country and are as follows (Civil Aviation Administration):

First: national airlines operating at the airport are as follows:

1.The Libyan Airlines. 2-Al-Buraq Air transport. 3. African airlines.
4. The Libyan company for aviation. 5. Company one nine.
6- Naizak Company. 7- World Aviation group (dedicated to air cargo).
8- Harouj Company / Veba, Previously for Oil Operations (dedicated to the oil fields).
9- Mellita Company (dedicated to the oil fields).
10- Schenker air transport company (dedicated to the oil fields).

For internal transport, the civil aviation authority in Libya has done positive steps towards the liberalization of air transport, and when air transport department granted work practice permission to a number of private national companies, which helped some of them to run internal airlines as of 2001, the essential objectives were:-

1- To increase competitiveness among firms that received permits to run internal operations.
2- lack of putting a specific tariff for domestic air transport, so the company will determine its tariff in accordance with its examination of the feasibility of making the borders of greater competition between these companies.
3- To ensure provision of transport services in the home land of all internal companies and not to focus on two or three of the multiple various domestic airports.
4- The importance of the link between Libyan cities and open the door for other indirect economic activities, and improve the reality of domestic air transport, which is reflected positively in the improvement of the local eco-tourism.
5- The importance of activating the competition between companies operating in Libya, through the program of liberalization of air transport procedures, which entails the growth of this sector and to protect the traveler and the service workers in the sector, including obligatory service, good performance, and not to put obstacles to economic challenge of growth, such as determining the prices of domestic air transport.

Second: foreign airlines operating at the airport are as follows:

1. Royal Jordanian airlines. 2. Egypt aviation company.
3. The Cairo company for air transportation.4. The Tunisian airlines.
5. The Turkish airlines. 6. Egypt global company.
7. The Dutch Airlines *(casual) (Al Azzabi).

*Flight crossbar is irregular trip and not-restricted to a declared schedule in advance

Air Fleet of Libyan Arab Airlines

The fleet was formed in 1964 and started actually managing its trips in 1965. The fleet initially contains two aircrafts of Caravelle, and then it was provided with a number of aircrafts of Fokker type 27, and Boeing aircrafts727. Then after 1969, the State has applied new programs and projects to develop and improve air traffic at airports in the country, as the Libyan airlines have become the only national service entrusted in air traffic internal and external. The air traffic began in Libya after World War I, and was credited for the Italians who were the first to have taken up the topic of airports and air traffic, and whom have inaugurated the first commercial airline aircraft airships between Libya and Italy on 1/11/1928 by Italian company called Sana. In 1960 an airline called (Libya FIA) was founded to conduct flights to Tripoli, Benghazi, Athens, and, Sebha.

This company continued in the air transport service until issuing the resolution of the establishment of Libyan Arab Airlines corporation owned by the State (Law No.28 for the year 1964). This institution has started to actually conduct flies in 1965, where the institution has opened many branches of airlines all over the country, See Table (2).

Table (2) Some air carriers operating in Libya

Company	Inception date	Property type	N. of aircraft	Market type
Libyan Airlines	1965	General	15	Domestic and International
Tebesti	1996	General	0	Domestic
Buraq	2000	Private	18	Domestic and International
African Airways	2001	General	6	International
Sager Al-wahdah	-	General	0	International
Libyan company for aviation	1996	Private	15	Domestic and International

Source:-Ahmed Saeed Al-Sharif and others, the economic feasibility study for the development of Benina airport in Benghazi, Economic Sciences Research Center, Benghazi, 2007, p 34.

Economic Indicators for Measuring the Density of Regional Relations for Benina International Airport

The rate of exploitation of mileage for Benina international airport network is determined by the number of seats available on the aircraft mileage revenue operating at the airport, or passenger mileage revenue setting during the year. We mean by seats revenue of mileage, the number of seats available for sale multiplied by the distance (in mileage) for each trip to the airports dealing with Benina International Airport. The number of passengers

mileage revenue means the number of passengers multiplied by the distance (in mileage) fare-payers for each trip to the airports dealing with Benina Airport, this measure shows us the intensity of regional relations with Benina International Airport.

For economic indicators applied by the researchers on the movement of passengers to Benina International Airport for the year 2009, the researchers collect the number of seats in the aircraft of eight kinds, which fall under the models of Boeing , Air bus and (C.R.J 900), where the number of seats was about 1340 seats, and by performing a simple calculation we have obtained the arithmetic average of 167.5.

The researchers then divided the results by the number of mileage seats and mileage passengers on the number of months of the year, to reach at the end to the monthly average for each. In addition to indicators that measure the density of air traffic at the airport, there are other economic indicators by which the efficiency of the airport, air fleet and the efficiency of the fleet services, not only to know the density of air traffic, but also to identify the level of economic performance. Here we can compare these indicators with the effective revenue and then compare the revenue costs to get the size of the profits(Farag,2000, P. 126).

* Medium = number of seats for these aircrafts ÷ Number of aircrafts
Average = 1340 ÷ 8 =167.5

As for the distance in mileage, the researchers have measured the distance between Benina International Airport and domestic and international airports that deal with Benina International airport during the year 2009 from the maps. Then transferred the distance between Benina Airport and airports dealing with it from a centimetre on the map to a kilometre, and turned the distance between airports from kilometre to mile road.

Measuring the Density of Air Traffic at Benina International Airport in 2009

The researchers have relied on some economic indicators for measuring the density of the air traffic at the airport, in order to identify the volume of traffic at the airport domestic or international.

First: on the basis of the number of monthly mileage seats

(A) An International level

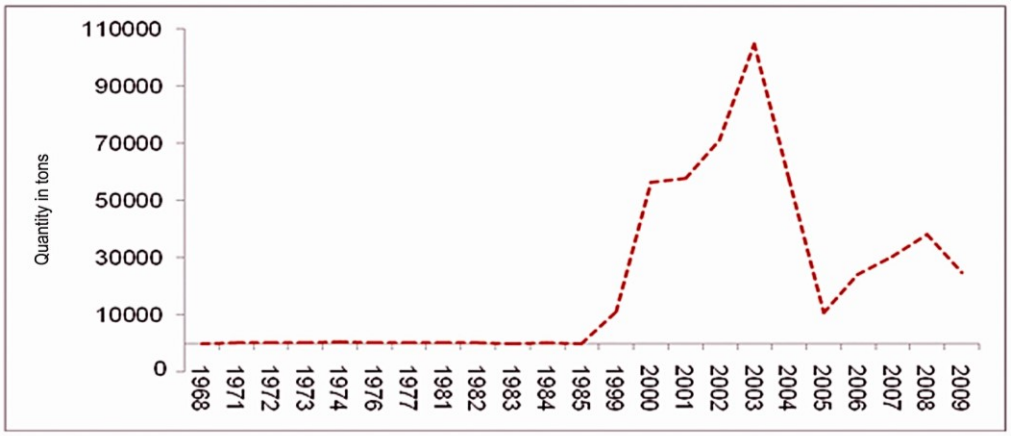
By tracing (Figure7), which shows the distribution of the ordinal ratio of international airports, that deal with Benina Airport, depending on the intensity of regional relations during the year 2009, based on the number of monthly mileage seats. one can categorize these airports into five categories as follows:

International airports (category one) that have more than 20,000 seats , Dubai airport was put on a greater proportion of the number of monthly mileage seats amounting for 14% of the total number of seats, followed by Casablanca airport with a rate of 11.7%, then Amsterdam Airport which came in third place with 10.2% of the total number of monthly

mileage seats, while Jeddah airport in Saudi Arabia, and Khartoum airport in the Sudan ranked fourth in percentage of 9.7% of the total number of seats (*). The fifth category of this classification is Cairo International Airport. which fall within Airports that have more than 2000 monthly mileage seats with a percentage of 4.7% of the total seats.

**The mile road: a unit measuring distance = 1, 609 meter*

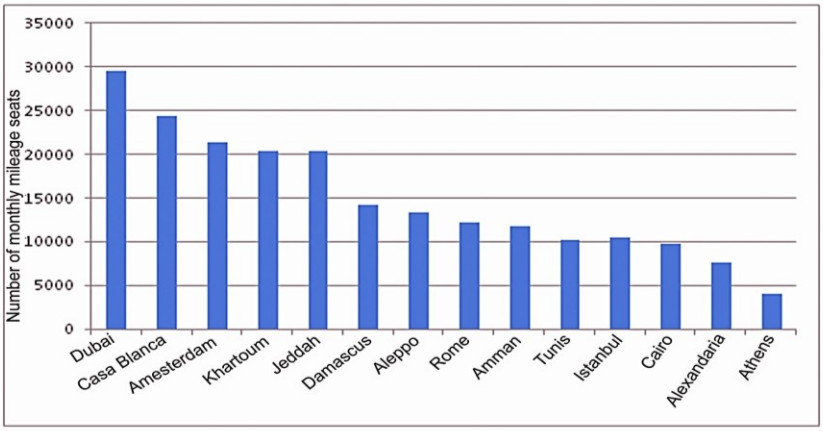
Figure (6) The development of airmail traffic in Benina International Airport during the period from 1969 to 2009



Source :-

1) - Nabila Saleh Radwan, the impact of the current Benina airport on the city and the region,(Garyounis University, Faculty of Engineering, Department of City Planning), 1986, for the years (1974-1979).
2) - Libyan Arab Jamahiriya, The Civil Aviation Authority and Public Administration to Benina International Airport, (Documentation and Information Office), for the years (1999-2009).

Figure (7) illustrates the international airports that handle with Benina International Airport based on the number of monthly mileage seats 2009



Source :-

prepared by the researcher, depending on air traffic data, Documentation and Information Office, the Civil Aviation Authority and Public Administration International Airport Benina 0.2009, unpublished data

Second, based on the number of passengers monthly mileage

By tracing (Figure 8), which shows the distribution of the ordinal ratio of international airports which deal with Benina International Airport , depending on the number of passengers monthly mileage during the year 2009. One can categorize these

airports into six categories. The first category includes international airports with significant traffic movement exceeding 5 million passengers, embodied in Cairo International Airport, with a percentage amounting to 20.7% of the total number of monthly passengers mileage. The sixth category comprising the rest of airports that the number of passengers ranges between 10,000 to 100,000 passengers, where all percentages recorded less than 1%, including the Amsterdam International Airport with 0.4%, and Khartoum International Airport by 0.3%, then the Athens International airport by 0,1%.

(B) The local level

The application of economic indicators on the domestic air traffic, between Benina International Airport and domestic airports, which deal with Benina airport, can classify those airports by the number of monthly mileage seats, and the number of monthly mileage passengers.

First, on the basis of the number of monthly mileage seats

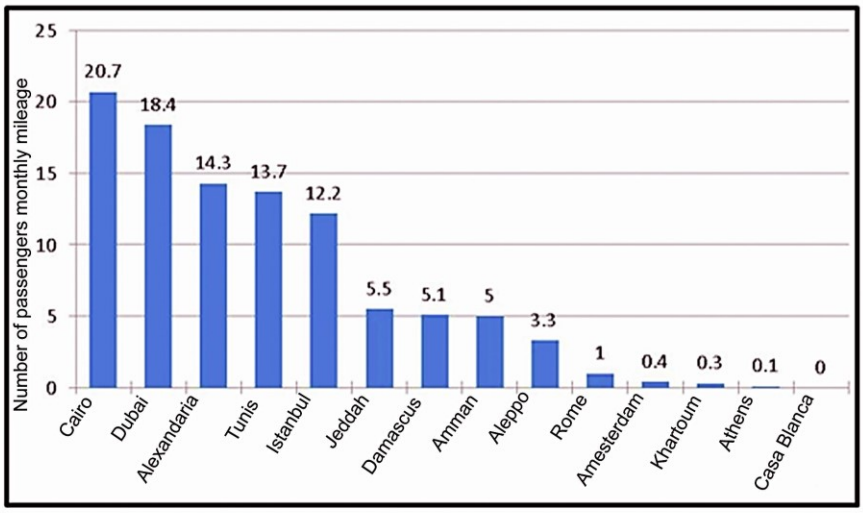
By considering the figure (9), which illustrates the distribution of the ratio of the number of monthly mileage seats, one can classify domestic airports that dealing with Benina airport into four categories, according to the air traffic density. The first category estimates the number of available seats by more than 7,000 seats, where airlines coming in and out of Benina Airport to Kufra airport stood at 29.2% of the total number of monthly mileage seats. The fourth category estimated the number of seats by more than 3,000 seats, representing the incoming and out coming aircraft to and from Benina International Airport. The Misrata Airport was the highest ratio of 14.3%, followed by Sirte airport of 11.1% of the total number of monthly mileage seats.

Secondly, on the basis of the number of monthly passenger's mileage

Shape (10) illustrates the distribution of the ordering ratio of the number of monthly passenger's mileage according to the density of passenger traffic. One can classify domestic airports that transacting with Benina airport into five categories. The category one has recorded the number of passengers that exceeding more than seven million passengers. Tripoli airport accounted for by this category acquiring the highest proportion (77.3%) of the total number of monthly mileage local seats. While category fifth ranges from the number of passengers by more than 20,000 passenger, represented by Sirte airport with a rate of 0.3%, the lowest percentage recorded between local airports during the year 2009. Through the application of previous economic indicators, we find that the economics of air traffic at the airport depends mainly on international airports, due to the financial return.

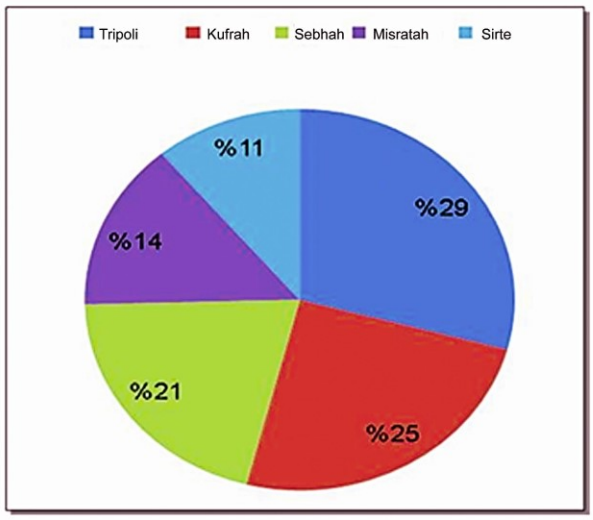
from trips, while Tripoli International Airport presided the scene and ranked first in terms of the number of monthly passengers mileage, that exceeding more than 7 million passengers, followed by the local airport of Kufra.

Figure (8) International airports that deal with Benina international airport based on the number of passengers monthly mileage for the year 2009



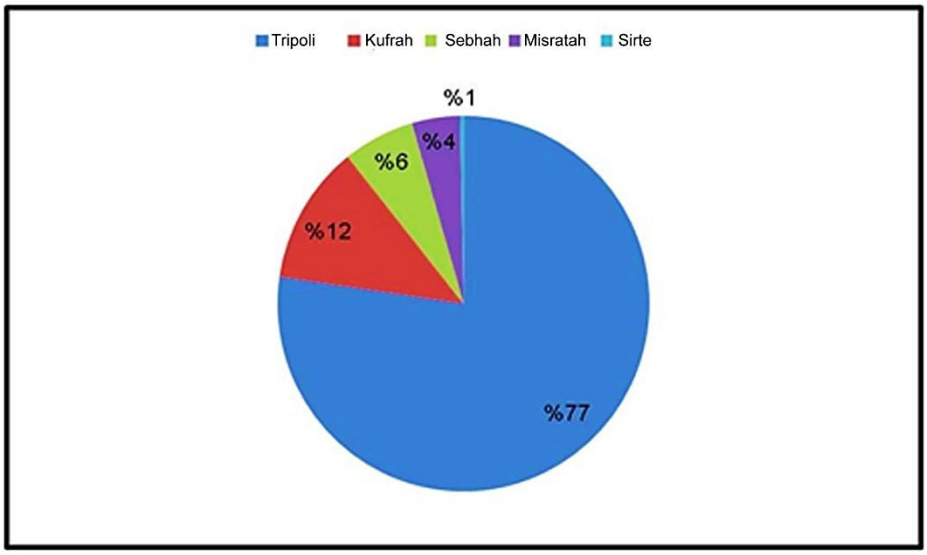
Source :-
prepared by the researcher, depending on air traffic data, Documentation and Information Office, the Civil . Aviation Authority and Public Administration International Airport Benina, 2009, Unpublished Data

Figure (9) displays the ratio of local airports dealing with Benina International Airport based on the number of monthly mileage seats for the year 2009



Source :-
Prepared by the researchers, depending on air traffic data, Documentation and Information Office, the Civil Aviation Authority and Public Administration International Airport Benina, 2009, Unpublished Data

Figure (10) demonstrates the ratio of local airports dealing with Benina international airport based on the number of monthly mileage passengers for the year 2009



Source :-
prepared by the researcher, depending on air traffic data, Documentation and Information Office, the Civil Aviation Authority and Public Administration International Airport

The Environmental Implications of the Use of Benina International Airport

Despite the importance of airports and the role it plays in economic and social development, but the effects on the surrounding environment have not yet received any attention in the past, and that because of the focus was mostly on the development of the aircraft industry, for this the problems that related to the impact of the airport on the nearby areas are rarely examined, and sometimes ignored (Deep, 2006, p. 3).

As the interest in the study on the environmental impacts of airports began in late 1960s, due to the development of air transport, many countries have begun to focus their attention on preserving their environments (Shehata, 2006, p. 100) .This alerted the International Organization for Civil Aviation (ICAO) to the extent of the seriousness of this problem, thus, the International Organization for Civil Aviation has issued supplement No. (16) for the year 1971, which was concerned with the noise of aircrafts, where the (ICAO) identified the noise levels of all aircrafts, according to its kind, weight and the number of engines (Tahoun, 2004, p. 137) ,Besides, the voice pollution or any noise from take-off and landing of aircrafts, there are other environmental problems which people are suffering from in areas very close to the airports, such as air gases pollution, aircraft exhaust, and the contamination of water and soil. The organization of environment protection estimated that nearly 40 million people in the United States of America, airports have affected their health. This is often held protests in some countries, when these countries try to establish airports in

some undesired places for the public, For example in Japan, an airport (Na) was opened under the protection of the army (Al-Bakri, P. 180) .

The gases pose a major threat to humans and the environment as well, it is the most dangerous emitted gaseous compounds of aircraft carbon and hydrogen compounds, nitrogen oxides, which react with each other and produce health damages to the digestive and respiratory systems, where sulphur dioxide gas causes irritation for the respiratory system. As for the problem of noise from aircraft, it is one of the most difficult of the environmental impacts on nearby residential areas. In applying the above on Benina International Airport, one found that the residential area located near the airport, and some scattered communities both fall under the direct flight line toward airstrips of taking off and landing at the airport.

It should be noted that the researchers were not able to get the measuring devices to determine the degree of noise caused by the movement of aircraft. The authors merely distributed a questionnaire on the population living near Benina International Airport, for identifying the extent of the population affected by aircraft noise, especially on their health and dismay over them, and also to get to know the impact of noise on the housing and the relevant caused damage. Table (3) demonstrates clearly the relationship between aircraft noise and some selected environmental and sanitary variables, measured by a x^2 test. To determine the impact of aircraft noise on the annoyance of age structure of members of the sample, a x^2 test was applied, revealing a significant relationship between noise and annoyance of the different categories of respondents. The general observed difference was statistically highly significant ($P < 0.001$). Likewise, the sudden discomfort upon hearing the noise was also statistically highly significant ($P< 0.001$). Moreover, The impact of aircraft noise on the price of land in Benina airport area revealed a highly significant relationship between the two variables ($P< 0.001$). Finally, educational status and vulnerability to noise did show further a strong relationship between the two variables.

Table (3): Results for selected variables related to the impact of aircraft noise on the neighboring area of Benina airport:-

Variables	X^2 Statistic values	Probability
Age structure and aircraft noise annoyance	15.364	0.001
Discomfort quickly upon hearing the noise	149.984	0.001
The impact of aircraft noise on the price of land in airport area	43.231	0.001
Educational status and vulnerability to noise	16.471	0.002

Source: Field study 2010

The relationship between the level of services provided within Benina International Airport and its relation to the degree of satisfaction expressed by the respondents

Table (4) distinctly shows the relationship between the level of some of the services covered by the study, and their relationship to a degree of satisfaction by the international and local hall clients, measured by a X^2 test.

Having applied this test on these variables, the findings of all variables included in the study area were highly statistically significant, both in international or local hall. The general observed difference was statistically highly significant ranging between P <0.001 and P <0.03, respectively, in each of the international and domestic terminal at the airport, which proves the existence of a strong relationship between the level of services provided to travelers and the degree of satisfaction with them.

The relationship between social and economic characteristics and their relationship to the purpose of the journey undertaken by travelers from Benina international airport:

Table (5) clearly shows the relationship between social and economic variables for travelers surveyed and their relationship to the purpose of the trip. In order to find out whether there is a relationship between these variables or not using a X^2 test has become indispensable for these variables and their relationship with the purpose of the trip.

The findings have shown , that there are some variables that were of a very high statistical significance of which, gender, nationality and monthly income in international hall, as there was a strong correlation between these variables and the purpose of the trip, ranging between P < 0.001 and P <0.01 , While the rest of the other variables in international trips did not prove to be so in terms of age, marital status and education. (P- values varied between P = 0.14 and P= 0.4), and this means that each variable is independent of the others and has no effect on the other variables. As regards domestic flights, it appears from table (4) there are some variables that recorded a strong high-statistically significant relationship based on a Chi- square test for social and economic variables and their relationship to the purpose of the trip.

The findings have demonstrated that the variables of gender and monthly income both scored high statistical significance ranging between P< 0.001 and P < 0.01 respectively, while other variables did not record the presence of a statistically significant relationship, where the probabilities were consecutively P= 0.3 , P= 0.3 , P= 0.5 , P= 0.5 meaning more clearly that there is no relationship between these variables and the purpose of the trip, due to the fact that each of these variables is independent of each other.

Table (4) The relationship between the level of services provided within Benina International Airport and its relationship to the degree of satisfaction expressed :-

International Flights				Domestic Flights			
Variable	X^2 statistic values	DF	Prob.	Variable	X^2 statistic values	DF	Prob.

passengers feeling comfortable when entering the airport	22,837	3	0.001	passengers feeling comfortable when entering the airport	16.476	3	0.001
respect and good treatment by airline staff	18.261	3	0.001	respect and good treatment by airline staff	12.620	3	0.01
Transfer baggage workers at the airport	8.593	3	0.01	Transfer baggage workers at the airport	8.919	3	0.03
security men do their job well	8.808	3	0.03	security men do their job well	47.542	3	0.001
Passport services inside the airport	22.160	3	0.001	good customs services within the airport	11.534	3	0.01
good customs services within the airport	9.825	3	0.02	Comfortable seats indoors	16.244	3	0.001
Lost-and-found office	11.985	3	0.01	Services of the restaurant	9.145	3	0.03
Airline passenger confidence	41.172	3	0.001	The availability of postal services	12.359	3	0.01

Source: field study, 2012

Table (5) X^2 test for social and economic characteristics of travelers and their relationship to the purpose of the journey

International Flights				Domestic Flights			
Variable	X^2 statistic values	DF	Prob.	Variable	X^2 statistic values	DF	Prob.
Gender	31.486	8	0.001	Gender	48.818	6	0.001
Nationality	45.697	8	0.001	Monthly income	25.733	18	0.01
Monthly income	38.799	24	0.03	Nationality	7.213	6	0.3
Educational level	49.545	40	0.14	Educational level	33.657	30	0.3
Marital status	9.533	8	0.3	Marital status	5.330	6	0.5
Age	34.550	32	0.4	Age	30.334	30	0.5

Source: field study, 2012

Evaluation of the Degree of Overall Satisfaction with the Services Provided Within the Airport

To measure the complacent process for the services provided by Benina International Airport , which has been using the Chi-square (X^2) test to determine the overall importance of the variables of the differences in the process to take advantage of the services provided within Benina International Airport. Table (6) clearly indicates the close relationship between the evaluation of passengers of international travelers and local trips to those services provided by the airport, and a group of selected variables represented the social and economic characteristics of travelers of the international and domestic trips.

The overall assessment for each of the five variables shown in Table (6), based on previous experience to take advantage of the services provided by the airport, and by using X^2 test the findings show that the overall assessment of these variables was not statistically significant, where the probabilities ranges between P= 0.1 = and P= 0.9 = respectively in the international terminal, while the local lounge recorded between P= 0.2 = and P= 0.8 .

This means that travelers are not generally pleased with the services provided within the Benina International Airport. This situation also calls for the need for attention to the development and consolidation of services provided within the airport, in order to upgrade the level of quality and quantity, and provide them with specialized technical personnel and well-trained to deal with passengers and outfitted with the latest hardware to increase its effectiveness, and administrative support systems to eliminate the phenomenon of administrative chaos and overlapping jurisdictions within this vital facility. So a detailed and clear plan should be developed for action and an accurate program to improve services at the airport, both in terms of processing and in terms of efficiency, for the great importance of the airport, because as previously mentioned is a great attraction force for the economic, social, political and cultural as well as the military and security level.

Table (6) X^2 test results for respondents' responses to selected variables related to social and economic characteristics of passengers and their relationship with the general satisfaction for the services offered in the airport.

International Flights				Domestic Flights			
Variable	X^2 statistic values	DF	Prob.	Variable	X^2 statistic values	DF	Prob.
Marital status	4.140	2	0.1	Educational level	12.969	10	0.2
Gender	3.587	2	0.2	Monthly income	9.289	6	0.2
Monthly income	5.999	6	0.4	Gender	3.805	2	0.4
Age	6.593	8	0.6	Marital status	1.689	2	0.4
Educational level	4.784	10	0.9	Age	6.511	10	0.8

Source: field study, 2012

Discussion and Conclusion

The researchers have revealed that the most important characteristics of the users of the airport are as follows: -

- That males accounted for 78.7% of category (30-39 years) of the total passengers, as well as 66.9% of singles ratio, including those with university level amounted to 63.6%, the majority of course from Libyans with a percentage of 89.1%.
- It has shown that high earners of monthly incomes estimated at about 450 dinars per month or more recorded the highest proportion (62.4%) of the total passengers, followed by middle-income group of 21.1% of the total international travelers and local trips.
- With respect to the distance which lies between the airport and the place of actual residence turned out to be less than 100 km, where it recorded the largest percentage of international and domestic flights, reaching 68.4% of the total passengers.
- The results of the study also demonstrated that the highest bound sources of demand towards the airport come from the city of Benghazi from various neighborhoods and suburbs , where amounted to 65.3% of the total passengers (international and local flights).
- It has also been found that 76.9% among 225 passengers on international flights were from the city of Benghazi , followed by passengers arriving from Al-Baida and El-marj with only 4.9% for each, and then Tobruk and Kufra 3.1%. The percentages of the rest of the cities and other areas are close to each other.
- Through the study of the motives of flight, we found that 35.1% of the total international passenger trips are moving for treatment outside the country, and who are travelling for social visits accounted for 19.6%, followed by travel to work by 14.2%. As for domestic flights, it has been shown that 37.3% of the total domestic passengers commute for business purposes and who move for social purposes represented in visits to family and relatives estimated at 28%from the total domestic flights.
- The findings of the study also demonstrated that 51.1% of the total passengers of international trips were to Egypt for medical treatment, social, tourism, shopping and education. Tunisia came in second class by 19.6% of the total passengers for the purpose of therapy and shopping . However, it has been shown as well that domestic flights accounted for 74.7% of the total travelling to Tripoli, because it is the capital of the country, and Misrata by 11.1%, followed by the city of Sirte by 6.2%, Kufra and oil fields came by no more than 2.7% for each, and finally Sebha represented by 2.2%.

Passenger Assessment Depending on the Services Provided by Benina International Airport can be summarized as follows:

- The results of the study showed that 71.8% of the total travelers believe that parking lots do not accommodate all cars, compared with 28.2% of the total passengers who think

that parking spaces can accommodate cars. The study results also showed that there was a feeling of dissatisfaction about this service by 46.9% of the total study sample.

- With respect to the public taxi services at the airport, the results of the study indicated that 52.4% of the total travelers believe that this service is available in terms of quality, while 47.6% on the contrary, they believe they are not at the required level. Thus, it became clear that they fall in their entirety under low level by 42.2% of the total study sample.
- Further, it has been shown that 57.8% of the total travelers believe that the transfer of luggage carts are available inside the airport, while 42.2% believe that they are not available, and about the level of this service, it became clear that they fall under low level of 36.9% of the total study sample..
- The results of the study revealed that 38% of the total travelers believe that audio advertising works regularly, whilst 62% said they are not good. For the screens information display 76.4% of the total passengers think that they do not do their jobs well and regular in the lounges of the airport, while 23.6% believe they are good. Finally , for the level of degrees of satisfaction with these services shows that they fall under the low level.
- The results of the study showed that 80.7% of the total passengers at the airport see that the seats of international and domestic lounges inadequate , and that 82.2% of the total passengers perceive them as uncomfortable, in general , the level of satisfaction with the services turned out to fall entirely under the low level
- For heating, ventilation and air-conditioning services within the airport's lounges, the field study results showed that 74.7% of the total travelers believe that they are not good, and in contrast, 25.3% of the passengers evaluated these services as good inside the lounges at the airport. for the degree of overall satisfaction with the level of these services, the results demonstrated that they fall under low Level with a large margin amounted to 74.4% of the total study sample.
- The results of the study also reported the existence of relationships between the different variables included in this study, where the statistics of this study showed a strong significant relationship with variables of type , nationality and monthly income for international passengers.
- The results of the study also reported the existence of relationships between the different variables included in this study, where the statistics of this study showed a strong significant relationship with variables of type , nationality and monthly income for international passengers. Furthermore, the results showed that there is a clear and strong influence of monthly income on the purpose of the trip. Also the variables of type and monthly income of local trips recorded a significant statistical relationship with the purpose of the trip.
- The findings denied the existence of a relationship between social and economic variables with local excursions, and its relationship with the best airline or not all of these

variables have a significant impact on each other, and this indicates that they are independent variables, where the statistics of the study pointed to the level of services provided within the airport for passengers was not at the required level, due to dissatisfaction of passengers. Therefore, these services need further attention and development by officials because of lacking maintenance and renewal.

Findings and Recommendations

Findings

It may be useful at the end of this study to review the most important findings made by the researchers, and to answer questions posed in this study. In the light of that, some recommendations were made that would lead to improving the level of services provided in Benina airport and Libyan airports in general. The researchers reached a number of conclusions that can be summarized as follows:-

- Through the study of population growth for the area of Benina, it was found from the results of this study that the airport did not contribute to the growth of the region as is customary known in most airports in the world.
- As for the evolution of population growth in the areas served by the airport during the period 1973-2006, it has seen growth rates of clear contrast in terms of population growth recorded the highest rate during the period 1973-1984, where it reached 5.1%.This is due to the political, social and economic transformations the country witnessed, which was reflected in the population growth.
- The results of the study showed that the airport has a spatial characteristics of easy access and communication through a network of roads that have contributed to the emergence and development of the airport network, and through the spatial link, where the airport represents the nearest air connection point with many countries of the world, where most airlines favor, because of its convenient location.
- A review of the historical stages which the airport experienced until arriving to the current state , the airport has undergone four historical periods and the second period was the most important one, in which Benina and the other Libyan airports witnessed flourishing, where the State started to implement a series of economic and social plans.
- As it turns out also that there is a significant effect of political and economic conditions experienced by the country reflected on the process of spatial and spatial interaction of Benina Airport with other airports (domestic and International). The spatial process has seen a clear fluctuation between increases and decreases in the movement due to the circumstances experienced by the country as mentioned previously.
- It has been shown through the studying of the compositional structure of the airport facilities and components that most of the components of the airport suffer from worn out and lack of maintenance. With regard to the labor force at the airport, the results of

the study revealed that the year 2010 recorded more increase in the number of employees compared to the year 2009.

- The study showed the lack of departments within the organizational structure and the absence of a special guide to run the airport, besides, the lack of a contingency plan in the event of severe weather and natural disasters.
- Through the study of spatial interaction of the airport during the year 2009, and in order to know the most important airports that have dealt with Benina Airport, turned out to be based on the number of monthly mileage seats, where, Dubai Airport obtained the largest proportion in the number of seats which reached 14%, while Cairo International Airport came first place on the basis of the number of passengers, where formed the prime region of the airport.
- At the local level, and in terms of the number of mileage seats, Kufra airport came first place by 29.2%, and in terms of the number of passengers, Tripoli International airport has the form of prime territory of the airport, by receiving more than seven million passengers.
- As for the geographical region of air freight and cargo weights, owing to the weights of shipping, Dubai Airport has the form of a higher proportion of the shipping weights of more than 140 thousand monthly mileage tons with a rate of 74.3%, while each of Tripoli and Kufrah airports form the top notch region for the airport, with a rate of 94.14%, as well as for air mail.
- We found out from the findings of the study that the noise brought about by warplanes cause great nuisance to residents living near a residential area of the airport; which is far from the runway less than 2 km. The questionnaire analysis results also showed us that 32% of the total respondents surveyed suffer from ear and hearing problems. With regard to the environmental effects on housing near the airport, it has been shown that 33.5% of the total sample studied individuals complain of disruptions in phone calls.
- As for the relationship between aircraft noise and some of the variables included in the study, the results of the study showed that there is a strong relationship between age structure and vulnerability of aircraft noise that whenever human progress with age, the less to afford high sounds.
- The results of the study also demonstrated that the airport is currently suffering from a host of problems that had a negative impact on the efficiency of its operation, it has become clear through the questionnaire analysis that the level of services provided within the passenger terminals, is not at the required level, they need more attention and development by officials of the civil aviation authority of the country.

Recommendations

The researchers found a set of recommendations that are necessary to be taken into account by officials and those interested in the field of airports and air transport in order to achieve the desired objectives perfectly which are as follow:-

- More attention must be paid to the application of environmental legislation, in order to preserve the environment around the airport from the dangers arising from the management of Benina international airport.
- The officials of the civil aviation administration must separate between civil and military aircrafts, in order to avoid problems arising from the joint use, which claimed the lives of passengers of flight No. 1103 heading to Tripoli in 1992.
- Creating an integrated organizational structure illustrates the organizational relationships between all actors at the airport, in order to solve the problem of overlapping jurisdictions between each other.
- Management must unify security agencies operating within the airport, and determine the whereabouts and the allocation of special uniforms for each of them
- Creating an information center along the lines of air navigation center responsible for air traffic management. This center configures database related to air traffic at the airport, and the problems that face it, because of the lack of recorded data accuracy and sometimes conflicting. Also the center in coordination between the engineering department and information technology , to facilitate the work of a special team of incidents..
- More attention must be paid to airport ground handling services in order to achieve better service.
- Airport officials Should take into account the services provided and should be improved in order to provide a distinctive and satisfactory service for travelers, and by conducting surveys in order to know travelers impressions of these services, and this must be done on a regular basis, so as to enable decision makers and those interested in airports know the strengths and weaknesses, and then work to address the shortcomings
- In light of the rapid development of aviation, we have to keep pace with the development requirements of an airport, and work to provide the latest equipment in order to keep pace with modern technological development.
- Management the airport and the department of civil aviation must separate access flights with each other, in order to prevent congestion in the halls at the airport.
- Attention must be paid to health services within the airport and work on their development, because they are too weak or negligible.
- To ensure the safety and health of passengers and airport staff, measures must be taken to prevent smoking inside the halls of the airport in order to preserve the health of passengers.

- Providing commercial markets for the sale of local products, and commemorative cards, expressing the history of the country and its laboratories.
- Studying the current situation inside the airport, in order to identify the difficulties faced by its workflow, and then propose scientific and practical solutions to overcome those difficulties.
- Training and qualifying the workforce at the airport, in an effort to create a cadre of qualified specialist skills and competencies in conformity with global standards and specifications.
- In order to facilitate and simplify the procedures for passenger travel, the airport management must use sophisticated electronic systems, aimed at saving time and effort, represented by the self-acceptance systems, and e-booking, coded card system and advanced paging system.
- Working to pay attention to air cargo facilities at the airport and organizing postal cargo flights shipping and simplifying procedures for achieving the best performance.
- Airport management should focus on finding a solution to the problem of passengers accommodating, especially in the case of a delay or cancellation of the trip, there is no hotels in the study area to accommodate passengers arriving from remote regions, as well as the attention of waiting halls and its expansion as well as providing necessary recreational requirements such as TV and comfortable places to spend time interesting in the case of jet lag or not to attend.
- For the airlines operating at the airport, all airlines must examine the travelers impressions about the services they provide, in order to find out their shortcomings, and to update its fleet, so that meets all the needs of the traveler in terms of leisure and entertainment, and to focus more accurately on the dates of their flights, and rehabilitation care and training of air crews for achieving passenger satisfaction
- The officials of civil aviation and public administration of the airport, should prepare a contingency plan, especially during sudden and dangerous weather disasters.
- The rehabilitation of the airport with the latest cutting-edge technology and means of moving belts and surveillance equipment and vehicles transporting passengers with sophisticated luggage and other modern technologies that help to accelerate the development of passenger traffic at the airport.

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