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AN ANALYSIS OF THE SOCIOECONOMIC EFFECTS OF FLIGHT DELAY AT NNAMDI AZIKIWE INTERNATIONAL AIRPORT ABUJA, NIGERIA.

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ABSTRACT
This study analyzed the social and economic effect of commercial flight delay in Nnamdi Azikiwe International airport [NAIA], this is to help to monitor, identify and improve on the challenges being faced by airliners operation in NAIA owing to flight delay. Data were obtained from both primary (questionnaires and interview) and secondary sources (FAAN and airline offices at the NAIA), and were analyzed using descriptive statistics with a sample size of 400 respondents selected purposively. Findings of the study revealed that majority of the respondents (83.5%) travel more than one time in a year for business, leisure and tourism, education, visit to family, and official purpose, and that 89% of these respondents have experienced flight delay with the perceived causes including but not limited to technical issues (20.5%), weather (15.8%) and traffic among others. The study also revealed that about 65.4% of the respondents have experienced flight delay about 5times within the study period. The study finds that most flights are delayed for 1-5hours. Flight delay has negative social and economic effects on travellers. The study recommended that timely weather information is needed to limit flight delay associated with weather while alternative airplane should be made available when technical issues arises. Also, airline operators should pay attention to the nature of their flight delays so as to structure mitigation strategy that help them tackle it. Though there are no remedies to some social losses, airline operators should endeavour to compensate travellers affected by delay.

Keywords: Flight, Transportation, Social effects, Economic effects, Weather, Technical issue.

INTRODUCTION

Air transportation is preferable as a fast means of moving persons or goods using airplanes and helicopters, but delay often occurs. Flight delays are obviously frustrating to air travellers and costly to airlines. Flight delay is complex to explain, because a flight can be out of schedule due to problems at the airport of origin, at the destination airport, or while airborne or a combination of these factors often occurs (Bai, 2006). Notably, commercial aviation stakeholders understand flight delay as the period of time by which a flight is late or postponed (Wieland, 1997). Flight delays have been attributed to several causes but the root cause of delay can be either manmade or natural (Boye, 2015). Manmade commercial flight delay is often caused by airmen (personnel involved in flight movement) which could range from slow facilitation process, technical or maintenance problems, airspace cognition, movement breakdown while the latter is caused by natural occurrence such as bad weather, natural disaster like volcano eruption, tornados. However, Mirza, Page and Geinde, (2009) stated that weather accounts for most of natural flight delays. The spectrum of weather information is an important component for the safe conduct of a flight and the efficient management of air traffic in future There has been an increase in the number of flights being delayed for long hours and most of the causes are not being communicated to the passengers. This usually results in anger, agitations, loss and anxiety among the passengers who might have pending commitments in their destinations. A visit to the Nnamdi Azikiwe International Airport [NAIA] shows that most passengers who experience delayed flight are left in a state of anger and frustration which sometimes makes them act in violent and abusive manners due to the thought of missed appointments, damage and loss of cargo. In some other cases, passengers travelling to connect a flight in the destination airports are left at a loss of paying for a flight change or missed flight. Others travelling for business or work-related trips are also put at a loss. It is however noted that for some passengers, flight delay may be advantageous to them (for instance passengers who could not get a later flight to book, or those who arrived late to the airport). Also, there are scarce documented evidences of flight delay (despite being common) by the airline operators, which maybe because evidence like that may cause a backlash on them. This perhaps, is a reason for paucity of literature in this area of air transport study in Nigeria.

Some authors have carried out studies on flight delays and its socio-economic effect in different parts of the world. Authors such as Chen, Yu and Zhu (2018); Stone (2015) and Mamman (2004) were reviewed. Chen, Yu Tsao and Zhu (2018) carried out a study on the indirect impact of flight delay on China's economy. An input-output method and the Gosh model were used to analyze indirect impact of flight delay on China's economy. A simultaneous demand-fare equation to estimate the direct output of the air industry due to flight delay control

was employed. Their results showed that china lost 350.71 billion in 2013 due to indirect impact of flight delay thus making delay control beneficial to both passengers, carriers and the country generally.

The focus of Stone (2015) study is on the effect of flight delay and cancellations in small communities. This was done using government data (BTS 2014) based on average delays on each route, originating at small airports, delayed flights that would result in missed connection (less than 40mins connection time) were determined and the next available flight chosen if connection would be missed. Stone (2015) also calculated total annual delay caused by cancelled flights by comparing original itineraries with those altered by cancellations. However, Stone (2015) found that 72.3% of connecting itineraries would face missed connection and therefore delayed resulting in late arrivals, missed flights and potential additional cost.

Mamman (2004) conducted an empirical study of flight delay in Nigerian aviation industry using Chanchangi Airline as case study. Data were collected from existing reports from Chanchangi airline at Kaduna, Lagos and Abuja and were analyzed using simple percentages. Findings showed that the delay is caused by different circumstances like cancellations, mechanical malfunctions, and weather among others which could be spatial or temporal. The researcher also identified that socio-economic effects are enormous and constitutes a cost to the airline, users and economy as a whole. The author found 49% increase in a rate of flight delay by the airline between years 2002-2003.

From the literature consulted, the authors used various methods to assess the socio-economic effect of flight delay. However, based on the literature available, no study has been carried out on the socio-economic effects of flight delay on passengers and airlines using reported data obtained from passengers and airlines operators at Nnamdi Azikiwe Airport Abuja which is the gap in knowledge this study intends to fill. In view of this, the study answered some research questions which include: What are the socio-economic characteristics of the air travellers and workers of the airlines at the NAIA? What are the causes of flight delay in NAIA? What are the social effects of flight delay to passengers and airlines at NAIA? What are the economic effects of flight delay to travellers and airlines at NAIA?

However, the aim of this study is to analyze the social and economic effect of commercial flight delay at Nnamdi Azikiwe International airport [NAIA], and the aim was achieved using some specific objectives which are to: examine the socio-economic characteristics of the respondents (air travellers and workers of air lines) at the NAIA, Abuja; examine the causes of flight delay at the NAIA; examine the social effects of flight delay on both the passengers and airline; and to examine the economic effects of flight delay on both the passengers and airline.

MATERIALS AND METHODS

Data used for the study are the Social data; Economic data; Causes of flight delay; Population data; and the direct and indirect effects of flight delay on respondents. The study period is 2015-2017. This is because earlier than 2015, there were few regular commercial flight operators and on the other, currency and availability of data are more guaranteed in this period. These data were gotten from both primary and secondary sources. The primary data for the study were gotten through administration of questionnaires and interviews. The data on socio economic characteristics of the respondents, causes of flight delay, economic effect of flight delay and social effect of flight delay were gotten using convergent parallel design which is a mixed method that entails the study concurrently conducting qualitative and quantitative elements in the same phase of the research process. These methods are weighed equally, analysed independently but interpreted together (Creswell & Plano-Clark, 2011). The questionnaires contained both structured and unstructured questions. While the interview was used to get information from the airliners on the causes, effects and frequency of flights delay. However, the secondary data was gotten from the head offices of the airlines in FCT. The data on staff population of the airlines and frequency of flights from 2015-2017 was obtained from the airline offices, while population of passenger inward and outward movements among other statistical data was gotten from the statistics department of FAAN in the NAIA.

The sample frame for this study was both the domestic and international terminals in NAIA. To get the sample size data for international and domestic movements for three (3) years were obtained, which arrived at 332,699 average monthly passenger movements. The sample size for this research was obtained using the Yamane (1967) sample size technique for a known population with 95% degree of confidence and 5% sampling error assumptions. The formula is written as;

$n=N/1+N(e)^2$

where n=the population sample size

N=population size

P=population proportion (assumed as 50% since this would provide maximum sample size)

e=level of significance (set at 0.05 for the purpose of this study)

Given:

Average monthly domestic passenger movement= 261,261 passengers

Average monthly International passenger movement= 71,438 passengers

Total monthly passenger movement (N) = 332,699 passengers

$e = 0.05$

$e^2 = 0.0025$

$$n = \frac{N}{1+N(e)^2}$$

$$n = \frac{332,699}{1+332,699(0.05)^2}$$

$$n = \frac{332,699}{1+332,699(0.0025)}$$

$$n = \frac{332,699}{831.748}$$

$n = 399.99 \ \Omega \ 400$

The above method was adopted from Inuk (2016) who assessed the socio-economic determinant of commercial air travel in Nnamdi Azikiwe International Airport. However, the sample size is an important feature of any study that aims to

make inferences about the population from a sample (Singh and Masuku, 2014).

The sampling technique that was employed for the study was purposive sampling. The data collected are both qualitative and quantitative in nature. The quantitative data were obtained from questionnaire while qualitative was obtained from interview carried out in English language at the airline offices/counters at the NAIA. The quantitative data were analysed using descriptive statistics which were presented as frequency distributions in numbers and percentages, while qualitative data were analysed using synthetic model which combines interpretive social approach and feminist critical social approach (Ajayi, A. O. 2003). This tried to understand how flight delay affects respondents by asking certain questions to discover faults and flaws of flight operations to promote actions that eliminate the problems. Also, manual coding of transcriptions was employed in analysis qualitative data, where the interviews were repeatedly listened to, and transcribed into word documents. This coding of data sets was done based on related meanings for the purpose of identifying hidden patterns.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Table 1 presents the socioeconomic characteristics of respondents. A total of 60% of the respondents are males while 40% are females, with 25.75% of travellers less than 26years of age, while 57.5% passengers were between 26-45years old and the remaining 16.75% were above 45years. Also included in Table 1 is the distribution of respondents by marital status which shows that 45% of respondents are single, 50% are married, 2% are widowed while 3% are divorced. Respondents who possess tertiary education account for 86.75% of total respondents, 9.5% of respondents for secondary education, while respondents with other forms of education accounts for 3.75%. About 15% of the respondents earn less than 30,000naira, those who earn 31,000 were 23% while 62% earn above 100,000naira. This result shows that majority of the respondents earn above 100,000naira monthly.

Table 1: Socioeconomic Characteristics of Respondents

Socioeconomic Characteristics	Parameters	Frequency	Percentages
Gender	Male	240	60
	Female	160	40
	Total	**400**	**100**
Age (years)	11-15	16	4.00
	16-25	87	21.75
	26-35	135	33.75
	36-45	95	23.75
	Above 45	67	16.75
	Total	**400**	**100**
Marital Status	Married	200	50
	Single	180	45
	Divorced	12	3
	Widowed	8	2
	Total	**400**	**100**
Educational background	Secondary	38	9.50
	Tertiary	347	86.75
	Others	15	3.75
	Total	**400**	**100**
Occupation	Civil servant	145	36.25
	Diplomat	14	3.50
	Entertainer	25	6.25
	Businessman/woman	114	28.50
	Students	22	5.50
	Unemployed	10	2.50
	Professional	22	5.50
	Others	48	12.00
	Total	**400**	**100**
Income (₦)	0-18,000	36	9
	19,000-30,000	24	6
	31,000-50,000	16	4
	51,000-100,000	76	19
	Above 100,000	248	62
	Total	**400**	**100**

Source: Field survey (2019)

The result implies that more males travel by air than females at Nnamdi Azikiwe airport and the possible explanation for this difference could be attributed to the fact that males engage in business more than females in the area, thus more men travel for business purposes. Another explanation could be that most of the men that travel by air have their families located in other part of the country and visits them from time to time. This is a common practice in Nigeria, when men are

transferred from one part of the country to Abuja; due to high standard of living in Abuja, they relocate alone and leave their families in the other states visiting them from time to time. With regards to international travel, it is a common practice in Nigeria were men travel out for greener pastures and send money to their families which could also explain the high number of male than female traveller.

However, the result also shows the variation in age of the respondents. The result indicates that majority of the respondents fall within the age of 26-35years; this age group are in their youthful years and as such are in search of greener pasture by exploring diverse areas of life. Respondents within the age of 11-15years had the lowest respondents, which could be because respondents in the age group are considered as teenagers (minors), and may not be always allowed to travel alone. This result further indicates that people of different age groups travel at the airport for various reason such as educational purpose, business purpose, and recreational purpose among others.

It is clear, when this result is put into the frame of gender composition of respondents which is male dominated that they seem to frequently travel by air to visit their families. As a lot of men leave their wives in their hometown and other places, while they come to Abuja for work.

Furthermore, majority of the respondents possess tertiary education thus it could be stated that higher educational status influences the use of air transport in Nigeria. Possible explanation could be that education enlightened people see more benefits in using air travel than uneducated ones. This is because air travel is faster than rail or road thus saving time. In same vein, it could also be attributed to income level of educated individuals. In most cases they have better jobs than uneducated individual and they can therefore afford the fare of air travel. This generalization may not be completely true because some uneducated people earn more than educated ones as revealed by the statistics.

Survey also shows that individuals from various occupational backgrounds patronize air transport in Nigeria. However, civil servants accounts for the highest figure among respondents. This could be as a result of the location of head office of various ministries and parastatals in Abuja. Civil servant visits Abuja for various reasons ranging from biometrics, salary complaints, documentations among others. Businessmen/women are the second major travellers among respondent, this could also be attributed to Abuja being where some corporate issues and activities are and being handled and also location of head offices of companies. Business individuals looking for government contracts among others visit Abuja for this reason.

Finally, Air travel cost within thirty to forty thousand naira (₦30,000-₦40,000) depending on the booking, ticket and the class for domestic flights. While, more than hundred thousand naira (₦100,000) for international flight. Thus, it appears that some respondent's trips were paid for by company, family and friends among others. This provides possible explanation for the high income level of majority of the respondents that make use of this mode of transport. To buttress this point, Chudy-Laskowska and Pisula (2017) revealed that air passenger transport may be affected by many diverse variables their income, the future amount of the GDP, the population of the country, the volume and value of foreign exchange and consumption levels

Experience of flight delay

Figure 1 presents experience of flight delay in the NAIA. Results indicate that 89% of the respondents reported to have experienced flight delay while only 11% expressed contrary opinion. This result indicated that majority of the respondents have experienced flight delay. This result supported that of Boye (2015) who posited that air traffic delay has become a major problem for air traveler and airline operators as it is a complex phenomenon that can be due to problems at the origin airport, at the destination airport, or when the aeroplane is airborne.

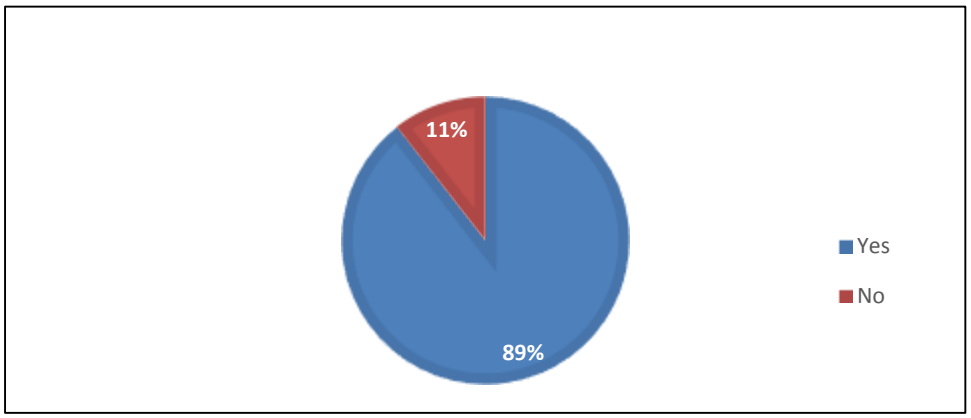

Figure 1: Experience of Flight Delay
Source: Field Survey (2019)

Causes of Flight Delay

The results in figure 1 indicates that majority of the respondents have experienced flight delay. A total of 57.3% of the respondents indicated that they were informed that delay was due to technical issues, weather and traffic congestion, 37% of the respondents indicated that delay was due to unknown reasons because the airlines sometimes don't tell them the causes of delay. However, 2.8% of the

respondents claimed other reasons such as checked in passengers who haven't boarded, luggage loading or unforeseen strike, while 22.1% stated more than one reason on different trips, or cases where bad weather and traffic congestion occur simultaneously.

Table 2: Causes of Flight Delay

Cause of Flight Delay	Frequency	Percentage
Technical Issues	82	20.5
Weather	63	15.8
Traffic congestion	7	1.8
Not known	148	37.0
Others	11	2.8
More than one reason	47	22.1
Total	**358**	**100**

Source: Field Survey (2019)

This result showed that majority of the respondents are aware of one or more reasons that cause flight delay. This is supported by the findings of Aisling and Kenneth (1999) who reported that sources of flight delay include many elements, such as weather, airport congestion, luggage loading and connecting passengers. Weather is a major contributor to delays in the air traffic control system.

An interview conducted with checking and boarding officer of Overland Airways with a work experience of 6years indicated that the airline often experiences flight delay due to weather related issues and operational challenges. Also, the Max Airline staff interviewed stated that 'flight delay is usually caused by VIP movement, weather, fuel and passengers". This therefore indicates that weather is a prominent factor causing flight delay.

Social effects of flight delay

The social effect of flight delay is presented in Table 3. A total of 58.8% of the respondents stated that they missed their events, 4.9% stated they elimination of waiting time at connecting airport For instance, many airlines operate several routes (Yola-Abuja-Port Harcourt, this means a delayed flight from Yola enroute Port Harcourt through Abuja has reduced the waiting period in Abuja), 31.2% stated loss of long time acquaintances and anger while 5.1% stated other social effects apart from what others experienced. This means that flight delay is not always negative, though these could be more as demonstrated by missed opportunities and anger.

Table 3: Social Effect of flight Delay on Passengers

Social Effect	Frequency	Percentage
Missed events	166	58.8
Elimination of waiting time at connecting airport	14	4.9
Loss of long-term acquaintance	11	3.9
Anger	77	27.3
Other	14	5.1
Total	**282**	**100**

Source: Field Survey (2019)

As pinpointed earlier, social effects of flight delay differ for passengers and airliners. For the airliners, loss of patronage and harsh words from passengers are effect airliners have to contend with. An excerpt from the interview with some personnel holding key management positions of some airline operators drive home the point. For instance, the deputy manager of Air France during the interview on social effect of flight delay commented that:

"…delay leads to social effects like reduced patronage, blames from passengers and arrogance from passengers."

Similarly, a staff of Air Peace further buttress this point that

"…delay causes loss of customers and diminishing the integrity of the company, though these social effects are usually cumulative and it is only when it has become habitual that it influences patronage"

However, Ball et al. (2010) identified the socioeconomic effects of flight delay as extra cost, extra labour, extra fuel which ultimately increase operational cost. These differences in effects are obviously owing to differential stages in economic development between United States of America where air transportation has reached maturity and Nigeria where some airliners still struggle to break even.

Economic Effects of Flight Delay

Table 4 presents the economic effects incurred by the respondents, where 54.4% of the respondents missed their appointments/opportunity, 8.7% loss/damaged their cargo, 22.1% missed their connecting flights, 6.5% started a new economic connection while 8.3% incurred/gained other economic gains. Just as the social effect, the economic effect is both positive and negative for the passengers. It was noted that some respondents gained economic opportunities at waiting lounge. However, the benefit is outweighed by the negative effect as majority of the respondents missed their appointment or opportunities. Sizeable proportion of the

respondents missed their connecting flight while some lost or got their cargo damaged. On the other hand Zou and Hansen, (2014) found out that passengers suffer economic effect because airlines tend to pass delay cost to passengers through higher fare, whereas delay has an upward effect on flight frequency.

Table 4: Economic Effect of Flight Delay on Passengers

Economic Effect	Frequency	Percentage
Missed appointment/ opportunity	143	54.4
Loss/damage of cargo	23	8.7
Missed connecting flight	58	22.1
Economically purposeful networking at waiting lounge	17	6.5
Others	22	8.3
Total	**263**	**100**

Source: Field Survey (2019)

CONCLUSION

It can be concluded that flight delay is a common phenomenon at both the local and international wings of NAIA. Flight delay has both social and economic effects on travellers. However conclusion from the analyzed data is that negative effects of flight delay outweigh the positive effects all things being considered. Some of these negative effects include loss of acquaintance, missed opportunities and anger while missing appointment or opportunities as well as missing of connecting flight and loss or damaged cargo among other effects. The study recommends that timely weather information is needed to limit flight delay associated with weather while alternative airplane should be made available when technical issues arises. Also, airline operators should pay attention to the nature of their flight delays so as to structure mitigation strategy that help them tackle it.

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REFERENCES

Ajayi, A. (2003). Contemporary Social Science, Qualitative Data Analysis and Presentation. In T. Agbola, L. Egunjobi, C. Olatubara, D. O. Yusuf, and M. Alabi (Eds.), *Research Methods: A practical Guide* (pp. 369-376). Lagos, Marina: MURLAB Searchwisdom Educational Services Publishers.

Aisling, J. R. and Kenneth, J. B. (1999). An Assesment of the Capacity and Congestion levels at European Airports. *ERSA Confrence papers. 99*, p. 241. European Regional Science Association.

Bai, Y. (2006). *Analysis of Aircraft Arrival Delay and Airport on Time Performances.* University of Central Florida Orlando, Florida., College of Engineering and Computer Science, Florida.

Ball, M., Barnhart, C., Dresner, M., Hansen, M. Neels, K., Odoni, A., Peterson, E., Sherry, L., Trani, A. and Zou, B., (2010). Total Delay Impact Study. NEXTOR Final Report Prepared for the U.S. Federal Aviation Administration. < http://www.nextor.org/pubs/TDI_Report_Final_11_03_10.pdf>.

Boye, A. B. (2015). Causative Factors of Air Traffic Delay in Muritala Muhammed International Airport Lagos, Nigeria. *British Journal of Economics, Management and Trade.* 8(3): 230-236,

Bureau of Transportation Statistics (BTS) (2014b). *Passengers: All carriers – All airports*. United States Department of Transportation, Office of the Assistant Secretary for Research and Technology. Retrieved from: http://www.transtats.bts.gov/Data_Elements.aspx?Data=1

Chen, Y., Yu, J., Tsao, S.-B., and Zhu, J. (2018). An Empirical Study on the Indirect Impact of Flight Delay on China's Economy. *sustainability, 10*, 1-13.

Creswell, J. W & Plano Clark, V. L. (2011). *Designing and conducting mixed methods of research*. Thousand Oaks, CA: Sage.

Inuk, A. E. (2012). *SocioEconomic Determinant of Commercial Air Travel in Nnamdi Azikiwe International Airport, Abuja,Nigeria*. Unpublished Thesis, Ahmadu Bello University, Zaria, Department of Geography and Environmental Management.

Krejcie, R. V., and Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurements, 30*, 607-610.

Mamman, I. (2004). *Analysis of Flight Delay in Nigerian Aviation Industry*. Nigerian Institute of Transport Technology, Zaria.

Mirza, A. K., Page, C. and Geinde, S. (2009). *An Approach to Flight Safe-using GML/XML Objects to define Hazardous Volume Space for Aviation.* France. Retrieved September 25, 2009 from FlySafepaper.html

Singh, A. S., & Masuku, M. B. (2014, November). Sampling Techniques & Determination Of Sample Size in Applied Statistics Research: An Overview. *International Journal of Economics, Commerce and Management, II*(11), 6.

Stone, M. J. (2015). Investigating the Effect of Flight Delays and Cancellations on Travel from Small Communities. *2015 Travel and Tourism Research Association International Conference* (pp. 1-6). Califonia: Tourism Travel and Research Association: Advancing Tourism Research Globally. 5. Retrieved from http://scholarworks.umass.edu/ttra/ttra2015/Academic_Papers_Oral/5

Wieland, F. (1997). Limits to Growth. Results from the Detailed Policy Assessment Tool [Air Traffic Congestion]. *Digital Avionics systems Confrences*. 1-9.

Yamane, T. (1967). *Statistics: An Introductory Analysis*, (2nd ed.). New York: Harper and Row.

Zou, B. and Hansen, M. (2014). Flight Delay Impact on Airfare and Flight Frequency: A Comprehensive Assessment. *Transportation Research Part E*, 69, 54–74