MULTIDISCIPLINARY APPROACHES
IN THE CURRENT TIMES

DR. SANGEETA SHASHIKANT SHINDE

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PREFACE

Scholars' perspectives in their own subjects are broadened by multidisciplinary study. It also provides the chance of multidisciplinary partnerships which give insight into another field which is very important for increasing the depth of every research.

Considering all this editor collaborated research chapters from different fields and is happy to publish this book "Multidisciplinary Approaches in the Current Times"

It has been observed that multidisciplinary collaborations are a good method to build a new network of scholars and meet people from different fields. Multidisciplinary projects facilitate communication with peers from other fields. These encounters would not occur in the absence of Tran's disciplinary research. Multidisciplinary projects expand the network of contacts significantly, especially for young scholars. When it comes to starting new ventures, there is also a multiplicative effect. It increases your chances of making new financial contacts. The effect and visibility of one discipline's progress increase as a result of multidisciplinary study.

This book is intended to help people comprehend the numerous researches that are being carried out in various sectors at the national and international level. This book will provide an idea about different research going on in numerous fields so it will have great help to students, junior researchers, and instructional professionals

ACKNOWLEDGEMENT

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CHALLENGES AND SECURITY ISSUES FACED BY MOBILE BANKING

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ABSTRACT

Mobile Financial Services is an approach which offers financial services for banking with mobile wireless networks which enables for users to execute banking transitions. In today's world Smart phones have become a must needed device. Large pool of people is used to with mobile technology and user friendly with all application. On the other hand, smart phones increase the danger of security extensively. Ignorance and negligence of the user is the main reason for cyber-attacks. There are many reasons which breach the security like granting permissions to apps without understanding rules and regulations, avoiding security features available in the device and storing critical information without encrypting it. The paper provides challenges and security issues for Mobile Banking

Keywords: Cyber-attacks, Smart phone, Financial Services.

1.1 INTRODUCTION

Mobile Banking is a mobile financial service through mobile phone. Mobile banking refers to the use of a mobile device to perform banking tasks to perform banking transactions. Now a days Smart phones are vital part of human life. Smart phones provide great helping hand to consumers and organisation for personal as well as business use. Services like staying connected to the world, allowing advance computing features and impressive web connectivity making etc are more useable ad vulnerable. Majorly teens, college students and middle-aged parents fall victim for mobile addition.

Smartphones can be used for many different purposes like sending/ receiving e-mails, staying online in social media using programs such as Twitter, Google+, and Facebook as well as conducting electronic financial transactions. Smart phones become a target for attackers because of the valuable information. So smartphone users need to take precautionary measures, including awareness of vulnerabilities and threats as well as adoption of security controls against threats.

1.2 OBJECTIVES

1. To study the Features and Challenges of Mobile Banking.

2. To study the best practices for Mobile Banking Security.

1.3 FEATURES OF MOBILE BANKING

1. Mobile payment application is user friendly with little or no learning for the customers. It provides simplicity and usability while conducting transactions.

2. It provides universality while doing the transaction in between one customer to another customer or from business to a customer or between business.

3. For mobile banking development should be based on standards and open technologies which allow one implemented system to interact with other system

4. Security, privacy and trust are the most sensitive for mobile banking. A customer must be able to trust a mobile payment application provider.

Mobile banking is a very effective way of improving customer service could be to inform customers better. A bank could, through the use of mobile technology, inform owners each time purchases above a certain value have been made on their card. With this customer is informed

about their card use. Similarly, the bank could remind their customers for loan repayment dates, or banks simply intimate them that which bill has been presented and is up for payment. On the other hand, the customers can also request for additional information. Customers can automatically vie deposits and withdrawals as they occur and also pre-schedule payments to be made or cheques to be issued.

A mobile is almost carried with the customer. It can be used over geographical area, no need to visit the bank ATM or a branch to avails of ban's services.

According to study there are most influential factors which help to spread of mobile technology among customers. People can easily access the up-to-date information. Lower production cost and granted by the technology revolution are the main criterial where these products/ services accepted in the market by the end use. At the same time, it is more customized to meet individual requirements. The important character of mobile technology permits real time information about consumers based on their actual behaviour. With all these characteristics a shift from local markets to a global economy. A shift from mass markets to personal, one to one relation. With the mobile banking it is transforms from 'on time' to 'right now' mobile technology which allows communication/ transaction.

1.4 CHALLENGES OF MOBILE BANKING

1. India is developing country where 18 official languages are spoken. The state government tells to correspond in their respective regional language for official purposes. More than tow thirds of the Indian population is illiterate, creating difficulties in understanding and deployment of mobile banking solutions.

2. A valid bank account holders only allowed to mobile banking. This limits the full potential of mobile banking to extend micro-credit and bring banking to the large number of unbanked customers.

3. All transactions must be India's national currency, this may pose a constraint for interoperability between Indian mobile payments and the world.

4. Only existing financial institutions and banks are allowed to give mobile banking service. Microfinance Institutions (MFIs) cannot be achieved by these due to existing large fixed costs.

1.5 TYPES OF ATTACK IN SMART PHONES

- Unauthorized SMS messages in which secretly sends the expensive messages to the premium rate SMS services.

- There are malware infected editions of popular games available on the unofficial or third-party Android market.

- Few malwares attack the device with the intention of capturing the messages which contain the information of bank services, transactions.

- Unwanted applications may introduce risk and security threat.

- Smartphone cameras, speakers and microphones use for new attacks.

1.6 BEST PRACTICES FOR MOBILE SECURITY

1. Majority mobile devices may be locked with a screen lock and unlocked with a password, biometric with finger print and face recognition for personal identification. Nowadays as the best practice, multifactor authentication is considered. But security is based on password complexity and user's attention to its confidentiality.

2. Operating system like android and iOS should be up to date. Google and Apple provide regular updates to end users which can be helpful for resolving recent vulnerabilities and other threats and also it provides additional security features.

3. Taking regular back is a basic method of preventing data loss and deletion. Because user data include individual user files likes documents, spreadsheets, pictures and videos, contact and other sensitive data.

4. Data encryption is also good mobile security where translates data into another form, or code, so that only authorized parties can decrypt and read these data. This feature is used for data transmission over network. It requires a password to encrypt and decrypt data files. In case of forgets the password, the data recovery is usually problematic.

5. Minimizing both Bluetooth and Wi-Fi usage reduces exposure to having vulnerabilities exploited, although the flaws are not in these standards, but in their implementation.

6. Social engineering is a term that encompasses a broad spectrum of malicious activity. By design, social pen testing is the practice of applying social engineering scams on an organization's employees to evaluate their capability to provide sensitive information.

7. Be sure not to jailbreak your device: jailbreaking is a privilege escalation with the aim of removing software restrictions imposed by the device manufacturer.

8. Be sure not to grant unnecessary permissions to applications: app permissions are the privileges an app has—like being able to access peripherals such as the camera, contact list, or location.

1.7 CONCLUSION

Security is the main issue for mobile banking. It is always an arms race between attackers and defenders. Mobile security will continue to deliver a plethora of issues to face. For secure transition need to maintain trust in between bank and the customer's mobile phone. Effective identification of the authorized user should be there which is lagging in current mechanism. Loss of mobile phone can result in insecurity for the mobile banking. The most frequent mobile threats include data leakage, malware or malicious software, direct hacker attack, intercepting communication, stolen and lost phones etc. mobile security best practices are recommended guidelines and safeguards for protecting mobile devices. Although there is no way to hundred percent guarantee security.

REFERENCES

1. Murat Koyuncu (2019).: 'Security Awareness Level of Smartphone Users: An exploratory Case Study' Hindawi, Mobile Information Systems, Volume 2019, Article ID 2786913, https://doi.org/101155/2019/2786913.,11pages

2. Vishal Goyal(2012): 'Mobile Banking in India: Practices, Challenges and Security Issues', ISSN No. 2278-3091, Volume1, No.2, May-June 2012, International Journal of Advanced Trends in Computer Science and Engineering, www.warse.org/ijatcse/info.html

3. Kunjal Gajjar(2015): A study of Challenges and Solutions for Smart Phone Security, https://www.researchgate.net/publication/281643072, Emerging Research in Computing, Information, Communication and Applications.

4. Pawel Weichbroth(2020): Mobile Security: Threats and Best Practices, Hindawi, Mobile Information Systems, Volume 2020, Article ID 8828078, http://doi.org/10.1155/2020/8828078, 15pages

5. Shubham Chatterjee (2016): A Comprehensive Study on Security issues in Android Mobile Phone-Scope and Challenges, International Journal of Innovative Research in Advanced Engineering (IJIRAE), ISSN: 2349-2763, Issue 03, Volume3, www.ijirae.com

IMPACT OF LAND USE CHANGES ON SOIL LOSS (EROSION) IN CALABAR RIVER BASIN, CROSS RIVER STATE, SOUTHERN NIGERIA

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ABSTRACT

Human-induced modifications of the vegetation cover in river basins may cause strong geomorphic responses by disturbing sediment supply, transport and deposition regimes. This research was set out to ascertain these geomorphic responses arising from Land Use Changes / Land Covers (LULC) that have taken place in Calabar river basin overtime (1980 to 2010). Two fundamental tools applied were GIS and remote sensing which were used for the assessment of LULC. Remote sensing provided multi temporal images, while GIS was used to analyze the data from a geographic perspective. Furthermore, field experiment was carried out in the area in order to assess the level of sediment yield using experimental plots for five land use types / plots: urban, farmland, grassland, bare and forest surfaces. The result of the analysis for LULC provided six major classifications which include urban (built-up), water bodies, forest, farm, grass and bare surfaces. The built-up area and farmland land uses have increased tremendously (3.19% - 20.73%) and (10.20% - 23.79%) respectively; reductions in forest (35.85% - 24.84%), water bodies (8.77% - 5.27%), Grassland (24.68% - 12.67%) and bare land uses (17.31% - 12.69%). Similarly, the result of fieldwork conducted from all the five land use types, urban land use recorded the most significant amount of sediment loss (33.9kg), farmland (33.5kg), bare (28.8kg), grassland (14.9kg), and forest (5.7kg). The study revealed that urbanization is a major human activity to contend with in the region. To ameliorate hazards associated with urbanization, the study recommends among others monitoring of variables of sediment loss such as rainfall amount and intensity, infiltration capacity of the soil, slope length and gradient etc.by reforestation and creation of forest reserves.

Key words: Geospatial mapping, Land use, Land cover, River basin, Sediment yield.

1. INTRODUCTION

Land is a fundamental factor of production and through much of the course of human history it is connected to economic growth. Changes in land use and land cover predate history and are the direct and indirect consequences of human actions to secure essential resources. Land use generally refers to the earth's terrestrial surface as modified by human activities, whereas land cover may refer to natural biophysical attributes of the earth's surface. Though humans have been modifying land to obtain food and other essentials for thousands of years, current rates, extents and intensities of land use and land cover changes are far greater than ever in history, driving unprecedented changes in ecosystems and environment processes at local, regional and global scales. These changes encompass the greatest environmental concerns of human populations today, including climate change, biodiversity loss and the pollution of water, soils and air. Monitoring and mitigating the negative consequences of land use and land cover changes while sustaining the production of essential resources has therefore become a major priority of researchers around the world.

More recently, industrialization has encouraged the concentration of human population within urban areas (urbanization) and hence decreased the population of rural areas; accompanied by the intensification of agriculture in the most productive land and the abandonment of marginal land. All of these processes are observable simultaneously around the world today. The extent to which humans have modified fluvial systems through changes in land use is difficult to

overestimate. Changes in land use have impacted the delivery of water, sediment, nutrients, and other materials downstream, and can alter water quality, aquatic habitat, and channel and floodplain morphology over short to intermediate time scales (10^{-1}–10^3 year). Urbanization is a particularly pervasive type of land use change that represents a suite of alterations that are associated with industrial, commercial and residential development. This form of land use change may increase runoff and sediment production and generate substantial responses in flooding, sedimentation and channel morphology downstream (James, 2013). Urbanization tends to decrease infiltration capacities, increase Hortonian overland flow, and concentrate flows in storm drains and channels.

Nigeria in general and Calabar in particular had experienced significant land use changes and soil degradation. Most of the changes in vegetation and rural land use in Nigeria take place within the tropical areas (Ayoade, 1992). In Calabar region, there is a massive shift of land development from the eastern and southern parts of the city to the northern part of the state because of the restrictions imposed by the Calabar river, Great Kwa river estuary and the wetlands of Cross River estuary (Efiong, 2011). For instance, the National Integrated Power Project (NIPP) is making use of large expanses of land at Ikot – Nyong in Odukpani; Pamol Rubber Plantation and Tinapa Leisure Resort in Odukpani and Municipality respectively and is situated along the Calabar–Itu highway of the study area.

There are continuous economic activities carried out in these lands by man which has affected the ecological condition of the inhabitants. Despite these activities, there is no evidence of ecological attention by the government to improve the environment in the region. There is the existence of dearth of literature and also, low level of recognition on the ecological dimensions of land use studies in Nigeria (Okude, 2006). The link between Calabar river basin directly or indirectly determines what happens in Calabar the State Capital of Cross River State which is the host to major African Leisure Resorts.

In Nigeria, Cross River State presently has over 40% of the remaining Tropical High Forests (THFs) of the entire nation (Balogun, 1994). The forest resource base includes the mangrove swamps and tropical rainforest in the south, the central and the derived Guinea savanna towards the north (Ogar, 2006).Thus, Cross River becoming the most forested State in Nigeria with at least 75% of its population inhabiting rural communities. In Nigeria, Ogbonaya (1996) estimated the rate of forest loss to be about 4,000 km^2 a year. The researcher also envisaged that if this rate continues unabated, Nigeria will have no natural forest left in less than fourteen years. However, 5% of the forest now remains, and out of this, 4% is in Cross River Region (NEST, 1991).At present, 34% of Cross River State is forest (Dunn, 1994). In the forest reserves of the Calabar river catchment, the trend has manifested in the level of exploitation for agriculture, fuel energy, construction, urbanization etc.

Table 1: Tree Exploitation from Forest Reserves that Traverse the Calabar River Catchment

Location	Number by Year				
	1988	**1990**	**2000**	**2001**	**2003**
Awi – Akampa	1176	159	1113	1375	667
Oban	295	1139	447	721	547
Odukpani	110	41	76	70	67
Total	**1581**	**1339**	**1636**	**2166**	**1281**

Source: Cross River State Forestry Commission, Calabar 1988, 1990, 2000, 2001and 2003

For instance, even the Cross River National Park (CRNP) with a forested land of about 4,000 sqkm was established in 1994, the depletion of the rainforests within and outside its delineation

boundaries through commercial logging is increasing rapidly. Akintoye (2002) asserted that this precious vegetation has gradually become the commercial logging targets of multi-nationals logging and wood processing firms like Hanseatic Nigeria Limited (German), Kisari Investment Company Limited (Belgian) and most recently Wempco Agro-Forestry Company Limited (Hong Kong/Chinese). Egbai et al (2011) are of the view that there is no correlation between apparent lack of vegetation cover, sandy nature of soil, high temperature regimes and the location of Calabar as a city. In their opinion, the exposure of the soil to rainwash cannot be attributed to the geographical location of the city.

Similarly, the rapid rate of deforestation is further accompanied by urban expansion due to diverse human activities in the region. The trend explains the significant land use changes experienced in the study area overtime. Jackson et al (2012) noted that in every coastal environment, expansion of an urban / residential area over a period of time encroaches on other land uses such as farmland, water body, swamp/mangrove, grass, bare forest surfaces etc. It is therefore conceived that in Nigeria, the urban centre is linked with rapid rate of urban expansion. Consequently, where simultaneous provision for adequate urban runoff disposal system is lacking as in the study area, then, the contributive role of urban surface characteristics are severe erosion and flooding as well as other environmental hazards. The United Nations Development Programme (1995) asserted that the persistent flooding in Calabar has regularly resulted in reduced socio-economic activities, causing residential houses and fences to collapse. The flood in Calabar region has been categorized into severe, moderate and low (Abali, 2016).

Table 2: Noticeable Areas of Severe, Moderate and Low Flood in the Study Area

S/N	Zone	Areas
1	Severe Flooding	Effut-MacDonald Street, Duke Town road, Old Odukpani road, Spring road, Federal Secretariat /MM, Highway, Atekong Street, Effio-Ette junction, Esuk Mba Street, Ebito Street, Palm Street-Webber, EdimOtop.
2	Moderate Flooding	Imo Street, Oro Street, Ikon Street, Ika-Ika Street, Ambo Street, Dr. Dean Street, Go'Idie-Target, Atamunu-Mayne Avenue, Goldie- Atamunu, Mount Zion-Atakpa,EkpoAbasi Junction, Polycal Staff Quarters.
3	Low Flooding	Otop Abasi Street, Goldie-Target, Murray Street, Webber, Nelson Mandela Street, Ibesikpo, Enebong.

Source: Adapted from Abali (2016)

Between January, 2012 and October, 2013; an estimated total number of 482 buildings were affected by severe flood in Calabar (Udoimuk, et al., 2012). In the urban centre, the growing human desire to settle in the area has worsened the incidence of flood because residents tend to ignore flood aspect of urban development planning, land use and rainfall pattern (Umoh, 2004). However, since flooding in the area mainly results from rainfall, then change in rainfall pattern definitely brings about change in the dimension of flooding.

This study therefore posits that the intensity of soil loss (erosion) in the study area is therefore dependent on the land use that has changed overtime due to increasing human activities. Studies of soil loss (erosion) have identified the causes to include excessive rainfall, land use changes, nature of slope, soil texture and vegetation cover (Ede, 2002: Egbai, et al., 2011; Nduji, et al., 2012; Abali, 2016; Oyegun, et al., 2016).

To facilitate the attainment of the goal of this study, the following research questions were put forward:

1.   What are the major land use types of the study area?

2.   What is the trend of land use changes in the study area overtime?

3.   How does the intensity of sediment loss vary on the different land use types?

4.   What impact has sediment loss on the landforms of the study area, especially on drainage channels, slope sides, road networks and farmlands?

2.   THE STUDY AREA

The study area, located in south - eastern Nigeria lies between Latitudes $4^0 45^1$N and $5^0 10^1$ N and Longitudes $8^0 05^1$ and $8^0 45^1$ E. It is within the Hydrological Boundary of the Calabar River system. It is a fourth–order river catchment with an estimated area of $460 km^2$. It is a low land underlain by coastal plain sands of Benin Formation. The mean annual temperature remains about 27^oC throughout the year and, with a total rainfall of about 300cm. The relative humidity is estimated to reach 90 percent (Fig. 1).
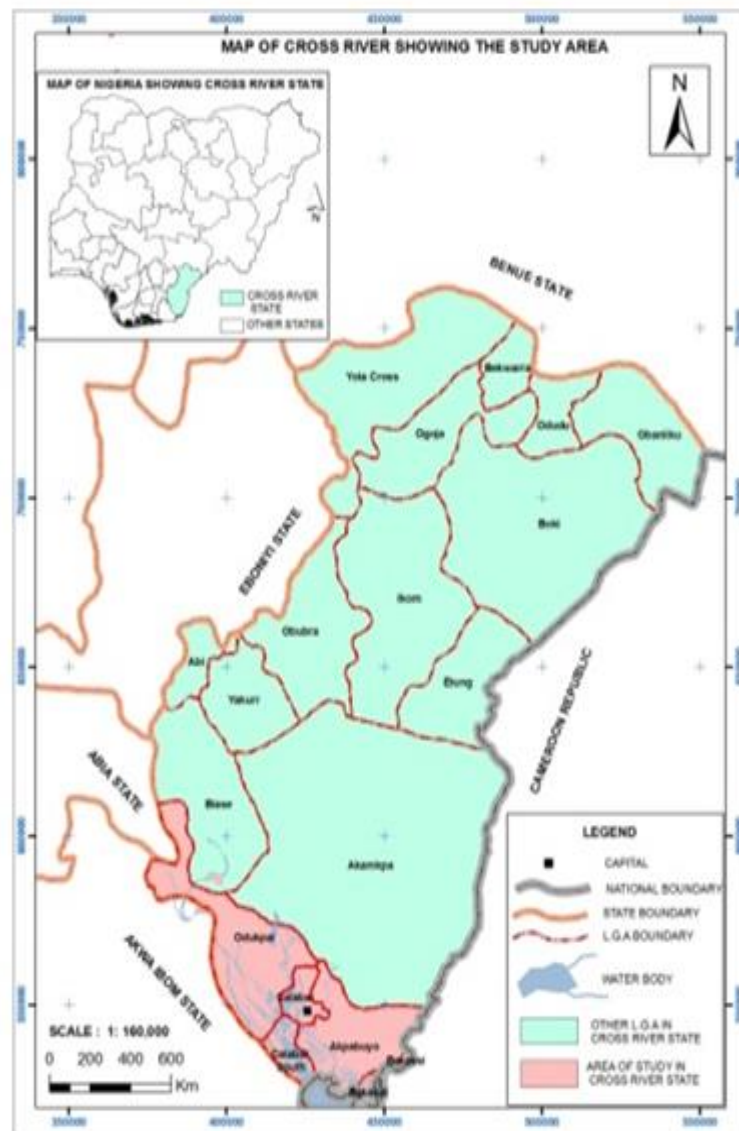
Fig. 1: Cross River State Showing Study Area

3. METHODS OF DATA COLLECTION
3.1 Measurement of Land use Changes / Land cover

Land use activity of the basin of the study area integrated data collected through available topographical map and aerial photographs. This served as a basis for interpretation and comparison of the change of the different land use types in the study area. The satellite imageries' interpretation of the study area covered four epochs: 1980, 1990, 2000 and 2010 on a scale of 1:500,000. The study also integrated the available topographical map of the study area on a scale of 1:160,000.The study adopted data from different sources and used different methods and approaches to analyze the long term land use/cover changes and trends in the four decades of the study area. The approaches included imageries from different satellites (Landsat), multi-temporal dates (MSS 1980, TM 1990, ETM 2000 and ETM+ 2010), fieldwork surveys and forest inventory application. Pixel-based classification was applied as a new approach of imagery classification. The Earth Resources Data Analysis System (ERDAS) version 9.1and Integrated Land and Water Information System (ILWIS) software version 3.7 were used for imageries processing and masking and classification. Meanwhile, ArcGIS was employed for database development, spatial data analysis, and producing thematic maps and SPSS were used for statistical analysis. Coordinates of different locations in the study area were obtained by the use of a GPS using the WGS 84 32N Minna Datum.

Landsat satellite imagery of the study area was acquired for four epochs: 1980, 1990,2000 and 2010 from Global Land Cover Facilities (GLCF) and U.S.G.S. (United State Geological Survey).The approach includes imageries from different satellites (Landsat), multi-temporal data such as Landsat 1-5, the Landsat Multi-Spectral Scanner) 60m resolution in multispectral (MSS1980), Landsat TM 1990 (Landsat 4 and 5 Thematic Mapper) 30m resolution in multispectral (TM 1990), Landsat 7 Enhanced Thematic Mapper 30m resolution in multi-spectral (ETM 2000) and Landsat ETM + 2010 (Landsat Level1 Enhanced Thematic Mapper Plus) 30m resolution (ETM+ 2010). Consequently, six land use types with varying degrees of changes were identified. They include water body, forest, bare, urban, farm, and grass surfaces.

3.2 Measurement of Rainfall-induced Sediment Loss

Sediment loss measurement in this study involved the use of experimental plot approach. The methods entailed the use of experimental plots for five land use types - urban, farmland, grassland, bare and forest surfaces; generated by installing a 2 inch pipe in the midway of the lower boundary of each plot/land use type ($5.4m^2$) to a metal sedimentation box (31 by 23cm); arranged in a convex slope series on a foothill at 20% gradient slope oriented parallel to the topography.

The fieldwork was conducted for twelve months or one year between September, 2014 and October, 2015 to cover the two seasons and all rainfall events. During the period, every geomorphic variable during the one-year was monitored. Only sheet flows strong enough to dislodge sediments were included. Measurements of the dependent (Y) and independent (X) variables were simultaneous for all rainfall events from beginning to end of experimentation. Furthermore, only clastic sediment were evaluated. The study considered surface erosion limited to sheet flow process and not channel erosion.

Arising from the above, after every rainfall events, the sediments were removed from the sedimentation boxes and taken to the laboratory, oven-dried at a temperature range of $105-110^0C$. The sample were then placed in a Gallekamp Hotbox oven whose maximum operating temperature is 200^0C and weighed.

Arising from the above, data for the dependent variable and independent variables from five slope sides / land use types were generated for the purpose of the study, using experimental plots designed at GPS: Latitude 5^006^1 -31.72"N and Longitude 8^017^1 - 08.08"E of the study area.

They include forest ground, bare surface, urban surface, farmland and grassland. Consequently, the models below were developed in the study.

Plate 1: Researcher's Experimental Plot with Sedimentation Boxes

4.   RESULTS AND DISCUSSION
4.1: Result of Land use Changes / Land cover
Below is the result of Land use / cover classification **(Figs. 2 – 5), (Plate 2)** and summary table of result **(Table 3)** and statistical information.
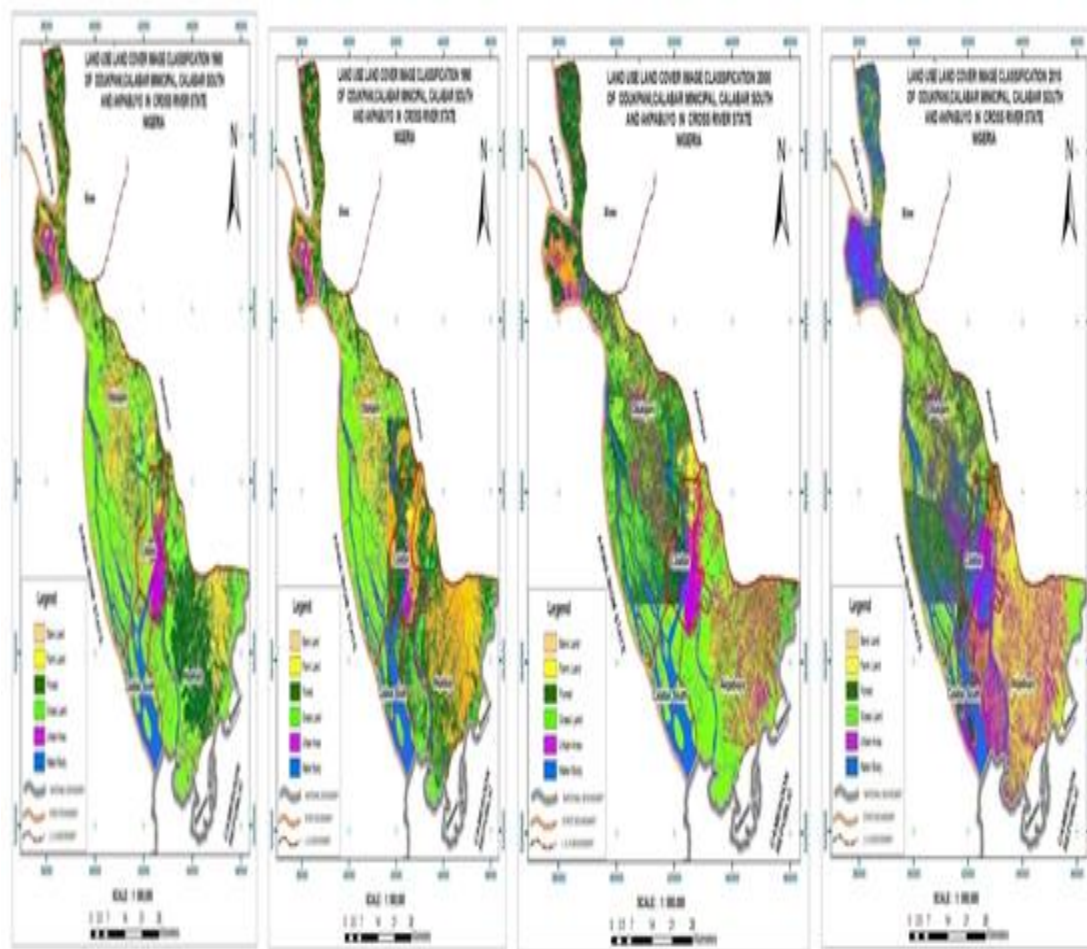
Fig. 2: LU/LC 1980   **Fig.3: LU/LC 1990**   **Fig. 4: LU/LC 2000**   **Fig. 5: LU/LC 2010**

Plate 2: Urbanized (Concretized) surface, Bare surface, Grassland, Farmland

and Pamol Forested Rubber Plantation side by side along

Calabar – Itu Highway of the Study Area.

Table 3: Summary of Land use Change Category at Different Epochs (1980 - 2010) in the Study Area

Land use Change Category	1980		1990		2000		2010	
	Area (m^2)	Percentage (%)	Area (m^2)	Percentage (%)	Area (m^2)	Percentage (%)	Area (m^2)	Percentage (%)
Water body	205098300	8.77	136590300	5.84	128119500	5.48	123402600	5.27
Urban Area	74699100	3.19	173699100	7.42	271471500	11.60	485040600	20.73
Grassland	577357200	24.68	574892100	24.57	583918200	24.96	296449200	12.67
Farmland	238747500	10.20	283138200	12.10	282449700	12.07	556709400	23.79
Forest	838700100	35.85	705433500	30.15	606020400	25.90	581134500	24.84
Bare surface	405070200	17.31	465919200	19.91	467693100	19.99	296936100	12.69
Total	**2339672400**	**100.00**	**2339672400**	**100.00**	**2339672400**	**100.00**	**2339672400**	**100.00**

Source: Geographic Information System (GIS)

The initial records of land use changes / covers obtained in 1980 above revealed that water body occupied 8.77%, urban area (3.19%), grassland (24.68%), farmland (10.20%), forest (35.85%) and bare land (17.31%) of the total land area. The summary result shows that forest was the dominant land use type. Urban land use was the least recorded within the period **(Fig. 6).**

Histogram of Landuse Cover 1980

	Water Body	Urban Area	Grass Land	Farm Land	Forest	Bare Land
■ Series1	8.77	3.19	24.68	10.20	35.85	17.31
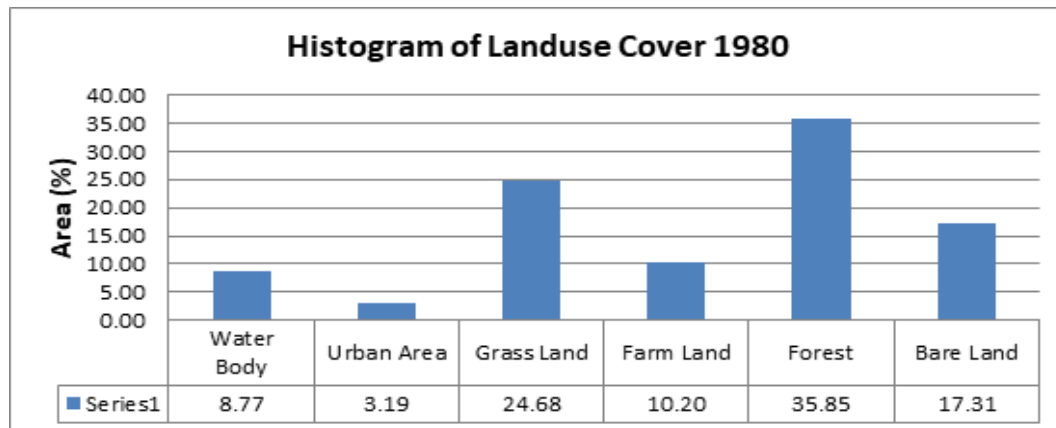
Fig.6: Histogram of Land use Cover (1980) of the Study Area

By 1990, urban land use type had increased by 4.23% and then expanded / encroached on farmlands, bare surfaces, water body and the surrounding secondary forest. Within the period; mangrove swamp, forest, bare surfaces, farmlands had reduced significantly **(Fig. 7)**.

Histogram of Landuse Cover 1990

	Water Body	Urban Area	Grass Land	Farm Land	Forest	Bare Land
■ Series1	5.84	7.42	24.57	12.10	30.15	19.91
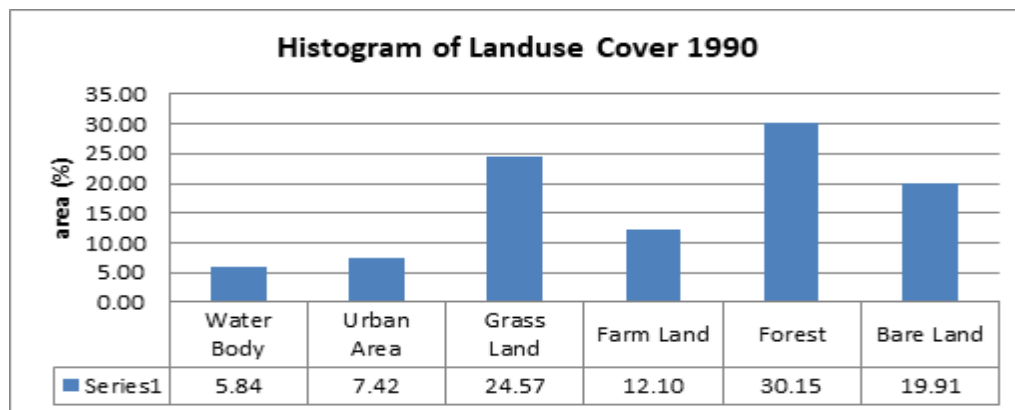
***Fig.7:** Histogram of Land use Cover (1990) of the Study Area*

By 2000, urban land use had increased by 8.41% and then expanded / encroached on farmlands, bare surfaces, water body and the surrounding secondary forest. Within the period mangrove, bare surfaces and forest had reduced **(Fig. 8)**.

Histogram of Landuse Cover 2000

	Water Body	Urban Area	Grass Land	Farm Land	Forest	Bare Land
■ Series1	5.48	11.60	24.96	12.07	25.90	19.99
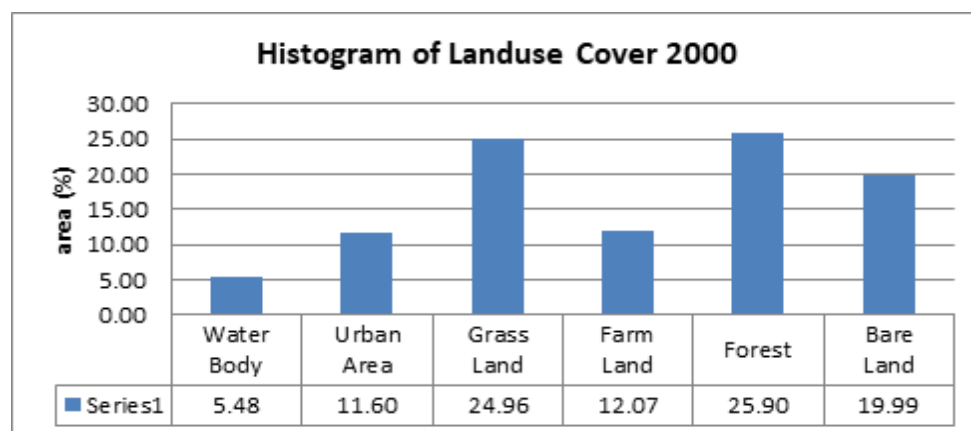
***Fig.8:** Histogram of Land use Cover (2000) of the Study Area*

By 2010, urban land use had increased by 17.54% and then expanded / encroached on farmlands, bare surfaces, water body and the surrounding secondary forest. Within the period; mangrove and forest had reduced significantly **(Fig. 9)**.
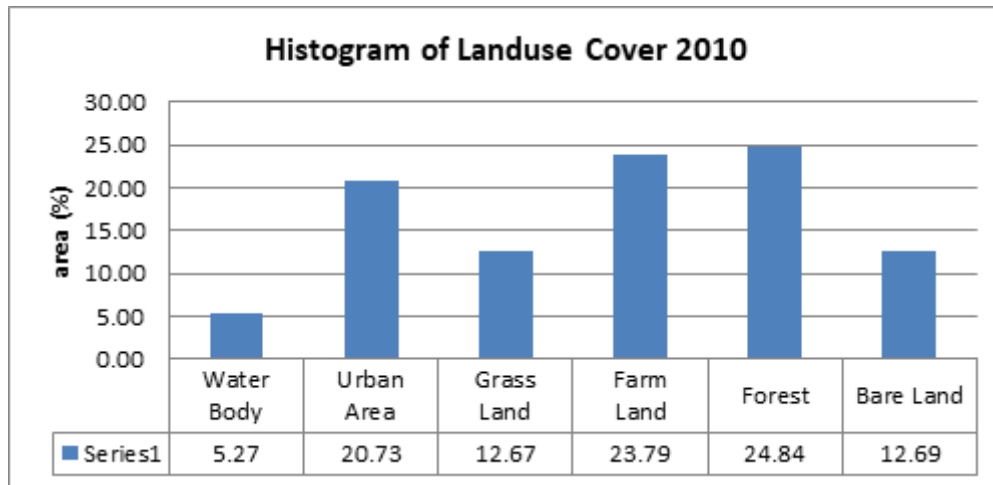
Fig.9: *Histogram of Land use Cover (2010) of the Study Area*

4.2 Models Developed for Rainfall-induced Sediment Loss in the Study

The summary of the models developed in the study at the 99.9% probability level show the explanation provided by the various land use types for sediment loss. For instance 17.6% of variation in sediment loss is explainable by urban surface, 41.0% of variation in sediment loss is explainable by bare surface, 32.1% of variation in sediment loss is explainable by farmland, 14.7% of variation in sediment loss is explainable by grassland, 8.4% of variation in sediment loss is explainable by forest ground and 42.4% of variation in sediment loss is explainable by the model developed for the study in the Calabar River catchment. Below are the detailed individual and joint contributions of the independent variables to sediment loss (dependent variable) from the various land use types (Tables 4 and 5).

Table 4: Summary of Measured Variables of Interest in the Study

Variables	Land use Types					
	Urban Surface	Bare surface	Farm land	Grass land	Forest Ground	Totals
Sediment Loss (kg) $\bar{x}$	33.9138	28.7754	33.4992	14.9477	5.6646	**116.8007**
Rainfall Amount (mm) $\bar{x}$	41.7385	41.7385	41.7385	41.7385	41.7385	**208.6925**
Rainfall Intensity (mm/min) $\bar{x}$	0.5682	0.5682	0.5682	0.5682	0.5682	**2.841**
Slope Gradient (%) $\bar{x}$	52.0000	52.0000	52.0000	52.0000	47.6292	**255.6292**
Slope Length (m) $\bar{x}$	5.2020	4.0180	4.6177	4.5746	15.4365	**33.8488**

Particle size (kg)						**268.0**
sand (%)	58.0	49.0	48.0	56.0	57.0	**61.0**
silt (%)	11.0	13.0	18.0	12.0	7.0	**171.0**
clay (%)	31.0	38.0	34.0s	32.0	36.0	
Vegetation Cover (dummy variable)	4.2469	1.0263	2.3462	5.0917	7.0705	**19.7816**
Infiltration Capacity (cm/hr) ($\bar{x}$)	4.8200	5.9554	4.7831	4.5015	5.0723	**25.1323**

Source: Researcher's Fieldwork (2015)*significant at the 0.001 Level

Table 5: Models Developed in the Study

Land use	Coefficient of Determination %	F – ratio (Regression Equation)
Urban Surface	17.6	$Y = 11.580 + 0.434x_1 + e$
Bare Surface	41.0	$Y = 5557.614 + 0.965x_1 - 0.445x_2 + 26.606x_3 - 26.356x_4 + 0.231x_7 + e$
Farmland	32.1	$Y = 20.307 + 0.576x_1 + e$
Grassland	14.7	$Y = 27.213 + 0.400x_1 + e$
Forest Ground	8.4	$Y = 2.683 - 0.356x_3 + e$
Model	42.4	$Y = 62.521 + 0.268x_1 + 0.229x_3 - 0.532x_4 - 0.160x_6 + e$

Source: Computer Analysis Output of SPSS (*significant at the 0.001 Level)

3. SUMMARY AND CONCLUSION

a. Land use Changes / Land cover

The dynamics of the land use and land cover in Calabar River Catchment has been attributed mostly to increasing urbanization. Urban land type plays the dominant role in the land use change pattern in the region. This means that Calabar river catchment is increasingly being urbanized while at the same time engagement of the inhabitants in agriculture as a major economic activity. In the study area, within a 30 year period (1980-2010), the result of land use changes showed that urban land use type encroached on farmland, grassland, bare land, water bodies and grassland.

b. Monitoring of Rainfall-induced Sediment Loss

Calabar river catchment is an urbanizing area. Consequently, some of the surfaces are paved or cemented. Monitoring of sediment losses requires rainfall amount and intensity,reforestation aimed at increasing the vegetation cover and infiltration capacity of the soil, thereby reducing the surface runoff. The presence of vegetation in this basin can also reduce nutrient and material loss to the river. Furthermore, legislation against indiscriminate felling or burning of trees is recommended. Furthermore, the researcher recommends sustainable forest resource management in the basin.

Significantly, there is the need to preserve the already existing forest at certain reaches of the stream. This is recommended because mature vegetation has a higher rainfall interception rate a

tendency to reduce rates of overland flow and generates soil with higher infiltration capacity and better general structure. As revealed by the study, monitoring of sediment loss requires increase in slope length and gradient, infiltration capacity of the soil, vegetation cover, particle size characteristics. Detail procedures for individual variables are shown below:

i.   Monitoring of Rainfall Amount and Intensity

In the built-up areas like, storm wash from roofs and runoffs from paved surfaces concentrate into narrow paths. In a high rainfall region such as Calabar river catchment, the use of urban master plan incorporating well designed drainages is essential for the protection of surfaces from sediment loss.

ii.   Monitoring of Slope Length and Gradient

To reduce the velocity of sediment loss down the slopes requires that where slopes are extensive, structures constructed along them should be broken into reaches or terraces in order to shorten lengths and gradients. This is because the steeper the slope of a field, the greater the amount of sediment loss from erosion by water. Furthermore, soil erosion by water also increases as the slope length increases due to the greater accumulation of runoff and increased velocity of water which permits a greater degree of scouring (carrying capacity for sediment). Agriculturally, certain conservation measures can reduce soil erosion. Tillage and cropping practices, as well as land management practices, directly affect the overall soil erosion problem and solutions on a farm. For example, contour ploughing, strip cropping, or terracing may be considered.

iii.   Monitoring of Infiltration Capacity of the Soil

To increase the infiltration capacity of the soil aimed at reducing sediment loss, reforestation and establishment of forest reserves at designated areas should be encouraged. This will in turn increase permeability by displacing the soil particle size characteristics. Furthermore, legislation against indiscriminate felling/burning of trees and public enlightenment on dangers associated with felling/burning of trees. Generally, soils with faster infiltration rates, higher levels of organic matter and improved soil structure have a greater resistance to erosion.

iv.   Monitoring of Vegetation Cover

To reduce the amount of sediment loss, there is need for an increase in vegetation cover. To achieve this, reforestation and establishment of forest reserves are required. Plant and residue cover protects the soil from raindrop impact and splash, tends to slow down the movement of surface runoff and allows excess surface water to infiltrate. Soil erosion potential is increased if the soil has no or very little vegetative cover of plants and/or crop residues. The erosion-reducing effectiveness of plant and/or residue covers depends on the type, extent and quantity of cover. Vegetation and residue combinations that completely cover the soil, and which intercept all falling raindrops at and close to the surface and the most efficient in controlling soil (e.g. forests, permanent grasses).

v.   Monitoring of Particle Sizes

Sand, sandy loam and loam textured soils tend to be less erodible than silt, very fine sand, and certain clay textured soils. To displace the particle sizes requires increasing the permeability/infiltration capacity of the soil. To achieve this requires increasing the vegetation cover by planting of trees and establishment of forest reserves.

REFERENCES

- Abali, T. P. (2016). Land cover Dynamics and Sediment Loss from Land use Types in Calabar River Catchment, Cross River State. Ph.D Thesis, University of Port Harcourt.

- Ayoade, J.O. (1992). Introduction to Climatology for the Tropics. Ibadan: Spectrum Books.

- Balogun, P. (1994): The impact of Social and Economic Issues on Forestry in Cross River State, Nigeria,Calabar: *Cross River Forestry Department.*

- Cross River State Forestry Commission (1988, 1990, 2000, 2001 and2003). *Annual Report.* Calabar: Forestry Commission.

- Dunn, J. (1994): An Overview of Agroforestry in Cross River State. Cross River Forestry Project (ODA Assisted), Calabar.

- Ede, P. N (2002). Correlates of Sediment Loss Over Land use Types in Port Harcourt. Ph.D Thesis, University of Port Harcourt.

- Effiong, J. (2011). Changing pattern of land use in the Calabar river Catchment, south eastern Nigeria. *Journal of Sustainable Development*, 4(1), 92-102.

- Egbai, O.O.; Ukata, S. U.; Ndik, E. J. ;Ewa, E.E. and Ubor, U.U. (2011). Assessment of soils susceptibility to erosion menace in Calabar Metropolis, Cross River State, Nigeria. *Journal of Human Ecology*, 36 (3), 205-209.

- Jackson, K. P.; Hart, L.; Adekunle, I. and Nkwunonwo, U.C. (2012). Investigating the changes in the coastal environment of Okrika, Rivers State between 1986 and 2007 using remote sensing and GIS techniques, *47th Annual General Meeting and Conference of Nigerian Institution of Surveyors, 25-29 June 2012.*

- James L. A., and Lecce S. A. (2013). Impacts of Land-Use and Land-Cover Change on River Systems. In: John F. Shroder (ed.) Treatise on Geomorphology, (9), 768-793. San Diego: Academic Press.

- Nduji, N. N.; Nnam, V. C. and Ekpete, B. O. (2012). Gully erosion monitoring of Iyioku river, Nike, Enugu State, Nigeria, using remote sensing, *47th Annual General Meeting and Conference of Nigerian Institution of Surveyors*, 25-29 June, 2012.

- Ogar, T. O. (2006). Forest Distribution from Logging Operations in Etung Local Government Area, Cross River State. M.Sc Thesis, University of Port Harcourt.

- Oyegun, C. U; Umeuduji, J. E; Abali, T. P and Abua, M. A (2016). Land cover dynamics in Calabar river catchment, Cross River State, Nigeria. *Journal of Research in Environmental and Earth Science, 2 (9), 11-18.*

- Udoimuk, A. B.; Osang, J. E.; Ettah, E. B.; Ushie, P. O.; Egor, A. O. and Alozie, S. I. (2012). An empirical study of seasonal rainfall effect in Calabar, Cross River State, Nigeria. *IOSR Journal of Applied Physics (IOSR-JAP), 5(5), 7-15.*

- United Nations Development Programme, UNDP (1995). Studies on erosion, flood and landslide in Abia, Akwa Ibom, Cross River and Imo States. *Baseline Report, 1995,* 3, 10-15.

FLOOD DETECTION AND WARNING SYSTEM USING CLOUD BASED ENERGY EFFICIENT IOT

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ABSTRACT

Advance flood prediction and forecasting plays a vital role in the lives of people in flood prone locations. Recurrent floods cause huge destructions to crop, public utilities and loss of lives. Solution to this destruction is to alert the public about the hazardous situation well in advance in order to evacuate and protect the assets. In this paper, we propose a flood prediction and warning system using Internet of Things (IoT). IoT is an incredible innovation which contributes in checking climate information and making it accessible for different exploration measure. IoT sensors are limited with power batteries. An energy saving mechanism is used to retain the systems energy level. Effective acquisition of data from the specified environment will support in accuracy of flood prediction and forecasting. Data collected are stored in a centralized cloud for effective analysis. Environmental attributes such as rainfall, temperature, humidity and wind flow are collected from Chennai region for the research work. Feed Forward Artificial Neural Network (FFANN) method which sums up the relationship between the information layer and yield layer is used to foresee and forecast flood ahead of time. Seriousness of flood is intimated to the corresponding personals to take precautionary measures. Experimental results prove the efficiency of the proposed work compared to the existing systems.

Keywords: IoT, Flood prediction, FFANN, Flood warning

I. INTRODUCTION

Disasters are recurrent and threatening which affects the natural rhythm of normal life structure. Among all other disastrous happenings flood is one of the commonly occurring mishap in many parts of India. As indicated by World Meteorological Organization (WMO) flood stays the third greatest calamity on the planet [2]. In the course of recent many years, floods have represented 44% of all debacle episodes and have influenced 1.6 billion individuals around the world. China is the country generally affected by floods from 2000 to 2019, with a normal of 20 floods each year and 900 million individuals influenced (UNDRR 2020) [3]. The main aim of this research is to predict flood early by effectively gathering weather data with efficient energy saving mechanism. It also focuses on early flood forecasting in order to mitigate destructions caused by flood.

Lately, various researchers have applied different techniques for anticipating and estimating floods. All the methods remain challenging due to variances in big data generated by sensors and climatic conditions. The introduced model depends on determining and recognizing the flood ahead of time dependent on natural variables like rainfall, temperature, humidity and wind flow. Preprocessing techniques are carried out to reduce data redundancy. The data that is preprocessed is then analyzed using FFANN for flood prediction and forecasting. ANN structure is non-linear which contains many interlinked processing components for computation [1]. ANN is utilized in view of its attributes such as high parallelism, generalization abilities, learning and fault tolerance [3]. Flood severity is forecasted to the concerned personals for further steps to be taken. Performance analysis is carried out to prove systems efficiency.

Discussion on related study is mentioned in Section II. Research zone and data utilized are discussed in Section III. Core modules of flood prediction and forecasting is stated in Section IV. Performance analysis is done is Section V. Proposed model is concluded in the final section.

II. RELATED STUDY

Etebong B. Isong [5], highlighted the remarkable necessity of cost and power efficiency in deploying wireless networks. Different sensors, for example, temperature, rainfall, humidity and water level, captures the signs or information and communicate to microcontroller. The analog information sent is digitalized using Analog-Digital converter incorporated in microcontroller. Zigbee module sends information received from its radio to the processing unit which in turn sends packets received from sensors to Zigbee module. Henceforth, data may be communicated and furthermore got by different hubs. Additionally, the microcontroller sends commands to Zigbee module for the setup of the network.

Mohd Saber et al [6], fostered a framework, which is utilized to discover the flood level by gathering the data, for example, water level, water pressure, and the degree of precipitation. The gathered data is passed to the microcontroller for additional preparing, and afterward the information associated with the server through Wi-Fi and permits sharing of the information to web. The framework was productive because of its collaboration in the working of the activities like monitoring, analyzing and correspondence.

Tejaswitha et al [7], proposed a model to alarm the flood happenings in the coastal regions. Wireless Sensor Networks are used to monitor the river water level. Huge information collected is sent to server via wireless communication protocol for further process. As GSM module keeps network signals accessible routinely for effective prediction.

Raihan Ul Islam [8], fostered a web based BRBES framework for multi-level flood prediction to improve the accuracy. The proposed framework needed huge computational force, which used greater quantities of manage everything bases and flexibility by changing into web-based plan for unrivaled comfort. Additionally, a similar investigation was completed with the AI procedures like Artificial Neural Networks (ANN) which optimized quick flood detection. Additionally, Support Vector Machine (SVM) based Linear Regression strategy was executed.

III. RESEARCH ZONE AND DATA SET

Lindsay in [4] states that Chennai is a low-lying area comprising rivers, backwater lakes, salt pans, wetlands and sand ridges that lies on India's southeastern coastal plain. It is in the Western Ghats downpour shadow. From southern end of Kerala to Maharashtra–Gujarat border there is a series of mountain running. This reach obstructs the moisture bearing southwest storm from arriving at the city. Chennai in this way gets a large portion of its downpour from October to December during the northeast monsoon. Thus, water bodies in the city is in this way occasional and recurrent. The city's area implies that it is additionally exposed to the climatic dejections that create over Bay of Bengal during changes among southwest and northeast rainstorm when ocean surface temperature is at its most elevated. These rise in May and November, much of the time forming into the hurricanes and typhoons that have regularly crushed Chennai and the Coromandel Coast. Therefore, the study area is chosen as Chennai.

Dataset is obtained from Regional Meteorological Department, Nungambakkam. Weather attributes like temperature, rainfall, humidity and wind flow are collected for about 5 years from 2015-2019.

IV. PROPOSED METHODOLOGY

Figure 1 describes the architecture of the proposed system. It comprises of three phases: Data acquisition, Preprocessing and Prediction and Forecasting. Data acquisition phase collects the weather parameters from different sensors. Collected data are then stored in a centralized cloud for preprocessing in the next phase. The data obtained from the phase is then used for further process of flood prediction and forecasting.
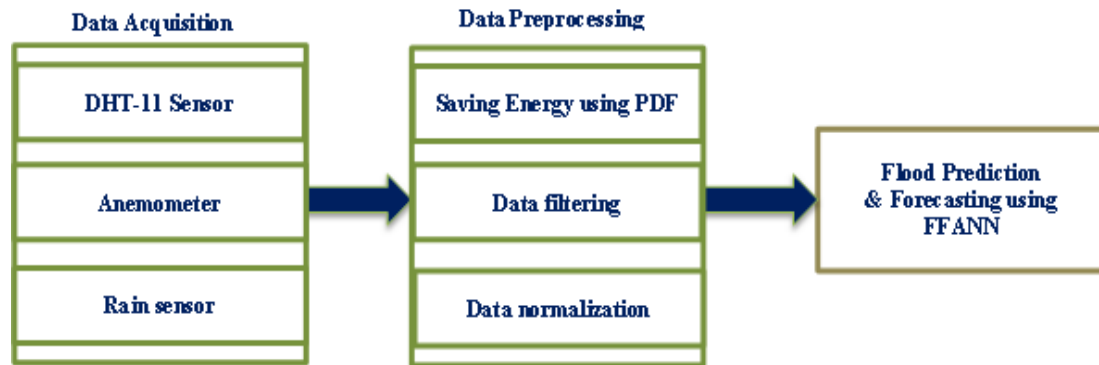
Figure 1 : Proposed System Structure

Data Acquisition

Large amount of flood related data is gathered using IoT sensors from Chennai region. Sensors used for data acquisition are DHT11Sensor, Anemometer and Rain Sensor. These sensors are operated using limited power batteries and therefore systems energy is conserved with effective use of the sensors. Obtained data is then conveyed to a centralised AI cloud through wifi where pre-processing is done for further analysis of flood prediction and forecasting. Table 1 shows the flood attributes and its related sensors.

Table 1. Flood Attributes and sensors

Flood Attributes	Sensors Used
Temperature	DHT11
Rainfall	Rain Sensor
Humidity	DHT11
Wind flow	Anemometer

Preprocessing

PDF for Sensor Energy Conserving

Large number of sensors that operate with limited power batteries are used to continuously monitor the environmental parameters. Sensors produce huge amount of monitored data which drains lot of energy per second. Systematic sleep and activation of the sensors can save lot of energy to avoid data redundancy. Sensors placed in areas where the probability of flood is less is shutdown and areas with maximum flood probability will be active which is done using probability distribution function. Reducing the frequency of data being transmitted from areas where the probability of flood is medium will also save a little more energy. Thus, sensors effectively monitor and collect the data to be analyzed. Algorithm 1 shows the mechanism of proposed system's energy conservation.

Algorithm 1: Mechanism of Energy Saving

MV: Mean value

SD: Standard Deviation

TV_{less}: Less probability to sleep mode

TV_{high} : High probability to active mode

P : Current flood status

1   Determine the flood data using normal probability distribution function

2   If $(P <= TV_{less})$ then

3   Set sensors to sleep mode

4   If(P>= TV_{high})

5   Set sensors to active mode

6   If (TV_{less} < P < TV_{high})

7   Reduce frequency of data transmission

8   Exit

Data Filtering

All flood related data not pertaining to the proposed work is removed to minimize computational time of the proposed system. Details like dust storm, lightning and thunderstorm are filtered.

Data Normalization

The term normalization is to rationalize the data to a common format of data type based on the heterogeneity of data. This preprocessing step is performed to effectively predict and forecast the flood events.

Flood Prediction and Forecasting using FFANN

Feed Forward Artificial Neural Network (FFANN) is a method implemented for classifying the data for flood prediction as normal, medium and extreme and forecasting. FFANN consists of three layers: Input, hidden and output layer. Figure 2 shows the FFANN's structure. Multiple inputs are fed into the network for processing and multiple outputs are retrieved based on the categories predicted. Each input is multiplied with weight and combined to give the predicted output. Transfer function is used to activate the neuron. Output is calculated to predict flood severity level using the following equation.

$FS_l = f(A \times w_k - t_l)$

Flood severity level is forecasted to the respective agencies and the people living in the flood predicted areas. Algorithm 2 shows ANN flood prediction and forecasting process.
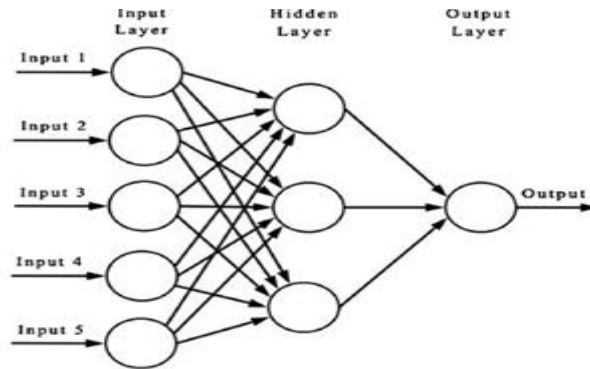
Figure 2 : FFANN Structure

Algorithm 2: Flood prediction and forecasting

$A = A_1, A_2, A_3 \ldots \ldots A_n$: Preprocessed flood attributes used as input to ANN

w_k : Weight of each node

t_l : Threshold value of each attribute

FS_l : Flood Severity Level

1   Calculate Flood Severity Level using the preprocessed attributes ($FS_l = f(A* w_k - t_l)$)

2 If ($FS_1 > t_l$) then

3 Extreme Flood; Forecast the severity to respective agencies and public

4 If ($FS_1 = t_l$)

5 Medium Flood; Forecast the situation to respective agencies and public

6 Else

7 Normal Situation; No Forecasting done

8 Exit

V. EXPERIMENTAL ANALYSIS OF FLOOD PREDICTION

Proposed model is assessed using the environmental weather data obtained from Regional Meteorological Department. Dataset is divided into two subgroups for training (70%) and testing (30%) purpose. Training efficiency of the proposed model is proved by ANN's tenfold cross validation using the methods Mean Absolute Error (MAE), Root Mean Square Error (RMSE), Root Absolute Error (RAE) and Root Relative Squared Error (RRSE) Table 2 shows the error values of the predictive model proposed and the other methods. Proposed predictive method outperforms in its performance efficiency.

Table 2. Comparison of MAE, RMSE, RAE and RRSE of proposed and existing methods

Methods	MAE	RMSE	RAE	RRSE
Proposed	0.21311	0.415	18.50	28.58
KNN	0.96	2.11	20.13	29.63
SVM	3.46	4.91	20.98	30.14
Decision Tree	4.34	5.26	21.56	30.95

Accuracy of the proposed predictive and forecasting model is proved using different statistical measures like accuracy (A), sensitivity (S), specificity (SP) and F-Measure(F). Comparative analysis is done with three other methods like KNN, SVM and Decision Tree. Figure 3 shows the results of accuracy compared with the other existing methods. The recommended model gives an outperforming result of accuracy 95%, sensitivity (96%), specificity (94.9%) and F- measure (95.4%). Thus, the efficacy of recommended system is proved.
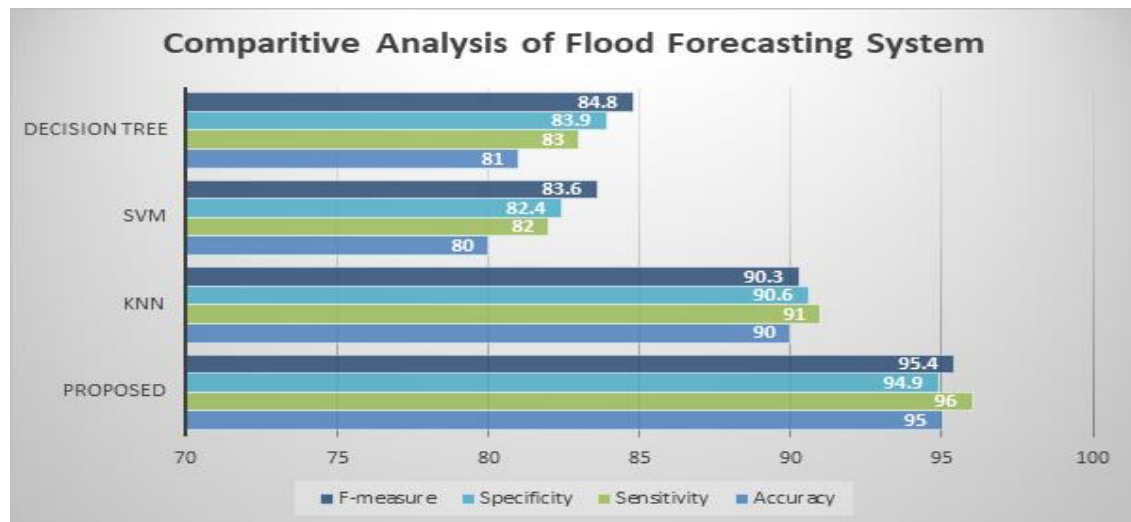
Figure 3 : Comparative analysis of Proposed and Existing methods

VI. CONCLUSION

Flood is one of the most destructive disasters in India. Solution to this catastrophe is an early prediction and warning. In this study, a cloud-based energy-proficient IoT framework is proposed for early flood predicting and forecasting. The proposed model viably decides the prediction and forecasting measures for the specific review region (Kerala, India). This structure contributed hopefully with productive improvement in sensor lifetime to generate optimistic data. ANN algorithms for prediction and forecasting created productive outcomes with an accuracy of 95%. Experimentation results are put away at distributed storage of cloud platform for respective agencies to take powerful measures on time.

REFERENCES:

[1] Tur R, Can B, Koç M, "Artificial neural networks based on principal component analysis, fuzzy systems and fuzzy neural networks for preliminary design of rubble mound breakwaters", Appl Ocean Res, 2010.

[2] "Marufish Disaster Preparedness", Marufish world of Disaster Preparedness. [Online], January 2015.

[3] Mandeep Kaur, Pankaj Deep Kaur, Sandeep Kumar Sood, "Energy efficient IoT-based cloud framework for early flood prediction", Springer, July 2021.

[4] Lindsay Bremner, "Planning the 2015 Chennai floods", EPE: Nature and Space, Vol. 3(3), pp. 732–760, 2020.

[5] Edward N. Udo, Etebong B. Isong, "Flood Monitoring and Detection System using Wireless Sensor Network", Asian Journal of Computer and Information Systems, Volume 01–Issue 04, December 2013.

[6] Mohd Sabre, M. S., Abdullah, S. S., & Faruq, A., "Flood Warning and Monitoring System Utilizing Internet of Things Technology", Kinetik: Game Technology, Information System, Computer Network, Computing, Electronics, and Control, Vol. 4, No. 4, pp 287-296, 2019.

[7] V. Tejaswitha, M. Jagadeesh Babu, "Monitoring of Water Level Variations in Rivers and Flood Alert System Using Wireless Sensor Networks", International Research Journal of Engineering and Technology, Volume 03, Issue 07, 2016.

[8] Raihan UI Isalam, "Wireless Sensor Network based Flood Prediction using belief rule based Expert system", International Journal of Engineering and Technology, Volume 7, Issue 12, 2017.

[9] Sandeep K. Sood, Rajinder Sandhu, Karan Singla, Victor Chang, "IoT, big data and HPC based smart flood management framework", Sustainable Computing: Informatics and Systems, Elsevier Inc., pp. 102-117, 2018.

[10] Supatmi S, Hou R, Sumitra ID, "Study of hybrid neuro fuzzy inference system for forecasting flood event vulnerability in Indonesia", Comput Intell Neurosci1, 2019.

[11] Mukerji A, Chatterjee C, Raghuwanshi N, "Flood forecasting using ANN, neuro-fuzzy, and neuro GA models", J Hydrology Engineering, Vol.14, pp.647–652, 2009

DESIGN AND PERFORMANCE ANALYSIS OF FRANCIS TURBINE RUNNER FOR VERTICAL AXIS WIND POWER GENERATION

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ABSTRACT

The Worldwide interest is in renewable energy systems has increased immeasurably, due to different environmental concerns like global warming and other various factors. Renewable energy is vital source for harnessing the natural forces such as wind energy as in age which is very conscious of the different environmental effects of burning the fossil fuels, and where sustainability is an ethical norm. Wind power is a major source of sustainable energy, and it can be harnessed using both horizontal and vertical axis wind turbines. This thesis presents the studies of a vertical axis wind turbine performance for applications in urban areas. In this thesis, the design principle of Francis turbine is used for the studies for wind applications. The VAWT design considered in the present study comprises of 11 rotor blades and 12 Stator blades, where the average wind speed of 3.5m/s has been considered. For making the designs of the turbine different software like Autocad and Catia V5 is preferred in this thesis.Numerical simulations with Ansys Fluent software are presented to predict the fluid flow through the turbine rotor of the vertical axis turbine (VAWT). Simulations of air flow through the turbine rotor were performed to analyze the performance characteristics of the device.The targets which were laid ahead of us at the beginning of this project were successfully achieved through careful and wise manipulation of theoretical and practical knowledge as well as under the capable guidance of my professor Lai, Wei-Hsiang at National Cheng Kung University(NCKU). Objectives were accomplished, not with ease but certainly.

Keywords: wind energy,Autocad,Catia,Ansys CFD,Francis turbine runner.

1. INTRODUCTION:

The rising concerns over the global warming, environmental pollution, and the energy security have increased interest in developing renewable and eco-friendly energy resources such as wind, solar, Geothermal, Hydro power, hydrogen, and Biomass as the replacements for fossil fuels. The energy harness from wind energy can provide a suitable solution for global climate change and the energy crisis to meet the demand to supply. The wind power utilization can essentially eliminate the emissions of $CO2$, $SO2$, NOx and bunch of other harmful wastes as in traditional coal-fuel power plants or Radioactive wastes in Nuclear power plants.70% of the total power used by the world's total population is generated from the burning of fossil fuels.Of this 30% of total power, only about 0.3% is produced by converting the kinetic energy of wind into electricity by wind turbines. In view of global interest to reduce the greenhouse gas emissions and provide sustainable energy that will meet the rising demand of energy services required, various efforts are underway to meet the supplement demand our energy base with renewable energy. This increasing demand for renewable resources and global concern about pollution and environmental degradation are consequences of our total dependence on fossil fuels. Wind energy has been identified as the most promising renewable option. It is an ancient technology, which recently has become a promising large–scale source of power production. Besides that, a simple and cheap construction, it's environmentally characteristics account will be helping for its growing importance. Different Policies are being formulated by many nations today to ensure that wind power will become a growing role in future energy supplies.

Sustainable energy is needed, but the question is how to make the selection among all the various alternatives presents. For instance, wind energy be chosen over solar energy or

geothermal? Considering the land area occupied by a university like NCKU, an installed circular solar collector with an area of 1 square meter could give an average of about 7.0 KWh/day; while a vertical axis wind turbine (VAWT) covering the same area could yield up to 4.5 KWh/day (estimate based on numbers from Thirty-Year Average of Monthly Solar Radiation). But solar power is generally more expensive per Watt than wind power.A study conducted with a renewable energy resources (RES) cost comparison has shown that the cost of wind energy and solar over a period of one year yielded $12.24 per Watt for solar, against $7.02 for wind [1]. In this contrast wind power is a more viable option.Not only the cost but other benefits of wind power are its attractiveness as an alternative power source for both large utilities, and small scale and distributed power generation.

The rapid growth in the production of wind power generation globally. This utilization of wind for electricity generation is expanding very quickly, due largely to the technological improvements, industry maturation and increasing concern with greenhouse emissions due to the burning of fossil fuels. The Association of Wind Energy Generation [1] has predicted this trend will continue as because there is much opportunity to grow this resource internationally. Given this enormous wind resources, only a small portion of the usable wind potential is being utilized presently. Government and electrical industry regulations, as well as government incentives, have a large role in determining how quickly the wind power will be adapted to its peak.

Wind turbine technology have evolved over the years.Different types of wind generators came into existence and different alteration of design have done and try to produce the wind energy to meet the demands.Even though after different alteration these wind turbines comes under two basic category: Horizontal wind turbine (HAWT) and Vertical axis wind turbine(VAWT) and these turbine have rotor spin in horizontal and vertical direction. Even further the vawt have been grouped into two types :

1.   The drag based

2.   The lift based.

Both used the aerodynamic forces to extract the wind power.
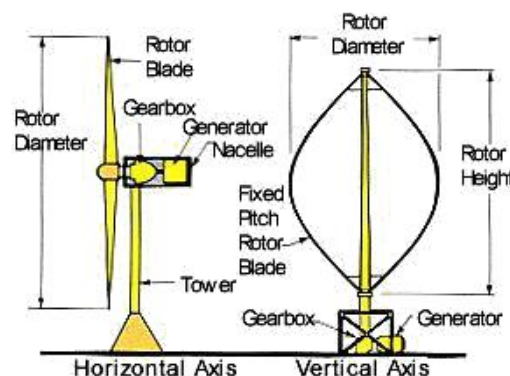
Fig.1.Types of wind Turbine

Today the wind turbine industry is dominated by the horizontal axis wind turbine.The vertical axis

wind turbines are very much uncommon.Unlike the VAWTs,the horizontal wind turbine is not omni- directional,when the wind direction changes the HAWTs have to change the direction.An advantage of HAWT is that the blade pitching is protected against the extreme wind

conditions.The basic advantage of VAWTs are that they accept wind from all the directions, in that way they eliminate the possibility of re-orienting of the the turbine.This helps to simplify the design and reduce the cost of construction ,aids and eliminates the problem of installing the gyroscope.They have low tip-speed ratio and they are not self starting .Even though it have many shortcomings ,it is attracting the interest globally.It is attracting the developers and researchers who are working to improve and helps to optimize the turbine for better efficiency. HAWTs and VAWTs are both wind power generators that convert kinetic energy of the wind into electric power. A major disadvantage with the HAWTs is power generation ability lost when the wind speed exceeds a certain value known as the cut-off speed. Shutting down is required due to safety and protection of the wind turbine structures, mainly blades during high wind speed. Most HAWTs have a rotor cut-off speed range from 20 to 25 m/s. HAWTs are therefore not suitable in cyclone and storm prone areas. Also, they are not suitable in urban areas. The VAWT has several advantages over HAWTs, such as suitability in urban areas, low noise at low tip speed ratios, better esthetic to integrate into architectural structures, insensitivity to yaw wind direction and increased power output in skewed flow [7, 9].These advantages have led to a growing research interest in VAWTs, to bridge the gap of shortcomings with HAWTs. New advances in VAWTs and this wind turbine design will be the focus of this thesis. The aerodynamic performance of vertical-axis wind turbines and computational simulations will be examined.

2. METHODOLOGY :

This chapter includes the different methods we followed in designing our turbine to get the optimum design which achieved the project objectives.In order to achieve goals and planned results within a defined schedule and a budget, a manager uses a project. Regardless of which field or which trade, there are assortments of methodologies to help managers at every stage of a project from the initiation to implementation to the closure. In this study, we will try to discuss the most commonly used project management methodologies. A methodology is a model, which project managers employ for the design, planning, implementation and achievement of their project objectives. There are different project management methodologies to benefit different projects.There were two scopes we followed to achieving our objectives:

1. Performance analysis: where we study the different parameters that effect the performance. Parametric studies can be performed using different methods, were we get the overall dimensions and different characteristics of the turbine.

2. Design analysis: where we select the materials which the turbine is made of. Stress analysis and vibration analysis were performed to ensure safe operation of the turbine under extreme conditions.

In this study we will focus on the performance analysis only,due to different constraints of VAWTs .We will be not able to perform all the analysis because the model is in the beginning stage of validation, if we able to do performance analysis efficiently and the model is validated then in future we can go for other studies for this model

2.1. VAWTs Performance Parameters:

The wind turbine parameters considered in the design process are:

1. Aerodynamics and Performance Characteristics

2. Lift Force

3. Drag Force

4. Reynolds Number

5. Blade Solidity

6. Tip Speed Ratio

7. Bezt Number

8. Rotor Performance Parameters

9. Blade Element Theory

10.Torque and Power

3. COMPUTATIONAL STUDY:

Computational fluid dynamics is a branch of fluid mechanics that uses numerical analysis and data structures to solve and analyse problems that involve fluid flows. Computers are used to perform the calculations required to simulate the interaction of liquids and gases with surfaces defined by boundary conditions. With high-speed supercomputers, better solutions can be achieved. Ongoing research yields software that improves the accuracy and speed of complex simulation scenarios such as transonic or turbulent flows. Initial experimental validation of such software is performed using a wind tunnel with the final validation coming in full-scale testing, e.g. flight tests.The computational method is one of the finest methods for solving engineering problems where the experimental study is quite costly.Computational Fluid Dynamics or CFD is the analysis of systems involving fluid flow, heat transfer and associated phenomena such as chemical reactions by means of computer-based simulation. The technique is very powerful and spans a wide range of industrial and non –industrial application areas. From the 1960s onwards, the aerospace industry has integrated CFD techniques into the design, R&D and manufacture of aircraft and jet engines. More recently, the method has been applied to the design of internal combustion engines, combustion chambers of gas turbines and furnaces.Furthermore, motor vehicle manufacturers now routinely predict drag forces, under–bonnet air flows and the in–car environment with CFD.CFD is becoming a vital component in the design of industrial products and processes.The variable cost of an experiment, in terms of facility hire and/or person – hour costs, is proportional to the number of data points and the number of configurations tested. In contrast, CFD codes can produce extremely large volumes of results at no added expense, and it is very cheap to perform parametric studies, for instance, to optimize equipment performance.

3.1 Tools used :
CATIA V5 and ANSYS 15 FLUENT are used for modelling and simulation of Francis turbine for wind power generation. ANSYS 15 FLUENT is used for 3D case of simulation.

3.2 CATIA V5:
CATIA® is the world's engineering and design leading software for product 3D CAD design excellence.CATIA (an acronym of computer aided three-dimensional interactive application,) is a multi-platform software suite for computer-aided design (CAD), computer-aided manufacturing (CAM), computer-aided engineering (CAE), PLM and 3D, developed by the French company Dassault Systèmes[21].It is used to design, simulate, analyse, and manufacture products in a variety of industries including aerospace, automotive, consumer goods, and industrial machinery, just to name a few. It addresses all manufacturing organizations, from OEMs through their supply chains, to small independent producers.If you stop and take a look around, CATIA is everywhere. CATIA is in the plane that just flew over, the car that just went silently by, the phone you just answered, and the bottle of water that you just finished.

3.3 ANSYS :
ANSYS, Inc. is an American Computer-aided engineering software developer headquartered south of Pittsburgh in Cecil Township, Pennsylvania, and United States. Ansys publishes engineering analysis software across a range of disciplines including finite element analysis,

structural analysis, computational fluid dynamics, explicit and implicit methods, and heat transfer.ANSYS Fluent, CFD, CFX, FENSAP-ICE and related software are Computational Fluid Dynamics software tools used by engineers for design and analysis. These tools can simulate fluid flows in a virtual environment for example, the fluid dynamics of ship hulls; gas turbine engines (including the compressors, combustion chamber, turbines and afterburners); aircraft aerodynamics; pumps, fans, HVAC systems, mixing vessels, hydro cyclones, vacuum cleaners, etc[22].3D model modelled in CATIA V5 is saved as step file format which is then import to ANSYS 15 and generated in Designer module.

Pre-Processor Setting:

Pre – processing consists of the input of the flow problem to a CFD programme by means of an operator – friendly interface and the subsequent transformation of this input into a form suitable for use by the solve.The user activities at the pre – processing stage includes definition of the geometry of the region of interest. It is called the computational domain.
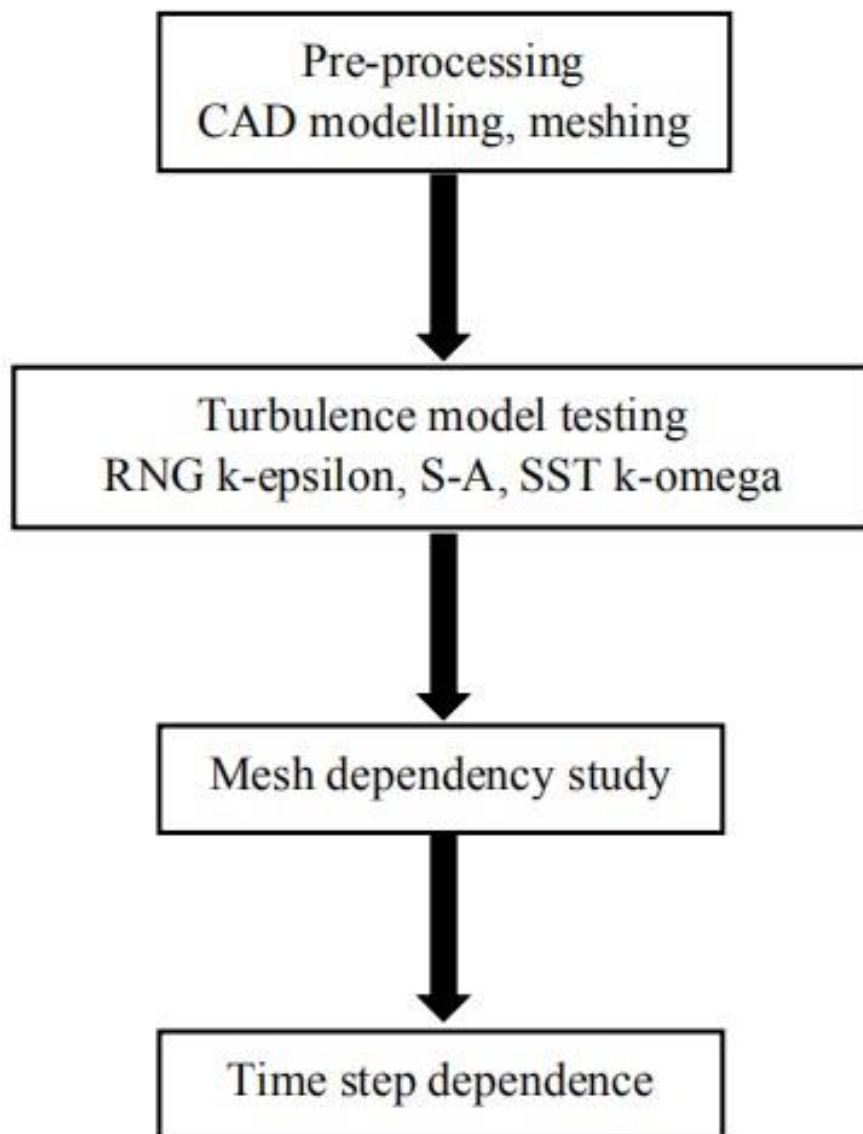
Fig 3.3.1 Flow Process For CFD

Fluid Flow (Fluent)

Subject:	Model For Wind Turbine Analysis
Author:	Amit kumar Gope
Prepared For:	Thesis
Date:	2019-6-17
Comments:	
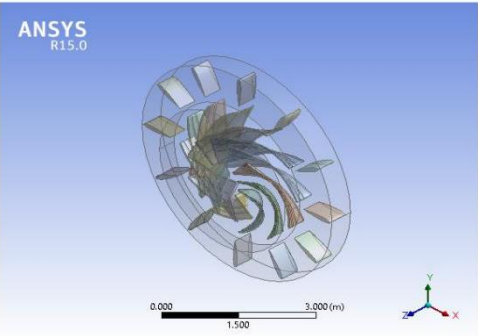
Fig 3.3.2 Geometry model for CFD Analysis

Grid generation is the sub – division of the domain into a number of smaller, non – overlapping sub – domains. It is also called Mesh. Selection of the physical or chemical phenomena that needs to be modeled, definition of fluid properties and the specification of appropriate boundary conditions at cells, which coincide with or touch the domain boundary, are also included in Pre – processing.
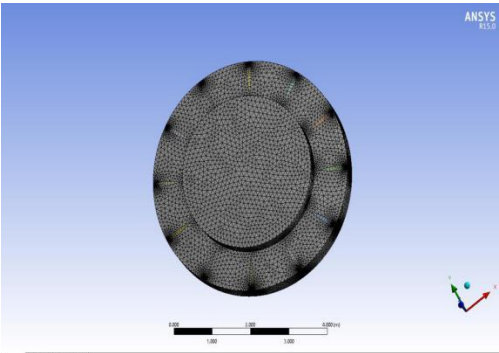
Fig 3.3.3 Meshed model of Francis turbine model

Table 3.1 Details and Sizing inputs of a mesh

3.3 Viscous models – (CFD):

Modern engineers apply both experimental and CFD analyses, and the two complement each other. For example, engineers may obtain global properties, such as lift, drag, pressure drop, or power, experimentally, but use CFD to obtain details about the flow field, such as shear stresses, velocity and pressure profiles, and flow streamlines. In addition, experimental data are often used to validate CFD solutions by matching the computationally and experimentally determined global quantities. CFD is then employed to shorten the design cycle through

Physics Preference	CFD
Solver preference	FLUENT
Advanced Size function	On: Curvature
Relevance center	Fine
Smoothing	Medium
Element size	0.1801 m
No.of Nodes	447720
No.of Elements	2184275

carefully controlled parametric studies, thereby reducing the required amount of experimental testing.

Solution procedure for selecting the models for analysis

1.A computational domain (geometry) is chosen, and a grid (also called a mesh) is generated; the domain is divided into many small elements called cells.

2.Boundary conditions are specified on each edge of the computational domain (2-D flows) or on each face of the domain, (3-D flows).

3.The type of fluid (water, air, gasoline, etc.) is specified, along with fluid properties (temperature, density, viscosity, etc.).

4.Numerical parameters and solution algorithms are selected.

5.Starting values for all flow field variables are specified for each cell.

6.Beginning with the initial guesses are solved iteratively, usually at the center of each cell.

Once the solution has converged, flow field variables such as velocity and pressure are plotted and analyzed graphically.

7.Global properties of the flow field, such as pressure drop, and integral properties, such as forces (lift and drag) and moments acting on a body, are calculated from the converged solution.

4. RESULTS AND DISCUSSION:

In this chapter we are going to observe the results which are obtained from simulation using Ansys 15 FLUENT .we are going to observe the different contour plots for velocity , pressure and streamline to observe the flow direction. We will also plot some graphs which are obtained from the CFD simulation.Results obtained from simulation are in the form of Velocity Contour, Streamline, and Volume Rendering

A contour plot is a graphic representation of the relationships among three numeric variables in two dimensions. Two variables are for X and Y axes, and a third variable Z is for contour levels. The contour levels are plotted as curves; the area between curves can be color coded to indicate interpolated values. You can interactively identify, label, color, and move contour levels, and change the resolutions of rectangular grids to get better contouring quality and performance. You can choose linear interpolation or thin-plat smoothing spline to fit contour surface functions. You can also toggle, identify and label observations in the contour plot, control the orientation of the plot, and control the information shown on the axes.ANSYS Fluent enables you to plot contour lines or profiles superimposed on the physical domain. Contour lines are lines of constant magnitude for a selected variable (isotherms, isobars, and so on). A profile plot draws these contours projected off the surface along a reference vector by an amount proportional to the value of the plotted variable at each point on the surface.

A method of measuring stream discharge in which point velocity measurements are translated into average cross-sectional flow velocities by contouring the point velocities; these averages are then multiplied by the areas of the cross sections to give the discharge.Velocity contours for different case with wind speed and rpm.
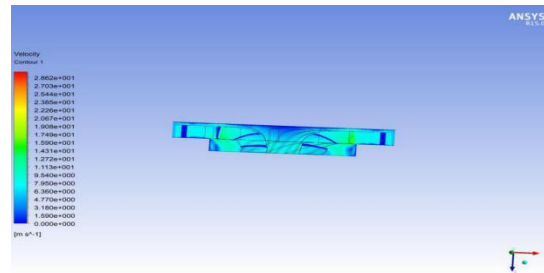
Fig4.1.Contour plot on the plane inside inlet for 5m/s
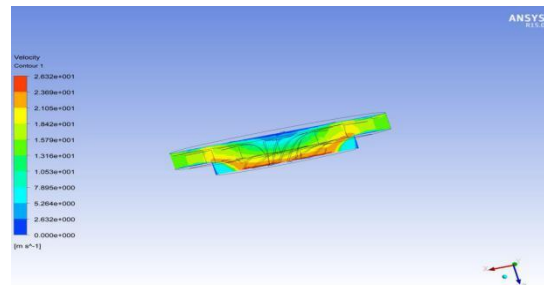
Fig 4.2 velocity contour plot on inside plane at 12 m/s
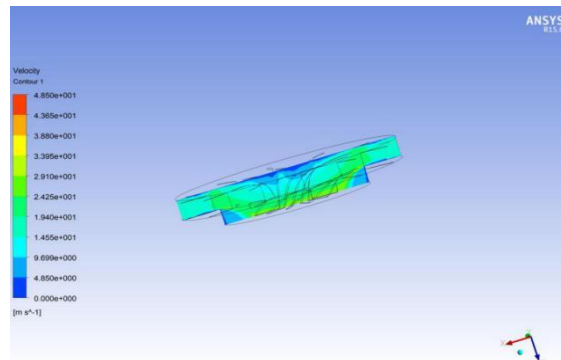
Fig 4.3 velocity contour plot on inside plane at 13 m/s
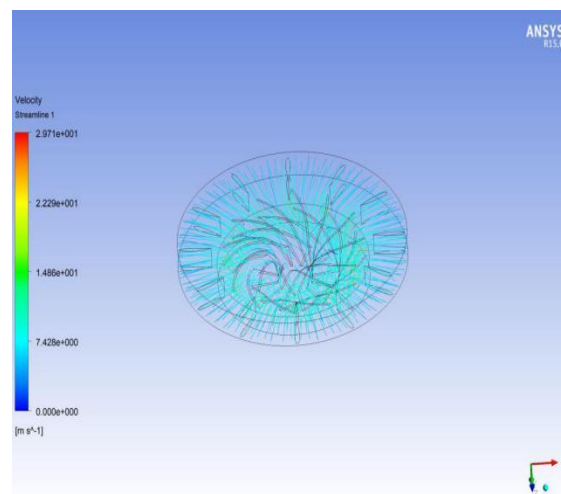
Fig 4.4 velocity stream lines at 5 m/s
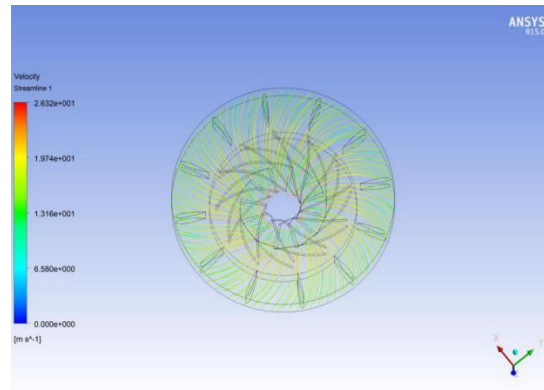
Fig 4.5 velocity stream lines at 12 m/s
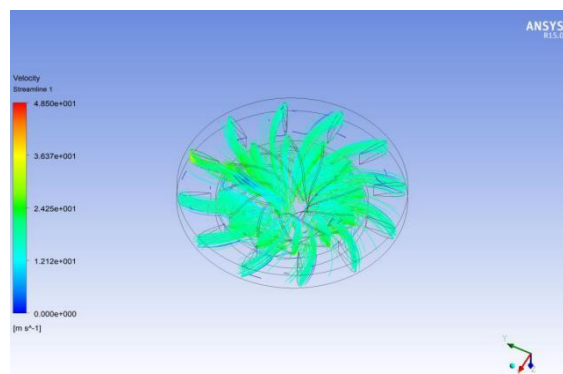
Fig 4.6 velocity stream lines at 13 m/s
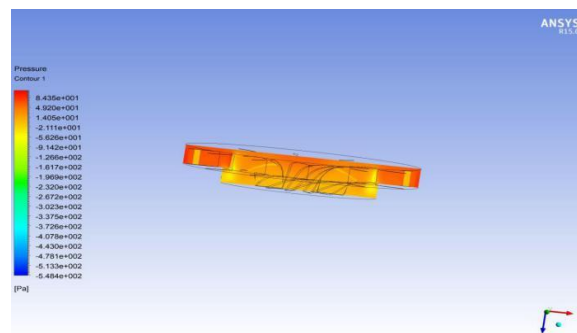
Fig 4.7 pressure contour on a plane inside the turbine at 5m/s
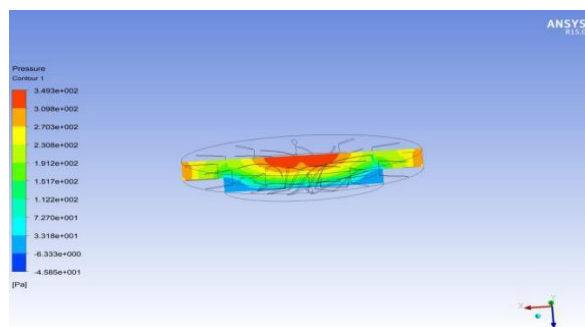
Fig 4.8 pressure contour on a plane inside the turbine at 12 m/s
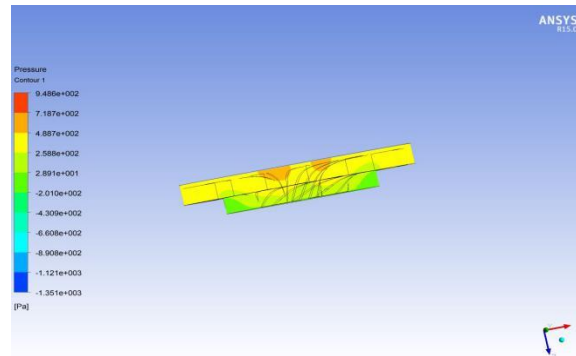
Fig 4.9 pressure contour on a plane inside the turbine at 13 m/s

4.2 Graphical Representation:

Theoretical and CFD analysis graph will be plot in this section of chapter.we will try to understand the theoretical graph which are calculated using the theory and explanations able for this kind of problem.We will also try to understand the VAWTs test and all other parameters.
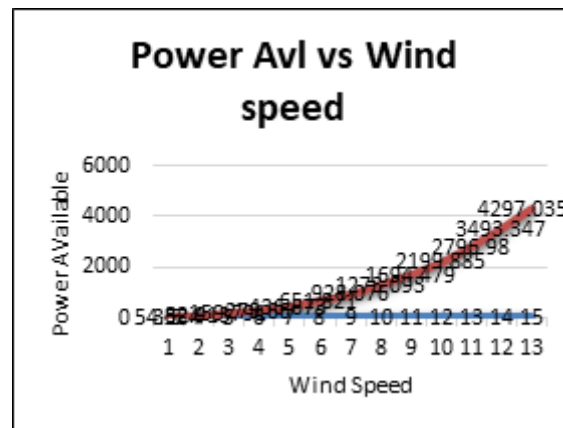
Fig4.2.1Graphical Representation of Power available vs Wind speed (Theoretical)
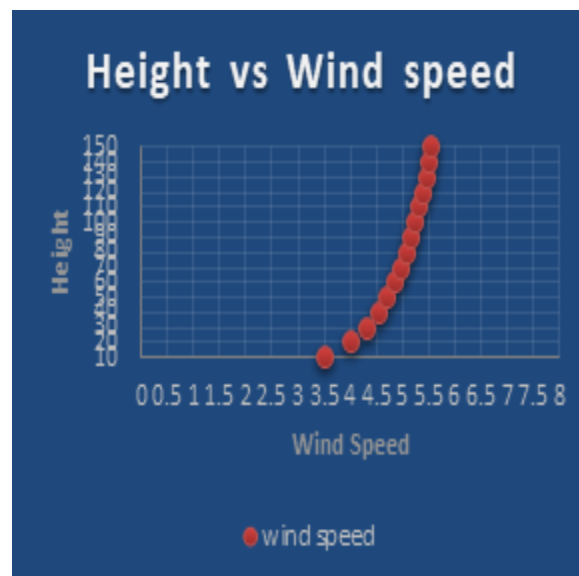
Fig 4.2.2 Graphical Representation of Height vs Wind speed (Theoretical)
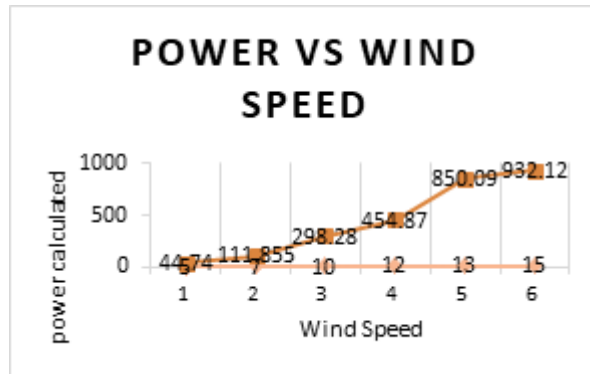
Fig 4.2.3 Graphical Representation of Power vs Wind speed (Experimental)
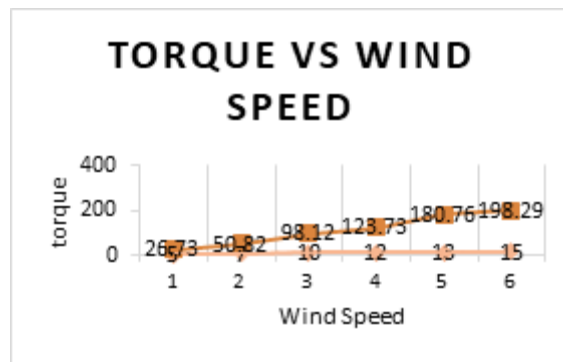
Fig 4.2.4 Graphical Representation of Torque vs Wind speed

5. CONCLUSION:

CFD has been a very useful modelling and analyzing tool the performance of a VAWTs .it is an inexpensive and effective method of simulating and testing a large no of models that could not be readily examined in a wind tunnel.Small designs changes can be studied with these models and tested quickly.In this thesis, a 3d model's numerical analysis has been completed using the turbulence model with multiple rotating reference frame to formulate and get the averaged results from analysis. Results were made in the form of contours,streamline,and the graphical representations.By the present work done, Influence of different wind velocity on the model has been analyzed.With the performance parameters observe during the simulation are giving the sufficient amount energy from model.By doing this simulation , we can finally conclude that the model is validated and can work as a wind turbine.

In the future ,the present work can be taken as a reference and can be done experimental work and the model can be tested in the wind-tunnel to get the model performance parameters at the ambient atmospheric parameters to verify the model.

6. REFERENCES:

[1]. Abe, K., Nishida, M., Sakuraia, A., Ohya, Y., Kiharaa, H., Wadad, E., Satod, K., 2005. "Experimental and numerical investigations of flow fields behind a small wind turbine with a flanged diffuser." Journal of Wind Engineering and Industrial Aerodynamics. Vol. 93, pp. 951–970.

[1] Aerodynamics Physics Organization. http://hyperphysics.phy-astr.gsu.edu/Hbase/pber.html April, 2001

[2] Daniel Borsodi Araya, Aerodynamics of vertical-axis wind turbines in full-scale and laboratory-scale experiments, ,California Institute of Technology Pasadena, California

[3]   https://en.wikipedia.org/wiki/Darrieus_wind_turbine

[4]   https://en.wikipedia.org/wiki/Savonius_wind_turbine

[5]   http://airfoiltools.com/calculator/reynoldsnumbe

[6]   https://www.coursehero.com/file/33299236/EME3203-W12pdf/

[7]   http://www.gvtech.com/ENG/Products/software.html

[8]   https://livecorecorp.com/ansys.php

[9]   Kovarik, T., Pipher, C., Hurst, J., "Wind Energy", Prism Press, 1979

[10] Kelecy, F., "Wind Turbine Blade Aerodynamics," Fluent news, vol. 11, no.1, pp. 7, spring 2002.

[11] "Wind Energy costs", part of the National Wind Coordinating Committee's Wind Energy Series, No. 11, 01 (1997)

[12] Manwell, J. F., McGowan, J. G., Rogers, A. L., "Wind Energy Explained; Theory, Design and Application", John Wiley & Sons Ltd, 2002, Amherst.

[13] Naterer, G.F., and Pope, K., Effects of Rotor–Stator Geometry on Vertical Axis Wind Turbine Performance, Technical Report, University of Ontario Institute of Technology, Oshawa, Ontario, 2007

[14] Newman, B.G., "Measurements on Savonius Rotor with Variable Gap," Proceedings of the sherbrooke University Symposium on Wind Energy, Sherbrooke, Canada, 1974, p. 116.

[15] Paraschivoiu, I., Double-Multiple Streamtube Model for Studying Vertical-Axis Wind Turbines, AIAA Journal of Propulsion and Power, Vol. 4, pp. 370-378. 1988

[16] Paul Cooper and Oliver Kennedy "Development and Analysis of a Novel Vertical Axis Wind Turbine" University of Wollongong, Wollongong, 3 (2005)

[17] [R._Carriveau]_Fundamental_and_Advanced_Topics_in_(z-lib.org)

[18] Simão, C. J., Ferreira, G., Bussel, G .V and Kuik, G. V. "Wind tunnel hotwire measurements, flow visualization and thrust measurement of a VAWT in skew." 44th AIAA Aerospace Sciences Meeting and Exhibit/ASME Wind Energy Symposium, 2006.

[19] Sathyajith, M, Wind Energy Fundamentals, Resource Analysis and Economics, Springer-Verlag Berlin Heidelberg, Netherlands, 2006.

[20] Thesis report - Ajedegba WithRosen comment.12

[21] The Energy Blog,http://thefraserdomain.typepad.com/energy/2008/05/worlds-largest.html May 15, 2008

[22] "Wind Energy Basics" ,by Paul Gipe

[23] Wang, F., Bai, L., Fletcher, J., Whiteford, J., Cullen, D., "The methodology for aerodynamic study on a small domestic wind turbine with scoop." Journal of Wind Engineering and Industrial Aerodynamics, vol. 96, pp. 1-24, (2008). International Conference on Computer Applications and Industrial Electronics,. December 4-7, 2011 Penang, Malaysia.

INVESTIGATING COMMON ERRORS IN LEARNING ENGLISH LANGUAGE MADE BY IRAQI EFL SECONDARY STUDENTS

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ABSTRACT

Errors are widely made by learners of English as a second language as well as native speakers. These errors can affect their learning ability and change the meaning of the sentences as well, so there will be misunderstandings or ambiguity by the listeners. It is important for learners of the second language to control these errors in the early stages of studying to be efficient.

The researcher intends to investigate the errors made by Iraqi EFL secondary school students in sixth year. The sample is 72 students from Babylon secondary school in the city center. The sample is divided into two groups. A pretest and post-test are used to find the differences between two groups. The researcher analyzes the data and takes out the mean, standard deviation, and percentage errors.

It is concluded that there is a difference between experimental and control groups. The inter-lingual skills that Iraqi EFL learners have play an important role in making mistakes while using English in and outside schools.

*Keywords: errors, **Learning** , English language , EFL, Secondary students.*

INTRODUCTION

It is important to have a look at the errors that make by the learners of English as a second language. Researchers start developing many hypotheses about the process of second language learning, since these hypotheses will help the teachers to analyze their students' errors by using special techniques. As such, the teachers can figure out the causes of errors, whether they are caused by mother tongue interference, teaching techniques, or problems in the target language.

This study will have lots of advantages to the learners of English language because it helps them to avoid such errors in all aspects of English language such as, semantic, syntax, and phonology etc.

Errors can change the meaning of the whole sentence or the text which is uttered by English users. Therefore, the researcher will focus on some errors that are commonly made by Iraqi learners and teachers as well, since the English language is not their mother tongue.

The goal of this study is to discuss shortly the kinds of errors and reasons behind making these errors. Most of the discussions lead to linguistic interference from Arabic into English in areas of spelling , pronunciation and some syntactic features.

Linguists like Corder (1974) declares that there are two types of errors "systemic" and "post-systemic " errors. Chomsky also distinguishes two types of errors. First, performance errors are not serious as they are made when the learners are tired or hurried.

Second, Competence errors on other hand, are more serious than performance errors because they reflect unsatisfactory learning .

Competence is the ability to speak and understand a language, while performance is the actual application of this ability in language behavior (Chomsky : 1965).

Errors can be attributed to two main factors. In the first place, there's interlingual error, which refers to mistakes made by students in their native language. Lado ((1957:67) makes a point of emphasizing for it.

Intralingual difficulty, on the other hand, is caused by the difficulty of learning the second language (Dulay and Burt :1974).

The following phenomenon demonstrates the presence of intralingual errors:

1-More complex structures are avoided in favor of simpler structures. Simple tense instead of progressive tense, for example.

2-For example, (* given, * comed) uses not applied structures.

3-Correction that isn't required. To give you an idea, consider the following example:

4-Errors that stay in use for a long time as in producing a sentence like, (*he go to school).

5-Errors caused by bad teaching that is introduced by untrained teachers who do not have experience to do so.

6-It is said that learners sometimes avoid difficult structures like the passive voice (Kleinmann:1977).

7-It is found that some learners think that (is) is the marker for present while (was) is the marker for past as shown below.

*John is works as an engineer.

*David was works as a doctor.

(Dehham & Kadhim:2015)

In this study, the researcher will focus on the first major cause of errors that made by Arabic learners of English which called interlingual or interference since it plays an important role in English language.

LITERATURE REVIEW
Arabic learners of English find that it is difficult to learn easily the writing system of English language because of the Rome alphabet which is different from Arabic.

Arabic has twenty-eight letters, while English has twenty-six letters (*Tritton,1984).*

It is also noticed that, in Arabic there is no difference between print and script as well as upper case letters and lower-case letters. English, therefore, is totally different since it has capital and small letters, silent letters which are written but not pronounced, so it is found that it is difficult to deal with the silent letters. Arabic learners have problem with these letters because they are widely used in many words (Scott, 1962).

It is also noticed that English writing system is from left to right, while Arabic is from right to left.

As a result of regular spelling and pronunciation, most English words are considered to have a regular pronunciation. Despite this, a set of spelling conventions is followed, with many exceptions. As an example of an exception to the rule, there are several words like leisure, weird, seize, Fein and Keith that can be written with the ki before the e except after the c. Arabic learners of English are particularly vulnerable to the following types of errors:

Inconsistency in spelling weak vowels, e.g., *chambur, *prignant.

errors caused by differences between the sound systems of English and Arabic, such as the substitution of the letters (b) for (p), as in *beoble and *bubil.

errors attributed to analogy, such as "languaging" (compare knowledge), "money" (compare money).

Inconsistent spelling in English word derivation, such as high/hight and speak/speech.

(Dehham:1913)

"Some Linguistic Problems Facing Arab Learners of English" Nabil A. Ali is Nabil A. Ali.

Over generalization of spelling rules

Errors caused by differences in the orthographic representation of the common vowel sounds in the two languages, e.g., Mohammed, Mohammad, and Muhammad from Arabic "mhmd".

Concerning vowel system, Scott (1962:23) states that vowel system of Arabic is totally different from that of English. Arabic has three long vowels. aa, uu, and ii, and three short vowels: a, u, and i,. The English vowel system, on the other hand, is much more complex.

There are numerous English diphthongs, such as u, io, oo, uo, and oo, but only two Arabic diphthongs: w and y. (Alwahaj & Aljumaily:1999).

Arabic speakers learning English often make mistakes when it comes to vowel shapes, such as round and unrounded, long and short, and high and low. To be clear, the Arabic vowels are allophones for the vowels in English (/u/, o:/, and o/). Because of this ambiguity, Arab English learners pronounce boot, boat, and bought incorrectly. This explains why these students write the following:

Muslim, Moslem;

karan, kuran;

Mohammed, Muhammed, Mohammad. (Roach :1983)

SYNTACTIC ERRORS
Syntactic errors are widely made by the learners of English as a second language. These errors involve, verbs, relative clauses, articles, pronouns, and prepositions. During my teaching experience, I have noticed that most of the learners cannot make a sentence out of any mistake. It is important to be able to make good sentences since errors can either change the meaning of the sentence or make it ambiguous to reader or listener.Here are some common errors in details (Dehham:2020).

ERRORS IN USING VERBS
Learners of English language make many errors that relating to verbs. Here are some common errors that can be shown as follows:

A-Deletion of the third person singular (s).

It is the most common mistake I have seen through my studying and teaching. In these sentences we need to add third person singular (s).

- *He give me an apple.= It should be(He gives me an apple)
- *She speak English well. = It should be (She speaks English well).

B-Misuse of the Verb Form.

Most of English learners cannot use the verb form correctly.

- *He comed early yesterday.
- *They gived their passport to police.
- These must be like that:
- He came early yesterday.

They gave their passports to police.

Here the learners have weakness to differentiate between regular and irregular verbs.

C-Deletion of verb to be.

Learners ,sometimes, do not know where to use verb to be in sentences.

- ▪ *Your sister pretty. = It should be (your sister is pretty).
- ▪ *Cars new.= It should be (cars are new).

(Scott, 1962)

RELATIVE CLAUSES
The learners of English and sometimes the teacher as well have problems to deal with English relative clause. As a personal experience in teaching grammar to students who are in different levels of study, shows that they make lots of errors . These errors can be explained in the following:

1- Insertion of extra or returning pronouns in different positions.
A-Subject position: It is one of the most common errors that happened with the English learners who add subject pronouns to the sentence even there is a relative pronoun .e.g.

- ▪ *The man who he comes is my uncle.(incorrect)
- ▪ The man who comes is my uncle.(correct)

B-Direct object: It is one of the errors that learners do.e.g.

- ▪ *The girl that (who) I met her is my cousin. (Incorrect)
- ▪ The girl that (who) I met is my cousin. (correct)

C-Indirect object: It is widely happened in all levels of study. e.g.

- ▪ *The student whom I gave a gift to him is clever. (incorrect)
- ▪ The student whom I gave a gift is clever. (correct)

D-Object of preposition: It is also widely happened with students. e.g.

- ▪ *The key which I opened the door with it made of steel.(incorrect)
- ▪ The key which I opened the door with made of steel.(correct)

E-Possessive position: It is difficult to students to master that error. e. g.

- ▪ *The dog which its tail is long barked yesterday. (incorrect)
- ▪ The dog whose tail is long barked yesterday .

or

- ▪ The dog which has a long tail barked yesterday.

(Scott, 1962)

2- Deletion of relative pronouns.
Here is also a problem that lots of learners do not use the relative pronouns ,so their sentences are weak. e.g.

- ▪ *A young man is wearing a nice suit called me yesterday. (incorrect)
- ▪ A young man who is wearing a nice suit called me yesterday. (correct).

Relative pronoun may be omitted only if it is , restrictive , object of a verb , or a preposition which governs it is at the end of clause. e.g.

- The man(whom/ that) you see in the garden is the farmer.

- The man (whom/ that)) my father is talking to is the postman.

But the next sentence we cannot omit the relative pronoun since it is continuative. e.g.

- My brother Zaki whom my mother is talking to , is an engineer .

(Scott, 1962)

3- Misused of (who, whom) in relative clauses.
As we know that "who" is used to subject while "whom" is used to object. e. g.

- *The man who she was talking to is her father(incorrect)

- The man whom she was talking to is her father. Or

- The man to whom she was talking is her father. (correct)

- *The man whom wrote this poem is famous. (incorrect)

- The man who wrote this poem is famous. (correct)

In the first sentence we must put "whom" because the subject is there, while in the second one we must put "who" since we do not have subject.

4- Subject –Verb agreement.
The subject and verb of a sentence must agree with one another in number, whether they are singular or plural. If the subject of the sentence is singular, its verb must also be singular, and if the subject is plural, the verb must also be plural.

. e.g.

- *The boys who is talking loudly is my friends.(incorrect)

- The boys who are talking loudly are my friends. (correct)

PREPOSITIONS
Prepositions are very important to be controlled by the learners of the English language and teachers as well. They are widely used in everyday speech. As a teaching experience, I find that lots of students cannot use the prepositions correctly in their sentences. So I shall explain the common errors that made by the learners as follows:

1   At instead of in.
Many students cannot differentiate between at and in when they use them in a sentence since at is sometimes used with place and time. e.g.

- *I am sitting at classroom.(incorrect)

- I am sitting in classroom. (correct).

(Fries,1945)

It is better to use in with closed place. It means (inside) while at is used in place when the subject is beside or about to reach to inside.

- I am at school. (Means beside or in its border)

2   From instead of at.

It is also one of the common errors that learners make is to use from instead of at in the following example.

- *I bought a T-shirt from that Mall. (incorrect)
- I bought a T-shirt at that Mall.

It is preferable to use from with human while at with inanimate things. e.g.

- I barrowed a phone from my friend.

(Dehham:2015)

3. By instead of With.

By is commonly used with means of transport and time as well. But the learners use (by) as a means of help to do something. E.g. The common errors as follows:

- *I opened the door by the key.(incorrect)
- I opened the door with the key. (correct)
- *I cut the meat by knife. (incorrect)
- I cut the meat with knife. (correct).

(Ali:2019)

4. Home is preceded by prepositions.

It is one of the common errors that the learners make is using a prepositions like (to, for) with home. e.g.

- *I go to home early. (incorrect)
- I go home early. (correct)

(Dehham:2015)

5- From instead of out of.

There is also common mistake to use from instead of out of when you talk about numbers. e.g.

- *I answered eight questions from ten last exam. (incorrect)
- I answered eight questions out of ten last exams. (correct)

6- To instead of (of).

To is used instead of (of) in this example.

- *I am thinking to buy a new house.(incorrect)
- I am thinking of buying a new house, or I am thinking about buying a new house.(correct)

"To + infinitive" is not used after "think," so the correct sentence needs to use "of or about +ing form of the verb". (Scott and –Tucker,1974)

7. Pronouns

There are many common errors in using pronouns or reflexive are made by the learners. e.g.

- *If we eat in this restaurant, everyone must pay himself. (incorrect)
- If we eat in this restaurant, everyone must pay themselves. (correct).

Here we need to use the plural form of the pronoun, since everyone means all.

METHODOLOGY

In the current study, the experimental research is applied. the researcher chooses sixth year of secondary schools students in the Babylon Province as the population of the study. He intends to take sample from the city center of the Province. The researcher chooses Babylon secondary school students of sixth year to be the sample. The sample contains 72 students. The researcher divides the sample into two groups, experimental group and control group. After that, a pretest is made to the sample . Then the researcher explains the common errors to experimental group through using a suitable method in teaching English. Later, a post-test is given to the experimental group. Finally the researcher, analyses the results by finding Means and Standard Deviation for both groups.

RESULTS

After analyzing the data, the researcher finds that most of Iraqi EFL students have made mistakes in using English. These mistakes are made because of the interlinked between the English language and their mother language. The results can be summarized in the following tables.

Table (1) Presents Data Analysis for Means and Standard Deviations

Test	Group	Group	Mean	S.D	Percentage. Error
Pretest	Exp. G	35	3.01	58	78%
	Cont. G.	37	3.20	47	81%
Post-test	Exp. G	35	6.28	57	11%
	Cont. G.	37	5.63	41	69%

From the above table ,the researcher concludes that Iraqi EFL learners have made many mistakes in the pretest when it is given to both control group and experimental group. The mean is (3.01) for experimental group and (3.20) for control group. The results show that both have made mistakes in the first exam, since they have no idea about the common errors that they make. So, the percentage error is (78%, 81%). While in the post-test where the experimental group was treated differently by the researcher, they have made little mistakes . It is clear from the error percentage. The experimental group is (11%) while control group is (69%).

CONCLUSION

The researcher concludes that Iraqi EFL learners have made common errors while they are using English language in everyday life and at schools. It is notified that experimental group have made mistakes during the pretest. After that they have been treated and taught especially, so the mistakes are minimized when they have been explained the errors in many lessons. Explaining the errors to Iraqi EFL learners can help them using English perfectly in and outside the schools.

Finally, the researcher concludes that the mother language has strong effects on Iraqi EFL learners in using English correctly.

REFERENCES

- Ali, D.B.; Dehham, S.H.; Hasan, A.A.N. The effect of using index cards games technique on Iraqi EFL intermediate students' performance on writing skill . Indian Journal of Public Health Research and Development, 2019, 10(1), pp. 1093–1097.

- Alwahaj ,Abbas & Aljumaily , Abdallah A., (1999).*English Grammar for students.* Teacher Training Institute. Baghdad.

- Chomsky, Noam. *(1965) Aspects of the Theory of Syntax, Cambridge, Mass,: MIT press.*

- Corder, S.p. (1973*), Introducing Applied linguistics. New York:Penguin Books.*

- Dehham, S. H. (2013). " Iraqi EFL University Learners' Use of Catenative Verbs in English. *journal of Human Sciences*, *1*(18).

- Dehham, S. H. (2015). The use of English adjectival affixes by Iraqi EFL learners: An error analysis. *English Linguistics Research*, *5*(1), 14-31.

- Dehham, S. H., & Kadhim, H. M. (2015). The Problematic Use of Noun Diminutive Forms in English. *journal of Human Sciences*, *4*(22).

- Dehham, S.H.; Bairamani, H.K.; Shreeb, M.A. Enhancing iraqi EFL preparatory school students' speaking skill by using debate technique | Mejoramiento de la habilidad de hablar de los estudiantes iraquíes de inglés como lengua extranjera mediante la técnica de debate. Utopia y Praxis Latinoamericana, 2020, 25(Extra1), pp. 453–462.

- Dulay, H. and Burt, M. *(1974).* Natural sequences in child second language acquisition. *Language learning, 24, 23-40.*

- Fries, C. (1945*). Teaching and learning English as a Second Language. Ann Arabor: University of Michigan press.*

- Kleinmann, H. (1977).Avoidance behavior in adult second acquisition. *Language Learning, 27, 93-107.*

- Lado, R. (1957*). Linguistics across cultures. Ann Arbor: University of Michigan press.*

- Roach, p. (1983).*English phonetics and phönology: A Practical course. Cambridge: Cambridge University press.*

- Scott, G.C.(1962),*Practical Arabic. London: Longman Group limited.*

- Scott, M. and ----Tucker, C.R. (1974). Error Analysis and Second Language -Strategies. *Language Learning, 24, 69-97.*

- *Tritton, A. S. (1984) Teach Yourself Arabic. U.S.A.: Hodder and Stoughtan Limited.*

CHALLENGES AND ADJUSTMENTS OF PHILIPPINE EDUCATORS IN THE NEW NORMAL

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ABSTRACT

The emerging New Normal in education posed numerous challenges both to the educators, students, parents and other stakeholders in the academe. This research explored the teachers' challenges and adjustments in the New Normal of teaching. Three-hundred thirty-seven teachers from the Philippines, Indonesia, Malaysia and Thailand participated in the study by answering a survey that was conducted from August to September 2020. The 337 educators who participated in this research were mostly aged 29 to 38 years old; females; have been teaching mostly college students for up to 10 years in a government school. The respondents experienced challenges such as very slow and/or unreliable and unstable internet connection; faculty rooms that lack privacy during simultaneous online classes; lack of licensed/registered LMS for online classes; and lack of computers with an internet connection. They did not experience challenges in physical readiness but they were not emotionally ready because they preferred classroom teaching to virtual teaching. They made several adjustments in their teaching-learning environment, and with their students, curriculum, teaching strategies, and use of technology. Their age, sex, type of school, and level of students taught are significant factors in their challenges and adjustments to the New Normal of the teaching-learning process. A proposed educators' coping program in the New Normal was the output of this research.

Keywords: Adjustments, challenges, educators, new normal, pandemic, teaching-learning

INTRODUCTION

The COVID-19 pandemic brought enormous changes to the Education sector across the world. The emerging New Normal in education posed numerous challenges both to the educators, students, parents and others. In the Urban Dictionary (2009), the New Normal was defined as the after condition of the occurrence of some intense change, thus becoming the accepted event. The term applied to the field of education as it was experiencing a great deal of change. Educators were obligated to shift from traditional classroom teaching to virtual teaching. Their roles as teachers shifted 360 degrees in that they themselves needed to learn about the use of technology and the internet in their daily teaching activities. They became 'fanatics' of various webinars with their aim to learn how to become a virtual teacher. As a response to the COVID-19 pandemic, teachers made recordings of their lessons and uploaded their lessons online so students could access them at any time. Innovation was also observed as they switched to Google Classrooms, WebQuest and other online sites (Fox, 2007). No matter what hardships they experienced; how burdensome were the tasks given to them, they did not have any other option except to adjust and to adapt to the New Normal of teaching and learning.

In the Philippines, actions were done by the Department of Education (PDepEd) through the implementation of RA No. 8370. The PDepEd implemented online learning resources such as the PDepEd Commons website, which already has 8 million users. Llego (2020) suggested the Open Educational Resource (OER) platforms be used by public school teachers in order to access and review materials. As well TV and radio-based solutions were launched in areas with limited access to the Internet and allotted 15 percent of the total daily air time to the broadcast network of child-friendly content.

The assessment made by the government showed that teaching-learning in the New Normal boiled down to two major concerns: Internet connectivity, and the issue of the curriculum and educational materials that had to be adapted for use with a blended learning environment. Access to educational materials through the Internet wasn't worth much if the Internet itself was inaccessible due to lack of service or network infrastructure. An article published in Esquire Philippines. (2020) stated that the Philippines was ranked 77 among the countries with the slowest and least stable Internet connection. Furthermore, Cigaral (2020) cited in the National Economic and Development Authority and World Bank reported that despite the digitalization acceleration activities in the country during lockdowns, the weak digital infrastructure was hampering the effective use of digital technologies. Despite the provisions in the budget for equipment and commercial access to the Internet much has still to be done to improve digital connectivity throughout the country. It would also be important to fast track the implementation of RA 10929, the Free Internet Access in Public Places Act, which mandates that public basic education institutions, state universities and colleges, and Technical Education and Skills Development Authority (TESDA) technology institutions to have free Wi-Fi access. The law targets 2,527 live sites in public schools and 1,804 live sites in state universities as well as TESDA institutions (Dharmaraj, 2020). Department of Information Communication and Technology secretary spearheaded the deployment of the 'Free Wi-Fi for All' Program. As of June 30, 2020, around 4,248 live sites have been installed and are operational all over the country.

The support of the family (the parents and guardians) was an integral resource that should be empowered to help the learning process of the students (Angara, 2020). The role of the parents was crucial for the effectiveness of the blended learning lessons as they are the ones who guide and taught their children (Malindog-Uy, 2020). Despite the critical period of the pandemic, it was the right of students to continue education. The help of online technology was important but the support of parents, caregivers and communities was a must (Mateo, 2020).

To further understand the difficulty of the teachers, this study explored the challenges that they experienced and the adjustments they made to counteract the effect of the Covid-19 pandemic on the teaching and learning process. Teachers as educators from various schools, colleges, and universities in the Philippines, Indonesia, Malaysia and Thailand were asked to participate in the survey which was conducted by the researchers during the month of August to September immediately after virtual and blended learning was implemented in their respective schools.

OBJECTIVES

1. To describe the profile characteristics of the respondents in terms of age, sex, years of teaching experience, type of educational institution, and level of class handled.

2. To describe the challenges experienced by the educators in terms of resources, and readiness (physical and psychological).

3. To describe the adjustments made by the educators in terms of the teaching-learning environment, students, curriculum, teaching strategies, and use of technology.

4. To determine if there was a significant difference in the challenges and adjustments of the teachers across the profile characteristics of the teacher respondents.

5. To construct a proposed action plan that could be used by teachers as they cope with teaching students in the New Normal.

METHODOLOGY

This research employed a descriptive method. It examined variables in naturally occurring situations by describing and interpreting the state in which these variables are found (Calderon

and Gonzales, 2014), as well as establishing the significant relationship or difference between the identified variables. The variables examined in this research included the profile characteristics of the respondents as well as information obtained from the Likert-type survey about the challenges they experienced and the adjustments they have made in relation to the New Normal of teaching-learning.

Respondents of the study were teachers of junior, senior high school and colleges, from various government and private schools and universities in the Philippines, Malaysia, Indonesia and Thailand. A total of 377 respondents participated in the study through a Google form survey that was distributed to them via a snowballing technique. Convenient sampling was used, in which all the survey questionnaires which were retrieved in a period of two weeks (last week of August and the first week of September 2020) were considered as respondents. The survey included informed consent as well as information on data privacy law. Data gathered from the survey-questionnaire were subjected to statistical treatment and analysed and discussed to arrive at conclusions and a proposed program for the educators as they dealt with the challenges and adjustments to the New Normal of teaching as a result of the Covid-19 pandemic.

RESULTS
1.   Profile Characteristics of the Respondents
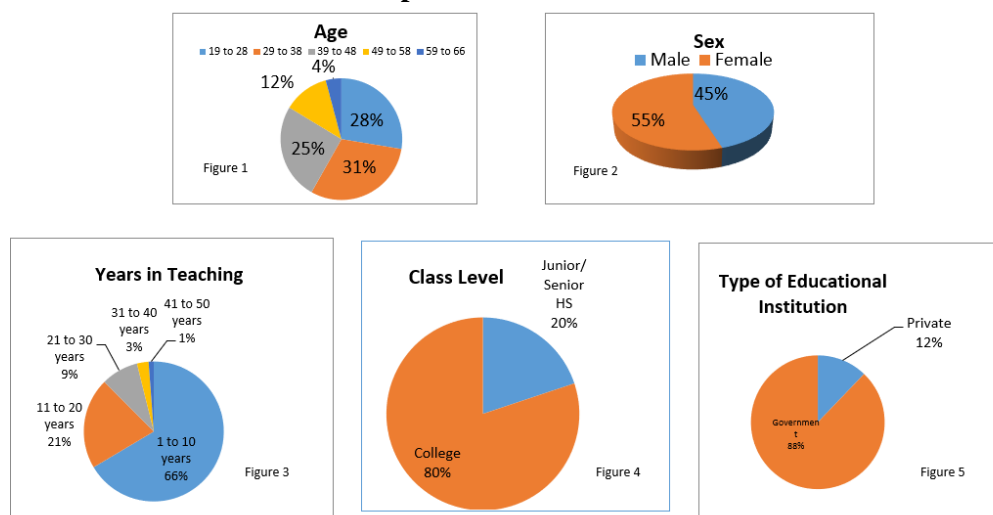
Figures 1-5. *Distribution of the Profile Characteristics of the Respondents*

Age. The age range of the educators who participated in this research was from 19 to 66 years old. More than 30 percent of the respondents were 29 to 38 years old and 4 percent were in the 59 to 66 age bracket.

Sex. The number of female teacher respondents (54.9%) was higher by almost ten percent higher than the number of males (45.1%). This shows the teaching profession attracted both males and females in countries across Asia.

Years in Teaching. In terms of the respondents' number of years in the teaching profession, a majority (66.47%) of teachers have taught up to 10 years and there are at least four (4) respondents who have been teaching for 44 years and more.

Type of Educational Institution. More than 87 percent of the respondents are teaching in government institutions while the remaining 12 percent are from private institutions. The researchers are educators in a government university. The researchers considered that the

respondents should have experienced the challenges of teaching in the New Normal and were able to share the adjustments that they had made in relation to the New Normal.

Level of Class Handled. Eighty percent (80%) of the teachers are teaching college students while almost 20 percent are handling junior or high school students. The start of the school year in the New Normal varied around countries. In the Philippines, there were schools that reopened in August 2020, while others opted to open in early October.

2.   The Challenges Experienced by the Respondents in the New Normal
Challenges of the Educators in the New Normal in terms of Resources
The various challenges experienced by the respondents were categorized into two categories where the first was in terms of resources that they used in teaching in the New Normal. The computed mean of the educators' responses revealed that they experienced challenges in terms of: 'Very slow and/or unreliable and unstable internet connections'; 'the faculty gets noisy when holding simultaneous online class'; 'there's a lack of licensed/registered LMS to be used for online class'; 'there is no privacy in the faculty room when holding discussions during the online class'; 'there is a lack of computer/laptop/tablet with required specifications to download apps/programs for handling online class'; and there are also teachers who experienced 'no internet connection'. On the other hand, the respondents disagreed that they experienced the following challenges: 'lack of necessary gadgets (camera, microphone, earphone) for holding virtual class'; 'lack of appropriate space to hold the online class at home'; 'the space in the faculty room does not comply with social distancing guidelines'; and 'lack of learning resources/modules that can be used in the New Normal'.

The speed of internet connection proved to be the first and foremost concern of the teachers in handling a virtual class. Data from the Speedtest Global Index published by the World Population Review showed the comparison of the internet speed of the four respondent countries. In terms of downloading using a mobile phone: Malaysia with a 32,365,999 population had an average internet speed of 21.29 mbps; Thailand with a population of 69,799,978 had an average internet speed of 20.18 mbps; the Philippines with a population of 109,581,078 had an average internet speed of 15.75mbps, and Indonesia with a population of 273,523,615 had an average internet speed of 11.77mbps. This clearly shows that as the population of a country increases, the average internet speed decreases.

The least reported problem was the lack of available learning materials or modules that could be used in the New Normal. It was stated by the respondents during random interviews that prior to the opening of the classes for this school year, PDepEd and CHED in the Philippines required all the teachers to prepare their modules aligned to the mandated curriculum.

Challenges of the Educators in terms of Readiness
Physical Readiness. The teacher respondents disagreed that they experienced any physical readiness challenges. They prepared themselves in relation to the numerous changes that were needed due to the New Normal of the teaching-learning process. Such as physically preparing themselves in using technology and the internet for a virtual teaching-learning process.

Psychological Readiness. The educator respondents believed that 'Emotionally, they are not ready because they are more comfortable with handling face to face or physical class than in virtual class'. While they were emotionally ready 'to the drastic change around them caused by pandemic'; 'about the effects (death of many people) of the pandemic around them'; 'that they might not become effective in holding online class'; and 'they are prepared for the New Normal of virtual teaching'.

The respondents experienced emotional challenges because teaching in the New Normal challenged their comfort zone. They now needed to teach in front of a computer through the

internet without knowing if the students were actively listening. The students were required to mute themselves during discussions to avoid disruptions they were not allowed to open their cameras as it slowed their internet speed. This caused anxiety for the teachers and also the learners.

On the other hand, the teachers believed they should not be affected too much by the changes because of the pandemic and that worrying would not be good for their psychological state.

3. Adjustments Made by the Educators in the New Normal

Teaching-Learning Environment Adjustments. The educators strongly agreed with 'attending webinars on how to cope up with the new learning environment of virtual learning'. They agreed that as part of their adjustment they needed to 'set-up their own space for an online class at home'; 'design their teaching work plan applicable for their work from home teaching'; 'make dry runs of their classes at home to ensure that the delivery of lessons is student-friendly'; and 'coordinate with their University regarding the Work From Home requirements'.

These results were a clear manifestation that as educators they were always prepared to adjust. Prior to the reopening of classes, they had already prepared themselves to teach their students virtually.

Student-Related Adjustments. The respondents: 'secured the complete list of their students together with their contact information'; 'validated from their students that the teaching modalities they are using are convenient to them and to their situation'; 'instructed their students to create an online account (email, social media groups, and chats) exclusively for their online teaching-learning'; 'ensured that students can easily access the LMS that they are using'; and 'researched online on how to deal with students during the virtual class'.

The educators agreed that student-related adjustments were essential for them. They understood that their role was crucial in the provision of learning to the students.

Curriculum-Related Adjustments. The respondents agreed to adjust their curriculum to the New Normal. Part of their adjustments were they: 'developed new instructional materials suited for the New Normal'; 'get in touch with friends to get acquainted with appropriate teaching-learning tools fit for the curriculum of the New Normal'; 'aligned the objectives of their lessons to the revised syllabus for the New Normal'; 'designed a syllabus that is aligned to the new curriculum for the New Normal.'; and 'revised the curriculum that they used to align it to the New Normal'.

The educators adhered to the importance of aligning the curriculum to the needs of the learners. The curriculum served as the framework of the teaching-learning process, where the objectives were aligned to the lessons as presented in the syllabi.

Teaching Strategies Adjustments. Pedagogy is most important as it determines whether the students achieve or not and adjustments were required in virtual learning is very different from the classroom and face to face teaching. Educators: 'prepared online instructional materials (pdf, ppt, videos and others) ahead of time or before their online class'; 'selected the most accessible and convenient LMS for their students'; 'familiarized themselves with the different online video conferencing tools for their online class'; 'established a classroom teaching-learning atmosphere in their virtual class'; and 'updated their teaching skills by practicing virtual class prior to their actual online class with their students'.

Use of Technology-Related Adjustments. The respondents made adjustments in terms of using technology, thus they: 'installed various software/apps that are necessary for their virtual class'; 'joined different social media sites/LMS to keep updated in their virtual class'; 'upgraded their computer/gadgets to fit the requirements of holding their online class'; 'subscribed for personal

internet connection at home'; and 'bought equipment like microphone, ring light, webcam, headphones with noise canceller and other gadgets for their online classes'.

The teachers believed that teaching in the New Normal would not become possible without the use of technology. They made efforts to adjust their traditional teaching or face to face classroom teaching into virtual teaching using various technologies and the internet.

4. Significant Difference in the Challenges and Adjustments of the Educators across their Profile Characteristics

Table 1. *ANOVA for the Significant Difference in the Challenges and Adjustments of the Educators according to their Profile Characteristics*

	Ages		Sex		Years in Teaching		Type of Institution		Level of Class	
Challenges in terms of :	**F**	**Sig**	**F**	**Sig**	**F**	**Sig**	**F**	**Sig**	**F**	**Sig**
Resources	.835	.504	.006	.939	.963	.428	.020	.888	3.483	.063
Physical Readiness	2.196	.069	6.282	.013	.918	.454	.305	.581	2.025	.0156
Psychological Readiness	2.260	.062	5.513	.019[5]	1.410	.230	3.0006	.084	5.601	.019[5]
Adjustments in terms of :										
Teaching-Learning Enviroment	.637	.637	.145	.704	1.701	.149	6.409	.012[5]	1.403	.237
Students	1.120	.347	2.022	.156	1.078	.367	3.357	.068	.381	.537
Curriculum	.257	.905	4.418	.036[5]	.851	.493	4.061	.045[5]	.466	.495
Teaching Stategies	3.028	.018[5]	.141	.708	2.220	.067	2.484	.116	.008	.928
Use of Technilogy	.687	.601	.274	.601	.304	.875	.225	.635	2.880	.091

The analysis of variance showed that a significant difference was established between: physical readiness and sex characteristics of the respondents (F=6.282); psychological readiness and sex of the respondents (F=5.513); and psychological readiness and level of a class taught by the teachers (F=5.601).

A significant difference was established between: adjustments in the teaching-learning environment and the type of institution where the respondents are teaching (F=6.409); adjustments in curriculum and sex of the respondents (F=4.418); adjustments in curriculum and type of institution where the teachers are employed (F=4.061); and adjustments in teaching strategies and age of the respondents (F=3.028).

The significant difference between the physical and psychological readiness of male and female teachers indicates that female educators are more likely to experience physical and psychological challenges of the New Normal compared to the male teachers. [Editors note: A descriptive study establishes associations between variables and not causality. Associations may be caused by many variables. For example, the results may be showing that women are more

likely to report. It may be culturally inappropriate for males to appear less strong or more emotional. The term physical readiness needs to be carefully defined and the data do not rely on only self-reports. This research offers no data to examine these issues and more cultural research is needed]. The study did not explore this so the results of the cross-tabulation according to gender showed that male teachers were more physically adjusted compared to female teachers. Physically, men were regarded to be stronger than females while females tended to become more emotional in dealing with situations. These perceptions require further research.

In terms of challenges to psychological readiness, the results of the cross-tabulation showed that junior and senior high school teachers experienced more challenges in psychological readiness compared to the college teachers.

In terms of challenges in the teaching-learning environment, the teachers from the private institution were more adjusted compared to the teachers in government schools. The environment of private schools was more controlled and protected compared to government schools. As students from private schools pay tuition and matriculation fees, this money is used for operations and making the teaching-learning environment safe and secure, while government schools depend on the budget provided by the government.

The adjustments in terms of curriculum indicated the female teachers were more adjusted compared to the male teachers. The same observation was true for private and government schools, as supported by the results of the cross-tabulation of data.

Adjustment of teaching strategies according to age showed the teachers who were in the extreme age brackets (younger and older age range) preferred to adjust their teaching strategies to a higher level compared to the teachers in the middle of the continuum. The younger teachers were very willing to explore more teaching strategies, while teachers who have been teaching for almost half of their lives found the situation of the New Normal as something that they needed to explore, exerting more effort.

5. Proposed Action Plan For Educators To Cope With Teaching In The New Normal

A proposed action plan for the educators had to incorporate the identified issues and concerns discussed earlier. This plan called for action on all those listed.

5. PROPOSED ACTION PLAN FOR EDUCATORS' TEACHING IN THE NEW NORMAL

IDENTIFIED ISSUES/ CONCERNS	OBJECTIVES	SUGGESTED ACTIVITIES	PERSONS/AGENCIES INVOLVED	EXPECTED OUTCOMES
Very slow and/or unreliable and unstable internet connection	To have a faster and/or more reliable internet connection	1. Involve the government in making actions to improve the speed of internet connection in the country. 2. Some LGUs are already doing the job of granting permission to new internet service providers with faster internet connection in their community/municipality/city 3. In the Philippines, the government should fast track the implementation of RA No. 8375	National (DICT, CHED, DepEd) and LGU officials, School Administrators, Parents and Teachers	✓ Faster and more efficient internet connection for holding online classes; higher than the mobile downloading average of 15.75mbps
Faculty room gets noisy when holding simultaneous online class	To have a more private faculty room where teachers can hold simultaneous online class	1. Program Coordinators/Deans to make recommendation to school administrators to provide a more private faculty room where the teachers can hold classes simultaneously 2. Installation of dividers to minimize noise in the faculty room 3. Set-up classrooms with internet connections for faculty to hold online class	School Administrators, Deans, Heads, Teachers	✓ Faculty room/classroom for teachers' online class with privacy and free from distraction and unnecessary noise
Lack of licensed/registered LMS to be used for online class	To acquire licensed/ registered LMS	1. Communicate the need for a licensed/registered LMS to the school administration, so that they can purchase or acquire a license	School Administrators, Deans, Heads, Teachers	✓ Licensed/registered LMS for the teachers and the students
Lack of computer/laptop/tablet with required specifications to download apps/programs for handling online class	To help teachers acquire laptops/computers with required specifications for online class	1. Purchase computers and other gadgets that the teachers need in their online class. 2. Offer a loan to purchase laptop/computer for the teachers to use in their online class 3. Collaborate with Government, Non-Government Organizations, Private Sectors who are willing to donate/provide computers and other online gadgets for teachers' use in their online class	Government Agencies, School Administrators, Deans, Heads, Teachers	✓ Teachers with computers/laptops and other gadgets for holding online class
Teachers are more comfortable with handling face to face or physical class than in virtual class	To help the teachers adjust in teaching virtual class	1. Provide the necessary measures for the teachers to appreciate and adjust to the New Normal of virtual teaching. 2. As much as possible, refrain from overloading the teachers with so much paper works that they consumed so much of their time and prevent them from focusing in their online class	CHED, DepEd, School administrators, heads, teachers	✓ Teachers and learners who are adjusted to the New Normal of Teaching and Learning ✓ Effective and efficient online/virtual teaching and learning

IDENTIFIED ISSUES/ CONCERNS	OBJECTIVES	SUGGESTED ACTIVITIES	PERSONS/AGENCIES INVOLVED	EXPECTED OUTCOMES
Webinars on how to cope up with the new learning environment of virtual learning	To provide webinars to the teachers on how to cope up holistically to the New Normal of teaching and learning	1. Facilitate the conduct of online training and workshops to the teachers on the following: ✓ Tips on how to adjust to the New Normal of teaching and learning environment ✓ Curriculum development and revisions for learners in the New Normal ✓ How to deal with students in the New Normal ✓ Development and preparation of work plans for the New Normal ✓ Learn how to use new teaching strategies using technology and in the internet in the New Normal ✓ How to use LMS and other online applications ✓ Preparation for Work from Home ✓ Developing student-friendly curriculum and teaching modalities ✓ Netiquettes for handling online class	CHED, DepEd, DICT, School administrators, heads, teachers	✓ Effective and efficient online/virtual teaching and learning that benefits all the stakeholders
Work plan applicable for my work from home teaching environment.	1. To provide an alternative work arrangement for teachers who prefer to work from home 2. To lessen the risk for the teachers to acquire the virus because of going to and from the school	1. Initiate to provide the teachers the work from home option especially if the desired internet connection for them is available at home	CHED, DepEd, School administrators, heads, teachers	✓ Teachers who enjoys the comfort of teaching/ working from home, without the risk of acquiring the virus because of going and coming from work everyday ✓
Complete list of students together with their contact information	To have a more systematic record of the students, so that the teachers can easily contact the students	1. The records-in-charge of each school to provide the teachers with access to the information records (name, contact number, email) of the students so that the teachers can easily have direct access to them	School Administrators, Records in-charge, teachers, IT personnel	✓ More efficient recording of students' names and information ✓ Efficient communication of information to the students ✓ Minimize the stress of the teachers
Provide teaching modalities which are convenient to the learners and to their situation.	To provide a learner-friendly teaching modalities	1. Conduct a research to determine what teaching-learning modalities are student-friendly 2. Set-up/implement the student-friendly teaching modalities	School administrators, teachers, students	✓ Effective and convenient learning process for the teachers and the students

IDENTIFIED ISSUES/ CONCERNS	OBJECTIVES	SUGGESTED ACTIVITIES	PERSONS/ AGENCIES INVOLVED	EXPECTED OUTCOMES
Online account (email, social media groups, and chats) exclusively for my online teaching-learning.	To instruct the students to have a personal online account exclusively for teaching-learning purposes	1. Set-up a school domain where the students could create their online accounts that will be exclusively used for online teaching-learning	School administrators, IT personnel, teachers, students	✓ More efficient submission and checking of student requirements
Getting in touch with friends to get acquainted and familiarize with appropriate teaching-learning tools fit for the curriculum of the New Normal	To provide a support group for teachers in order to get familiar with online teaching tools To provide online tutorials to teachers regarding the use of video conferencing tools for online class	1. Set-up a support group for teachers. 2. The support group must be accessible to the teachers online and offline in case the needed help is urgent 3. Prepare and provide a step-by-step tutorial to the teachers who are not familiar with video conferencing apps and tools that are used for online class	IT personnel, School administrators, heads, teachers	✓ Established support group for teachers ✓ Well trained teachers on the use of video conferencing tools in their teaching
Preparation of online instructional materials (pdf, ppt, videos and others) ahead of time or prior to online class.	To provide online trainings to teachers on how to develop effective online instructional materials	1. Conduct a training-workshop on preparation of online instructional materials to the teachers	IT personnel, School administrators, heads, teachers	✓ Well trained teachers who facilitates an effective teaching-learning process that benefits the students
Establish a "classroom teaching-learning atmosphere" in the virtual class with students	1. To help teachers to establish rapport during online class with their students and parents (if desired) 2. To prevent online bullying among the teachers and the students	1. Provide an online training for the teachers who are new to online teaching. 2. Orientation among the students regarding the consequences of online bullying (teachers and students) 3. Emphasize the rules for holding online class (mic, mute, camera on/off, proper attire while holding online class, etc)	School administrators, heads, teachers, parents, students	✓ A desirable teaching and learning environment for the teachers and the learners ✓ Effective teaching and learning process despite the pandemic

The identified issues and concerns were: "Very slow and/or unreliable internet connection"; "Noisy faculty room when holding simultaneous online class"; "Lack of licensed/registered LMS to be used for online class"; "Lack of computer/laptop/tablet with required specifications to download apps/programs for online class"; "Teachers are more comfortable in classroom teaching than in virtual teaching"; and "Webinars on how to cope up with the new learning environment of virtual learning".

The proposed activity/action to the identified issues and concerns were: "To involve the government in making actions to improve the speed of internet connection in the country"; "Some LGUs are already doing the job of granting permission to new internet service providers with faster internet connection in their community/municipality/city"; "In the Philippines, the government should fast track the implementation of RA No. 8375"; "Program Coordinators/Deans to make recommendation to school administrators to provide a more private faculty room where the teachers can hold classes simultaneously"; "Installation of dividers to minimize noise in the faculty room"; "Set- up classrooms with internet connections for faculty to hold online class"; "Communicate the need for a licensed/registered LMS to the school administration, so that they can purchase or acquire a license"; "Purchase computers and other gadgets that the teachers will use in their online class"; "Offer a loan to purchase laptop/computer for the teachers to use in their online class"; "Collaborate with Government, Non-Government Organizations, Private Sectors who are willing to donate/provide computers and other online gadgets for teachers' use in their online class"; "Provide the necessary measures for the teachers to appreciate and adjust to the New Normal of virtual teaching"; "As much as possible, refrain from overloading the teachers with so much paper works that they consumed so much of their time and prevent them from focusing in their online class"; "Facilitate the conduct of online training and workshops to the teachers on the following: Tips on how to adjust to the New Normal of teaching and learning environment; Curriculum development and revisions for learners in the New Normal; How to deal with students in the New Normal; Development and preparation of work plans for the New Normal; Learn how to

use new teaching strategies using technology and in the internet in the New Normal; How to use LMS and other online applications; Preparation for Work from Home; Developing student-friendly curriculum and teaching modalities; Netiquettes for handling online class"; "Initiate to provide the teachers the work from home option especially if the desired internet connection for them is available at home"; "The records-in-charge of each school to provide the teachers with access to the information records (name, contact number, email) of the students so that the teachers can easily have direct access to them"; "Conduct a research to determine what teaching-learning modalities are student-friendly"; "Set-up/implement the student-friendly teaching modalities"; "Set-up a school domain where the students could create their online accounts that will be exclusively used for online teaching-learning"; "Set-up a support group for teachers"; "The support group must be accessible to the teachers online and offline in case the needed help is urgent"; "Conduct a training-workshop on preparation of online instructional materials to the teachers"; "Prepare and provide a step-by-step tutorial to the teachers who are not familiar with video conferencing apps and tools that are used for online class"; "Provide an online training for the teachers who are new to online teaching"; "Orientation among the students regarding the consequences of online bullying (teachers and students)"; and "Emphasize the rules for holding online class (microphone mute, cameraon/off, proper attire while holding online class, etc)".

The persons or agencies involved will be national government agencies such as the DICT, CHED, DepEd, and Local Government Units (LGUs), School Administrators, Deans, parents and teachers and other school personnel such as the personnel from the school's IT department .

The expected outcomes will be: "Faster and more efficient internet connection for holding online classes; higher than the mobile downloading average of 15.75mbps"; "Faculty room/classroom for teachers' online class with privacy and free from distraction and unnecessary noise"; "Licensed/registered LMS for the teachers and the students"; "Teachers with computers/laptops and other gadgets for holding online class"; "Teachers and learners who are adjusted to the New Normal of Teaching and Learning"; "Effective and efficient online/virtual teaching and learning"; "More efficient submission and checking of student requirements"; "Established support group for teachers"; "Well trained teachers on the use of video conferencing tools in their teaching"; "Well trained teachers who facilitates an effective teaching-learning process that benefits the students"; "A desirable teaching and learning environment for the teachers and the learners "; and "Effective teaching and learning process despite the pandemic".

CONCLUSION

There were 337 educators from four countries in Asia who participated in the study and who experienced challenges in resources and technology. While they reported confidence meeting challenges in physical readiness; many reported they were not emotionally ready in teaching a virtual class. The teachers made adjustments in terms of their teaching-learning environment, the students, the curriculum, the teaching strategies, and the use of technology. The age, sex, type of school and level of students taught by the teachers were factors that affected their concerns and adjustments to the New Normal of teaching-learning.

REFERENCES

- Allen, I. E., and Seaman, J. (2003). Sizing the opportunity: The quality and extent of online education in the United States, 2002 and 2003. Available: http://files.eric.ed.gov/fulltext/ED530060.pdf [2020, September 6].

- Alhabeeb, A. M. (2015). The quality assessment of the services offered to the students of the College of Education at King Saud University using (SERVQUAL) method. *Journal of Education and Practice, 6*(30), 82–93.

- Angara, S. M. (2020). *The challenge of education in the new normal*. Available: https://businessmirror.com.ph/2020/06/19/the-challenge-of-education-in-the-new-normal/ [2020, September 20]

- Bayne, S., Evans, P., Ewins, R., Knox, J., Lamb, J., McLeod, H., O'Shea, C., Ross, J., Sheail, P. and Sinclair, C. (2016) *Manifesto for teaching online*. Digital Education at Edinburg University. Available: https://onlineteachingmanifesto.wordpress.com/the-text/ [2020, October 1].

- Bloemer, W., and Swan, K. (2015). Investigating informal blending at the University of Illinois Springfield. In A. G. Picciano, C. D. Dziuban, & C. R. Graham (Eds.), *Blended learning: Research perspectives*, (vol. 2, pp. 52–69). New York: Routledge.

- Bonk, C. J., and Graham, C. R. (2007). *The handbook of blended learning: Global perspectives, local designs.* San Francisco: Pfeiffer.

- Calderon, J.F. and E.C. Gonzales (2014). *Methods of Research and Thesis Writing*. Mandaluyong City, Manila: National Bookstore.

- Cigaral, I. N. *Government roadblocks make Philippines internet slow and expensive*. Retrieved from: https://www.philstar.com/business/2020/10/05/2047345/government-roadblocks-make-philippines-internet-slow-and-expensive [2020, October 9]

- Dela Cruz, R. C. (2020). *Philippine News Agency*, August 26. Available: https://www.pna.gov.ph/articles/1113475#:~:text=%E2%80%9CThe%20country's%20average%20download%20speed,Ookla%20said%20in%20a%20statement [2020, October 8]

- Dharmaraj, S. (2020). *DICT fast-tracks free WiFi project in Philippine schools*. Available: https://opengovasia.com/dict-fast-tracks-free-wifi-project-in-philippine-schools/ [2020, September 17]

- Dziuban, C., Graham, C.R., Moskal, P.D., Norberg, A., and Sicilia, N. (2018). Blended learning: the new normal and emerging technologies. *International Journal Educational Technology in Higher Education, 15*(3). https://doi.org/10.1186/s41239-017-0087-5

- El-Erian, M.A. (2010). *Navigating the new normal in industrial countries*. Washington D.C.: International Monetary Fund. Available: https://www.researchgate.net/publication/337792251_Navigating_the_New_Normal_Political_Affinity_and_Multinationals'_Post-Acquisition_Performance [2020, September 17]

- Esquire Philippines. (2020). *So, Yeah, the Philippines Has Expensive Turtle Internet*, According to a New Study. Available: https://www.esquiremag.ph/culture/tech/philippines-internet-a00203-20200820 [2020, October 25]

- Fox, B. (2007). *ICT Use During SARS: Teachers' Experiences*. Available: https://www.researchgate.net/publication/255566570_ICT_Use_During_SARS_Teachers'_Experiences [2020, October 1]

- Llego, M.A. (2020). *DepEd Online Learning: The Growing Role of the Smartphone in Education*. Available: https://www.teacherph.com/deped-online-learning-smartphone-education/ [2020, October 3]

- Malindog-Uy, A.R. (2020). *"Blended Learning" In Virus-Hit Philippines*. Available: https://theaseanpost.com/article/blended-learning-virus-hit-philippines [2020, September 29]

- Mateo, J. (2020). *Highlighted With Millions Of Students Left Behind*. Available: https://www.onenews.ph/as-classes-open-learning-crisis-highlighted-with-millions-of-students-left-behind [2020, October 4, 2020]

- Philippinebasiceducation.us. (2013). *Teacher Statistics for the Philippines*. Available: https://www.philippinesbasiceducation.us/2013/05/teacher-statistics-for-philippines.html [2020, October 20]

OPPORTUNITIES FOR AUGMENTING FARMERS INCOME AND AGRIBUSINESS

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ABSTRACT

Disparity between yield increase and increase of input cost, labor cost and fuel cost is a huge facor affecting Indian agriculture. The input cost for cultivation has increased significantly over the past decades and as a result the net income for the farmer has not increased substantially. There is a need to promote profitable allied practices such as horticulture, fisheries, livestock etc. to help the farmers to realize better net incomes. Also, the realization of better pricing is important to increase the net income of the farmers as most of them sell their agricultural produce locally to intermediaries and end up not realizing appropriate value for their produce. The FPOs (Farmers Producer Organizations) can significantly help alleviate this vulnerability at the grassroot level. An attempt is made in this paper to analyse the opportunities for augmenting farmers income through agribusine

INTRODUCTION

India ranks at number 2 in the world when it comes to farm output. According to the Situation Assessment Survey of Agricultural Household 2013, an average Indian farming household earns just Rs 77,124 in a year, translating to Rs 6,427 monthly, barely enough to cover the average monthly expenditure of Rs 6,223.

India has achieved record foodgrain production of 297 million tonnes during 2020-21 and 314.67 million tonnes of fruits & vegetables largely due to favourable monsoon after two consecutive years of deficit rainfall. 48% of the population of India dependent on agriculture. Crops including fruits and vegetables account for 59.0 percent of GDP in 'agriculture, forestry and fishing' sector. Around 41.0 percent of GVA of this sector based on livestock products, forestry and fisheries. Agro-processing (textiles, food, oil, etc.), retail, credit, warehousing, transport, etc. are also GDP contributors that rely on agriculture for their growth. Agriculture has the moral responsibility of meeting food and nutritional security in consonance with the agro ecological backdrop. It has to generate gainful employment resulting in income gains to make the farmers more economically secure. It has to generate raw material that will directly support agro-processing of food and non-food products to support secondary agriculture. It has to support agro-processing industry to produce primary and intermediate goods, which will feed the manufacturing sector. Agricultural practices need to be on a sustainable basis.

Agricultural sector received continuous attention of the policy makers and stakeholders.

–A number of initiative were undertaken to improve the performance of this sector. For the first time in our history, Hon'ble Prime Minister of India exhorted to "Double the Farmers' Income" by 2021-22 and helped in channelizing the efforts in the unified direction. A holistic approach is being followed from top to bottom in an integrated manner and the slogan is catching the momentum and attention of one and all.

DFI goal was also coupled with many new and well-thought out schemes

–*Pradhan Mantri Fasal Bima Yojana*

–e-National Agricultural Market

–*Paramparagat Krishi Vikas Yojana*

–*Pradhan Mantri Krishi Sichai Yojana.*

DFI Mission, requires accurate information on certain indicators which reflect the farmers' income and welfare.

The most appropriate measure of farmers' well-being is the level of farm income. A few attempts made by some scholars to prepare estimates of farm income in the past based either on a sample of farmers or a particular segment of agriculture. Various methodologies and estimates of farmers' income are available only on point basis. The studies largely referred to the growth in agricultural output (VOP/AgGDP/GSDP), output and input price behaviour along with price spread, rise in wages, rising indebtedness, to indicate the given state of Indian framing. Chand et al (2015) provided series of farm income based on NSSO data.

Important Schemes which would help in role of Augmenting Agricultural Income

1.   Soil Health Management
- Setting up of new soil testing laboratories and strengthening the existing labs.
- raining of lab staff/extension officers/farmers/field functionaries on balanced use of fertilizer.
- Promotion and distribution of micro nutrients.
- Issue of Soil Health Cards

2.   Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)
- Developing long term solutions for mitigating the affect of drought.
- Increasing area under irrigation.

3.   National Food Security Mission (NFSM)
- Under implementation in 638 Districts of 29 States.
- Promotes & extends improved technologies, i.e., Seed, Micro Nutrient, Soil Amendments, Integrated Pest Management, Farm Machinery & Implements, Irrigation Devices, Capacity Building of Farmers.
- Includes cluster demonstrations of rice, wheat, pulses & nutri-cereals, distribution of improved seeds/need based inputs, resource & energy conservation techniques, efficient water application tools, cropping system based training and local initiatives.

3.   e-NAM
- Pan India electronic trading portal in selected regulated wholesale markets in States that have undertaken reforms.
- Common tradeable parameters developed for 124 commodities.
- 585 markets integrated on e-NAM till date.

4.   Pradhan Mantri Fasal Bima Yojana (PMFBY)
- Available to farmers at very low rates of premium.
- Farmers to get full insurance. No capping of sum insured.
- Insurance cover at all stages of crop cycle.
- Focus on covering non-loanee along with loanee farmers.
- Target for area coverage 40% (2017-18) and 50% (2018-19)

6.   Rashtriya Krishi Vikas Yojana (RKVY - RAFTAAR)
- Incentivise States to increase public investment in agriculture & allied sectors

- Provide flexibility & autonomy to States in process of planning and executing schemes.

- Focus on pre and post-harvest infrastructure, integrated value chains

7.   Mission for Integrated Development of Horticulture (MIDH)
- Launched on 1st April 2014 for holistic growth of horticulture sector.

- Ensures forward and backward linkages through a cluster approach with active participation of stakeholders.

- Includes supply of quality planting material, technology promotion, productivity improvement, human resource development, creation of post-harvest management infrastructure.

Sources of Income Growth
DFI Committee identified Seven Sources of Income Growth:

1.   Improvement in crop productivity

2.   Improvement in livestock productivity

3.   Resource use efficiency or savings in cost of production

4.   Increase in cropping intensity

5.   Diversification towards high value crops

6.   Improvement in real prices received by farmers

7.   Shift from farm to non-farm occupations

Non Farm sources of Growth
Improved value addition and processing

•Reducing dependence on agriculture

•Review of current programmes and schemes

–ACABC

–MIS

•Governance related

–Linkages among high powered think tanks

–Prioritization of research areas for investment

–Making the farmers party to the mission

–Centre-state linkages

–Consensus among stakeholders

Small and marginal farmers can generate more revenue from basic farming. There are various ways to earn good money in agriculture.

Opportunities for Augmenting Farmers Income through Agribusiness
Agriculture Business can be divided into three broad categories and they are as follows:

- Productive Resources like feed, seed, fertilizer, equipment, energy, machinery etc.

- Agricultural Commodities like raw and processed commodities of food and fiber.

- Facilitative Services like credit, insurance, marketing, storage, processing, transportation, packing etc.

1. Agricultural Farm

One can start an agricultural farm by investing reasonable money. You can produce items as per the local demand and sell them locally. For far areas you can even supply the product through distribution channels.

2. Vermicompost Organic Fertilizer Production

It requires very low investment and hence can be considered profitable for the startup agricultural business. You can simply start this business by the proper know-how of the production process. Vermicompost contains water-soluble nutrients and is a very good, nutrient-rich organic fertilizer and soil conditioner. It has different uses such as in farming and small scale sustainable, organic farming. Interestingly, vermicomposting can also be applied for the treatment of sewage sludge.

3. Dried Flower Business

Are you aware that flowers are among the most profitable plants, which are producing one of the highest returns of any speciality crop? Well yes, its true! Flower production is one of the fastest-growing crop trends in today's agriculture. It requires all types of flowers especially unique and hard to grow varieties.

Growing, processing and selling dried flowers could put you on the path of making money with a sustainable business from the very first year. Therefore, it's one of the most profitable agriculture business idea that you can opt.

4. Fertilizer Distribution Business

The fertilizer industry is getting highly organized in India. Any individual can start a fertilizer distribution business as a small, medium and large-scale basis. Though, small distributors generally operate within the district and large distributors within the state, or sometimes in more than one state.

Fertilizer distribution is an ongoing business and shows no signs of fading. One can start this business with moderate capital investment.

5. Organic Farm Green House

The increased demand for organically grown farm products has led to the growth of this agricultural business. As there are many health risks in the foods grown with chemicals and fertilizers, people are growing organic food.

6. Poultry Farming

Poultry farming is one of the fastest-growing & most profitable agriculture businesses in the current Indian market scenario. Adding to it, poultry business is the best idea for those who want to make a successful agri-business career in India.

It has transformed into a techno-commercial industry from the status of backyard farming for three decades. It is considered to be the fastest growing sector of agriculture and farming business.

7. Mushroom Farming Business

By doing this business you can make good profits in just few weeks. It requires a low start-up capital investment. Even with a little knowledge of mushroom growing and with a farm mushroom farming business can be done.

8. Hydroponic Retail Store

It is a new plantation technology which requires soil free way of plantation for both commercial and home use. Hydroponics stores sell the specialized equipment and supplies that hydroponic gardener's need. Planning plans a crucial role to start a Hydroponic Retail Store.

9. Snail Farming

It is a process of raising land snails specifically for human consumption. It has a high rate of protein, iron, low fat, and almost all the amino acids needed for the human body. Moreover, one should have specific knowledge of modern technology.

10. Sunflower Farming

The land is the primary requirement to start sunflower farming. Growing sunflowers for oilseed requires a small investment. It is also known as Commercial Cash Crop. Sunflower is a highly profitable crop in oilseed production and takes very short duration 80-115 days to grow. It's also suitable to grow in rainfed conditions and has the ability to perform in diverse agro-climatic & soil conditions.

11. Bee Keeping Business

It demands day to day monitoring with close supervision of the bees. Beekeeping business is done for selling honey and other products like wax. Not to forget, as the demand for honey is growing globally. Opting for this business is a profitable venture which requires a small investment.

12. Fish Farming

Fish farming is raising fish commercially in the tanks & ponds for the purpose of producing food. Commercial fish farming has already established as a profitable business venture all over the world. This business can be done at any time of the year. It requires modern techniques and moderate capital investment. Interestingly, you can easily raise the fishes in tanks until they are ready for selling or marketing and they don't need the wide capture of wild fish. Commercial fish farming also helps to preserve natural ecosystems.

13. Fruits and Vegetables Export

One can start the export of fruits and vegetable business by collecting them from local farmers. It can be done through easy communication means like a telephonic conversation, computer with an internet connection.

14. Florist

It requires a retail space and connection with the flower growers. It is one of the most profitable retail agriculture business ideas that can also be done online by providing customers with doorstep delivery of flowers.

15. Frozen Chicken Production

The demand for this product is growing globally. One can start Frozen Chicken Production business by living in a metro or a suburban city. Food business is one of the best businesses you can ever think of doing. It has a high turnover as people would always eat no matter what their financial situation is like.

16. Botanical Pesticide Production

Botanical pesticides are naturally occurring chemicals extracted from plants known to have insecticidal properties. It is very essential and mandatory for organic farming. As the demand of this product is high, it is considered as one of the most profitable agriculture business ideas.

17. Broom Production

It is a good and profitable business idea as broom has been used for centuries for cleaning purpose. It is a simple business and can be done with a moderate capital investment. Broom can

be divided in two categories. First is broom made with natural materials and second is a plastic broom.

18. Basket Weaving

One requires a thoughtful planning and a high level of creative mind having a flair for design. It can simply be done from a home location with moderate capital investment. You can sell baskets online and in-person, by renting a booth at a trade show or flea market. It increases sales and reaching out to more customers.

19. Flour Milling

Establishing your own brand product is highly profitable in this business. Flour milling business can be divided in two types- small scale flour mill and large scale flour mill. Opting for small scale or large scale should fully take your specific conditions into consideration.

20. Kulhar Tea/Milk Business

You can start this business with only Rs 5000 and earn Rs 50,000 monthly. You can start selling kulhad tea in the country's major railway stations, railway depots, airports, bus depots, and malls. The price of Kulhad tea in cities varies from Rs 15 to 20. In Kulhad tea business, you can save around 1000 rupees in 1 day.

Some Other Profitable Agriculture Business Ideas

- Livestock Feed Production
- Fruit Juice Production
- Groundnut Processing
- Cashew-nut Processing
- Quail Egg Farming
- Shrimp Farming
- Fish Hatchery
- Piggery
- Soya Beans Processing
- Spice Processing
- Vegetable Farming
- Chicks Hatchery
- Rajanigandha Farming
- Tea Growing
- Grocery E-Shopping Portal
- Landscape Expert
- Medicinal Herbs Farming
- Cactus Arrangements
- Dairy Farming
- Jatropha Farming
- Potato Powder

- Corn Farming

- Certifies Seed Production

- Soil Testing Lab

- Green House Flower Export

- Horticulture Crop Farming

- Potato Chips Production

- Fodder Farming for Goats and Cows

- Agro-Farming Blogging

Strategy/Mechanism for Augmenting farmers' INCOME

1. By increasing productivity of crops

➢ Timely supply of good quality of sufficient seeds prior to season.

➢ Timely availability of good quality of inputs

➢ Applying short duration high yielding varieties.

➢ Increase SRR of hybrid seeds

➢ By promoting Farm Mechanization

➢ Application of Integrated Nutrient Management

➢ Application of Integrated Pest Management

➢ By increasing irrigation facilities & enhancing water-use efficiency

➢ Adoption of DSR/Zero Tillage/SRI

2. BY INCREASING cropping intensity

➢ According to land capability, irrigation and other facilities farm plan should be prepared for Kharif, Rabi and Garma for 03 years e.g.

i. Paddy - wheat/pulses/Maize

ii. Maize – Wheat/Pulses/Maize

iii. Maize – Wheat/Pulses/Maize - Mung

iv. Vegetable (cauliflower) - potato - onion – mung

v. Maize/Vegetable – Potato-Potato-Onion-Mung

vi. Paddy (short duration) - vegetable - onion - maize

vii. Paddy - vegetable - maize

➢ Short duration hybrid/HYV seeds to be used.

➢ Use of rice fallow land

Rice- Makhana cropping System

3. CREATE MARKETING FACILITIES FOR GETTING BEST RECOVERY PRICE OF PRODUCE

➢ Implementation of e-NAM

➢ Formation of FPO/Farmers' Co-operative Societies

➢ Create more marketing channels (PS UP)

➢ Market-oriented variety wise cultivation (by J&K)

➢ Assured price scheme (by AP)

➢ Effective procurement strategies to procure on MSP

(Rajasthan)

➢ Trading policies should be farmer-oriented , not trader

➢ Price-deficit financing scheme by M.P.

4. Diversification of cropping system with high value crops
➢ Cash crops- Sugarcane, Betel leaf and

Vegetables

➢ Spices - Turmeric, Ginger, Dhania, Garlic,

Ajwain and Saunf

➢ Mushroom Cultivation

➢ Rearing of honey bee

5. Promotion of integrated farming system
➢ Synergise blending of crops/horticulture, dairy, fishery, and poultry to provide regular income.

6. Protected cultivation of vegetables and flowers
with Micro irrigation

7. Value-addition through storage , processing , pack house , referral van , ripening chamber , warehouses , cold chain & marketing , etc.
8. Management of post-harvest losses for horticultural crops
9. BY REDUCING COST OF PRODUCTION
➢ Subsidy on farm inputs

➢ Provision of subsidy on HYV/ hybrid variety of seeds in light of market price.

➢ Subsidy on mechanization in light of market price.

➢ Use of green manuring e.g. Dhaincha, Moong, Cowpea, Sunhemp etc.

➢ Application of balance dose of fertilizer on the basis of soil health card.

➢ Provision of subsidy on diesel.

➢ Promotion of custom hiring system.

➢ Use of bio fertilizers e.g. Rhizobium, PSB, Azotobactor, Azolla, Blue green Algae, Mycorrhiza

➢ Subsidy of transport

➢ Use of Gobar/Bio gas

➢ Promotion of zero tillage technology.

➢ Promotion of DSR

➢ Use of Organic fertilizers and Manures

10. **Formulation of Land Leasing Act**

11. **Digitization of Land Records**

12. **Certificate of cultivation for tenant farmers by AP**

13. **Provision for practicing kitchen gardening for Urban households and poor people.**

14. **Implementation of Pradhan Mantri Fasal Bima Yojana (PMFBY)**

15. **Regular region wise weather forecasting.**

16. **Agro forestry**

17. **Construction of water harvesting structures**

18. **Risk Management to cope up with climate change , through Climate Smart Agriculture**

CONCLUSION

The farmers' socio-economic condition is complex where several aspects of value addition are out of the hands of the community. The role of the farmers in the whole system is more on the receiving end as 'passive subjects' rather than 'active stake holders' despite the fact that sorghum and other millets constitute one of their main sources of livelihood. In order to achieve the goal of doubling farmers' income through millets cultivation, there is need for a viable strategy comprising of three major elements: (i) scientific crop cultivation in participatory mode and capacity building with support of R&D organizations coupled with inputs supply in single window mode, (ii) promotion of value-addition and creating market demands through collective action like, formation of FPOs and SHGs, and (iii) policy support for buy back arrangements with MSP, crop insurance, inclusion in MDM and PDS system, infrastructure for farm-gate processing and warehouses.

REFERENCES

1. Ramesh Chand, 2017. Doubling farmers" income. NITI Policy Paper 1/2017.

2. Recommendations of the national round table conference on doubling the farmers" income by 2022. 30 April, 2016. Indian Council of Food and Agriculture.

3. Satyansai, K.J.S., and Sandhya Bharti 2016. Doubling farmers" income: way forward. Rural Pulse, XIV, MarchApril 2016.

DEVELOPMENT AND PRESERVATION OF KARAKALPAK ETHNIC CULTURE

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ANNOTATION
This scientific article highlights the place and role of the Karakalpak ethnic culture in the development and preservation of the identity of the people. The authors analyze the culture and life of the modern Karakalpak family, which inherits to the next generation the traditional way of life associated with national holidays and traditions, dastans performed by Karakalpak bakhshi (singers), legends and tales of the past, told by the older generation. The article argues that social changes in the global space contribute to the emergence of certain changes in the content of cultural identity, language, art, spiritual categories, which are elements of the basis of the national identity of each people and various ethno-regional units, which further strengthens the study of this issue under the influence of the globalization process.

Key words: Karakalpak culture, identity, awareness of national identity, globalization, ethnology, ethnos, ethnoculture, cultural heritage, morality, renewal, socialization, stability, family, generation, ancestors, laws of ethics, smart, institutions, development, history, archeology, ethnography, folklore studies, art criticism.

The processes of modern world globalization reflect the socio-cultural changes taking place around, peculiar approaches to the issues of "identity", "consciousness of national identity", "ethnic" in the social sciences, the characteristics of the states appearing on the world map. Because in the context of globalization, interest in local culture is based on a unified form of ethno-cultural properties of a behavioral nature, which lead to a noticeable disappearance of peculiar properties. Therefore, "local", "regional" and "global" changes necessarily have a positive or negative impact on the future fate of the nation. The positive side of the impact of globalization is that it accelerates the rapprochement of peoples, states, national cultures and economies, the negative side of influence in the processes of globalization, intensifying throughout the world, is that the culture, language, traditions of thousands of small and backward ethnic groups and nations cannot compete with the national culture, the rich language of large nations and are gradually moving away from active socio-economic life. Therefore, due to modern globalization, the destruction at a certain level of continuity between the emerging new values and the life experience of mankind requires the need for a special study of the problems of national identity and self-consciousness, which are changing in the modern process of various threats.

Social changes in the global space contribute to the emergence of certain changes in the content of cultural identity, language, art, spiritual categories, which are elements of the basis of the national identity of each people and various ethno-regional units, which further strengthens this issue under the influence of the globalization process. While as a result of globalization, integration, informatization and scientific and technological progress of society, the intellectual potential of human development, progressing at an accelerated pace, serves to improve the economy of the nation, peoples and nationalities living in different countries, ignoring the process of national identity of peoples (awareness of national identity) increases the danger of

losing the national identity of peoples. As a result, it is impossible to fill its place. As the President of Uzbekistan S. Mirziyoyev emphasized: "In recent years, there has been a deep geopolitical transformation of the world and the destruction of the former systems of security and stability. The process of globalization is increasingly accelerating, which leads not only to the growth of human capabilities, but also to the intensification of contradictions, the deepening of the gap between rich and poor countries. As a consequence of the totality of all these processes, unprecedented threats to peace and stability have arisen, which are transnational in nature and in scale" (Mirziyoyev 2017: 31).

Another reason for considering as an object of independent study of the national self-consciousness of peoples in the context of globalization is associated with the formation of national consciousness in countries that have reached independence, and the growing need for it. The processes of globalization lead to the disappearance of established stereotypes of thinking, moral foundations, national traditions and the emergence of global consciousness and global culture. This is happening simultaneously with the process of national identification... Therefore, this process occurs simultaneously with the desire to preserve ethnic culture, national identity, this is manifested in a person's awareness of himself as part of a certain ethnic society. (Safayev 2005: 271) To date, a global event is the protection of local national traditions and characteristics (Sapozhnikova 2013: 60-63). Since the real threat of globalization to modern society shows the desire to point out its negative consequences. Having comparatively analyzed modern traditions and customs and their significance in modern society, Aliyev A.K. concluded that "whatever heights the development of society reaches, it, as usual, will retain simple stereotypical relations controlled by traditions." (Aliyev 2003: 62-63)

On this basis, in places where traditions and customs exist, regardless of what modern society is, there are traditional social institutions inherent in that society. Because traditions and customs are one of the main structural parts of social institutions (Davletiyarov 2019: 23). It is necessary to take into account, says the historian Askarov M.M., that Central Asia has always been the center of mutual influence and mutual displacement of different ethnic groups, tribes, peoples, various religious and confessional beliefs, diverse languages and dialects, heterogeneous cultures and values. Defining identity boundaries in such a situation is particularly difficult, and this is only feasible through years of research in the field (Askarov 2019: 62). Awareness of national identity and its preservation not only in Uzbekistan, but also in developed countries today is turning into an urgent problem, because national self-consciousness manifests itself when the past cultural heritage of peoples is preserved. Therefore, today many research centers and research institutes deal with issues of national relations, ethnic identity in the international framework for the study of the ethnic origin of peoples of different regions in the world ethnosociology. Because it is within the framework of the activities of these institutions that the issues of socialization of the individual and the process of awareness of national consciousness are investigated.

These issues, being priority areas for the development of social sciences and humanities in foreign countries, different aspects of this problem are studied from the point of view of social anthropology, ethnology and ethnosociology. Thus, the Institute of Ethnology and Anthropology at the Academy of Sciences of Russia dealt with the issues of "Studies of ethnic, civil and other forms of social consciousness", "Center for Interethnic Studies", organized at the Institute of Sociology - "Interaction and coherence of state, civil, ethnic and religious identity in a changing society", the Research Council on Economic and Social Issues in the city of Cardiff in the UK studied the issues Identity in ethnic and religious relations, the Institute of Racial Relations in London - issues of social and legal equality of ethnic groups, the French Institute of Central Asian Studies deals with the culture, way of life and ethnic identity of the peoples of Central Asia. (Kadirova 2020: 5)

In the period of strengthening the integration of the world community, the study from the scientific side of the existence of the culture of various ethnic groups ensures the social development of society. Social institutions are one of the important chains within ethnic culture, which are of great importance in transmitting as a heritage from generation to generation the rich historical and spiritual culture of mankind. After the achievement of independence of Uzbekistan, interest in the need for awareness and the phenomenon of the processes of national identity of the peoples of Central Asia, in particular Uzbeks, Karakalpaks, Kazakhs, Kyrgyz and Turkmens, increased. Also, the restoration of cultural heritage was identified as an important task at the level of state policy. Without studying and taking into account the history of traditional culture, state policy is not implemented. Uzbekistan is a kind of country where representatives of various nations, ethnic groups and faiths are gathered. All conditions have been created in the country for the preservation of culture, traditions, customs of peoples (Mirziyoyev 2018: 367). Uzbekistan is a multinational republic in the world.

A comparative analysis of the information revealed that in 1939 there were 97 nations and ethnic groups in the population list, in 1959 - 113, 1979 - more than 120 nations and ethnic groups. In the list of the population of 1989, more than 125 nations and ethnic groups lived in Uzbekistan, the total number of which was 19 million 810 thousand people, as of January 16, 2021, they exceeded 34.5 million.people.

With the achievement of independence of Uzbekistan, a new period began for the Karakalpak people. The political, economic, spiritual and cultural directions of the Karakalpak people have radically changed. All opportunities have been created for the study of the national cultural heritage, based on the needs of the people in studying their culture, religion, spiritual and cultural heritage. Now the Karakalpaks, based on the created opportunities, seek to restore forgotten values, to realize national self-consciousness, since the existing peculiar spirituality and values of this people are important for study in modern times. Indeed, the Karakalpak people, like multinational peoples, have a rich spiritual and cultural heritage, an ancient historical past, so the study of its undisclosed facets, the use of instructive aspects for the updated modern period is a requirement of the time. As scientists recognize, to determine the country, the people should have such signs as: language, region, existence within a certain state, unity of economy, culture, religion, traditions and customs, values, solidarity of the ethnic group. However, in the process of formation of the Karakalpak people, these signs changed in different periods and had a different influence in each of the periods.

After the independence of Uzbekistan, the national, ethnic and civil identity of the Karakalpak Republic was given special attention, so the citizens of Karakalpakstan are considered the second indigenous nationality of the Republic of Uzbekistan.

The national traditions of the Karakalpaks, due to the fact that they lived next to such ancient Turkic peoples of Central Asia as Uzbeks, Kazakhs and Turkmens, were inextricably linked and similar to their traditions, customs, national values. As is known from the sources, the formation of the ethnogenesis of the Karakalpak people took place in inseparable connection with the history of the ethnic groups of the Uzbek people. The study of the cultural heritage of the Karakalpak people as an integral part of the Uzbek people is reflected in the issues of interethnic harmony in the "Strategy of Actions for the Further Development of the Republic of Uzbekistan" for 2017 - 2021. President of Uzbekistan S. Mirziyoyev on November 10, 2016 in his speech "I am not only a son of the Uzbek people, but also of the Karakalpak people" during a meeting with representatives of the Karakalpak Republic said: "My close acquaintance with Karakalpakstan, or rather love for this land, charm for life began in my student years. When we were picking cotton in the Jizzakh and Syrdarya regions, after working around the fire, guys and girls from Karakalpakstan read poems by Kunkhuzh, Azhinyoz, Berdakh, danced. We were

surprised. Then, having heard the Karakalpak folk songs "Buzatov", "Aydinlar", "Dembermes" for the first time, I was fascinated and this feeling has remained with me to this day (Mirziyoyev 2017: 204). Indeed, the mythological, ethnic, artistic and mythological traditions of the Karakalpak nationality, the rich musical culture not only in the Khorezm region, but also in Central Asia and the Middle East influenced the development of this culture.

In addition, as a result of the study of history, archeology, ethnography, folkloristics, art criticism of the Karakalpak people, rich materials on the history, culture, fiction, religion, national traditional family values have been collected, the analysis of which from a historical and philosophical point of view confirms that the Karakalpak national culture is of great importance in realizing the national identity of the people, where family relations are important.

The territory of the republic today occupies 166.6 thousand m2. Compared to other regions of Uzbekistan, the land area of Karakalpakstan is the most extensive. The administrative-regional structure of the Republic consists of 15 districts: Amu Darya, Beruniy, Karauzak, Kegeyli, Kungrad, Konlikul, Muynak, Nukus, Tashtakupir, Turtkul, Khuzhaili, Chimbay, Shumanay, Buzatov, Ellikkala, the city of Takhyatash and the capital Nukus. There are 12 cities, 14 urban-type settlements, 124 villages and citizens' assemblies. The modern Karakalpak people, although considered the indigenous stratum of the population, are a minority. At the beginning of 2014, the population of the Republic was 1 million 736 thousand people. According to the data of 2019, the total population of the Karakalpak Republic is 1 million 869,000 people (Kadirova 2020: 87), among which 32.1% are Karakalpaks, 32.3% are Uzbeks, 26.3% are Kazakhs, other peoples living in this region since ancient times, that is, Turkmens, Koreans, Tatars, Russians, Ukrainians and others, make up 9.3% (Alimov 2019: 32). The first information about the Karakalpak tribes is found in the works of Russian scientists, travelers and officials (Y. Khanykov, P. Rychkova, A.V. Kaulbars, A.L. Kuna, P.P. Ivanov, A.S. Morozov, B.A. Andrianov, R Kosbergenov, T.A. Zhdanko). A special ethnological study of the Karakalpak people began in the first half of the XX century. The history of the origin of the people and its economy is studied in the works of P.P. Ivanov, where valuable information is given (Ivanov 1934: 178 - 200).

Information about the historical past Karakalpaks is also given in the work of T. A. Zhdanko "Essay on the history of ethnography of Karakalpakstan". The work contains information about the clan structure and social structure of the Karakalpaks in the XIX - early XX century, gives an analysis of their location, their relationship with other peoples. In the poetic works of the classic of Karakalpak literature, Berdakh, information about the Karakalpak roots is also given. Thus, in the work "Shazhara" ("Genealogy"), he described in detail the Karakalpaks. Therefore, this work is considered a valuable source for studying questions about the ethnic origin of the Karakalpak people, because it contains legends and customs related to the origin of the Karakalpak tribe in poetic form. Awareness of national identity, first of all, is associated with the way of life and traditions of past generations of this people. Issues of education are one of the eternal issues of society, which is given attention to ensure that the modern generation reveres and respects traditions, customs, morality, material and spiritual values. An important aspect of the awareness of national consciousness is precisely the national and moral education. In this regard, the founder of sociology, O. Comte, wrote that "It is necessary to educate feelings, its development through exercises in moral education.". The process of education and the associated awareness of national identity have always been topical issues for our people. Because the means of education in the family form individual and social consciousness, manifested in micro and macro processes of awareness of national identity. When we say a microcondition, we mean social relations in the family and between close relatives, since the younger generation receives the first information about their origin, ethnic history, ancestors, their people, tribe, traditions, customs in the family. The Karakalpaks have some customs that

are not found in other peoples. Hence, each custom forms the national basis of the people. Customs are a path historically traveled by every nation (Membetov 1995: 15). Especially small ethnic groups ask questions, who are we, how do we differ from others? They are looking for answers by turning to the spiritual and cultural roots, the foundations of national culture (Malychnik 1998: 198).

Such a situation, on the one hand, shows the factor of growth of the national consciousness of the people, on the other hand, the desire of any ethnic group (regardless of whether it is small or large) to learn the historical roots of the origin of its nationality. The materials collected in the study of the history of peoples are considered the cultural value of the people. Such a culture has a rich material on moral, aesthetic and family education, folk traditions, folk art and craftsmanship (Kuznetsova 200: 2). As we emphasized above, the national traditions of the Karakalpaks are similar and interrelated with the traditions and customs of other peoples. For example, the Karakalpaks, like neighboring peoples, treat their elders with reverence and a kind of respect. This is especially evident in family relationships during breakfast, lunch or dinner together. By tradition, everyone sits around the tablecloth, taking into account the seniority, at the beginning of the table sits the eldest in the family - the father, on its right side - the eldest son and the rest of the sons, on the left side sit according to the seniority of the woman. Meals begin only after the older members of the family. For guests, usually, specially sewn and beautiful national kurpachi are made. It should be emphasized that the older generation, especially the elders, behave sedately, do not talk much, being a model of serious behavior for young people. Clothing is an expression of the national culture of every nation. According to Suloeva M.A., in the traditional culture of any ethnic group, clothing occupies a special place, since it encodes information about the perception of the surrounding world. It is not only a mediative link connecting its owner with other cultures, but also participates in the process of broadcasting its own traditions, stereotypes of behavior and is an important factor in self-identification (Suloeva 2020: 45). A distinctive men's clothing is "shapan" or "shekpen", this is a traditional robe made of raft fabric. Shapans were quilted (syrylgan inestyogan (syrylmagan). For young men, these robes were sewn from brighter colorful shades, and old people wore white. From the women's clothing of karakalpaks, a colorful robe with embroidered national arnament and a headdress, which is called "saukele" (KGM Foundation 3, department of MPI), is brightly distinguished. But, unfortunately, today's youth do not wear national clothes, except for weddings and holidays.

Another important custom in the life of the Karakalpak people is the marriage of girls and the marriage of boys. So the parents of the girl and the boy agree among themselves, the girl's kalym is determined. After the engagement and payment of the kalym, the future groom, according to the customs of the Karakalpaks, has the right to meet and talk with the girl with a special gift. The amount of kalyma per girl varies and is different. In addition to kalym, customs give tribute for mother's milk, tribes and similar customs that must be fulfilled. The bride is held on time. The girl's parents, based on their social status, build a home for their daughter. After the send-off, the groom's parents hold a "face opening" ceremony. In addition, various events (weddings) are held at the birth of a child, circumcision, torment (birthday according to the twelve-year cycle of the chronology). The way of life of the Karakalpaks, who have been living on the shores of the Aral Sea and the Amu Darya for many years, is peculiar and unique, semi-nomadic and semi-sedentary. This is due to their geographical location, the region of the republic consists of an oasis, steppe and semi-desert. The Karakalpaks were engaged in cattle breeding, leading a sedentary lifestyle were engaged in agriculture, fishing and hunting. Because the coast of the Amu Darya, covered with tugai, was rich in wild doors and birds. In every Karakalpak family, both men and women had their own responsibilities. For example, in livestock families, the duties of men and women require complementing each other, the task of

men is mainly to drive animals to pasture, but a woman also helps him. A man in the pasture monitors the herd, a woman, returning home, is engaged in household chores: washing, cleaning, cooking. In the evening, she helps her husband to drive the herd into the corrals, women are also engaged in the dressing of wool, prepare bedding, clothes, and also weave carpets from it.

In families where they were engaged in fishing, men caught fish, women cleaned them, salted them, smoked, that is, they were assistants to men, freed from household chores. In the families of livestock breeders and hunters, women used to process skins, sew special clothes from them, in modern times this work is carried out in special workplaces. The way of life of the people in this difficult period of development undergoes dramatic changes, the place of past ethnic and subcultures is occupied by the concepts of common cultures, the spiritual and social appearance of nationalities and peoples is changing. The preservation of the spiritual and cultural consciousness of nationality becomes one of the first tasks to be solved. The family, in its true sense, while preserving national traditions and customs and values, must show unanimity with modernity in order to resist the threats and cataclysms of modern times. The family should be the cradle of values, preserve the continuation, the health of the generation. Ethnography, national traditions, customs, legends and tales become a fairy tale. Because the glorious past and traditions of the Karakalpaks are associated with the Aral Sea. Such dastans as "Gurugli", "Alpomish", "Kirkiz" and "Aikulesh" reflect the way of life and traditions of the people, all the feats and heroes in them glorify the way of life and traditions of the past. The nomadic way of life is reflected in the art and culture of this people. The concept that the horse is the wings of the jigit appeared in these dastans, in the songs and legends the sound of the waves of the Aral Sea and the Amu Darya is reflected. Karakalpak women from childhood are taught to sew utov (material for yurts), to cook food from fish and poultry. Wheat and corn were important in everyday life, from them were prepared and baked flatbreads (churek), bugursaki, chelpak (fried dough), from corn flour mixed with pumpkin, baked "tanning" bread. The Karakalpaks have another custom that is not found in any people. For example, if someone comes to the house without an invitation, then the owners necessarily, inviting to the table, ask to taste at least a piece of bread, if the guest is during lunch or dinner, then he is necessarily imprisoned for dasturkhan and fed. This alone testifies to the hospitality and goodwill of the Karakalpaks. The Karakalpak people have always sought to preserve national traditions and customs, to be in harmony with modernity, research in this regard was built on the basis of mutual respect in the family. The Turkic peoples have a custom: in the father's house, daughters are considered a guest, they are accustomed to this from childhood, they are respected and dear. In the husband's house, they are considered mistresses. However, the young daughter-in-law cannot sit at the same table with relatives until she gives birth. The birth of a child is a sign of belonging to the husband's family. Karakalpaks, like Kazakhs, cannot marry a relative, brave young men steal girls from another tribe and thus such a custom is considered an important factor in preserving the national gene pool. This tradition is an eternal custom inherent in a nation with a nomadic way of life.

In the family there are initial and basic stages of upbringing, the initial stage is carried out directly in the family, where sons and daughters are prepared physically, based on opportunities and lifestyle, and are prepared for the main stage. The main stage prepares young men to become men who are able to benefit the people and the nation, teach them socialization, behavior in society. The main criterion of education is national traditions, customs and values. Karakalpak youths, along with the ability to care for livestock and be riders, to master all aspects of the way of life of the nomadic people, should be able to sing dastans, which contribute to the feeling of the meaning of these dastans (poems).

Since ancient times, the Karakalpaks have inherited customs that provide for the preservation of water bodies in purity, careful attitude to the surrounding natural world. According to the relics of ancient beliefs, water and fishing equipment: kayik (boat), au (net) had sacred properties. For example, to get pregnant, childless women would take a boat across the Amu Darya and arrange a sadaqa, a sacrifice to god. For the same purpose, childless women walked around the mast of an experienced fisherman's boat three times and touched it. The patron saint of the boat was saint Nuh (biblical Noah) (Esbergenova 2020: 126). Regardless of who we are, if every citizen knows well the history of his past, the rich spiritual and cultural heritage of his ancestors, it will be difficult to lead such citizens astray, to be influenced by various currents. Deep and comprehensive study and awareness of historical cultural processes, the great spiritual and cultural heritage left by ancestors contribute to the fact that sharp positive turns will appear both in the life of the country and in the social way of life of people. Because through the study of the history of the motherland, our thinking expands, the worldview changes, and most importantly, peace and stability will be strengthened in the country.

REFERENCES

1. Aliyev A.K. North Caucasus: modern problems of ethnopolitical development. - Makhachkala, 2003.- P.- 62-63

2. Alimov O. World, politics, society. Revised and supplemented 9th edition. // Guliston., - 2019., P-32

3. Askarov M.M. Analysis of identity categories in the late 20th and early 21st century in present-day Uzbekistan (based on English-language materials) / Scientific result. Social and humanitarian research. T. 5, No. 4, 2019. S. 62-77. Baiburin A., Toporkov A. At the origins of etiquette. Leningrad, 1990. - P -66

4. Akhmedova Feruza. Professional Education Pharmaceutical Personnelin Uzbekistan. Eastern European Scientific Journal.2018.

5. Bekmurodov M, Akhmedova F. Kadirova X.B. Study the process of harmonization formation of personal and professional qualities at students//International Journal of Psychosocial Rehabilitation, Volume-24 (Special Issue 1), 2020. pp. 597-605

6. Davolyalyarov M.M. Traditional social institutions of karakalpaks. Nukus: "Ilim." 2019. - P-23.

7. Esbergenova S.H. Beliefs and rites of caracalpaks associated with fishing. Herald of Anthropology, 2020. № 2(50)

8. Ivanov P.P. Essays of the history of karakalpaks / Materials on the history of caracalpaks. Compilation. M., L.: Academy of Sciences Publishing House, 1935. - P. 9-91; Ivanov P.P. Materials to study the history of caracalpaks / Karakalpakia. Works of the first conference on the study of the productive forces of the Karakalpak ACSR. Volume II- L.: Academy of Sciences Publishing House, 1934. - P.– 178-200

9. Kadirova X.B. Features of the national identity of the Karakalpak people. Doctor of Philosophy (PhD) dissertation in sociology. - Tashkent: National University of Uzbekistan, 2020.-P-87.

10. Kadirova H.B., Akhmedova F.M..Sociological Analysis of the Nation's Identity, the Levels of Feeling the National Identity in Uzbekistan. International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-9, Issue-1, November 2019

11. Kuznetsova T.V. Tradition of the people in the culture of post-Soviet Russia. -M.: Moscow State University Herald, Series 7, Philosophy. 2001. №2.

12. Malichnik I.V. The national culture and national consciousness. M.: 1998. P. 5

13. Membetov K. Ethnographic history of the Karakalpaks. Nokis. Karakalpakstan. 1995. -P.- 15

14. Mirziyoev Sh.M. We will build our great future together with our brave and noble people. People close to my heart, my soul. Speech at a meeting with voters of the Republic of Karakalpakstan November 10, 2016. Shumonoy. 2017.-P.-204.

15. Mirziyoyev S.M. People's Approval is the highest assessment of our activities. T.: Uzbekistan. 2018. P -367.

16. Mirziyoyev S. Confidently will continue the path of national development at a new stage.- T: "Uzbekiston" . 2017.- P.-33

17. Sapozhnikova I.A. Phenomenon of modern globalization / Sixth Lazarev readings: the face of traditional culture at the beginning of the 21st century. Chelyabinsk, February 26-27, 2013 - Chelyabinsk, 2013. -P.- 60-63

18. Safayev S. Global Processes and National Identity / History and Self-Awareness: Uzbekistan and Germany in the 20th Century. - T., 2005.- P. -271

19. Snesarev G.P. Materials about primitive-communal remnants in the customs and rites of the Uzbeks Khorezma / MHE, v. 4. M., 1960. -P.- 138.

20. Sorokin Pitirim. Man. Civilization. Society. M., 1992. P. 427

21. Suloeva M.A. the role and functioning of traditional women's clothing arresh italy in the modern sociocultural space. Herald of Anthropology, 2020. No 4 (52) P.45.

ECOPHOBIA IN GITA MEHTA'S A RIVER SUTRA

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ABSTRACT

Gita Mehta is an award-winning documentary film-maker and author. Gita Mehta's A River Sutra is a Portfolio of short stories connected with a common thread-the sutra of the Narmada river that intertwines stories and lives of the people on her banks. The diverse and richness of nature is the major theme of her novel that triggers human interactions and also facilitates them in completing their course of action and life. The novel primarily focuses nature, climate, environment and ecology which become one of the most essentials in the narrative. Also, it highlights contradictory behavior of characters towards nature. Each story chronicles some or the other connectivity between the characters and nature. The present paper attempts to examine the phobic relationships between ecology and characters. The confluence between human beings and ecology reaches to the extremes that the characters either succumb to nature or go mad. The harsh and fierce ecology affects these subjects by driving them mad or by killing them. Gita Mehta draws the ecophobic canons of nature, especially of the Narmada river through her stories.

Keywords: Ecology, ecophobia, trigger, nature and thread.

INTRODUCTION:

Gita Mehta's *A River Sutra* is a directory of short stories connected with a common thread-the sutra of the Narmada river that intertwines stories and lives of the people on her banks. The Narmada river becomes the common linkage between the characters and the unnamed and sagelike narrator who is also a connector like the river with the lives of the people. As these stories are set in the nature and the ecology of the Narmada river, ecology becomes a common platform that experiences the human pangs. The narrator in this novel is a retired bureaucrat who resides in the government rest house at the bank of the Narmada. Many visitors visit the Narmada pilgrimage and share their stories with the narrator. The visitors come to Narmada river to purify their sins. These instances indicate that Narmada river symbolise as a purifier. Further, their experience revolves around the ecology which creates phobia and philia towards nature. The sentiment of fear, anger, hate, destruction and agony are expressed by their retorts create ecophobia. The present research paper attempts to examine the instances of ecophobia in the short stories in *A River Sutra*.

Illustration: Gita Mehta introduces a superannuated and identity less bureaucrat who lives in a bungalow situated on the bank of the Narmada river—the government rest house— that becomes the centre for human interactions on the backdrop of nature as it is bounds by the jungle and the tribes from the Vano village. Pilgrims from all over the nation visit the Narmada river for worship and for the pleasure of being a part of nature, environment and ecology. Often times, the river becomes a source of death and suicide for people who throw away their lives like a cigarette butt. In other words, the Narmada river is both ecophilic and ecophobic as it purifies the sins of pilgrims and also, at times, becomes a source of escape from the agonies of life. The Narmada river gives a new beginning for the pilgrims as they purify their sins through penance, and, for some pilgrims, the river relieves them from the hell like life on earth. In the very opening page of the introductory part of the novel, the narrator explicates the mixed reaction towards the Narmada river as ecophilic and ecophobic, as he says, "The river is among our holiest pilgrimage sites, worshipped as the daughter of the god Shiva. During a tour of the

area I had been further intrigued to discover the criminal offense of attempted suicide is often ignored if the offender is trying to kill himself in the waters of the Narmada." (ARS 1)

Mehta narrates how the narrator, an aged person who has embraced vanprastha willingly becomes a part of the Narmada ecology. His reclining of urban life and urban identity highlights his love for ecology. Here, in the government rest house, when he is working as the manager, he becomes one with the nature so much so that he feels the heartbeat of the river pulsating under the ground. This indicates his assimilation with ecology with the feeling of ecophobia that Mehta chronicles the mysterious nature in its ecophobic canon:

With twilight, the water at Mahadeo starts flickering with tiny flames as if catching fire from the hundreds of clay lamps being floated downstream for the evening devotions.

My day usually begins on this terrace. I have formed the habit of rising before dawn to sit here in the dark with my face turned towards the river's source, an underground spring that surfaces four hundred kilometers to the east.

In the silence of the ebbing night I sometimes think I can hear the river's heartbeat pulsing under the ground before she reveals herself at last to the anchorites of Shiva deep in meditation around the holy tank at Amarkantak, I imagine the ascetics sitting in the darkness like myself, their naked bodies smeared in ash, their matted hair wound on top of their heads in imitation of their Ascetic god, witnessing the river's birth as they chant:...(ARS 3)

Further, Gita Mehta showcases who the bond between the narrator and ecology is developed. As the winds cool down the temperature in the forest, the narrator after his exertions settles down with the coolness of the nature. It shows the power of ecology to trigger the pulse rate of the living beings along with the rise in temperature. The narrator has never stepped into the caves on the banks of Narmada river. He has the fear of the snakes and the snake bites—triggering the ecophobia and mystery in the narrator as he says:

I never enter the caves, for fear of snakes, unable to believe that even the Narmada will protect me from a serpent's fangs. Instead I sit on a large boulder at my side peering into their darkness. The caves have been deserted for centuries, but I am always hopeful of encountering some passing Jain traveler who may have stopped here for a moment's worship. (ARS 6)

Gradually, the narrator greets a Jain monk who narrates the story of his ceremony of becoming monk from a very wealthy family. He is hardly thirty years of age who explicates the difficulties of leading the life of a monk. Every time he is aware of the micro life that surrounds him. Even plucking a fruit from a plant is an act of violence. The young monk enunciates the ecophobia through nonviolence, "It is very tiring to be worrying all the time that you may be harming some living thing. I must always look down while walking for fear that I may step on an ant. Even plucking bananas becomes an act fraught with danger. Who knows what small creatures live in the leaves or trunk of a banana tree?" (ARS 7)

The second story in *A River Sutra* entitled, 'The Monk's Story' highlights the past of a monk who was a wealthy young man, who discarded his family, international identity, business, diamond companies, beautiful wife and two children just to become a monk. The monk was known as Ashok who establishes a parallelism between Emperor Asoka and himself. As Emperor Asoka left all his luxuries and became a monk and lived in the forests, similarly, Ashok leaves all the riches and property of his father and becomes a monk. The worldly pleasures are temporal and nature is permanent. While discussing the procession Ashok explicates ecophobia as the cool and soothing effect of nature are lost, "All I can see is dust being kicked up from the playing fields, which have become powdery with summer drought. The temperature is over 110 degrees. Under the intense sun my head begins to swim, but if I ask

for water I know it will be lukewarm. There is no ice left in the city. No bottled soft drinks, no vegetables, no fruit." (ARS 11-12)

Further, in the procession that is taking Ashok to become a monk, he throws coins and currency notes and also gold, diamond as well as silver coins towards the crowd. This act highlights that riches are useless when someone embraces ecology and monkhood. Further, Ashok talks about nonviolence and peaceful life. The phobia of destroying ecology is evident in every act as farming and industry. This exhibits destruction of several lives of mini and micro creatures and organisms. Several common activities of human beings result into ecophobia unawarely. In a discussion with his child, Ashok illustrates ecophobia, "If we were farmers we might unknowingly kill creatures under our plows. In industry the earth is drilled for oil, iron, coal. Can you imagine how much life is extinguished by those machines?" (ARS 16)

Gradually, Ashok revisits the past as he is narrating the story of his life to the narrator. Primarily, he is more concerned with his father and his father's attitude towards life. His father is a businessman who never looks beyond business. When he was travelling around the world with his father to understand the diamond trade, Ashok comes across the distressing poverty of the miners. Both the businessmen and the miners destroy ecology. Gradually, as he reconnects the story of his procession, he remembers how the elephant keepers exploit elephants for money. In this regard, the tamed elephants symbolise ecology, and the elephant keepers are human beings who exploit ecology. Ashok narrates the ecophobia in his procession, "The elephants are becoming agitated by the riot. The elephant keepers try to control them, striking the heads of the great beasts with iron pronged prods until blood rolls down their ears. The elephants trumpet in rage and the mobs fall back in terror of being trampled under their immense gray feet." (ARS 17-18)

Gita Mehta unfolds the story of Ashok who was once a very wealthy young man. At the age of 26, he is fatigued by the world as he finds greed and unending desire everywhere. This everlasting human desire becomes ecophobic for Ashok to push him towards taking the decision to become a monk. Ashok underlines the cause of renunciating the world, "Gradually my life of unremitting pleasure ceased to satisfy me, leaving me exhausted from the last indulgence while anticipating the next. At the age of twenty six I had already become fatigued by the world, knowing that even at the moment of gratification, the seed of new desire was being sown." (ARS 19)

The third part of the book is about the observations of the narrator who has been witnessing ecology in various phases. From the government rest house situated at the height, he visualises the river following calmly. At times, half burnt corpses are thrown into the river for salvation. This instance proclaims ecophobia as it exhibits destruction of nature and at the same time nature as soother and absorber. The narrator observes, "At this hour I have sometimes seen the dull glow of something being swept downstream and known it was the corpse of an ascetic thrown into the river with a live coal burning in its mouth." (ARS 28)

The fourth part of the novel *A River Sutra* deals with a story about Music teacher Master Mohan in the story titled 'The Teacher's Story'. At the Quawwali concert, Master Mohan comes across a young blind boy, Imrat who sings so beautifully that Master Mohan starts wiping unawarely. The power of singing and the purity of voice are so heavenly that Master Mohan forgets everything. Also, he learns that Imrat has an elder sister who has brought him to Calcutta. The unnamed woman tells him that the terrible floods swipe the entire village, killing several people, including the members of her family. This also highlights ecophobia. The young woman narrates ecophobia, "Last year I brought Imrat with me to Calcutta to sell my embroidery. While we were here, terrible floods swept our village away. Our father, my husband, everybody was killed." (ARS 40) Subsequently, the writer brings forth the song of Imrat that flows from his

throat incessantly like nectar. The prayer in the early morning in the praise of the Lord showcases Him as Creator and Destroyer. The lines bring forward ecophobia:

"The heat of Your presence

Blinds my eyes.

Blisters my skin.

Shrivels my flesh.

"Do not turn in loathing from me.

O Beloved, can you not see

Only Love disfigures me?" (ARS 46)

Master Mohan lives a secluded life, away from his family though they live under the same roof. Though he tries to escape from his wife and the scornful looks of his daughter and son, they disturb him with the loud noise of film music which he hates. In other words, Master Mohan's seclusion is always interrupted by his family members. The loud noise of film music becomes ecophobic for him.

Subsequently, the narrator explains the five flower-tipped arrows unleashed by Kama—the Enchanter, the Inflamer, the Parcher, the Paroxysm of Desire, and the Carrier of Death. In other words, Kama incarnates desire and death. The narrator also traces how Kama affected Lord Shiva, the Ascetic. In this illustration he connects Hindu mythology and ecophobia through Kama and the destruction of Kama by Lord Shiva. He narrates ecophobia, "Then Maya, the Illusion of the Worlds, had appeared—the only woman capable of arousing the lust of Destroyer of worlds. Enraged at the destruction of his meditation, the Ascetic had opened his third eye, the Lotus of command, and reduced Kama to ashes, even as he himself was being consumed by Desire." (ARS 63)

The sixth part of the novel *A River Sutra* is a very short event that discusses how Nitin Bose, a visitor to the narrator at the Narmada rest house is captured by Police as he is caught attempting suicide. A police constable named Shashi narrates these details to the narrator. Certainly, this makes the narrator to visit the police station at Rudra hurriedly. Shashi is a rough driver who drives very fast. The narrator mounts upon his motorcycle and Shashi drives through the jungle towards Rudra. The narrator emphasizes the speed of the vehicle and its impact on him. The ecophobia is the evident of the narrator explains his journey towards Rudra through the jungle:

The wind whipped past my face, making my eyes water as we raced through the jungle towards Rudra. By the time the motorcycle bumped onto the tarmac road, my eyes were watering so badly the small painted houses were only a blur of lime-greens and blues connected by bougainvillea bushes and rows of black crows perched on electric wires. (ARS 67)

Nitin is working in Calcutta, a demographically dense city where refugees from Bangladesh stay on the railway platforms. The density of demography highlights the over exploitation of land as a resource. Nature is exiled resulting into ecophobia. The narrator explicates the ecophobia through the observations of Nitin Bose:

Outside our office Calcutta crumble under the weight of neglect, exploitation, poisonous humidity, traffic jams, power failures, and roads plowed up like rice fields to make an underground railway, while a whole generation stoically waited for the city to return to what it once had been as more trainloads of refugees arrived to sleep on railway platforms already overcrowded with refugees from the partition of India fifty years earlier, the war in Bangladesh

twenty years earlier, the devastations of nature that daily drew the desperate to a great metropolis itself desperately surviving as if a war had just ended.

But we experienced only claustrophobia as we stared through the darkened windows of our airconditioned cars at the crowds teeming across the broken pavements. (ARS 71)

Gita Mehta enunciates the mystery and lust as in the darkness Nitin searches for her with a torch but fails to find her out. The ecology in the night is so mysterious that he does not make out whether it was Rima or his enchantment that he chases during these days at the estate. He swoons down while chasing Rima in the night. This indicates the mystery and ecophobia. He narrates:

I waited in the shadows. After a while I heard a rustling in the undergrowth, then the sound of breaking twigs as footsteps retreated into the woods that ringed my house. I ran to the wall. As I flung my leg over it I heard her call again, "Nitin, Nitin Bose."

"Rima, wait! I must talk to you!" I shouted.

"Nitin Bose!" The voice grew fainter as she ran into trees. The darkness was so dense I wished I had taken a torch from the guard so. I could see my way. Then I remembered the moon was in eclipse that night, and the superstitious guard would not venture out of the doors on a night so full of ill omen.

Heedless of the low branches whipping against my body. I ran after them through the jungle, calling her name my voice loud in the night. (ARS 86)

Mysteriously, Rima disappears into the jungle leaving Nitin lying under a tree. He is suffocated in the dark. The vegetation in the night exhales Carbon dioxide as a result he is breathless. The ecology does not allow him to breathe freely. The guard and the attendant help him to come back to the bedroom.

The eighth story interlinks the story of Nitin Bose and the following story of the courtesan in which the narrator develops a dialogue between himself and his assistant. This part of the novel brings forth the ecophilic and ecophobic phases of nature around the government rest house. The mysterious darkness and the ringing of bells in the darkness by the holy men around the river creates ecophobia and also they are coercive to the human mind. The narrator writes:

As always the darkness that precedes the dawn stilled my mind. I could not see the Narmada, but I sat with my face turned to the east where the river reaches herself to the holy men ringing the pool at Amarkantak, wondering what the ascetics thought about as they watched the water flowing from some secret stream, whispering in eddies below their crossed legs, mysterious and alluring in the dying height. (ARS 90)

A River Sutra intertwines another story to the collection through the river, titled 'The Courtesans' Story' which deals with the life of courtesans in Shahbag. The story states that the courtesans were rich and they were known for their beauty and learning. In past, mighty kings demanded these courtesans to educate their Princes and Princesses. While teaching in a milder way, the royal Princes were allowed to touch these courtesans. These courtesans represent milder nature in human shape that preaches the ecologically distanced people who are the future rulers. The gardens were rich and elaborate. The woman in the story narrates the ecophobia as the rich nature has diminished and due to modernisation houses are constructed. The purity of ecology is lost. She narrates:

Where there used to be gardens now we have factories. Our gracious old buildings have been torn down to be replaced by concrete boxes named after politicians. The woods that once ringed the city have been cut down for the shantytown of labor colonies. Even the boulevards around

our haveli been overrun so that our view is now only of a bazaar, and we must keep the windows to the west closed because of the smell from the open gutter. (ARS 108)

Section eleven of the novel continues the story of the courtesanwithout a title. It begins with the narrator observing nature around the government rest house. During the monsoon the Narmada showcases her terror through storms and incessant and fierce waterfalls. This ecophobia is very much evident when the narrator says:

I have always regretted the heavy storms that prevent me from coming to the terrace more often during the monsoons. The Narmada is at its most dramatic during this season. The distant waterfalls, swollen by monsoon rains, crash through the marble rocks like surf breaking at full tide, and below the rest house the river churns and bubbles around sudden rapids, eroding the gray-green stones lying on its riverbed into the oval lingams that are the symbol of Shiva. (ARS 112)

The narrator is alone and prefers to be lonely in the company of nature. He observes the changes and phases of nature around him right from fields to the skies. Often times, the narrator sits in the twilight of the dawn experiencing the fading darkness and approaching light that not only bridge day and night, but it invites an array of mysterious changes in the nature. These elaborations point out his notes on ecophobia:

I sat in the darkness repeating the invocation until the first rays of daylight pierced the monsoon mists shrouding the fields across the river. A strong windows pushing banks of clouds towards our hills. I watched them changing shapes and colours in the sunlight as they raced toward the eastern horizon like herds animals or battlements of medieval cities, some yellow, some of the color of smoke, some white with the pink blush of conch shells. (ARS 112)

Consequently, the narrator finds three rifles and two boxes of cartridges in the bush near his rest house. Also, a slender young woman enters the rest house who is nonetheless the young daughter of the courtesans who was abducted by Rahul Singh two years ago. She states that she was taken into deeper forests in the company of wild animals with no mark of civilization anywhere. The girl explicates her ecophobia during her initial days of abduction, "No human dwellings only the cry of wild beasts and shrieking of hyenas. For weeks I had been living in the jungles, fearing snakes each time I lay down. Now I was kept in a cave, like an animal. I begged God then to let me die." (ARS 116)The story ends as the old courtesan is relieved from her tension of her daughter who is free from the pangs of life.

The fifteenth episode captioned, 'The Minstrel's Story' deals with the yogic expeditions of Naga Baba in nature—right from jungles to snowy lands and deserts—exploring ecophobia.The Naga Baba's journey highlights his endeavours with ecology as he remains in the jungle in his meditation, he has to live upon the plants. The roots and fruits from jungles satisfy his thirst and hunger. Ecology not only keeps him alive but it also protects him from heat and cold. This ecophobia is evident when the writer narrates, "Then he had always been exhausted, not knowing which roots and berries to look for in the jungles, or which plants could suppress thirst and hunger, or which yogic exercises slowed down the metabolism so a man could endure the extremes of heat and cold." (ARS 153)

The narrator in this story amplifies the hardships of the Naga Baba who undergoes severe physical discomforts during his meditations like a sapling that faces several blows while developing into a tree. The Naga Baba had a teacher who, in the past, had taken him to the extreme ecophobic conditions like the highest passes of the Himalayas where he was left alone at a small stone temple. Further, he instructed that his teacher would come to see him if he survives the winter. Winter and chilling cold, freezing wind torture him but the Naga Baba survives through the harshness of cold and snow. The harshness of the extreme climate makes

him stronger in his meditation. The narrator explicates ecophobia that the Naga Baba undergoes, "The Naga Baba still could not bear to think of the winter—the hallucinations brought on by his solitary contemplations of death, the blizzards and the dwindling supplies of food that he had eaten raw because there was no wood to light a fire. The rodents dying in front of him as he meditated, their bodies frozen stiff by cold." (ARS 154)

Subsequently, the snow melts and the Naga Baba finds his teacher standing at the door of the temple. The teacher orders him to experience the harsh ecology of deserts. His teacher asks him to cross India barefoot and experience the hardships of living through the desert. Also, he is asked to live without water. Walking barefoot without water assimilates him with nature. He survives like a plant in all these hardships. Further, he is also asked to cross all human limitations. As a result, the Naga Baba sits in the cremation ground without food or water for nine days. He applies ash on his body, with his matted hair and the human's skull bowl, he sits in the cremation ground. The bowl of human skull amplifies the hollowness of human life. The human skull bowl also symbolizes that it is just a bowl without life left in it—a product of nature. His stay in the cremation ground and the human skull bowl indicate his closeness with the realities of life. For the common people, it is ecophobic site. The narrator details:

Now the prospect of sitting in the cremation ground without food or water for nine days no longer frightened the Naga Baba as it once had done. But he could see fear on the faces of the people crossing the road to avoid him. He knew his skin, gray under its daily application of ash, his matted hair falling to his waist in untidy knots, the human skull from which he ate and drank, were all terrifying reminders of death to ordinary people. He also knew they believed he possessed superhuman powers, the ability to levitate and to place irrevocable curses on any who displeased him. (ARS 154)

Further, the Naga Baba lives at a cremation ground near the funeral pyre and collects the ash from the burning pyre. The Naga Baba goes to the Dom and smears a pinch of ash on the Dom's forehead. The Naga Baba, after his meditations takes a bath in the water. After the bath, he comes and sits beside a funeral pyre. His intimacy with the cremation ground and the burning pyre exhibits the mystic ecoculture as well as ecophobia. The narrator keenly notes:

He went down to the stream to bathe. With the water still dripping from his body, he sat beside a funeral pyre where a body had just been cremated. The small of smoldering wood and the acrid aroma of burned flesh was still strong in the summer night as he took handfuls of the charred wood from the pyre and crumbled it between his fingers, throwing out fragments of bone and flesh before rubbing the ash over his hair and body in the ascetic's bath that would increase the power of his meditations. (ARS 155)

CONCLUSION:
Gita Mehta's *A River Sutra* explores the vivid phases of nature at varied sites experienced by the narrator and the characters. Characters in different short stories experience fear, anxiety, agony and hardships in nature. These stories are the reactions to nature and the changing ecology. Ecology, through various instances in these snippets showcases phobia that the characters and the narrator experience.

REFERENCES:
* Mehta, Gita. *A River Sutra*. Vintage Books, New Delhi, 1993. Print .

A NEW AND START UP VENTURE CAN UPLIFTS ECONOMY IT CHALLANGES AND SUCCESS. CASE STUDY- JSW TORNAGALLU BELLARY DIST

Dr. Rafiya
M.A., Ph.D Economics

Is business management uplifts economy…..yes

Without business there is no economy in the country business may be small or big business mangament is important… my topic is BUSINESS MANAGEMENT UPLIFTS ECONOMY…..YES incially a business start from small venture and to become big and successful lot of efforts team work hierarcy efficiment mangement plays key role in up liftment of business.

To prove this I have taken case study JSW TORNAGALLU BELLARY DIST. It was state in small village today it world wide this business not only provided huge income to the country improved surrounded villages provided employment to lakhs of people, which burning problem of the country ,education to the people hospitals facilities, n number of apartments, market, shops, beauty salon, garment shop, stationary, gym , hotels restaurents etc these provided income to the people it is again because of the industry.

Here i am providing detail successfull story of jsw and efficient management.

JSW Steel Ltd. The flagship company of over $11 billion JSW Group, JSW Steel is one of India's leading integrated steel manufacturers with a capacity of 18 MTPA. It is one of the fastest growing companies in India with a footprint in over 140 Countries. JSW Steel is an Indian steel company owned by the JSW Group in Mumbai, Maharashtra, India JSW Steel, after merger of ISPAT steel, has become India's second largest private sector steel company. The current installed capacity is 18 MTPA. A $11 billion conglomerate, with presence across India, USA, South America & Africa, the JSW Group is a part of the O.P. Jindal Group with strong footprints across core economic sectors, namely, Steel, Energy, Infrastructure, Cement, Ventures and Sports .JSW's history can be traced back to 1982, when the Jindal Group acquired Piramal Steel Limited, which operated a mini steel mill at Tarapur in Maharashtra and renamed it as Jindal Iron and Steel Company (JISCO)

The Group set up its first steel plant in 1982 at Vasind near Mumbai. Soon after, it acquired Pirmal Steel Ltd., which operated a mini steel mill at Tarapur in Maharashtra. The Jindal's who had wide experience in the steel industry, renamed it as Jindal Iron and Steel Co. Ltd. (JISCO). Jindal Vijayanagar Steel Ltd. (JVSL) was set up in 1994, with its plant located at Toranagallu in the Bellary-Hospet area of Karnataka, the heart of the high-grade iron ore belt and spread over 3,700 acres (15 km) of land. It is just 340 kilometres from Bangalore, and is well connected with both the Goa and Chennai Port. In 2005, JISCO and JVSL merged to form JSW Steel Ltd.

JSW Steel has also formed a joint venture for steel plant in Georgia. The Company has also tied up with JFE Steel Corp, Japan for manufacturing the high grade automotive steel. The Company has also acquired mining assets in Republic of Chile, United States

A multi-billion-dollar conglomerate, with presence across India, USA, South America & Africa, the JSW Group is a part of the O.P. Jindal Group with strong footprints across core economic sectors, namely, Steel, Energy, Infrastructure, Cement, Ventures and Sports.

The JSW Group is amongst the leading conglomerates in India, with presence across the vital sectors of the Indian economy. With a diverse workforce of over 40,000 individuals, JSW is known to be the "strategic first mover" to venture away from status quo, have the conviction to make fundamental changes and drive operational EXCELLENT.

Type	Public company
Traded as	BSE: 500228 NSE: JSWSTEEL
Industry	Steel
Founded	1982
Founder	Sajjan Jindal (Chairman)
Headquarters	Mumbai, Maharashtra, India
Area served	Worldwide
Key people	Sheshagiri Rao MVS, Dr.Vinod Nowal
Products	Steel, flat steel products, long steel products, wire products, plates
Revenue	₹571.68 billion (US$8.9 billion) (2016-17)[1]
Profit	₹13.34 billion (US$210 million) (2013-14)[1]
Number of employees	11103
Parent	JSW Group
Subsidiaries	Ispat industries Ltd
Website	www.jsw.in

CHAIRMAN

Mr. Naveen Jindal has many facets to his personality. He has represented Kurukshetra in the 14th and 15th Lok Sabha, is the Chairman of Jindal Steel and Power Limited (JSPL), Chancellor of the O.P. Jindal Global University (JGU), President of the Flag Foundation of India (FFI), a sports enthusiast and a family man. The Jindal Group, owns many plush addresses in the country, but nothing comes close to the charm **Naveen Jindal**, politician-industrialist's Delhi abode, Jindal House. Valued between Rs 125-150 crore, by Times News,

Mr. Naveen Jindal

The youngest son of **Shri O.P. Jindal**, the steel visionary and former Member of Parliament and Minister for Power in the Government of Haryana, Mr. Naveen Jindal is the man behind the transformation of a moderately performing company into a world class organisation. After consolidating its position as a leading player in the steel, power, mining and infrastructure sectors domestically, JSPL has now international operations in Africa, Oman, Australia and Indonesia besides its wide spread presence in India.

He has been ranked amongst the Asia's 25 Hottest People in Business by the Fortune Asia magazine for turning a struggling steel company into an Asian blue-chip giant. He has also been ranked as India's Best CEO by Business Today based on a BT-INSEAD-HBR study of top value creators for the period 1995 to 2011. JSPL has been rated the Second Highest Value Creator in the world by the Boston Consulting Group (BCG) of USA.

Also, in 2011 he figured in the Economic Times-Corporate Dossier list of India Inc's most Powerful CEO's. India Today named him among the Most Influential People in the state of Haryana and Ernst & Young conferred upon him the Entrepreneur of the Year Award in the field of Energy and Infrastructure in 2010.

He is not only a successful entrepreneur but also a caring politician, a compassionate social servant and an effective parliamentarian. He represented Kurukshetra Parliamentary Constituency (which has a population in excess of 2 million) in the 14th and 15th Lok Sabha.

He started his active participation in politics during his college days, during which he was the President of the Student Government and recipient of the 'Student Leader of the Year Award' at the University of Texas at Dallas (UTD). He is a management graduate from the UTD and was awarded the Distinguished Alumni Award for 2010 by the University for his contribution to public service, being a responsible corporate citizen and guiding his company in becoming a global player.

In recognition of his exceptional distinction in the fields of entrepreneurship and public service, unqualified reputation for honesty, personal integrity and high standards of personal and professional character, the UTD's school of management has been christened as the Naveen

Jindal School of Management. This recognition has led to the establishment of the Naveen Jindal Institute for Indo-American Business Studies.

In recognition of his outstanding contribution to legal education and corporate philanthropy, Mr. Naveen Jindal who is also the Founding Chancellor of the O.P. Jindal Global University was conferred with the Justice P.N. Bhagwati Award by Dr. A.P.J. Abdul Kalam, former President of India.

The dominant themes in his public agenda reflect his determination to work for a cleaner, safer and more equitable world, free of hunger, corruption, population instability and gender biases. Equally he is committed to issues like women's empowerment and promotion of sports at all levels. His ideology is to incorporate the best practices of business management into politics.

As issues of national pride and self-esteem have always been of utmost interest to him, he single-handedly took up the cause of restoring in Indians a national pride, choosing the Tricolour as his symbol. His decade long crusade culminated in a historic judgement by the Supreme Court of India, on January 23, 2004 that upheld the right of every Indian citizen to fly the National Flag freely, with respect and dignity. Following this, in response to his continuing campaign, the Home Ministry agreed in December 2009 to allow the flag to be flown at night when it is installed on a monumental flagpole with proper illumination. Further, on February 18, 2010 he got the Rules Committee of Indian Parliament to allow Members of Parliament to wear the National Flag on their lapels while seated in the House.

He is currently putting up 100 feet and 207 feet high monumental flags across the country. Over 64 monumental flags have been hoisted so far. Also, he is a national record holder in skeet shooting and an accomplished polo player.

Wel-come to the world's sixth largest steel plant
Located at Toranagallu village in the Ballari-Hospete iron ore belt, our 10,000-acre, fully integrated Vijayanagar steelworks is well-connected to both Goa and Chennai ports. With our cutting-edge of technology and constant innovation, it has emerged as a steel plant with one of the most efficient conversion costs globally.

Do you know how many steel plants exist in India? Which company manufactures the maximum production of steel? At what pace the top steel producing company is progressing? And how that company's growth will help in the overall development and progress of India? Let us unravel the success story of the JSW Steel, India's fastest growing and largest private sector steel company:

It houses India's largest blast furnace and the widest hot strip mill. It is the first in India to use the Corex technology for hot metal production. One of its unique feature is that it is among the first in the world to successfully utilise corex technology to produce "green steel". [Check the Share Price Details of JSW] History: The history of JSW Steel dates back to Nov 9, 1982 when the Jindal Group acquired Piramal Steel Limited at Tarapur in Maharashtra (that was formed on May 11, 1974) and renamed it as Jindal Iron and Steel Company (JISCO). In 1994, Jindal Vijayanagar Steel Ltd. (JVSL) established a steel manufacturing plant at a remote village of Toranagallu in the Bellary-Hospet area of iron ore belt of north Karnataka, spread over 3,700 acres of land.

The surrounding barren land was transformed into a Township. The Township boasts of a multi-speciality hospital, stadium, better education facilities for students, and basic amentities for nearby vilages. All the magnificence is an effort laid by each and every worker of the steel plant. Some interesting facts:

JSW is India's first company to produce 1 crore tonne of steel per annum. India's first corex furnace unit was established in 1996 at this plant for hot metal production and within two years, it started its operations. Corex is a technology in which there is almost no pollution is emitted, during steel production. JSW got its first oxygen plant in 1999. The process waste that is formed during the steel production is reused to make cement, at a separate cement plant. Besides steel, JSW also has plants that produce oxygen, hydrogen and nitrogen, through the medium of air separation. It generates 1,700 Mega Watt of power (electricity), that is supplied upto Maharashtra, except Toranagallu.

It is India's first steel company that implements total integrated resource planning solution and has reached 10 Million Tonnes Per Annum (MTPA) capacity at a single location. In 2009, JSW became the maximum quantity of producing steel unit. Everyday, it manufactures 500 tonne of steel. JSW's Vijayanagar plant has India's largest blast furnace, that was established in 2009. Currently, JSW produces 1.2 crore tonne of steel and aims to produce 1.6 crore tonne of steel by 2016.

In future, it plans to manufacture 2 crore tonne of steel by 2020 and 4.5 crore tonne of steel by 2025. Coal and other required material is imported from Australia and Brazil.

JSW Vice President (Admin), Mr Manjunath Prabhu said that "Make In India" initiative can take the country to a new level of development on the global platform. He also said that China produces more than ten times of steel than India and exports it to various countries, while adding that India can give tough competition to China's market, if the government brings some amendments in its policies.

Jindal Steel and Power Ltd (JSPL) clocked a net profit of ₹5,527 crore for the financial year 2020-21. In the previous financial year, JSPL had reported ₹574 crore net loss.

For the fourth quarter ended March 2021, the company reported a 23 times jump in its consolidated profit after tax (PAT) to ₹1,900.51 crore. Its net profit in the year-ago quarter was at ₹82.13 crore.

PARAMETER	FY 2019-20 (Rs. In Crores)	FY 2018-19 (Rs. In Crores)
Gross Revenue*	**30,021**	**31,806**
EBITDA	5,777	6,017
PAT	618	(263)
NET DEBT / EBIDTA	2.54x	~ 3.00x

Jindal profit sheet

Particulars	Mar 2021; ().Cr	Mar 2020; ().Cr	Mar 2019; ().Cr	Mar 2018; ().Cr	Mar 2017...
Sales Turnover	33346.19	26323.62	27863.33	18112.34	16094.68
Excise Duty	0.00	0.00	0.00	457.87	1645.51
Net Sales	33346.19	26323.62	27863.33	17654.47	14449.17

PRODUCTS

- Hot Rolled Product

- Cold Rolled Product

- Galvanised Product

- Pre-painted Galvanised Product

- Electrolytic tinplate

- TMT Bars

- Wire Rods & Special Steel Products

- Color Coated products

- Electrical Steel

Competitors of JSW Steel are Tata Steel, Essar Steel and SAIL.

REFRENCES

1. http://www.jindalsteelpower.com/contact/network-address.aspx

2. Jump up to:[a][b] *"Management Details". Jindal Steel and Power. Retrieved 5 June 2020*

3. Jump up to:[a][b] *"Jindal Steel & Power on the Forbes Global 2000 List". Forbes. 31 May 2013. Retrieved 1 December 2013.*

4. *"Jindal Steel and Power Limited". BSEindia.com. Retrieved 2 December 2013.*

5. *"Jindal Steel and Power Limited". NSE India. Retrieved 2 December 2013.*

6. Jump up to:[a][b] *"Annual Report 2013-14". Jindal Steel and Power. Retrieved 6 September 2014.*

7. Jump up to:[a][b] *"Shareholding pattern". BSE India. 30 September 2013. Retrieved 2 December 2013.*

8. *"JSPL launches 'Jindal Panther' TMT Rebars". 8 August 2013.*

9. *"Coalgate: Norm violated by government to favour Naveen Jindal". IBN Live. 6 September 2012. Archived from the original on 8 December 2013. Retrieved 1 December 2013.*

10. *"Congress MP Naveen Jindal blames government for coalgate". IBN Live. 7 September 2012. Archived from the original on 8 December 2013. Retrieved 1 December 2013.*

11. *"India's Bolivian ore". The Australian. 3 December 2007.*

12. *"Jindal Steel to exit from $2-b mining contract with Bolivia". 9 June 2012.*

13. Jump up to:[a][b] *"Management Details". Jindal Steel and Power. Retrieved 5 June 2020.*

Objective of the paper- it was a small remote place now it is big industry with job and income to the localities, garment shop, hotels, departmental stores, schools, colleges, hospital, banks, vegetables shops, apartments, barbar shops so many facilities and other amenties due to this huge income flow among people drastic changes in their lifestyle improved standard of living massive contribution to the economic developmement.

I tried covering jsw- their products, total number employees, their income, revenue, profit, parameters, competitors, braches etc.

INNOVATIVE APPROACH TO THE FORMATION OF A MORAL WORLDVIEW AMONG MEDICAL STUDENTS

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ANNOTATION

The article deals with the issues of moral education of future doctors, analyzes the issues of compliance with the principles of morality in the context of a pandemic and innovative approaches to the formation of a moral worldview based on the specifics of medical education based on the integration of knowledge of such sciences as physiology, biology, medical psychology and bioethics.

Keywords: morality, the process of moral education, entrogenic elements, extragenic elements, integration of knowledge, ethical thinking, moral feelings.

Reforming and improving the system of national education and upbringing are the basis for the success of the revival of our state, overcoming the general crisis of society. V.D. Shadrikov considers spirituality as the main force of the formation of humanity. At the heart of the origins of spirituality, the author points to such factors as the development of the brain, intelligence, the formation of consciousness, etc. The coronavirus pandemic poses a question to humanity with a new urgency, to which medicine has been looking for an answer since the middle of the last century, namely, "How to form a moral worldview among future doctors, what moral values should operate in the doctor's work?"

Of course, there are basic principles that a doctor must follow:

1.To be useful and not to cause harm.

2. To protect the personal freedom of both the doctor and the patient.

3. To protect human dignity.

4. Tell the truth and keep promises.

5. To observe justice and restore it.

It is clear that these principles should be the basis of any medical activity. And it should also be noted that compliance with the above principles first of all requires the formation of a moral worldview among future medical professionals. Because in the conditions of a pandemic or extreme situations, we can rely only on the moral worldview of medical workers. Based on this, such a task as to increase the effectiveness of moral education and to form a moral worldview in future doctors should come to the fore. To do this, you need to pay attention to the following areas:

1. Humanization of the educational process and education of the correct perception of the situation;

2. To form a philosophical approach and moral thinking.

3. Deepening of purposeful influence, taking into account the interests and motives of students, as well as the individuality of the student in the process of moral education;

4. To take into account the specifics of medical activity, to use the knowledge about the human being that is associated with medical research.

A doctor is required to have high morality, moral consciousness, conscientiousness and honor. These qualities are brought up over the years in the process of moral education. This means that it is necessary to approach the process of moral education in medical universities with great responsibility, and also take into account the specifics of the activity.

Based on these considerations, we have deeply studied the current concept of moral education, conducted a thorough analysis of the existing situation, identified the existing shortcomings and their causes. Moral education is a systematic educational impact on the human personality, aimed at the formation of socially consistent moral qualities in a person. These include responsibility, kindness, honor, dignity, humanity, a high culture of behavior, understanding and striving to preserve universal values, the development of moral beliefs and habits, a high culture of interethnic relations, patriotism, and the stability of the scientific worldview. From the definition of the Pedagogical Encyclopedia given above, it becomes clear that morality can only be considered as a complex, multi-level system combining such qualities as reason, will, feelings. The creation of a stable system of moral beliefs, thanks to which a person can independently understand the boundary between moral and immoral, is determined by the unity and harmony of moral consciousness, expressed in stable moral habits. This belief system informs us about the level of development of a person 's moral worldview .

Currently, pedagogical science considers moral issues as a social need. And this concept serves as the basis for the organization of moral education. During the process of moral education, the main attention is paid to the external elements of education, i.e. the education of moral behavior and the culture of communication. However, we approach the education of moral consciousness, the formation of moral feelings and moral worldview superficially. Moral education, which is not supported by awareness and feelings, cannot be full-fledged and does not meet modern requirements.

We use the following methods in the process of moral education: teaching, explanation, personal example, training, encouragement, punishment. These educational methods are effective in fostering a culture of communication, moral behavior with the participation of a teacher-educator. But, the above methods are not effective enough for the formation of a moral worldview, moral feelings like honor, conscience, duty, especially in higher educational institutions.

The education of moral consciousness is based primarily on the thinking of the individual, but we hardly use the method of scientific analysis in the process of moral education. And we also do not study such a question as the specifics of activity and morality in thinking. Meanwhile, it should be emphasized that the education of moral consciousness should be based on moral thinking. Moral thinking is thinking within the framework of morality.

We do not think and do not reflect on the fact that non-compliance with the norms of morality can eventually lead to negative physiological, psychological changes in the human body. We treat the issues of morality only as a social requirement and study this issue from a narrow perspective. And this leads to a one-sided and narrow approach in moral education. As a result, the possibility of achieving deliberately planned goals in the process of moral education is lost. It is not enough to form a moral worldview, beliefs and principles that are considered the basis of moral education of the individual. Only the integration of disparately developing sciences can provide solutions to the global problems that have arisen. Because integration expands the range of research and enables an integrated approach. Based on these logical arguments, it is advisable to organize scientific research through the integration of sciences. The synthesis and creation of unified conclusions of scientific discoveries of related sciences are sources of solutions to new problems or the emergence of new directions. Proceeding from these considerations, in our scientific research, when solving the problems of moral education, we turned to the integration

of sciences, to the collection of information, synthesis and development of unified conclusions that are stated in the field of biology, biophysics, physiology, bioethics, bioenergetics and medical psychology. All these disciplines are studied in one way or another in medical universities. This means that in medical universities, an integrated approach to moral education and, in particular, the formation of a moral worldview has huge opportunities.

By integration in the pedagogical process, researchers understand one of the aspects of the development process associated with the unification of previously disparate parts into a whole. Integration in pedagogy is the main way to solve the problems of successful implementation of graduates in the outside world. Integration is the unification of several ideas, points of view, spheres of activity, etc. into one whole. This process can take place both within the framework of an already established system and within the framework of a new system. The essence of the integration process is qualitative transformations within each element included in the system. The problems of integration in pedagogy are considered in different aspects in the works of many researchers. In the works of A.V. Petrovsky, N.K.Chapaev, the issues of integration of pedagogy with other sciences are considered. The multidimensional vision of integration demonstrated by the German researcher G. Pavelzig contributes to an adequate understanding of the role of integration and disintegration processes in the course of pedagogical activity. Currently, the problem of integrating the content of education is relevant and one of the most promising. Today, we must pay special attention to deepening the processes of moral education, enriching the content, developing moral and spiritual consciousness and worldview, moral feelings, forming new approaches to moral education based on the integration of knowledge related to moral issues. It is this approach to solving issues of moral education that is considered appropriate, it makes it possible to enrich the content of moral education, to understand the necessity and importance of moral education, to realize that morality is currently entering the arena not only as a social, but also as a personal need in the process of survival of society and each individual. Such a holistic approach will increase the effectiveness of moral education and will serve as a motive for the student 's independent work on himself .

By revealing the influence of morality on the biological essence, on the health of an individual, we will be able to awaken new motives and personal interests in future medical professionals. The study of moral canons based on human physiology, biology and psychology will open up new opportunities in the process of moral education, expand the worldview, enrich the content of moral education and increase the effectiveness of this process. Having introduced the specificity of medical education, we studied the issues of morality from the angle of biological and physiological laws. We studied how moral feelings such as respect, love, joy, gratitude, honor affect human health. The influence of negative feelings on human health was compared. This approach changed the attitude of students to moral education, aroused personal interest and formed moral consciousness, strengthened knowledge about moral culture. Such an integrated approach has yielded results. Students' attitude to moral issues has changed, personal interest in the moral issue has awakened. This, of course, will serve as an impetus for further self-development in moral education.

If we compare the experimental groups, we can see that students have increased interest in the subject being studied and, as a result, academic performance has increased from 62 percent to 72 percent. With an integrated approach, the perception and understanding of the essence of moral education broadened the horizons of knowledge, which in turn strengthened moral consciousness, moral beliefs and served as the basis for the formation of a moral outlook among future medical workers. Because the teaching embodies not only social, but also personal interests, the integration of knowledge has a tremendous educational impact and high results.

LITERATURE

1. Трошин, П. Л. Нравственное воспитание: понятие, сущность, задачи / П. Л. Трошин. — // Молодой ученый. — 2016. — № 8 (112). — С. 884-887. 2.М.К.Хашимова. Проблемы нравственного воспитания. Журнал «Вопросы гуманитарных наук».– М.:2009. – № 2. С. 207–300 lists.

3. M. K. Khoshimova . Problems of Bringing up Moral Perfect Personality Eastern European scientific journal. 4-2018. P.180.

4. Шамов. И.А. Биоэтика. Учеб. пособ.-М.:Медицина, 2009.-369 с.

DESIGN AND DEVELOPMENT OF CLOUD CUSTOMER SERVICES USAGE PATTERN BASED ATTACK DETECTION WITH FORENSIC METER FOR ENABLING QUICK REPORTING AND CLOUD DATA RECOVERY

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ABSTRACT

Cloud forensic is an interdisciplinary research of cloud computing and cyber security. Cyber forensic can be applied and required in various cloud computing services such as Infrastructure-As-A-Service (IaaS), Platform-As-A-Service (PaaS), Software-As-A-Service (SaaS) and Data-Storage-As-A-Service (DSaaS). Any attacks on software, platforms, infrastructure and storage must be investigate, report and recovered by cloud forensic techniques. Many cloud forensic techniques has been innovated and proposed in literature and tools have been using in IT industries to provide secure cloud services. With this evaluation of techniques and tools, attackers evolve their anti-forensic techniques as well to break the security measures. Hence the continuous monitoring and research care is indeed required in cyber security and forensic fields. Hence, many prestigious organizations like DRDO, CDAC, Microsoft, Google and Amazon etc. have been giving highest priority on cloud resources and functioning towards improving the cloud security and cloud forensic systems.

Keywords: Cloud Customer Services, Pattern Based Attack Detection, Forensic Meter, Cloud Data Recovery

I. INTRODUCTION

With the increased usefulness of cloud computing services, exploitation of possible security vulnerabilities is increasing at the same time. The distributed nature of cloud computing, on-demand services makes it an attractive target for potential attacks that are intended to infringe cloud protection. Despite security threat making delay in cloud migration, cloud computing became a primary necessity because of its industry ready solutions. Many cloud attacks were reported in literature. Hence, the forensic techniques to ensure its attack tracing are in demand. We propose a technique called Cloud Customer Services Usage Pattern (CCSUP) Based attack Detection with Forensic Meter (FM) Technique. Customer cloud usage log is key information that helps to analyze the attacker behavior during attack and footprint after the attack. Every customer has their own usage pattern which refers their access privileges, standard time and duration of usage, operations mode and speed, and user profiles etc. This usage pattern can be calculated and kept it as cloud customer usage pattern for future reference. Any variation in reference pattern can be consider as suspicious and starts analyzing the behavior, footprints and logs related to it, hence the detailed investigation is feasible.

II. LITERATURE SURVEY

Cloud computing is an emerging paradigm enabling clients to obtain computing services and resources such as networks, servers, storage, and applications. It provides services according to a business model based on pay-per-use [1].Intrusion Detection System (IDS) is a proactive surveillance system and security mechanism to defend sensitive IT infrastructures against malicious behavior. Cyber-attacks can compromise sensitive data and critical applications. IDS generally fall into two groups: the detection group based on signatures and the detection group for anomalies [2].IDS can previously defend cloud-based system from different types of attacks but cannot detect suspicious activities in a cloud environment [4]. IDSs can be broken down into: I host-based IDS: sensors that detect an intrusion centered on a single host. (ii) Network-

based IDS: Segmented network sensors. (iii) Distributed IDS: It integrates all types of sensors. It can be categorized as Mobile User IDS, Grid-based IDS and recently Cloud-based IDS.

Current IDSs are mentioned in Table 4.1 [5-12] with a number of shortcomings. Intrusion thwarts acceptability in a cloud environment. Cloud based Intrusion attacks are I Masquerade attacks (ii) Host-based attacks and (iii) Network-based attacks. Table 4.2 illustrates the identified existing intrusion attacks and its correspondence solutions .

III. PROPOSED SYSTEM

The idea of cloud service usage patterns and its observation forms the basis for looking into cloud customer usage pattern logs approaches to resolve forensic challenges. To address the challenges of current forensic techniques we propose Multisource Cloud Logs Forensic technique. The proposed CCSUP technique has two phase's namely cloud customer service usage generation and forensic investigation. In generation phase, CCSUP collects the customer usage pattern and stored at CSPs server. The CCSUP requires a database to store the usage pattern which is hosted in the server at the CSP. In CCSUP forensic investigation phase, CCSUP usage pattern gets checked against their present usage pattern. If any change in pattern, gets handled by Forensic Meter (FM). The FM value gets increased automatically. Once it reaches the specific threshold, reporting and recovery takes place automatically. On every attack confirmation, the forensic investigation phase triggers automatically to investigate the footprints.

The design of proposed CCSUP technique has been carried out to present the customer cloud usage pattern generation and forensic investigation. The proposed design involves:

1. An overview of proposed technique presents the way in which CCSU pattern gets generated,

2. An architecture of proposed technique depicts the CCSUP applicability in cloud scenario, and

3. The sequence and data flow for the CCSUP pattern generation and forensic investigation technique is presented.

4. State chart diagram to represents it different state during processing The development of proposed CCSUP technique has been carried out to assuage the cloud forensic and security developers and the proposed development involves:

5. A flow chart for CCSUP pattern generation and forensic investigation,

6. A petrinet model developed to understand analytically

7. An object oriented class structure to develop a class definition, and

The evaluation of the proposed CCSUP technique has been carried out to examine in forensic investigation. The evaluation methods are as follows: The perfection of CCSUP technique forensic investigation using finite automata theory, Figure 1 shows the basic idea of cloud intruder detection and prevention system.
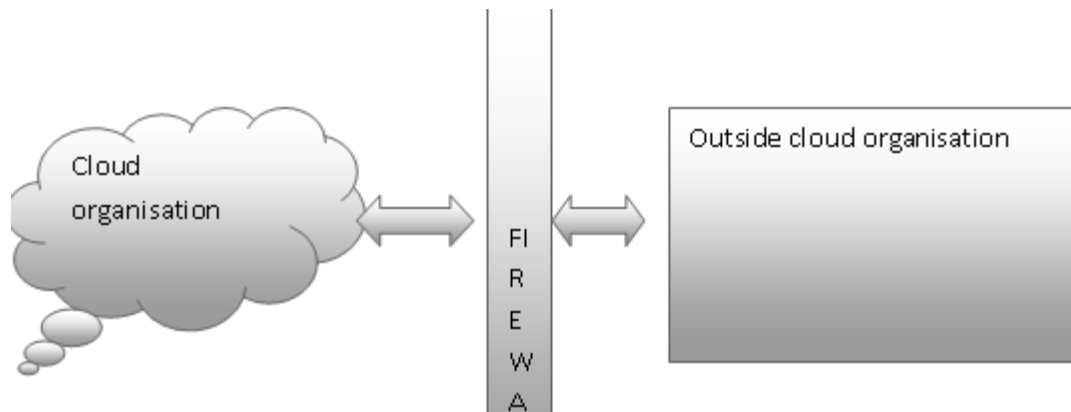
Figure 1Cloud intruder detection and prevention system

figure 2 Honey pot as a service, Honey pot is more a tool of detection and response than prevention. Honey pots can't prevent a particular virus or worm intrusion or spread, it purely collects information and detects patterns of attack. Honey d detects and logs any UDP or TCP connections. It helps cloud vendors add the database of signatures listed in blocks.
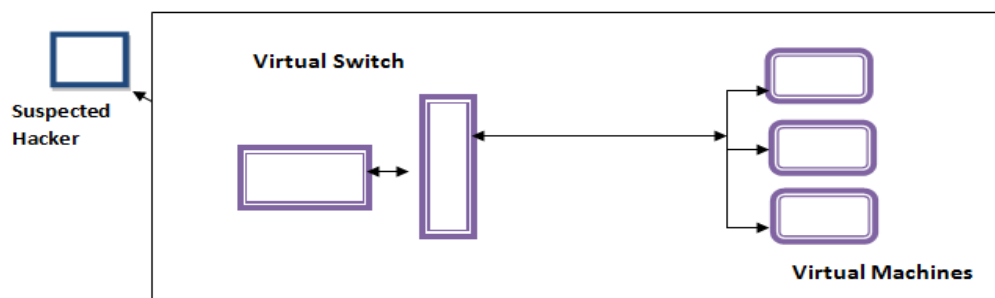
Figure2 : Honey pot as a service

Proposed technique state chart to depicts different states has been presented in fig 3 where the CCSUP techniques moves from states to state.
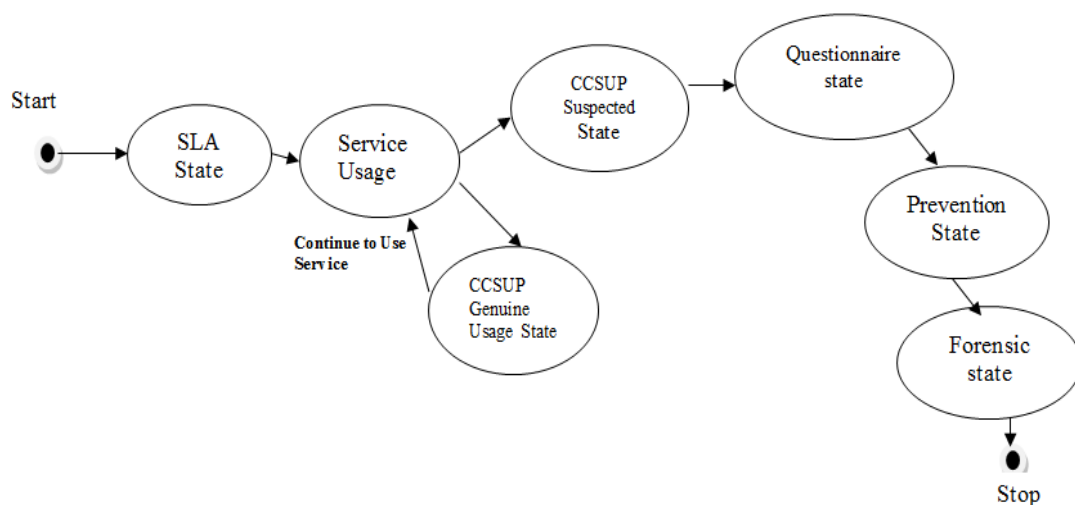
Figure 3 State diagram of the proposed system

IV. METHODOLOGY

To overcome the drawback of contemporary forensic investigation methods in cloud services we have proposed the CCSU pattern generation and forensic investigation technique. The design of the proposed technique involves presenting overview, architecture, state chart and data flow diagrams. We have used IBM rational rose software to provide design solution part of proposed CCSU pattern generation and forensic investigation technique.

The next part is to development of flowchart, class diagram and object diagram. Open source UML tools and text editors have been used to complete development phase. The perfection of CCSUP technique forensic investigation is done using automata theory.

V. RESULTS:

The attacker machine was then used to create an Architecture specific payload, named "test2.exe".
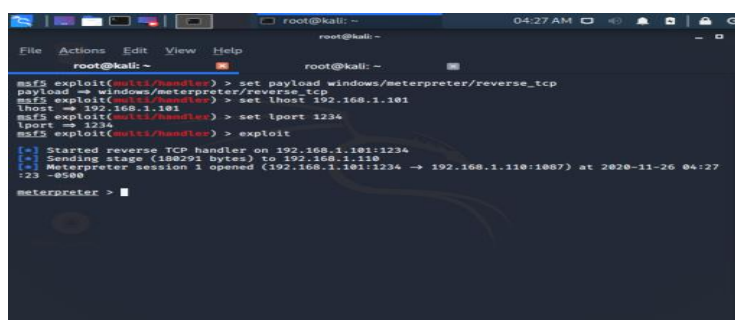
Metasploit was then launched using 'msfconsole'. The payload, lhost,lport, parameter was set. The exploit was then run, which allowed the attacker machine to listen on port 1234.

The file was then saved to the Desktop as shown

Upon running the file on the target machine, a reverse shell was opened on the attacker's machine.
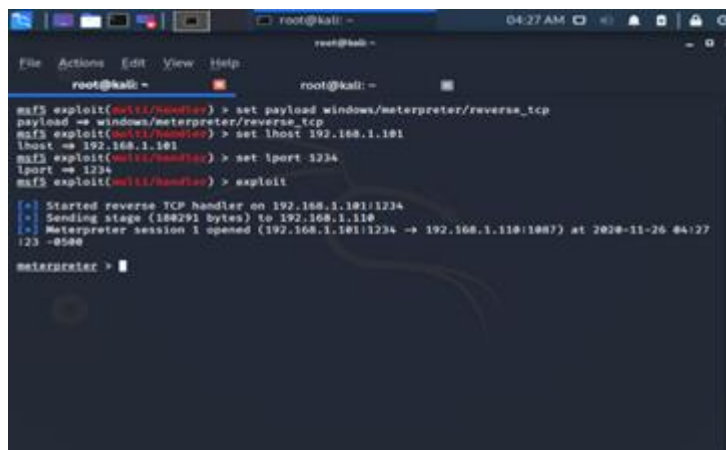
The attacker was able to fetch the current working directory as well.

The attacker was able to see the list of processes on the target machine. The created file was then uploaded to the target machine.

CONCLUSION

The Test-bed performed displayed that a custom payload delivered to the system allowed the attacker's machine to bypass the Windows Firewall and achieve a remote shell session. In effect, it allowed the attacker to perform actions that a physical user would – and additionally, if desired, offered a pathway to escalate to Administrator privileges and obtain complete control of the system.

REFERENCES:

1.   Almulla, S., Iraqi, Y. and Jones, A. (2013). Cloud forensics: A research perspective. In *9th International Conference on Innovations in Information Technology (IIT)*. Abu Dhabi: Ieee, pp.66–71.

2.   Birk, D. (2011). Technical Challenges of Forensic Investigations in Cloud Computing Environments. , pp.1–6.

3.   Guo, H., Jin, B. and Shang, T. (2012). Forensic Investigations in Cloud Environments. In *2012International Conference on Computer Science and Information Processing (CSIP)*. Xi'an,Shaanxi: Ieee, pp. 248–251.

4.   www.gartner.com/it /page.jsp?id=920712, Gartner, Gartner says worldwide cloud services revenue will grow 21.3 percent in 2009, Stamford, Connecticut, March 26, 2009

5.   F. Gens, IT cloud services forecast – 2008 to 2012: A key driver of new growth, October 8, 2008

6.   K. Kent, S. Chevalier, T. Grance and H. Dang, Guide to Integrating Forensic Techniques into Incident Response, Special Publication 800-86, NIST, Gaithersburg, Maryland, 2006

7.   S. Liles, M. Rogers and M. Hoebich, V, G. Peterson and S. Shenoi (Eds.) , "A survey of the legal issues facing digital forensic experts, in Advances in Digital Forensics", Springer, Heidelberg, Germany, pp. 267–276, 2009.

8.   P. Mell and T. Grance, "The NIST Definition of Cloud Computing (Draft), Special Publication 800-145 (Draft), NIST, Gaithersburg, Maryland, 2011

9.   Keyun Ruan, Joe Carthy, Tahar Kechadi and Mark Crosbie, Chapter 2, CLOUD FORENSICS, 16-26.

10. Chuvakin, K. Schmidt, Chris P. "Logging and Log Management: The Authoritative Guide to Understanding the Concepts Surrounding Logging and Log Management", Syngress, 460 pages, 2013.

11. Abdullah Gani, Suleman Khan, et. El , "Cloud Log Forensics: Foundations, State of the Art, and Future Directions", ACM Computing Surveys, Vol. 49, No. 1, Article 7, May 2016.

12. Flegel, Pseudonymizing, " unix log files", In Infrastructure Security. Springer, Berlin, 162–179,2002.

PRODUCTION OF NATURAL DYE FROM EGGPLANT PEELS AND ITS ALLERGIC TOLERANCE

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ABSTRACT

The use of color additive makes in food industry on a routine basis, in order to retain or revive the original color odor and appearance of a food. This is an main factor which influences the choices and satisfaction of the consumer at the time of purchase.The natural dye which can be extracted from purple colour egg plant was found to be higher when compared with green color varieties. In this study methanolic extract of different damaged egg plant skins were dyed to the scoured cotton fabrics in the form of purple, yellow and green colour. These fabrics were mordent with alum acetate/ acetic acid for fastening of the imparted colours.

Keywords: Colorant,Dye, Fabrics, Plant peel,

INTRODUCTION

Natural dyes from plants have been carried out in so many years alternate to the environmental threat and dangerous effects raised by artificial dyes and awareness created by researchers. In this decade, the emerging interest in rapid use of natural products by the people, which have more nutritive, safe and best to the quality of life and environmental protection. It has led to a reuse of natural dyes to the fabrics. In latest field of research showed the excellent properties of plant based dyes for its use in the dairy, food, cosmetics and for dyeing of cotton and artificial fibre.

Natural dyes have good biodegradable and compact with the natural sources. It is safe, non-allergan, anti-carcinogenic, easily extractable and renewable (Adeel et.al.,2009;, Pruthi N., Chawla G. and Yadav S ,2007; Saha P. and Dutta S,2007; Siva R.2007,Jothy,2008;;Onal A,1996). The problems with the use of plant based dyes in clothes dyeing are color better, more complex in dying , output results, latest color shades, blending nicely and quick fastness properties. But these obstacles can be reduced with mordants (Sachan K.and Kapoor V.P,2007; Adeel et.al.,2009) Surfactants are mixed to the dyeing system and intense the dye product solution for proper handling and in order to get homogeneous dyeing results. Coloring pigments present in plants which are mainly extracted from different parts of the plant (Adeel et.al.,2009; Katz,D,2004;Kumaresan M., Palanisamy, PN. and Kumar,PE2011).

The plant pigments of colouring additives which are tiny molecules with low molecular weight made of non-protein. It is should be responsible in triggering of allergies. This non protein components may activate the immune system, only when bound to proteins, act as a complex antigen. The natural additives are extracted from natural sources and other components such as sugars, proteins linked to the colorant, which may lead to an adverse reaction (Vankar P S., Shankar, R. and Wijayapala, S,2009; Pruthi N., Chawla G. and Yadav S ,2007; Samanta, A K. and Agarwal P,2009). The different varieties of egg plants varied with colorance, appearance and texture of vegetable. . Egg plants are marketed vegetables in India in the presence of high antioxidant, phenols and flavonoic constituents (Kamel, M.M., Helmy, H.M And Hawary, N.S ;Singh, P, Singh V.V. And Waghmare VN,2005). The aim of this process was to get plant basedl dye from various colored eggplant peels and dyeing to fabrics with waste.

MATERIALS AND METHODS

Extraction of Dye:

The different coloured damage egg plants were collected from vegetable shops and collected the peels, shade dried until the moisture reduced to below 3 percent. The dried plants were grinded and sieved to obtain the fine powder. The dyes from the plants were extracted by preparing the methanolic extract of the powdered sample (5gm in 25ml of methanol) and subjected into a soxhlet apparatus at 82-85°C at 1hr in 1lt capacity flask. After extraction, the extract was filtered and led to evaporate the solvent leaving the dye behind.

SCOURING:

The starch content present in the fabrics was removed by scouring. The fabrics to be analyzed were weighed. 2% of Washing Soda was added per weight of the fabric and detergent at 5.5% of of fabric. The salts were added to warm water and stirred well. The pre-weighed fabric was added and stirred further for about 20-30 mins holding the temperature at 85°C (Salam, M.A. and Salam,2005; Jothi, D,2008; Vankar PS., Shankar, R. and Wijayapala, S,2009; Aminoddin, and Haji,2010).

BLEACHING

Bleaching is process employed for the washingl of natural coloring material from the fabrics. The key of natural colour is made of organic compounds with conjugated double bonds.. The chemical discoloration takes place by the rupturing the chromophore via breakinging the one or more double bonds with conjugated system. The fabric shows whiter when the bleaching was completed. The fabrics was bleached by adding ascorbic acid(2g) and sodium hypochlorite (3ml) in 200ml of water and boiled at 90°C for 10mins. The material was dried and washed in sterile distilled water.

Mordanting

Mordanting in the fabrics was performed using alum acetate/acetic acid equal to 5% of weight of the cloth material (liquor ratio 1:40). The mordant bath was maintained at a temperature of 30°C for about 1hr along with continuous stirring serves as the firm fixative agent.

Dyeing

The cloth material was dying by 5% of the peel extract to obtain a medium shade range. The dye was soluble in water and maintained temperature up to 30°C and slightly increased in temperature to 80°C with constant stirring for about 45mins. Then the material was removed from the dye bath and treated gently in Sodium Lauryl Sulphate (SLS). The dyed cloth was dried and stretched (Kamel, M.M., Helmy, H.M And Hawary, N.S ;Pruthi N., Chawla G. and Yadav S,2008; Suitcharit C., Awae F. Sengmama W. and Srikulkit K,2010).

Allergic tolerance in using clothes

Dermatology analysis

This is a method for checking the irritancy of fabric cloth is the patch *in vivo* tests on people .It is a reliable test to identify dye substances which causes a potential irritant effect on the skin. This type of irritant reaction is strictly allowed to the part of application of the cloth and regresses in about 2 days. It showed as an allergic, if they cause erythema, edema, and inflammation occurs.

RESULTS AND DISCUSSION

The dye of eggplant peel found to be 13% in this process. The dye product can be achieved by modified procedures. Different plant waste materials can be recycled in the forms of organic manures ,Single cell Proteins etc (Anbuselvi et.al;2016,2009,2014;2017). Many plants gives yellow, green and red color .The cloth dyed with egg plant peel obtained various shades of yellow, violet and brown color (Figure1). The dark red and mixed blue dyes were extracted

from indigo color of *Indigofera tinctoria* (Chanayatht, AI., Sorasak L. and Suree P) Mordants play a main role in sticking color to the cloth. Color strength in dye depends on type of salt with metals used (Kamel, M.M., Helmy, H.M And Hawary,2009; Jothy,2008). The high interaction activity of iron stimulates the co-operativity between the fiber and the dye (Adeel S, Ali S, Bhatti IA. And Zsila F,2009;Jothi, 2008). The specific amino and carboxyl group present in the cloth should interact with the unabsorbed portion of dye. Ternary formation is due to the chemical bonded with metals on cloth and with the dye.

The mordanted fabric was repeatedly applied for dyeing due to light sensitivity. The chromatophore of the dye which makes it restrict to light reaction (Adeel S, Ali S, Bhatti IA. And Zsila F,2009,Jothi,2008) .Rapid light color bleachness was deducted in cloth dyed with the vegetable peel. This stimulates the formation of intermediate due to the metal ions and activates the chromophore by photolysis. The fastness is stimulated by diffusion rate and nature of the coloring material (Jothi,2008). The cloth dyed with eggplant peel dye exhibit better wash capability.. The fabrics dyed with pomegranate and *Basella alba* fruit exhibit good fastness properties (Jothi,2008;Adeel S, Ali S, Bhatti IA. And Zsila F,2009; and chromosomal banding dye of egg plant (Hayfaa A Al-Shammary, Rasha Salh and Haidr Sabah ,2015).

Mordants exhibited different color shade pattern to the cloth. Ssoft and light colors was applied to silk material by colorant of *Spathadia campanulata* (Kumaresan M., Palanisamy, PN. and Kumar,PE(2011) .The dye of pomegranate fruit peel can be used as a best alternate for the artifical dyes .

Figure1: Dyeing of clothes using different colored peels

It should be emphasized that no allergic symptoms were observed while using dyed clothes treated with the concentration 1% to 3% (a concentration considered remarkable for a dye), while Some person showed very little (0.01%) positive at a concentration of 5.%. Thus the egg plant peels were used an important source for natural dyeing Industry.

CONCLUSION

The different colored dye extracted from eggplant peels waste was found to be a quick, cheap and effective way, It showed two advantages, to get a natural dye at a cheaper rate for the textile , cosmetic, pharmaceutical, and food. The plant based natural dyes could promote the recycling of waste materials by reducing the environmental impact.

REFERENCES

- Aminoddin, and Haji Functional Dyeing of Wool with Natural Dye Extracted from Aminoddin, and Haji Functional Dyeing of Wool with Natural Dye Extracted from Berberis Vulgaris Wood and Rumex Hymenosepolus Root As Biomordant. Iran J. Chem. Eng.2010; 29(3).

- Adeel S, Ali S, Bhatti IA. And Zsila F. Dyeing Of Cotton Fabric Using Pomegranate (Punica Granatum) Aqueous Extract. Asian JChem,.2009; 21(5): 3493-3499.

- Anbuselvi S. and Jeyanthi Rebecca , 'Study on the Biodegradation of coir waste by three different species of Marine cyanobacteria', Journal of Applied Science and Research', December issue.,2009 ;.2369-2374

- Anbuselvi, Guddukumar,.Influence of Coconut Husk on Poultry Excreta in Organic Manure Formulation" International Journal of Pharm. Sci.Rev Research 2017;42(2):18 , 94-96.

- Anbuselvi,S, Surabhi Mahalanobis and Manas Jha Optimization of singlecell protein using Green gramhusk and Bengal gram husk by yeast" International Journal of Pharm. Sci.Rev Research 2014; 28(1) 35; 188-190.

- Anbuselvi.S, Priyanga K, Albenna Reji, Jyoti kumar Bhagat Production of organic manure from potato pee lInternational Journal of chem..Tech, 2016;9(5) :845-847.

- Asish Mitraa and Sanat Kumar Dasb. Fabric dyeing with natural dye extracted from Basella alba fruit and spectroscopic analysis of the extract at different conditions Journal of Chemical and Pharmaceutical Research, 2015, 7(12):1117-1124

- Berberis Vulgaris Wood and Rumex Hymenosepolus Root As Biomordant. Iran J. Chem. Chem. Eng.2010; 29(3).

- Chanayatht, AI., Sorasak L. and Suree P.Pigment Extraction Techniques from the Leaves

- Cotton Fabrics with Crocus Sativus (Saffron) Flowers Using an Ultrasonic Method. AUTEX

- Hayfaa A Al-Shammary, Rasha Salh and Haidr Sabah Eggplant Peel Ethanolic Extract: A Novel and Alternative Stain forChromosome Banding, J Bioproces Biotech 2015, 5(2):1-4.

- Jothi, D. Extraction of Natural Dyes from African Marigold Flower (Tagates Ereectal) for Textile Coloration. AUTEX Journal,2008; 8(2)

- Kamel, M.M., Helmy, H.M And Hawary, N.S. Some Studies on Dyeing Properties of

- Katz,D) Natural Plant Dyes,2004, <http://www.chymist.com>.

- Kumaresan M., Palanisamy, PN. and Kumar,PE. Application of EcoFriendly Natural Dye Obtained from Flowers of SpathodeaCampanulata on Silk Using Combination of

- Mordants. European J. Sci Research;2011, 52(3): 306-312.

- of Indigofera tinctoria Linn. and Baphkacanthus Cusia Brem. and Chemical Structure Analysis of their Major Chemical Components.)

- Onal A.: Extraction of Dyestuff fromMadder Plant (Rubia tinctorum L.) and Dyeing of Wool, Feathered-Leather and Cotton. Tr. J.Chem.,1996; 20, 204-214

- Pruthi N., Chawla G. and Yadav S. Dyeing of Silk with Barberry Bark Dye Using Mordant Combination. Natural Product Radiance,2008; 7(1):40-44.

- Research Journal,2009; 9(1).9.

- Sachan K.and Kapoor VP. Optimization of Extraction and Dyeing Conditions for

- Saha P. and Dutta S. Production of Floral Dyesfrom Different Flowers Available in West Bengalfor Textile and Dye Industry.<http://www.chemeca2007.com>

- Salam, M.A. and Salam, A Study on Color Fastness Properties on to Bleached Sulfonated Jute-Cotton Blended Fabrics with Basic Dyes. JTATM,2005, 4(4).:24.

- Samanta, A. K. and Agarwal, P.:Application of Natural Dyes on Textiles IJFTR,2009 34,384-399.

- Singh, P, Singh V.V. And Waghmare V.N:Naturally Colored Cotton http://www.cicr.org.in>

- Siva R. Status of Natural Dyes and Dye-Yielding Plants in India, Current Science, 2007;,92(7).28.

- Suitcharit C., Awae F. Sengmama W. and Srikulkit K. Effect of Chitosans Molecular Weights on Mangosteen Dye Fixation on Cotton Fabric. J. of Metals, Materials and Minerals,2010;20(1):, 27-31.Traditional Turmeric Dye. IJTK,2007; 6(2): 270-278

- Vankar PS., Shankar, R. and Wijayapala, S.. Dyeing Cotton, Silk and Wool Yarn with Extract of Garnicia mangostana Pericarp.JTATM,2009; 6(1).

A STUDY OF SELF-HEALING TECHNIQUES FOR BITUMINOUS PAVEMENT

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ABSTRACT
Self-healing technology is a new field that represents a revolution in transportation engineering. Incorporating self healing technology into the road design process that has a potential to transform road maintenance processes by increasing the life span of roads and eliminating the need for frequent road maintenance. The self healing of pavements eliminates the premature ageing and failure of pavements. Hence reduces the need of frequent maintenance of the pavements lowering the life cycle cost, eliminates the obstruction in the smooth traffic flow due to maintenance and rehabilitation. There has been a lot of research going on across the globe to study, try and implement this process which can be a an engineering marvel and gift to the commuters as well as people at large. There are various materials used as bonding agent as well as rejuvenator and based on their properties, this process is applicable. As of now this process is not very much successfully implemented but as it requires more research, we are also doing the same. The climatic conditions, temperatures, types of materials, properties and proportion of rejuvenator play an important role. The current maintenance cost per kilometre is INR 50000 for the conventional bitumen pavements. The study is still required that on which type of pavement and which type of damage this process can be implemented. This paper explains the process, types of materials available, research and methods available for self healing o bituminous pavements as of now and scope as well as requirement for further research.

Keywords: Self-Healing, Bitumen, Pavement, Microcapsulation.

INTRODUCTION:
A highway pavement is a structure consisting of superimposed layers of processed materials above the natural soil sub-grade, whose primary function is to distribute the applied vehicle loads to the sub-grade. The pavement structure should be able to provide a surface of acceptable riding quality, adequate skid resistance, favorable light reflecting characteristics, and low noise pollution. The ultimate aim is to ensure that the transmitted stresses due to wheel load are sufficiently reduced, so that they will not exceed bearing capacity of the sub-grade. Two types of pavements are generally recognized as serving this purpose, namely flexible pavements and rigid pavements. Improper design of pavements leads to early failure of pavements affecting the riding quality.

An ideal pavement should meet the following requirements: Sufficient thickness to distribute the wheel load stresses to a safe value on the sub-grade soil, Structurally strong to withstand all types of stresses imposed upon it, Adequate coefficient of friction to prevent skidding of

vehicles, Smooth surface to provide comfort to road users even at high speed, Produce least noise from moving vehicles, Dust proof surface so that traffic safety is not impaired by reducing visibility, Impervious surface, so that sub-grade soil is well protected, and Long design life with low maintenance cost. Flexible pavements will transmit wheel load stresses to the lower layers by grain-to-grain transfer through the points of contact in the granular structure. The wheel load acting on the pavement will be distributed to a wider area, and the stress decreases with the depth. Taking advantage of this stress distribution characteristic, flexible pavements normally has many layers. Hence, the design of flexible pavement uses the concept of layered system. Based on this, flexible pavement may be constructed in a number of layers and the top layer has to be of best quality to sustain maximum compressive stress, in addition to wear and tear. The lower layers will experience lesser magnitude of stress and low quality material can be used. Flexible pavements are constructed using bituminous materials. Typical layers of a flexible pavement includes seal coat, surface course, tack coat, binder course, prime coat, base course, sub-base course, compacted sub-grade, and natural sub-grade.

The failure in flexible pavements occur due to various reasons which includes: 1) Failures due to exposure: Weather conditions, ultraviolet rays, water through cracks, vehicle loads and petroleum and ageing of flexible pavement. 2) Failures due to distress: There are basically two types of distress - environmental and structural distress. The causes of environmental distress are snow, water, petroleum, etc and the remedy to it are the crack sealing, seal coating, chip seals. The reasons for structural distress are overloading, frosting effect or lower standards of design and wet sub grade. Alligator cracking of flexible pavements, corrugation in flexible pavements, potholes, rutting and swelling are some of the examples of failures of flexible pavement due to structural distress. Bleeding effect, block cracking effect, Bumps and sags, Joint reflection cracking, revelling, cold joints, longitudinal and transverse cracking are some examples of failures due to environmental distress.

The bituminous pavement has the potential to restore its stiffness and strength by closing the micro-cracks which occur due to overloading. The factors which influence the healing are 1) Bitumen properties which includes bitumen types, viscoelastic properties, surface free energy, ageing, diffusion, modifiers. 2) Asphalt mix composition: Bitumen content, aggregate structure, gradation, thickness. 3) Environment: Temperature, Loading history, Rest period and water/moisture.

Binder is the most essential substance in self healing of asphalt. Self healing process occurs on a molecular stage where broken molecules are available to form chains in presence of hydrogen bonds. Five essential conditions for self healing to be included in asphalt pavement design are good compatibility with bitumen, higher temperature stability, the ability to survive mixing and construction conditions as well as healing temperature of between -30*C. & 40*C. The methods which are at present available for self healing for bituminous pavements are 1) Nana particles: Nano rubber and nanoclay 2) Induction heating: Carbon fibre, graphite, steel fibres, wool and conductive polymer poloniline. 3) Rejuvenation: Resins and oils.

Binder healing agent is here termed as rejuvenator which is majorly used in rejuvenation process. The bitumen ages due to oxidation and polymerisation and as a result, it looses its viscoelastic properties. Asphaltenes and maltenes are the more viscous than resins or oils. When the cracks within the bituminous pavements are at initial stage, the rejuvenation process is applicable. With the application of rejuvenator, the life span of the pavement can be increased by few years (in exception to weather conditions). As using rejuvenators may be harmful for environment as well as it reduces the surface friction, its microcapsulation can help overcoming this issue.

The principle behind this is that when the micro cracks begin to form within the pavement system, they will encounter a system in the propagation path. The fracture energy at the top layer of the crack will open the capsule, and release the rejuvenator. The healing agent will then mix with the asphalt binder to seal up the crack, thus preventing its further propagation. This process prevents the formation of micro cracks within the pavement mix and will also prevent the complete failure of the pavement system. Till today, the microcapsules have been prepared out of prepolymer of melamine - coraldehyde modified by methanol as well as the calcium alginate solution which includes the calcium chloride and sodium alginate solution capsules with sunflower oil as rejuvenator. The core:shell ration should be 1:3 with rotation speed of 3000 rev/min.
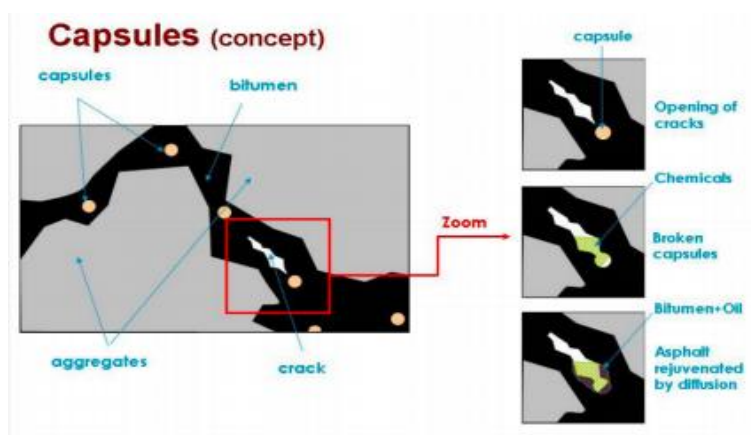
Figure 1:- Micro-capsulation Process

Figure 2:- Calcium Alginate capsules with encapsulated sunflower oil

MAIN BODY:

There have been some research related to the study, process, materials and implementation of self healing process of bituminous pavements, rejuvenators, microcapsulation which gives us an ideas about the current stage of research about the same worldwide as well as a scope to carry out further research work to make this process more effective and efficient. With the same motto, few of the important and most related research work are discussed here which drives us to a conclusion regarding the same further:

Amir Tabakovic and Erik Schlangen have worked together on the research subject of 'self healing technology for asphalt pavement'. In this research paper the authors have done a detailed study on self-healing technology which is an emerging field of material sciences. They have tried to incorporate this revolution in the field of material sciences to transform the road

construction and maintenance process. They have tried to perform experiments based on all three process of self healing, i.e. incorporating nanoparticles, induction heating and rejuvenation.

Amr M. Bakry, Shabbar Abbas, Barkat Ali, Hamid Majeed, Mohamed Y. Abouelwafa, Ahmed Mousa, Li Liang have jointly worked on the research subject 'Microcapsulation of Oils - A comprehensive review on techniques and applications'. In this article, the authors have worked on microencapsulation of marine, vegetable, and essential oils has been conducted and commercialised by employing different methods including emulsification, spray-drying, coaxial electrospray system, freeze-drying, coacervation, in situ polymerization, melt-extrusion, supercritical fluid technology, and fluidised-bed-coating.

T. Al. Mansoori, R. Micaelo, I.Artamendi, J. Norambuena-Contreras have jointly worked on 'Microcapsules for self-healing asphalt mixture without compromising the mechanical performance' in which the authors have checked the mechanical performance of the asphalt mixture by taking the samples and conducting various tests such as water sensitivity analysis, particle loss test, permanent deformation test, stiffness modulus and fatigue resistance with and without microcapsules. They used sunflower oil as rejuvenator in microcapsules.

Sampath Kumar Pasupunuri, Dr. Devesh Tiwari, Sunil Jain and Pradeep Kumar have worked on 'Self-healing pavements - A revolution in pavement materials'. In this research article, the authors have discussed in detail on the main three methods available for the self healing pavements focusing on reducing the maintenance cost as well as reducing CO2 emission. They have also discussed the loading conditions and sub methods available as per the materials in detail for self healing pavements.

RuiLi Tianshu Zhou, Jianzhong Pei have jointly worked on 'Design, preparation and properties of microcapsules containing rejuvenator for asphalt'. In this articles, it shows that they have worked on enlightening about the process designing and preparing the microcapsules as well as its properties. According to them, shell thickness and shell density increased by adding more prepolymer in the fabrication process. The optimum synthetic conditions were carefully explored by them to study the microcapsule properties. They also found the healing efficiency with optimum dosage of microcapsules.

Dharshan GM, Gokul S and M.Praba have worked on 'Identification of suitable self healing materials for the asphalt pavements' in which they have studied the effect of aggregate gradation on the design of flexible pavement (dense graded aggregate) and replacement of steel slag as coarse aggregates for pavement construction. They also conducted basic tests on aggregate and bitumen and identified the proper gradation for pavement mixtures. Further they worked on identifying the suitable material to reduce and heal the crack formation on pavement and have recommend a suitable and cost efficient material for self-healing.

NiloRuiz RianchoaAlvaro, Garciaa Daniel, Alvaro Garcia,Daniel Grosseggera, Tahseen Saadoon, Robin Hudson-Griffithsc have jointly worked on 'Properties of Ca-alginate capsules to maximise asphalt self-healing properties' in which the authors have worked to improve the self-healing rate of the asphalt by adding encapsulated oil in the asphalt mixture. This paper focuses on sunflower oil encapsulated in a porous calcium-alginate structure; the influence of capsules' strength and size in their compressive strength and, the influence of the capsules' thermal expansion, thermal resistance and, internal structure, in the release of the oil have been analysed.

Yupeng Zheng has worked on 'Evaluation of sunflower oil's healing effect in bituminous materials' in which the author has investigated the potential healing effect of sunflower oil in bituminous materials by employing dynamic shear rheometer (DSR) to evaluate the

performance of the asphalt binders. He found that, the resultant master curve indicated that by adding 5% sunflower oil, approximately 30% loss of modulus in aged bitumen could be restored. Thus, his test result had solid testimony that sunflower oil has the potential to fully recover the original rheological properties as well as healing capacity of the asphalt binder.

Yong-Rak Kim, Gabriel Nxengiyumya, Soroosh Amelian has worked on 'Research on high-RAP asphalt mixtures with rejuvenators - Phase 2' in which they have investigated the effects of type, dosage, and treating methods of rejuvenators when they were added in aged asphalt materials. To meet the goal, they used the three rejuvenators Triglyceride/fatty acid: agriculture-tech based, Aromatic extract: petroleum-tech based, and Tall oil: green-tech based by conducting various binder-level and mixture-level tests in this study.

CONCLUSION

After having learned about the basics of pavement, its design, its failure and the factors affecting it, self healing process, types of techniques adopted in self healing worldwide up till, different rejuvenators, microcapsulation process as well as the research carried out related to this topic has given us a broad vision for the self healing process of the bituminous pavements. After which we can conclude that there has been very less research work as of now in this field and especially none has shown us the actual implementation because it has rarely taken place. We can also say that this process of rejuvenation with microcapsulation process has is only limited to seal up the minor cracks a very initial stage to avoid major damage or propagation of cracks on the pavements.

As we look forward to implement this process in Indian conditions and pavement, we need to test it as per the Indian standards and tests specified for the same as well as the actual on site testing by applying it on the cracks shall give us a detailed idea about its consideration further on.

REFERENCES

- Self-Healing Technology for Asphalt Pavements by Amir Tabaković, Erik Schlangen

- Self healing pavements – A revolution in pavement material by Devesh Tiwari and Sampath Pansupunuri

- Self-healing technology for asphalt pavements Tabakovic, A; Schlangen, E

- A novel self-healing system: Towards sustainable porous asphalt

- Research Progress on Self-Healing and Repairing Technology of Asphalt Mixture Crack by Jia Hui, Yunhui Gu, Tong Wang, Ruinan Jian and Baolin Zhu

A CASE STUDY ON GLOBAL BUSINESS OF SPORTS LEAGUE

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ABSTRACT

Huge investments have been carried out in sports teams and professional sports leagues all over the world. There are different sports that are popular in different parts of the world. In the United States, its American Football, in Europe and UK it is Football (soccer); in the Indian sub-continent and Australia it is Cricket that attracts the largest crowd. Research analyses this business of investments in sports leagues around the world. Two research questionnaires were designed in order to carry out the aims and objectives of the research study. First Questionnaire was distributed through google forms and e-mail in an organization called Celtic Manor Resort, the organization for hosting the Ryder cup golf tournament located in United Kingdom, in order to achieve some of the objectives of the study and second questionnaire was distributed through e-mail to different participants in India in order to determine the other objectives of study.

The paper looks at the potential interest in investing in clubs and team franchises of sports league. The aim of this paper was to find out the attractiveness and risks, economically and financially, involved in the Global business of sports leagues. Research also concluded competitive structure of different leagues. Research identified Involvement of business in the field of sports and calculated the economic implications of having multiple leagues and explored the attractiveness and risks involved in business and carrying out recommendations appropriately.

Keywords: sports, business, leagues, popular

INTRODUCTION

According to Schaaf (2004), the sports industry in 2001 was worth about $194 billion leaving behind the electronics and food industry and one of the significant factors was considered to be commercialization. In the last three decades sport has shown a considerable amount of improvement and has moved on from just being played and managed by group of amateurs to a giant money making industry run by professionals. Moreover, sports has now become more business driven and market oriented with consumers. Experiences management teams are hired to build goals and targets using new and improved strategies to exploit the growing sport industry. The transformation of sports into professionalism has given rise to new era of strategies which are used to exploit the consumer and maximize profit.

The ownership of sports franchises has transformed tremendously. Eighty years ago, owners of the baseball teams often had reputation of being "penny-ante" player's just one stop to the right side of the law (Fetter, 2003). Today, some of the largest companies and wealthiest individuals also own franchises. The traditional competitive structure is absent in professional sports leagues and amateur organizations. Firstly, the competition is limited and secondly every organization restricts free and open competition. In such professional competitions the leagues limit the number of competitors by providing exclusives franchises in various markets. Sports leagues manage which teams may participate, where they can compete, the number of players on a team and the sharing of the revenues.

AIMS AND OBJECTIVES

- Involvement of business in the field of sports

- Critically analyzing different business models used in the field of sports leagues for

conducting business globally

- Calculating the economic implications of having multiple leagues

- Exploring the attractiveness and risks involved in business and carrying out recommendations appropriately.

REVIEW OF LITERATURE

In general there are two organisational forms for professional sports leagues joint ventures and single entities. Flynn and Gilbert (2001) state under joint ventures, teams are owned by business entities and come together to form a league. Whereas a single entity leagues is where teams are owned by single entity which is the league itself. Noll (2003) confirms the fact that there are two possible from of organisational forms for leagues. He explains with regards to joint ventures "*Member teams are independently owned and managed, and collectively create the league as a joint venture for coordinating their league activities*" (Noll, 2003). However with regards to single entities *"in these leagues, teams are not independent organisations, but are operating divisions of the league*" (Noll, 2003). In the United States Major League Baseball (MLB), National Basketball Association (NBA), the National Hockey League (NHL) and the National Football League (NFL) are all managed under the joint venture organisational form. Flynn and Gilbert (2001) explain that member clubs in these leagues divide income from national media rights, licences to league name logos and other properties. The clubs also produce income through merchandising, gate receipts sponsors and trading players. The only exception is the major league soccer (MLS) in the American professional sports industry as it is organised as a single entity ownership. The player contracts in MLB, NBA, NHL, and NFL are held by the franchises whereas in MLS they are owned by the league itself. Flynn and Gilbert (2001) also explain that the trend is moving towards establishing single entity leagues because of the several cases of antitrust controversies in NHL, NBA, and NFL. They also give examples of the Women's National Basketball Association (WNBA), American Basketball League and the Women's professional Soccer league to prove this trend. Noll (2003) explains that the most significant differences between the business models are the issues of resource allocation and league membership.

RESEARCH METHODOLOGY AND METHODS

Two research questionnaires were designed in order to carry out the aims and objectives of the research study. First Questionnaire was distributed through google forms and e-mail in an organization called Celtic Manor Resort, the organization for hosting the Ryder cup golf tournament located in United Kingdom, in order to achieve some of the objectives of the study and second questionnaire was distributed through e-mail to different participants in India in order to determine the other objectives of study.

Epistemological and Ontological stance

Jankowicz (2000, p110) suggests that epistemology is related to do with the researchers personal theory of knowing that is researcher considers as information according to his knowledge and disregards what he does not have any idea, whereas hill and McGowan (1999, p9) explains it as the nature of the relationship between the researcher and subject(s) of the research. Hussey and Hussey (1997, p47) provides a framework consisting of accepted set of theories, methods and ways of defining data, classifying two main research philosophies namely: positivist and Phenomenological, however they are further classified as quantitative, objectivist, scientific, experimentalist and traditionalist under positivist whereas qualitative, subjectivist, humanist and interpretivist under the phenomenological category. The researcher explains that one of the most significant points about this classification is not that they provide absolute choice but rather that they fill up the two ends of a continuum (Morgan and Smircich,

1980). This researcher explains that this research study is best located towards the phenomenological paradigm.

Research strategy
Primary data.
There are two distinct methods of collecting primary data – passive and active.

Secondary data
Government agencies like census bureau, information compiled for sale by commercial vendors, data published by universities, government, equity research, reports, trade association newsletter, etc.

Secondary sources
Websites, newspapers and magazine articles, published interviews from Indian Premier League (IPL), Indian Cricket League (ICL) and English Premier League (EPL) officials, published comments from cricket experts.

Population and Sample
A survey was sent to 110 carefully selected participants who follow different sports leagues around the world. The survey was conducted on internet and the E-mail was sent out to the participants to answer the questionnaire

Validity and Reliability of Data
The author has carried out mixed method research techniques and triangulation of data to increase the validity and reliability of the result. (Saunders et al, 2003)

DATA ANALYSIS
The result of analysis is classified under two categories depending on the questionnaires given in India and United Kingdom. Below is the summary:

1) Which sports league do you follow? (Questionnaire 1 and 2)
United Kingdom response summary

	Response percent	Response count
English premier league	72%	35
Indian premier league	10%	6
National basketball Association	4%	2
National Baseball League	4%	3
Other	10%	12

Indian Response Summary

	Response percent	Response count
English premier league	10%	10
Indian premier league	80%	60
National basketball Association	4%	2
Indian Cricket League	4%	3
Other	2%	5

2) Which business model would you like to prefer while investing in sports leagues? (Questionnaire 1)

	Response percent	Response count
Franchise model	17%	9
Single entity model	9%	4

Can't say	63%	32
Other	11%	5

3) Do you think it's beneficial to invest in sports leagues? (Questionnaire 1)

	Response percent	Response count
Yes	67%	32
No	23%	18
Can't say	10%	5

4) Do you purchase sports leagues merchandised products? (Questionnaire 1)

	Response percent	Response count
Yes	53%	26
No	47%	20

5) Would you recommend other business to invest in sports? (Questionnaire1)

	Response percent	Response count
Yes	47%	32
No	33%	18
Can't say	20%	5

Quantitative responses

For this research study, questionnaire 1 was distributed among 50 employees of the organization and 46 were properly filled giving a response of 90%. The different number of responses to different questions was totally based on the knowledge of the participants which can be described from the pie chart below
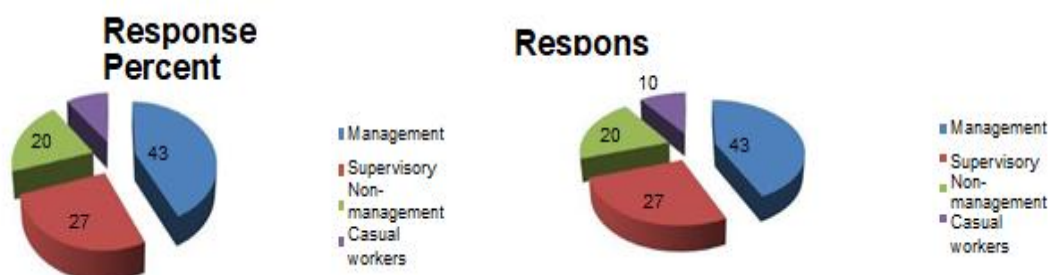
The above pie chart clearly depicts that 43% of the employees correctly filling the questionnaire were from the management level, i.e. they had better knowledge of the business involved in the field of sports and type of business model that can be used, whereas 27% of the employees were aware of the sports leagues being played and merchandise products available and if its beneficial in investing in sports leagues and rest of the employees were less knowledgeable about the relationship between business and sports leagues

Market structure

The following section will look at competitive structure of the sports leagues

1) Indian Premier League: is based on the joint venture or franchise ownership style. The League operated and managed by the Board of Control for Cricket in India (BCCI), conducted auctioning of the teams and sold rights to 8 franchises for a 10 year period contract. The 8 teams will compete with each other in the round robin format to claim the championship reward for the season. The IPL has set a limit on the number of teams that can take part in the league. For the first three years not more than 8 teams will be given permission to participate in the league after which the IPL can release the restriction and auction more teams to be participated in the league**.**

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2) **The Indian Cricket League:** is based on the single entity ownership style. The League is owned and managed by one organisation - Zee Telefilms, a media company. As mentioned above, the league comprises of 8 teams competing in the round robin format to determine the champion. Since the league is a single entity league all the decisions regarding the league's number of teams, entry and exit of teams from the league will be carried out by the same organisation

3) **The English premier league**- The Premier League is the highest category of English club football. It is considered to be as not-for-profit body from which all revenues that are generated are again redistributed to its shareholders or in confirmed payments, depending with sometimes the 20 Clubs in the League acting as the Shareholders. Each Club perceives the League to work as its trade association as well as its competition organizer and regulator. The competition consists of 380 games in a season, followed by in excess of 325,000 stadium fans over each match weekend.

Money Generated/ Invested

1) **Indian Premier League -** The BCCI has been nominal and its investments have been minimal in the launch the IPL which can be seen from the article titled 'Jiminy Cricket - *India's cricket board makes a cool billion dollars for doing not much'* (Economist, 2008). Since the IPL only possess the rights and powers to sets the rules and operate the league, requirement of substantial investments became negligible. These requirements were transferred to franchise owners who were responsible for marketing the league, paying player wages, investing in stadiums and infrastructure. As mentioned by Lalit Modi, IPL Chairman & Commissioner, "*To date we (the Indian Premier League) have made $1.75 billion*" (Modi, Indian Premier League rakes in millions from franchise sale, 2008). Research report also suggests that the IPL is already a $2 billion property (Alchemy, 2008). Arnab Mitra of IIFL companies also stated that between organisers, broadcasters and franchises, that the IPL will generate revenue of around $30 million a year into cricket. Taken into consideration, the Indian government had a total sports budget of $11.3 million (Mitra, 2008). The construction of the IPL is somewhat different from the other professional sporting leagues around the world where several existing teams collaborate together and form a league. The teams have their Directors on the Board of the league. In case of IPL first the league was constructed and then the rights of the league to the franchises were auctioned. The franchises do not have any Management Directors on the IPL Board. There has been anxiety among the franchises about carrying out work with each other as they have no representation on the IPL Board. As mentioned by Lalit Modi in his interview with Cricinfo, address this fact by stating "*There is no need for concern. We need to work with them. It's with their success we will achieve ours. It's not us against them. We are all on the same side. We will ensure we work with our partners and that's what my job is*" (Modi, IPL will revolutionise the game, 2008). The IPL is based on joint venture league style and has sold the rights to operate the teams to various franchises. Arnab Mitra of India Infoline suggests that the IPL franchises will generate annual revenues from the following sources:

- Television Broadcasting and IPL Sponsorship fee - $1.02 million

- Team Sponsors - $38 million ;Stadium advertisement - $19 million; Ticket Sales - $40 million He further adds the annual revenue stream for the IPL: Central Sponsors - $30 million

- Television Broadcasting fees - $100 million Franchises fees - $723 million

Some of the franchises would perceive IPL as the ways to promote their Brand (UB group) while other might be interested in the financial investment benefits (e.g. India Cements**).** However, the concept implemented is yet to unleash and revenues streams though are hard to anticipate would be enormous. The researcher believes that the three predicted successful teams could easily generate revenues of around $66mn per year in the next three-four years and all the teams are believed to transform into profitable after two - three years. Their OPMs could range from 15-20%. Investors looking for an investment in IPL should go ahead with investing in India Cements Ltd. Researcher according to the research results, believe that the company would be EBIDTA positive in the initial year. Conservatively, it is liable to generate a turnover of $66mn from IPL in the next three-four years. (Alchemy, 2008) According to the Television Audience Measurement (TAM) service in India, the average spectatorship for the IPL was at 6.28 TRP's (television rating point), whereas in the IPL finals ratings reaching the seasons highest of 9.8 TRP's (television rating point), which can also considered as the topmost rating ever for domestic cricket in India (TAM Media Research, 2008). This topmost rating of viewership suggests the astounding success of the IPL. According to Researcher, "*the IPL surpassed expectations of media professionals and the ratings were 30-50% more than expected*" (Alchemy, 2008). Also the Media companies related to IPL raised their ad rates for spot sales from

$5,000 - $6,250 for 10 seconds to $7,500 - $8,750 for 10 seconds. Especially, in semifinals and finals the ad rates were sold for $17,500 - $25,000 for 10 seconds. "*Not to mention the TRPs (TAM ratings) that we have garnered in India are quite frankly staggering. And all this because we have had some of the best cricketing entertainment provided by the best cricketers from around the world*" (Modi, Q&A, 2008).

2. Indian Cricket League

Zee Telefilms (Zee) started the Indian Cricket League (ICL) in April 2007, in collaboration with Infrastructure Leasing & Finance Services (IL&FS) with a starting investment amount of $25 million (Cricinfo - ICL FAQ, 2008). This starting investment in the ICL was shadowed when comparisons of investment by the IPL franchises were carried out, whereas Reliance Industries auctioned the rights for the Mumbai franchise at whooping $111.9 (most costly IPL franchise). The overall revenue generated by auctioning all the eight IPL franchises was staggering $723.5 million for the right to own a team. The researcher predicts that the revenues generated by ICL are outclassed when compared to the revenues generated by IPL since in the case of IPL, where several teams owned by different franchises, in the ICL all the competing teams are owned by one single entity. So all the costs incurred related to marketing the league, player salaries, stadium and infrastructure development are to be bear by Zee Telefilms the sole owner of the ICL. In an interview conducted by Indiantelevision.com, Himanshu Mody, Business Head of the ICL mentions that the league has begun to concrete its position in the market as more and more tournaments are conducted. Mody also rejected to comment about financial condition, but he did mentioned different revenue sources for the ICL which consisted of filed sponsorship, associate sponsorship, ticket sales sponsors, advertising revenues and broadband revenues. However the ICL is managed and operated by Zee Telefilms, a media company, all the matches that are conducted in the ICL are broadcasted by the same media company (Zee Telefilms). Thereby revenues generated from sale of broadcasting rights are not covered in revenue source for the ICL. Moreover, Mody (2008) mentions that ICL generated some television broadcasting revenues from international television contracts as it was telecasted in several overseas countries consisting UK, USA, Pakistan, Middle East, Australia and New Zealand. The researcher believes the ICL sold the global rights for just $10mn. As Sports marketer of Percept Holdings' joint managing director Shailendra Singh, mentions "*ICL could not raise much*

money and hence, the quality of 'cricketainment' and the marketing was not up to the mark. Even the stadia where the ICL matches were played weren't well-known". According to

a Map, a television ratings agency, the online television ratings of the initial three matches of ICL and moreover jointly, the ratings of all the 25-odd Zee channels for the initial hour of the ICL tournament was not able to generate potential spectatorship, and average time dedicated on the channels by the viewer's being just eight minutes. Astonishingly, the initial three T-20 matches conducted on November 30 and December 1 produced peak ratings of only 0.5 TRP's on Zee Sports in-spite some concrete promotions and appearances by bollywood personalities. (Financial express, 2009).

2) English premier League

The league carried out a significant strategy of selling television rights to Sky TV. As stated at its official website, "*At the time charging fans to watch televised sport was a relatively new concept, but a combination of the quality of football on offer and Sky's marketing strategy saw the value of the Premier League soar*".(Premier league, 2009) The first deal made by the league was valued £191million for five year contract. Sky and Setanta paid a whooping £1.7billion for broadcasting the matches from 2007-10. Sponsorship was another significant factor that played a tremendous role. In 1993 Carling purchased sponsorship rights for £12million for four years and the competition was termed as the FA Carling Premiership. It was later renewed for another four years with an investment of 300% rise. In 2001 the sponsorship right were transferred to Barclaycard for £48million over three years and it was termed as 'Barclays Premier League'. Later on again, Barclays renewed in 2007 with their new renewal price for

£65.8million for three seasons. This Rise in revenues has assured that English clubs can conduct matches on a global scale in relation with transfer fees and wages - a significant factor which has attracted some of the high quality overseas players towards the Barclays Premier League. As researcher believes according to the results achieved

Researcher analyzed a few of teams and found that, (Alchemy, 2008)

- 35% revenues are from gate receipts

- 30% from media

- 25% from sponsorships

The total revenues of three of the total 20 clubs are given below: (Alchemy, 2008)

- Arsenal- £177mn

- Tottenham -£103mn

- Birmingham City -£40mn

CONCLUSION AND RECOMMENDATIONS

- Involvement of business in the field of sports

- Calculating the economic implications of having multiple leagues

- Exploring the attractiveness and risks involved in business and carrying out recommendations appropriately.

Interestingly, the literature review on the unique topic Global business of sports clarifies the first objective, explaining the sport industry as widely defined industry involving a number of varied segments. Concerning about the second objective, it was observed through qualitative and quantitative ways that different business models exist for conducting business in sports. The economic implications of having multiple leagues and attractiveness and risks were explained

and analyzed with help for S-C-P paradigm tool. It explained that market performance of sports leagues in any market is recognized by market conduct, which in turn is based in market structure of sports leagues. It also explained using the finding and analysis section that structure, conduct and performance are interconnected through structural features against models of perfect competition, monopolistic competition, oligopoly and monopoly (Ferguson and Ferguson, 1996). To finally conclude sports has always been a unique game of business for players and investing organizations.

RECOMMENDATIONS

In every sports venture, the competitors must cooperate for the venture to be profitable. However Profit at any cost is problematic. According to the researcher, the franchise business model used for the business is appropriate model for conducting business in the field of sports leagues. As it helps lot of business organizations to increase their ways of investing in the field of sports leagues and generate potential revenues. It also helps small firms to take in the investment directly or indirectly. The researcher would recommend that there should be only one league in the same sport market. As it provides all the stakeholders of the game, the chance to benefit from the league. However the organization investing in the teams should carry out proper research, in order to avoid investing in the teams that are just going provide losses

REFERENCES

- Amaratunga, D. & Baldry, D. (2000). Theory building in facilities management research: Case study methodology. *Proceedings of the Bizarre Fruit Postgraduate Conference.* University of Salford, Salford, p.107-23.

- Amaratunga, D., Baldry, D., Sarshar, M. & Newton, R. (2002). Quantitative and qualitative research in the built environment: application of "mixed" research approach. *Work Study.* 51(1), p.17-31.

- Anderson, G. & Arsenault, N. (1998), *Fundamentals of Educational Research.*

- Routledge: Falmer London & New York.

- Argyris, C. and Schon, D.A. (1978) *Organizational Learning: A Theory of Action Perspective*. Addison-Wesley, London

- Alchemy. (2008). Indian Premier League (IPL) - *Participate in a media property of the future*. Mumbai: Alchemy Share and Stock Brokers.

- Atkinson, P. & Delamont, S. (2005). *Analytic perspectives*, in Denzin, N.K. and Lincoln,

- Y.S. (Eds), The Sage Handbook of Qualitative Methods, 3rd ed., Sage, Thousand Oaks, CA.

- Bain, J. S. (1951). Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940. The Quarterly Journal of Economics, Vol. 65 (No. 3), pp. 293-324.

- BCCI. (2007). Franchise Prospectus. Mumbai: IMG.

- Beverland, M.B. & Lindgreen, A. (2008). Addressing research quality in case studies: trends in industrial marketing management, 1971-2006", *Working paper*, University of Auckland Business School, Auckland.

- Borland, J., & Macdonald, R. (2003). Demand for Sport. Oxford Review of Economic Policy, Vol. 19 (No. 4), pp. 478-502.

- Brassington, F. & Pettitt, S. (2000). *Principles of Marketing*, 2nd Ed. England: Pearson education limited.

- Bryman, A. (2008). Of methods and methodology. *An International Journal Qualitative Research in Organizations and Management* 3 (2), p. 159-168

- Bryman A, & Bell, E. (2007). *Business Research Methods*. 2nd Ed. Illustrated, revised. Published by Oxford University Press.

- Cairns, J. (1990). The Demand for Professional Team Sports. British Review of Economic Issues, Vol.12, pp. 1-20.

- Cohen, L., Manion, L., & Morrison, Keith (2007). *Research Methods in Education,* 6th Ed. Routledge.

- Collis, J., & Hussey, R. (2003). *Business Research: A Practical Guide to Undergraduate and Postgraduate Students.* 2nd Ed. Palgrave Macmillan

- Cooper, D. R., & Schindler, P. S. (2001). Business Research Methods (7th ed.). London: Mcgraw-Hill College.

- Cowling, K., & Waterson, M. (1976). Price-Cost Margins and Market Structure. Economica , Vol. 43 (No. 171), pp. 267-274.

- Cricinfo - ICL FAQ. (2008). Everything you wanted to know about the ICL. Retrieved Sept 02, 2008, from Cricinfo: http://content-

- www.cricinfo.com/icl/content/current/story/310677.html

- Cricinfo - IPL Faq. (2008, June). FAQs: the Indian Premier League. Retrieved Aug 22, 2008, from Cricinfo: http://content-uk.cricinfo.com/ipl/content/story/337868.html

- Cricinfo. (2008). India Domestic Cricket. Retrieved Sept 02, 2008, from Cricinfo: http://uk.cricinfo.com/db/ARCHIVE/2007-08/IND_LOCAL/

- Cricinfo. (2008). Indian Cricket. Retrieved Sept 2, 2008, from Cricinfo: http://content-

- www.cricinfo.com/indiandomestic/content/current/story/261616.html

- Davis, R. (1999). Behavior Research Methods, Instruments, and Computers. Ann Arbor: University of Michigan.

- Dawson, P. (1994). Organisational Change: A Processual Approach. London: Routledge.

- Dobson, S., & Goddard, J. (2001). The Economics of Football. Cambridge: Cambridge University Press.

- Dymock, D. & McCarthy, C. (2006). Towards a learning organization? Employee perceptions. *The Learning Organization.* 13 (5) pp. 525-53.

- Easterby-Smith, M. (1997). Disciplines of organizational learning: contributions and critiques, *Human Relations.* 50 (9) p. 1085-113.

- Easterby-Smith, M. & Araujo, L. (1999). *Organizational Learning and the Learning Organization: Developments in Theory and Practice.* Sage Publications, London.

- Economist. (2008, Feb 2). Jiminy Cricket! Economist , Vol. 386 (8565), pp. pp.72-72. Ellinger, A.D., Ellinger, A.E., Yang, B. & Howton, S.W. (2002). The relationship between

the learning organization concept and firms' financial performance: an empirical assessment. *Human Resource Development Quarterly.* 13 (5-21).

- Ferguson, P. R., & Ferguson, G. J. (1994). Industrial Economics - Issues and Perspectives. London: The Macmillan Press

- Flynn, M. A., & Gilbert, R. J. (2001). The Analysis of Professional Sports Leagues as Joint Ventures.The Economic Journal , Vol. 111, pp. 27-46.

- Hamil, S., Michie, J., Oughton, C., & Warby, S. (2000). Recent developments in football ownership. Soccer & Society, 1(3), 1-10.

- Harvey, J., Law, A., & Cantelon, M. (2001). North American professional team sport franchises ownership patterns and global entertainment conglomerates. Sociology of Sport Journal, 18(4), 435-457.

- Hussey, J. & Hussey, R. (1997) *Business Research: A Practical Guide for Undergraduate and Postgraduate Students.* Palgrave Macmillan, NY.

- Hoffmann, R. (2007, November). Industry Analysis. Business Economics - MBA Lecture Notes .Nottingham: Nottingham University Business School

- Financial express (2009), IPL franchises should from ICL errors, Feb 19, 2008, from Financial express:

- http://www.financialexpress.com/news/bcci-has-lessons-to-learn- from-icl-errors/274408/0

- Indian Cricket League. (2008). About ICL. Retrieved Sept 02, 2008, from Indian Cricket League: http://www.indiancricketleague.in/about-icl/about-icl.html

- Indian Premier League. (2008, Aug 20). Indian Premier League - Players. Retrieved Aug 20, 2008, from Indian Premier League: http://www.iplt20.com/players.html

- Jankowicz, A.D. (2000). *Business Research Project.* Business Press, London

- Jones, J. C. (1969). The Economics of the National Hockey League. Canadian Journal of Economics,Vol. 2 (no. 1), pp. 1-20.

- Kahn, L. M. (2003). Sports League Expansion and Economic Efficiency: Monopoly Can Enhance Consumer Welfare. CESifo Working Paper, No. 1101.

- Kumar, A., & Prasad, S. (2008). India Media - Sports Entertainment. Mumbai: Kotak Institutional Equities

- Leeds, M., & von Allmen, P. (2002). The economics of sports. Reading, MA: AddisonWesley.

- Milne, G.R., & McDonald, M.A. (1999). Sport marketing: Managing the exchange process. Sudbury, MA: Jones & Bartlett Learning.

- Miloch, K. S., & Lambretch, K. W. (2006). Consumer awareness of sponsorship at grassroots sport events. Sport Marketing Quarterly, 15(3) 147-154.

RURAL ENTREPRENEURSHIP DEVELOPMENT IN INDIA

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ABSTRACT

Entrepreneurship is a wise answer to solve the unemployment, migration and to promote economic and social development in rural areas. Indian economy is highly dependent on rural economy as 72.2 % of the total population lives in rural areas where agriculture and allied activities are the major sources of income. Rural entrepreneurship is starting of enterprises in rural areas. The strengthening of the rural villages will encourage the preservation of natural resources and improve the rural economy. There exists a wide gap between rural and urban areas in terms of infrastructure, market and financial access etc. To reduce the disparities, revitalizing the rural economy can be achieved by establishing entrepreneurial ventures in rural areas. Rising rural incomes will have a multiplier effect by raising the demand for farm and nonfarm products and services instigating growth of employment opportunities. Indian Government has been continuously assigning increasing support and importance for the promotion and growth of rural entrepreneurship. The obstacles for growth of rural entrepreneurship are literacy, risk aversion, lack of skilled labor, less technical knowhow, limited access to essential services, lack of communication facilities etc. This paper provides an insight into the present scenario of rural entrepreneurship, advantages, opportunities, challenges and problems faced by the entrepreneur and institutions promoting rural entrepreneurship and their role in developing and fostering rural enterprises. Attempts have been made in this paper to discuss the key issues related to entrepreneurship and its challenges, problems and opportunities in India. It will also discuss the role of government in developing the rural developing

Keywords- Rural Entrepreneurship, Challenges, Opportunities, Entrepreneurship Development

INTRODUCTION:

Most of the businesses in rural India are family owned thus providing a firm entrepreneurial base which can be exploited by the establishment of the rural entrepreneur centers. According to a recent study by the Rural Policy, rural areas who just need support to specify their thirst for the welfare of the public. These are the social entrepreneurs working in non-profit enterprises such as social justice organization, micro enterprises and business association. Many of the young enthusiastic people turn towards the cities in order to fulfill their desire to become successful. The rural India cannot provide the growth prospect for these young entrepreneurs to be successful. It results that the most of them end up in finding ordinary and management jobs. The government can introduce such a programme which can provide an incentive for these young people and help them in setting up entrepreneur projects.

Objective of the study:

1) To study the concept and features of Rural Entrepreneurship in Indian scenario.

2) To study the necessity of Rural Entrepreneurship in Indian scenario.

3) To point out challenges and opportunities of Rural Entrepreneurship in India

4) To provide necessary recommendation for enhancing Rural Entrepreneurship in India

Research Methodology:
The present research is Descriptive Research. For the purpose of the study, data have been collected through secondary sources such as reference books, journals, articles published on internet websites etc.

Concept of Rural Entrepreneurship:
An entrepreneur is a person who either creates new combinations of production factors such as new methods of production, new products, new markets, finds new sources of supply and new organizational forms or as a person who is willing to take risks or a person who by exploiting market opportunities, eliminates disequilibrium between aggregate supply and aggregate demand or as one who owns and operates a business. India is a country of villages. More than three-fourth of India's population are living in rural areas. Among this population about 75% of the labor force is still earning its bread and butter from agriculture and its allied activities. Land factor which is limited, it is also unable to absorb the labor force in agriculture. Thus, there is a need to develop rural industries to solve rural unemployment and rural migration to cities. An essential pre-condition to development of the nation as a whole is Growth and development of rural economy. The basic object of this is to lessen the gap between rural urban disparities. In broader sense, rural entrepreneurship is defined "as the enthusiastic willingness of a villager to organize his or her economics activity, whatever it may be (a business, a job, an investment etc) with the help of appropriate technology and practices conceived for a sustainable living."

Necessity of Rural Entrepreneurship in Indian Scenario:
After over six decades of independence and industrialization in our country, still large part of population remains under poverty line. Agriculture continues to be the backbone of rural society. As per this study, seventy percent of holdings are held by small and marginal farmers resulting in overcrowding on the agricultural land and diminishing farm produce. This also results in migration of farm worker in large numbers to the urban areas. In both the cases the population remains under poverty line. Agricultural work force has a share of seventy per cent in the total work force of the country. Cultivators who own farmland come to about sixty-eight percent of this work force while agricultural labor accounts for the remaining thirty two percent. These cultivators are increasing in numbers over the years but the large increase was among the agricultural labor, which went up from twenty percent of the rural work force to thirty two percent. One also needs to keep in mind that there is a continuous growth of population. Thus it can be said that, the policy for rural entrepreneurship development has to tackle, the problems by providing other occupation option to the rural youths. "Youths in the rural areas have little options", this is what they are given to believe. This is the reason that many of them either work at farm or migrate to urban land. The need is to plant other option in the minds of rural youth. Entrepreneurship could be the best option. If planted and nurtured in the minds of rural women and youth, It could result is revolutionizing the Indian economy. It should be emphasized that the projects undertaken by these entrepreneurs should not be constrained by its location in rural areas. It should enjoy all the advantages of the location. So what is remarkable about a villager simply organizing his or her economics activity? In this context, it is remarkable that the majority of this vital workforce, because it is unorganized, goes without social security, job training, market data, insurance, health care, easy access to credit, efficient processes for production, marketing, accounting etc... The list is endless .While the government and a large number of NGOs are trying to address the various needs of the unorganized sector, any contribution, however small it is, made by anyone is a breath of fresh air for the people in this sector.

Challengers of Rural Entrepreneurship:

Rural entrepreneurship has its own drawbacks. Policies such as keeping of land in protection when there is already an over production and pricing income are two of the greatest threads to rural entrepreneurship. Due to the remote access and unavailability of knowledgeable labor, commercial markets and managerial staff are hindered due to the remote locations. It is vital for the success of the rural communities that the development of each rural project remain in the hand of the local agencies which in return cooperate with the government to oversee the leading factor that can help develop the rural areas.

1) Pricing:

It is easier to collect in larger amounts as every instance of collection and carrying of cash has associated cost. Disposable income, through, isn't always high since the bulk of rural India is agriculture and income cycle in agricultural are very erratic and not as predictable as in the case of us salaried individuals

2) Developing inorganic scale:

Finding the right partner with reach and presence in villages is very difficult to start with. More importantly, there are very few players who are strong on these counts across multiple typically requires partnerships resulting in higher partner management overheads.

3) Distribution and logistics :

Infrastructure contains to be a challenge in rural India. In addition to that, the scarcity of an efficient distribution network prevents penetration of products or services into rural India.

4) Payment collection:

The majority of the rural population is still unbanked. Clearly, non-cash collection becomes rather unlikely. Cash collection; on the other hand, are messy and difficult to monitor.

5) Scaling across geographies :

India is a land of many cultures and tradition, the contrast become that much starker in the case of rural India. Setting up operation on pan-India level represent different types of hurdles in different states ranging from political juggling to downright local factors. Any model where scalability involves scaling on-ground operations is bound to run into myriad issues as we move from one state to the next. Add to that the greater differences in consumer tastes and behavior across geographies then in the relatively more cosmopolitan urban population.

6) Social and cultural challenges:

One of the reasons for the failure of the kiosk model in Kuppam (HP's i.e. community) was the lack of usage by women which was largely due to their discomfort in going to kiosks run by men.

7) Poor self- image of rural youth & inadequate motivation :

Strong motivation is the '*mahamantra*' for success of any activity. Especially, the rural young generation is suffering with poor self-image. This is killing the talents of the rural youth.

8) Infrastructure sickness:

The rural India is still suffering with lack of infrastructure facilities. But at the same time, government is not concentrating on creating the rural infrastructure. This is the pitiable situation of rural India.

9) Cultural values:

In comparing to the urban people, the rural people have been committed to strong cultural values. In this globalizes world the most traditional people are also fatly adopting the foreign cultures and traditions. In fact the rural people don't easy to change the cultural values.

10) Policy Challenges:

Now and then there are lots of changes in the policies to change in the government. Problems of raising equity capital, Problems of availing raw-materials, Problems of obsolescence of indigenous technology Increased pollutions Ecological imbalanced, Exploitation of small and poor countries etc.

11) Growth of Mall culture:

Because of the globalization, modern economy encouraging is the mall culture rather than the traditional shops. Another side rural Indian people income is also increased, because of that these people also attracted to mall culture.

12) Poor Assistance & Power failure :

These two are the major challenges faced by the rural people. India is not a developed country, it is still developing country. Moreover India, don't have a sufficient power and electricity infrastructure facilities to satisfy the needs of their people. For filling the gap between the demand and unavailability the government of India has been committed to power cut to rural areas.

13) Lack of technical know How:

Rural Indian people they don't have strong technical educational knowledge. That is the reasons these people don't know how to use latest technology still majority of the rural entrepreneur's traditional and old technology.

Opportunities for Rural Entrepreneurship in India:

In spite of the above problems and challenges following are various opportunities for Rural Entrepreneurship in India;

1) Benefits of specialization

2) Social and cultural development

3) Free entry into world trade

4) Improved risk taking ability

5) Governments of nations withdrawn some restrictions

6) Spread of Technology and inventions spread into the world.

7) Encouragement to innovations and inventions.

8) Promotion of healthy completions among nations

9) Consideration increase in government assistance for international trade

10) The establishment of other national and international institutes to support business among the nations of the world

Role of government in Development of Rural Entrepreneurship:

Many successful entrepreneurs are prospering in the cities who are hailing from rural areas. It is essential to have a balanced regional development of the country and to avoid the concentration of industry in one place. Responsibility of rural areas is to try for better utilization of human resources as well as to improve the rural economy. Government has moral responsibility in designing, promoting, innovating rural entrepreneurial development programme for the upliftment of the rural economy on which the urban economy is build upon. Government should encourage the rural population and try to a bridge the gap between the extended and remote communities. But here, the government is not playing the role sincerely. Always, all the times government has only concentrate on the urban industrialization and urban economy

development. This is the right time the governments are changing their policy, and come forward with the more beneficial policies, schemes and subsidies for development of rural entrepreneurship as well as economy.

Suggestion for enhancing the worth of Rural Entrepreneurship in India:

The above analysis clearly reveal that Rural entrepreneurship should not only set up enterprises in rural areas but should be also using rural produce as raw material and employing rural people in their production processes. The following are few recommendations which may enhance the worth of rural entrepreneurship in the future.

1) To develop region through startup new companies or organization attract

2) Encourage skilled and professional people who have left in the rural community to come back in the main stream of the economic activities

3) To the area, laid-off skilled labor from nearby region and generate employment and provide job opportunities

4) To meet particular local employment needs

5) To help develop flexible manufacturing networks of co-operatives, micro and other manufacturing businesses

6) To promote co-operation between small firms in the network, thus promoting their competitive efficiency

7) To develop and produce a particular product that none of the firms could manufacture alone

8) To intensify training programmers to build the vocational skills for rural population

9) Start Small Branding work should come first Push through the discomfort

CONCLUSION:

From the above critical study it can be concluded that, to accelerate economics development in rural areas, it is necessary to promote entrepreneurship. Entrepreneurial orientation in rural areas is based on stimulating local entrepreneurial talent and subsequent growth of indigenous companies in the country. This in turn would create jobs and add economics value to a region, and at the same time, it will keep scarce resources within the community. Rural entrepreneurship plays an important role for economic development in developing countries such as India where it is still underdeveloped. There are many problems and challenges in growth of Rural Entrepreneurship. However there are immense opportunities in current Indian scenario. To bring a change the institutions needs to focus on synergies between Educations including modern vocational education training skill development; Innovation and Entrepreneurship should be encouraged

REFERENCES:

1) Ahirrao Jitendra. (2013), Enterpreneurship and Rural Women in India, New Century, New Delhi.

2) Kishor Choudhary. (2011), Effect of Globalization on Rural Entrepreneurship in India, Half Yearly Global Economic Research Journal, ISSN 2249- 4081, Vol. I, Issue, pp. 88-92.

3) Saxena Sandeep. (2012), Problems Faced By Rural Entrepreneurs and Remedies to Solve It, Journal of Business and Management, ISSN 2278-487X, Vol. 3, Issue 1, July-August.

4) Santhi N. and Rajesh Kumar S. (2011), Entrepreneurship Challenges and Opportunities in India, Bonfring International Journal of Industrial Engineering and Management Science, Vol. 1, Special Issue, December

5) http://www.scribd.com/doc/26661470/Rural-Entrepreneurship-in-India

6) Nandanwar Kalpana P. (2011), Role of Rural Entrepreneurship in Rural Development, International Referred Research Journal, ISSN- 0974-2832, Vol. II, ISSUE-26, March.

7) www.iosrjournals.org

SMART INVENTORY MANAGEMENT SYSTEM FOR SUCs USING QR CODE TECHNOLOGY (SIMS)

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ABSTRACT

Managing inventory at state universities is one of the most difficult tasks facing higher education. This is especially true for institutions that are vast, varied, and research-oriented.

As a university, you must keep a close eye on every cent spent. If you don't keep track of your instructional supplies, you'll end up losing money. There is no way to manually handle all of the things. Smart Inventory Management System for SUCs utilizing QR Code Technology is the appropriate solution for the ever-growing state university to address this problem.

The system reduces the hassles of manual data input and continuous maintenance, as well as guessing, mistakes, as well as time and money lost.

Smart Inventory Management System for SUCs using QR Code Technology underwent two stages namely, the development and assessment phases. The evaluation was according to the ISO 25010 Software Quality Product Standards.

The result of the evaluation shows that the system is functionally suitable, performance is efficient, compatible, usable, reliable, secure, maintainable, portable, and effective.

Keywords: Inventory, QR Code, State University

INTRODUCTION

Technology is progressing at a faster rate than it has ever been. Various approaches have been developed to make people's lives and jobs easier. Automation is at the forefront of these tactics. Automation provides answers to a wide range of challenges and organizational issues. Automation is defined as the functioning of a system and equipment in the desired manner at the proper time, under the control of mechanical or electrical devices that operate with or without human intervention (Arani, Namusonge, & Mbuvi, 2017). Most businesses today utilize it in conjunction with other ways and processes to meet everyone's information needs.

It is conveyed that through man's knowledge of technology, traditional and manual ways of working things were changed. In addition, technology gives people so much influence that they have started to develop a system that highlights creativity and innovation for work-related goals. To deliver effective and reliable customer service, institutions now have to automate. Oftentimes, it is the demand for proper and speedy services that motivates organizations to develop applications or information systems that track major transactions quickly (Koehler, 2006).

Running a large-scale educational facility takes a lot of time, money, and equipment. Each building has baseline requirements just to remain operating. University administrators may also want to equip their facilities with more than just the basics so the students have a more supportive learning environment.

Classroom management, paperwork, standardized examinations and many other tedious tasks occupy a very significant part of a teacher's day. Tracking, managing, and supporting their assets should be stress-free and uncomplicated. Taking care of school's assets is an important job, but should not be taking any time away from focusing on the fulfilment of its primary role – to develop students.

Unfortunately, many universities continue to rely on outdated, manual system to track and manage their inventory. Excel spreadsheets are the most common practice among this group. It is nearly impossible to track with accuracy of the value, condition, whereabouts and other data of inventory using a manual process, for data are constantly changing, and humans make mistakes. Whether it is a missed keystroke, duplication of effort, an oversight or some other errors, those slip-ups happen.

As a university, they have got to carefully watch where every single cent goes. Sometimes, educational executives will cut programs funding in an effort to save money.

For example, the Leyte Normal University Supply Office is one of the offices that caters delivery and inventory of supplies and equipment to its end users. Due to its numerous transactions, the Supply Office currently experiences problems in their transactions since all processes are done manually (Quisumbing, 2017). The ASCOT is a fast-growing society as manifested by its numerous development projects; however, most of its office transactions are still done manually, including the monitoring of procurement and inventory of supplies and equipment, thus resulting to tedious processing of procurement, lack of inventory, poor monitoring, and data inaccuracy (Lobres, 2018).

The Nueva Ecija University of Science and Technology (NEUST) was no different from other universities facing such problems. The NEUST still practices the traditional or manual process of doing some office transactions in spite of current technological developments. The practice resulted to common problems such as slow procurement processing, lack of inventory, poor monitoring, data inaccuracy and issues on transparency that further resulted to misinformation and other related problems. One problem commonly encountered in the Supply Office is the absence of precise inventory system to track the status of issued supplies and transferred equipment, which often led to data inaccuracy, loss of records, and human errors (Arkady, 2015).

This study sought to address these above-cited problems through the development of Smart Inventory Management System using QR Code that will automate the tracking and monitoring of tools and equipment. The study involves the development of system that features the computerization of the processes and transactions in the supply monitoring of the University. This involves the development of a web application that will track and monitor the assets of the University. QR code will be used to monitor and track the tools or equipment. It has the ability to check, transfer and return assets by simply scanning the QR code.

Successful implementation of the Smart Inventory Management System using QR Code can help the university to make the most of their budget without sacrificing any of their school's programs.

It will not only help the University's Property Custodian, but also the teachers and staff of the whole university. They will be able to track the assets entrusted to them. Also, it would be easier for them to request for repair whenever it is necessary.

The QR Code

Technology is constantly evolving. Every day, human deals with the progress of technology. The goal is to create a more advanced technology and able to bring great changes in helping every human task. One of the technological developments that is developing is the QR code. Specifically, QR Code or "Quick Response" Code is a barcode type that contains scanned dots matrix / scan using QR scanner or smartphone with built-in camera. QR code is widely developed in various fields for reasons of its practicality (Rochmawati et al., 2018).

Furthermore, QR code is a 2D matrix code that is designed by keeping two points under consideration. It must store large amount of data as compared to 1D barcodes and it must be decoded at high-speed using any handheld device like phones. QR code provides high data storage capacity, fast scanning, omnidirectional readability, and many other advantages including, error-correction (so that damaged code can also be read successfully) and different type of versions. Different varieties of QR code symbols like logo QR code, encrypted QR code, iQR Code are also available so that user can choose among them according to their needs. Nowadays, a QR code is applied in different application streams related to marketing, security, and academics and gain popularity at a really high pace. Day by day, more people are getting aware of this technology and use it accordingly. The popularity of QR code grows rapidly with the growth of smartphone users and thus the QR code is rapidly arriving at high levels of acceptance worldwide (Tiwari, 2016).

QR Codes consist of black modules arranged in a square pattern on a white background. They are designed to decode the data quickly. It is quite easy to create and use these codes (Pons, 2011). Using QR Codes for education is another way of using the Internet. Likewise, QR codes are versatile where a piece of long multilingual text, a linked URL, an automated SMS message, a business card or almost any information can be embedded into the two-dimensional barcode. With moderate equipped mobile devices, QR Codes can connect users to the information quickly and easily (LAW & SO, 2010).

According to the Usage of QR Code in Tourism Industry, QR code scanning allows the user to obtain in-depth information about the scanned item. Apps used for scanning QR codes can be found on nearly all smart phone devices. Travellers who have smart phone, equipped with the correct reader software, can easily access QR coded information (text, photo, video, web page, etc.) when it is available. Travellers can scan QR coded galleries, places, vineyards or monuments when they are visiting and reach the detailed information without using even a travel guide.

Quick Response Code has been widely used in the automatic identification fields. In order to adapting various sizes, a little dirty or damaged, and various lighting conditions of bar code image, this paper proposes a novel implementation of real-time Quick Response Code recognition using mobile, which is an efficient technology used for data transferring. According to Liu (2018), an image processing system based on mobile is described to be able to binarize, locate, segment, and decode the QR Code. Experimental results indicate that these algorithms are robust to real world scene image.

QR Code has the advantage of large information capacity and is similar to an AR marker in appearance. Thus, more interesting and useful applications can be developed by combining the QR Code with the traditional AR system. In this paper, we combine these two techniques to develop a product demo system. A QR Code is pasted on the package of a product and then a 3D virtual object is displayed on the QR Code. This system allows the customer to visualize the product via a more direct and interactive way. The system demonstrates the success of using QR Code as the AR marker to a particular application and we believe it can bring more convenient to our life in the future (Kan, 2009).

The QR Code technology will be used in the proposed system in replace with the traditional sticker that the Supply Office is using. With the use of QR Code technology it would be easier to track and monitor the tools and equipment by simply scanning the code. QR Code labels are easy to design, print and scan.

In comparison with manual data entry, QR Code scanning eliminates possibility of human error for check-in and check-out.

Tracking and Monitoring System

Tracking and Monitoring System is an integrated system for tracking assets (tools and materials) and personnel associated with a work site. Personnel are equipped with tracking devices having at least geolocation capability. Assets are tagged with RFID tags, which are interrogated at portals, by mobile scanners, or by personnel tracking devices having RFID reading capability (Fike et al., 2004). The tag readers and tracking devices are all in communication with a common "information backbone" and all data are delivered to, and processed by, a common command and control subsystem.

The findings of Amann & Essig (2015) provided evidence on the existence of hindrances for public procurement of innovation across European Union member states through the analysis of data from a large-scale survey. Further, differences in terms of the perception of barriers become evident depending on the availability of monitoring system for innovation performance.

Likewise, the study on public procurement monitoring system in the EU countries proved that it was possible to use and to adapt foreign monitoring instruments to the domestic realities of the public procurement market in order to achieve maximum effect in the form of budgetary savings (Dubinina et al., 2017).

Inventory Management System

In accordance with the present invention, a requisition and inventory management system is provided which employs both a host computer and a local computer which can be linked to permit two-way data communications in a real time environment. Each computer has an associated database which can be accessed by that computer. By accessing its respective database, each computer can build and transmit to the other computer communications blocks of data relating to a particular requisition of an item in Just-in-Time (JIT) inventory or to the management of the JIT inventory. The other computer can then use the received data to continue processing of the requisition or to update its JIT inventory records. Thus, requisition records are created from a real-time interaction between the host and local computers, with each computer using data from its respective database in conjunction with information entered by a Customer Service Representative (CSR) operating the local computer.

The system of the present invention also utilizes means for automatically determining which item in the JIT inventory are likely to require replenishment. The system then proposes a purchase or transfer order for an optimum quantity of the item, which the CSR may accept or modify (Johnson et al., 2015).

In general, warehouses are used to store goods or products. In a warehouse, it is difficult for a user who wants to locate a product because he or she has to do a manual search which also requires a lot of effort. In order to avoid this problem, the warehouse inventory management system is very helpful because it maintains the detailed product information and tells in which stockroom the product is present or available. The warehouse inventory management system is playing a significant aspect in many productions and goods-based methodology.

Though there are many wireless communication technologies, the RFID suits the best for the warehouse inventory management system. The tag information is transferred from the transmitter section to open-source hardware via a wireless link with the aid of internet. The warehouse inventory management system is built on the architecture of the internet and is developed to track the products attached to the tags with product information and their respective time stamps for further verification. The Raspberry Pi acts as a central server, monitoring all the information. The total system gives an archetype to correspond the information flow and material flow. The web page is also created to provide convenient

interface for the user to track the products. The developed system results a very low-cost system and works dynamically compared to the existing present warehouse inventory management system (Tejesh et al., 2018).

In view of the presence of human and technological constraints surrounding the function of the Supply Office, an ample amount of assistance through the development of computerized tools and methods should be extended to support their operational requirements. With the trends of technology nowadays, it is becoming more and more obvious that having a manual process of monitoring and conducting an inventory is no longer an advantage to offices. If the NEUST Supply Office wants a more effective process in their office, automation is a way to go. The Supply Office needs to realize that the development of Smart Inventory Management System is the better option to consider. Using this system, the supply, monitoring, and dispensing of office supplies, tools and equipment will become faster, convenient, and economical. It is on this premise that the development of Smart Inventory Management System with QR Code Technology for the NEUST Supply Office is strongly encouraged.

Specifically, this study sought answers to the following:

1. How may the Smart Inventory Management System be described using the System Development Life Cycle (SDLC) phase as:

1.1. analyzing;

1.2. planning;

1.3. designing;

1.4. coding;

1.5. testing;

1.6. implementing; and

1.7. evaluating?

2. How may the IT experts evaluate the technical quality of the Smart Inventory Management System using QR Code based on the following ISO 25010 Software Product Quality Standards in terms of:

2.1. functional suitability;

2.2. performance efficiency;

2.3. compatibility; 2.4. usability;

2.4. reliability;

2.5. security;

2.6. maintainability; and

2.7. portability?

3. How may the end-users evaluate the technical quality of the Smart Inventory Management System using QR Code based on the selected ISO 25010 Software Product Quality Standards criteria as:

3.1. functional suitability;

3.2. performance efficiency; and

3.3. usability?

4. How may the level of effectiveness of the Smart Inventory Management System be described in terms of:

4.1. objectives;

4.2. design; and

4.3. application?

Significance of the Study

The development of Smart Inventory Management System using QR Code will be a very effective tool for Nueva Ecija University of Science and Technology for the monitoring and tracking of supplies and equipment. The study will be beneficial to the following:

Supply Office. The proposed system will provide them a secured database for storing and monitoring that status of supplies and equipment wherein they can manage inventory, monitoring and tracking with accuracy and efficiency.

End-Users/Requisitioners. The study will provide them a system that will make the monitoring and tracking of supplies and equipment faster and fewer error due to human intervention.

Future Researchers. The findings of this study may serve as a guide for future researchers for they can use this as a reference if they are planning to conduct the same study.

University. Neglecting to track university's properties will result in lost money. There's simply no way the University can manage all its item manually. Successful implementation of the Smart Inventory Management System using QR Code can help the University to track and monitor its properties. Yet, the university will be able to make the most of their budget without sacrificing any of their school's program.

Materials and Methods
Research Design
The researcher used the developmental method of research to accomplish the desired system for the study. According to Ibrahim, as cited by Luciano et al. (2020), developmental research involves situations in which the product development process is analyzed and described and the final product is evaluated. Developmental research is a systematic study of designing, developing, evaluating instructional programs, process, and products that must meet the criteria of internal consistency and effectiveness (Olipas, 2019).

Through data gathering, the researcher was able to obtain significant information like forms and procedures vital to the development of the system. Before developing the proposed system, the researcher requested the selected respondents to evaluate the existing system. The results of this evaluation had been used as bases in improving the proposed system.

Locale of the Study
This study was conducted at the Supply Office of the Nueva Ecija University of Science and Technology during the second semester of the academic year 2020-2021.

Respondents
There were two sets of respondents in the study and both chosen using purposive sampling. Purposive sampling is applicable when only limited numbers of people can serve as primary sources of data due to the nature of research design and objectives of the study (Lewis et al., 2012).

The first respondents were the IT experts and technical staff who were chosen on the basis of their technical knowhow on the development and deployment of such type of system. They were requested to evaluate the system based on the criteria adapted from ISO 25010 Software

Product Quality Standards such as functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability and portability. On the other hand, the second respondents were personnel from the Supply Office where all the data, forms, and all other necessary information regarding the development of Smart Inventory Management System were requested. At the same time, they served as end-users together with the department heads, faculty and staff who evaluated the system in terms of features and functionalities.

Sample and Sampling Procedure

Purposive sampling procedure was used in selecting respondents for this study. This technique was employed because of the limited numbers of people who served as primary sources. In this study, the end users were purposively chosen on the basis of their practice in and familiarity with procurement flow and processes. The IT experts and technical staff on the other hand were purposively chosen on the basis of their technical knowhow and knowledge about system functionality and technicalities.

Research Instruments

This study utilized three sets of questionnaires. The first set of the questionnaire was used by the IT experts in evaluating the system based on the following criteria functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability and portability. The second set of the questionnaire was used by the End-users in evaluating system according to selected ISO 25010 Software Product Quality Standards such as functional suitability, performance efficiency, and usability. These criteria were selected because these are the only standards the End-users can relate with. The third questionnaire was utilized to evaluate the effectiveness of the system. This instrument used the following criteria: objectives, design and application.

Validity and Reliability of the Instrument

To test the content validity of the instrument, it was subjected to thesis advisory committee/research critics for scrutiny. A series of consultation and discussion was done to make sure that the items in the questionnaires were reliable and valid. To validate the principal instrument, the questionnaires were administered to the respondents to assess the content of the instrument. The responses were then considered for the final draft of the system. The experts approved that the instrument was valid and can be used as an instrument of the study.

Furthermore, the reliability of the proposed instrument was established by analyzing the data gathered in the field test and has an over-all Cronbach alpha value of 0.77 that signifies its reliability based on internal consistency as acceptable. In testing the reliability of the instrument, the system was tested to another set of respondents. The result was recorded and statistically treated.

Data Gathering Procedure

In the development stage of the system, the researcher first conducted series of interviews to collect information needed in analyzing the process and flow of transactions, and to gather forms and reports necessary in designing a system that would fit to the requirements of the end-user.

The system was then designed and developed according to specification and in consideration of the existing needs of the end users.

When the system was already running, the researcher proceeded to the evaluation stage where the system was used and evaluated by the intended users and IT experts and technical staff.

Before the evaluation proper, however, the researcher first sought permission from head of offices of the target evaluators.

When permission had been granted, the researcher administered the evaluation materials herself using the two sets of questionnaires based from ISO 25010 Software Product Quality Standard to ensure valid and reliable data. Evaluation by the IT experts and technical staff was based on functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability and portability. On the other and, evaluation by end users was based only on functional suitability, performance efficacy and usability.

The gathered data were then tabulated and scored after which these were analyzed and interpreted.

Results

1. *Evaluation of the Smart Inventory Management System for SUCs using QR Code Technology (SIMS) by the IT Experts*

Table 1

Summary of Evaluation of the Smart Inventory Management System for SUCs using QR Code Technology by the IT Experts

Software Product Quality Categories	Weighted Mean	Verbal Description
1. Functional Suitability	3.80	Very Functional
2. Performance Efficiency	3.60	Very Efficient
3. Compatibility	3.80	Very Compatible
4. Usability	3.50	Very Usable
5. Reliability	3.33	Very Reliable
6. Security	3.33	Very Secure
7. Maintainability	3.80	Very Maintainable
8. Portability	3.73	Very Portable
Average Weighted Mean	**3.61**	

2. *Evaluation of the Smart Inventory Management System of SUCs using QR Code Technology (SIMS) by the the Property Custodia, Supply Office, Department Heads, faculty and staff*

Tables 2

Summary of Evaluation of the Smart Inventory Management System for SUCs using QR Code Technology by the Property Custodian, Supply Officer, Department Heads, faculty and staff

Software Product Quality Categories	Weighted Mean	Verbal Description
1. Functional Suitability	3.49	Very Functional
2. Performance Efficiency	3.33	Very Efficient
3. Usability	3.84	Very Usable
Average Weighted Mean	**3.55**	**Very Functional, Very Efficient and Very Usable**

3. *Evaluation on the Level of Effectiveness upon Implementation of the Smart Inventory Management System for SUCs using QR Code Technology*

Table 3

Summary of the Evaluation on the Level of Effectiveness of the system

	Weighted Mean	Verbal Description
1. It searches, updates, archives and retrieves records efficiently.	3.52	Very Effective
2. It records tools and equipment details.	3.48	Very Effective
3. It monitors and tracks tools and equipment.	3.71	Very Effective
4. It generates ICS number or property code.	3.76	Very Effective
5. It generates QR Code.	3.62	Very Effective
6. It generates report.	3.43	Very Effective
7. It approves and disapproves transfer of tools and equipment.	3.43	Very Effective
Average Weighted Mean	**3.56**	**Very Effective**

DISCUSSION

The results of the evaluation in Table 1 shows that the SIMS conformed with the different software quality criteria of the ISO 25010 Software Product Quality Standards. These point out that the developed system is a quality product that can be applied in the University.

These results are evidence that the SIMS has satisfactorily met the product quality standards with no weaknesses. This is proved by the 3.61 mark attained by the system from the IT experts in all the criteria namely, functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability and portability.

The 3.61 mark is described as Very Functional, Very Efficient, Very Compatible, Very Usable, Very Reliable, Very Secured, Very Maintainable and Very Portable.

These results recommend that from the viewpoint of the IT experts, the SIMS is functionally suitable, performance efficient, compatible, usable, reliable, secure, maintainable and portable.

The data in Table 2 point out that the Property Custodian, Supply Officer, Department Heads, faculty and staff are ready to take and adopt the SIMS. This directs that the system is very functional, very efficient and very usable as per the assessment of the users. Such ratings which equate to Very Functional, Very Efficient and Very Usable verbal descriptions signify that the Property Custodian, Supply Officer, Department Heads, faculty and staff found the system as exceptionally capable in meeting their need. This further suggests their approval in adopting the SIMS under consideration in the tracking activity. Thus, these reveal that the end-users found the SIMS to be functionally suitable, performance efficient and usable.

In Table 3 the seven statements to determine the level of effectiveness of the SIMS obtained a verbal description of Very Effective with an average weighted mean score of 3.56. The results show that the system outstandingly meets all the essential requirements of the system user. This further shows that from the viewpoint of the end-user, the system is very effective. Within the seven statements, the item "It generates ICS number or property code" obtained a verbal description of Very Effective with the highest weighted mean of 3.76. This implies that working effectively in generating report and approving and disapproving of transfer of tools and equipment is lay open to enhancement.

CONCLUSIONS

Based on the findings, the following conclusions were drawn:

The Smart Inventory Management System for SUCs using QR Code Technology (SIMS) was successfully developed based on the different phases of the V-Model of the System Development Life Cycle (SDLC).

The Smart Inventory Management System for SUCs using QR Code Technology (SIMS) complied with the requirements specified in the ISO 25010 Software Product Quality Standards as evident by the ratings conforming to as Very Functional, Very Efficient, Very Compatible, Very Usable, Very Reliable, Very Secured, Very Maintainable and Very Portable given by the IT Experts.

The End-users are ready to accept and integrate the system in their process and workflow of transactions as proven by the qualitative rating of Very Functional, Very Efficient and Very Usable for the three selected categories of Functional Suitability, Performance Efficiency and Usability given by the End-users.

The Smart Inventory Management System for SUCs using QR Code Technology (SIMS) may be implemented in Nueva Ecija University of Science and Technology system based on the high level of acceptance received from the evaluators and because it features the technical functionalities and requirements that are needed for the effective monitoring of the supply inventory system of the University.

RECOMMENDATIONS

Based on the findings, the following recommendations were made:

1. The University may support full implementation of SIMS by providing the hardware requirement like a server that is only dedicated for the system and be placed on a secured place for security purposes.

2. As part of the Extension program, the University may conduct training for other SUCs for the utilization of Smart Inventory Management System for SUCs using QR Code Technology for the actual monitoring and tracking of their supply.

3. The Smart Inventory Management System for SUCs using QR Code Technology may be further enhanced its scope to completely suit with the requirements of the University's Supply Office.

REFERENCES

- Arani, W., Namusonge, G., & Mbuvi, L. (2017). Factors Affecting Automation of Inventory

- Management in Micro, Small and Medium Enterprises: A Case Study of Kitui County.

- B. Sai SubrahmanyaTejesh, S. Neeraja, Warehouse inventory management system using IoT and opensource framework. Alexandria Engineering Journal, Volume 57, Issue 4, 2018, Pages 3817-3823, ISSN 1110-0168, https://doi.org/10.1016/j.aej.2018.02.003.

- Denton W J 2003 Selection and Use of MySQL in a Database Management Course Journal of InformationSystem Education 14 4

- Kan, Tai-Wei & Teng, Chin-Hung & Chen, Mike. (2011). QR Code Based Augmented Reality Applications.10.1007/978-1-4614-0064-6_16.

- Ksonzhyk, Iryna &Dubinina, Maryna. (2017). MONITORING OF THE ACTIVITY OF PUBLICPROCUREMENT SYSTEM IN COUNTRIES OF EUROPEAN UNION AND

- UKRAINE. Baltic Journal of Economic Studies. 3. 238-243. 10.30525/2256-0742/2017-3-5-238-243.

- Law, Ching-yin and So, Simon (2010) "QR Codes in Education," Journal of Educational TechnologyDevelopment and Exchange (JETDE): Vol. 3 :Iss. 1 , Article 7. DOI:

- 10.18785/jetde.0301.07 Availableat: http://aquila.usm.edu/jetde/vol3/iss1/7

- Luciano, Ruth G., Gloria M. Alcantara and Renato Bauat, Jr. (2020). Design and Development of AlumniTracking System for Public and Private HEIs. International

- Journal of Scientific & Technology Research Volume 9, Issue 06, June 2020 ISSN 2277-8616.

- Markus Amann & Michael Essig (2015) Public procurement of innovation: empirical evidence from EUpublic authorities on barriers for the promotion of innovation,

- Innovation: The European Journal of Social Science Research, 28:3, 282- 292, DOI:10.1080/13511610.2014.998641

- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework forteacher knowledge. Teachers college record, 108(6), 1017.

- Niko Suhonen, Timo Tammi, Jani Saastamoinen, Jarkko Pesu, Matti Turtiainen, Lasse Okkonen. (2019)Incentives and risk-sharing in public procurement of innovations.

- Journal of Public Procurement 19:2,pages 129-145.

- Olipas, Cris Norman P. (2019). The Development and Assessment of an Online Student

- System with Short Message Service. International Journal of Scientific & Technology Research Volume 8, Issue 12, December 2019ISSN 2277-8616.

- Plinere, Darya & Borisov, Arkady. (2015). Case Study on Inventory Management Improvement. Information Technology and Management Science. 18. 10.1515/itms-2015-0014.

- Quisumbing, Lowell & Jr, Eduardo &Carolino, Clarence & Navarro, Ernest &Treceñe, JastenKeneth. (2017). Automated Supplies and Equipment Inventory Management

- System Using Barcode Technology for LNU Supply Office.

- Rochmawati, Naim&Anistyasari, Yeni &Fatrianto, Dwi& Kurniawan, IbnuFebry. (2018).

- A Responsive Web-Based QR Code for Laboratory Clearance Form. Journal of Physics: Conference Series. 1108. 012048.10.1088/1742- 6596/1108/1/012048.

- Saunders, M., Lewis, P. & Thornhill, A. (2012) "Research Methods for Business Students" 6th edition, PearsonEducation Limited Tiwari, Sumit. (2016). An Introduction to QR Code Technology. 39-44.10.1109/ICIT.2016.021.

- Yue Liu, Ju Yang and Mingjun Liu, "Recognition of QR Code with mobile phones," 2008 Chinese Control andDecision Conference, Yantai, Shandong, 2008, pp. 203-206, doi:10.1109/CCDC.2008.4597299.

AN EMPIRICAL STUDY ON ENTREPRENEURIAL ECOSYSTEM IN CHHATTISGARH DURING COVID-19

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ABSTRACT

To pour out the impact of COVID-19 on Entrepreneurship, its blooming and growth of start-up in the state of Chhattisgarh, we conducted this survey on more than hundred small scale startup businesses during the period of April 2020 – December 2021. This COVID-19 outbreak is a sharp reminder that pandemics, like other rarely occurring disasters, have happened in the past and will continue to happen in the future. Even if we cannot prevent dangerous viruses from emerging, we should prepare to dampen their effects on society. The current outbreak has had severe economic consequences across the globe, and it does not look like any country will be unaffected. This not only has consequences for the economy; all of society is affected, which has led to dramatic changes in how businesses act and consumers behave. We saw firstly huge cut back and unemployment just a few weeks into the crisis or within a very short period of time. But we noticed a considerable development in Small businesses, Start-ups and Entrepreneurship, Moreover as being a Mini India and full of resources, State Chhattisgarh also emerged in the Startup Industry. In fact in the situation of COVID-19 outburst Chhattisgarh explored and nourished a lot in startup Sectors. In this analytical study we will understand the growth and development of the Entrepreneurship environment in Chhattisgarh state.

Keywords: Entrepreneurship, Startup, pandemic, Eco-system, parameter

INTRODUCTION:

Chhattisgarh came into existence after bifurcation from state Madhya Pradesh in the year 2000. It is also renowned as the rice bowl of India and tribal tourism. Chhattisgarh is the fastest growing state in the field of industrialization, innovation and Research. In this Covid During the coronavirus (COVID-19) crisis, start-ups have continued to play a critical role for economies. Some innovative young firms have reacted fast and flexibly to the pandemic, and have been critical in helping many countries shift towards fully-digital work, education, and health services, and have provided innovations in medical goods and services (Report of OECD on Covid-19 and startups, 2020).

This state has a strong ecosystem for educational development, Health and Medical Services and in manufacturing concerns also . As a new emerging state full of minerals, resources and ample opportunity to develop in every way. The Government of Chhattisgarh recognises a new phase in which startups will be the engine for social innovation and, in the long run, the dominating job creators. By using science and technology, the state intends to become a global epicentre of entrepreneurship and innovation, fostering sustainable and inclusive growth and boosting global competitiveness. In 2016, the state government announced the 'Chhattisgarh Innovation & Entrepreneurship Development' policy with the objective of creating a conducive environment for innovation and entrepreneurship in the state.

Startup Ecosystem in Chhattisgarh : Ministry of
Incubation centres and Accelerators -Under the programme, the state has built three types of incubator/accelerator centres, focusing on technology, micro, small, and medium enterprises (MSME), and all other sector-agnostic firms.

1. Indira Gandhi Krishi Vishwavidyalaya (IGKV)

2. AIC@36INC

3. RKVY-RAFTAAR Agri-Business Incubator

4. Shri Shankaracharya Technical Campus Business Incubator

Prototype shops and Co-Working Space - Set up of shared facilities for all incubators for component fabrication and prototyping studios, including plastic and electronics laboratories, a machine shop, lesser cutters, welding stations, a textile department, a metal working shop, a wood shop, and a water jet cutter, among other prototyping setups.

To promote equitable and sustainable socio-economic growth, the state has built co-working spaces in the incubator-cum-accelerator for engineers, social entrepreneurs, government, technology firms, and impact investors.

Funding and Support system - Government funding for development of Start-Up
a) Govt. of India reimburses 100% of space rent and economy class air fare to women entrepreneurs, in case of participation in international exhibitions /fairs

b) Govt. of India provides Start up packages as per the Industrial Policy.

c) 100% concessions are provided for electricity charges by SSI manufacturing.

d) Free Stamp duty for purchasing or leasing Land.

Educational and skill development -For skill development, plan to encourage Institutes, Colleges and Universities to take initiative to develop the concept of entrepreneur in residence.

Successful entrepreneurs most typically hold the role of Entrepreneur in Residence (EIR) in venture capital companies, private equity firms, startup accelerators, law firms, or business schools. To encourage chosen student entrepreneurs to pursue their innovations/start-up ideas, the state has launched an internship and fellowship programme. The state encourages entrepreneurship by providing Innovation Kits and Start-up Toolboxes, as well as hosting boot camps at schools and institutions.

Market linkage - During prototype and market testing, the state ensures that corporate and state interactions are facilitated. The state connects entrepreneurs with industry investors so that they could invest in innovative solutions that were made with the help of customers. The state needs to conduct an annual startup event to showcase the skills of young talent who will be recognised on a state level.

Public Private Partnership -Entrepreneurship Awareness Programme was organized in the Chhattisgarh State. There are 45 Nos. of candidates participated out of which 40 male participants and 5 female participants . The participants were trained to become entrepreneurs.

Focus Areas for Development - The state has identified following areas as innovative business areas and is in the process of creating a special policy/ regulation to promote startups working in these areas. These include:

Core sectors such as Iron, Steel, Aluminium, Coal, Power etc	Emerging sectors of the State such as Defence, Automotive, Agro Processing, ESDM and Biotechnology	Social Innovation for empowering citizens

Financial Technologies (Fin Tech) with focus on financial inclusion and Mobile Commerce (m-commerce)	Internet & MobileTechnology and Social Mobility Analytics & Cloud (SMAC)	Safe and Smart Cities, and Smart Villages
Healthcare Technology	Social Innovation for empowering citizens	Emerging sectors of the State such as Defence, Automotive, Agro Processing, ESDM and Biotechnology
Wearable Technologies	Healthcare Technology	Internet & Mobile Technology and Social Mobility Analytics & Cloud (SMAC)
Core sectors such as Iron, Steel, Aluminium, Coal, Power etc.	Renewable Energy	Financial Technologies (Fintech) with focus on financial inclusion and Mobile Commerce (m-commerce)

Start-ups face significant challenges during COVID-19

However, most of the existing start-ups in Chhattisgarh face significant challenges, as they are more vulnerable than older incumbents to the shocks brought by COVID-19. They tend to engage in high-risk activities compared with other small and medium-sized firms (SMEs), face constraints in accessing traditional funding, and have a formative relationship at best with suppliers and customers.

At a time marked by significant economic uncertainty and with their revenues affected by containment measures and significant drop in demand, start-ups may become even more financially fragile and will need support for their short-term liquidity needs, critical for their survival (Report of OECD on Covid-19 and startups,2020)

.**REVIEW OF LITERATURE**

Low and McMillan, defines start-up as the" creation of new enterprises. Akansha Dutta suggests Start-up requires appropriate support and mentoring and enhancing the bank finance for the start-ups to encourage entrepreneurship and job availability. Tim Mazzarol et al. identify that, three key demographic variables (gender, previous government employment and recent redundancy) are the obstacles of small business establishment rather than trigger

The following Indian start-ups are currently the most followed– worthy. E-Commerce Start-ups: Flipkart, Snapdeal.com, Free Charge, Shopclues, Jabong.com, Bigbasket, Hungama, Book my show. Travel Start-ups: Yatra, Make my trip, Clear trip, Must see India, Ixigo. Transport: Ola, Taxi For Sure. Ad-tech: InMobi, AdNear, Adpushup, Vizur. Classifieds: Quiker, Cartrade. Search: Housing, Policy bazaar, India Homes, Iimjobs. Mobile: News hunt, Hike, Lookup. Fintech: Clear Tax. Social: Touchtalent.

Nowinski and Haddoud4 reported that in the field of entrepreneurship, a key attribute that needs to take root in every new venture is the intention to start a business. Thus, entrepreneurial intention concerns the individual's attitude towards starting a new business. The development of business, the expansion of existing ones and the creation of new corporations in the form of

joint stock companies have led to the emergence of such a term as corporate social responsibility. One of the definitions of corporate social responsibility is known as a conceptual approach, or style of corporate management, and when we are following it the effectiveness and quality of management decisions is reflected not only in the economic effects, but also responsibility for the consequences of the decisions made to all parties involved in the process of activity (Johnstone-Louis, 2017)

J P Sharma, Reshma Gills andTulsi Bhardwaj (2015) In this competitive era of growth, investors from all over the world are making more and more investments into Entrepreneurship for unleashing its existing potential as well as for exploring the untapped areas. But the specific and actual opportunities for different areas are not the same. Proper documentation and presentation of identified opportunities in different areas are lacking in our situation. In order to overcome these situations and develop a sustainable growth and economic independence among small and medium level farmers, extension and educational agencies need to help in developing human resources and capacities among them. Creation, documentation and replication of marketing innovation and marketing models by extension agencies may help in entrepreneurship development.

Research Gap: There were various studies done on the Startup ecosystem on the basis of industry wise such as tribal, agricultural based wise but there are no studies conducted on entrepreneurship development environment during pandemic. This study is an honest effort to fill the gap and contribute to society, academics, industrialists and stakeholders.

OBJECTIVES OF STUDY

- To understand the phenomenon of the startup ecosystem.

- To study and analyse the change in trend of the Startup Industry in Chhattisgarh.

- To Study the growth and development of startups during the period of COVID-19.

- To achieve insights into start up initiatives in Chhattisgarh.

- To study the future growth and opportunities in this Field.

Research design

This study was conducted on the basis of data collected from various periodicals, government reports, project reports and data published on government websites and magazines. During conduction of study investigators visited various incubation centers located in Raipur, Chhattisgarh and collected data by direct interview methods and continuous observation in the period of study.

Data collected during the Covid-19 outbreak happened and most industries got affected due to lockdown and migration of daily wages laborers.

Table1: District wise registered Micro, small, Medium, large, Mega and Ultra Enterprises in Chhattisgarh

| Sno.	District	Total Registration	Micro	Small	Medium	Large	Mega	Ultra
1	Balod	74	21	49	4	0	0	0
2	Baloda Bazar	251	55	193	1	0	0	2
3	Balrampur	36	6	30	0	0	0	0
4	Bastar	17	2	15	0	0	0	0
5	Bemetara	82	33	48	1	0	0	0
6	Bijapur	8	5	3	0	0	0	0
7	Bilaspur	172	81	82	5	4	0	0
8	Dantewada	6	5	1	0	0	0	0
9	Dhamtari	130	55	74	0	1	0	0
10	Durg	326	95	212	12	5	2	0
11	Gariyaband	56	22	34	0	0	0	0
12	Gorella-Pendra-Marwahi	11	3	8	0	0	0	0
13	Janjgir – Champa	220	112	108	0	0	0	0
14	Jashpur	64	35	28	0	0	1	0
15	Kabeerdham	61	19	41	1	0	0	0
16	Kanker	48	22	25	1	0	0	0
17	Kondagaon	13	7	6	0	0	0	0
18	Korba	103	57	45	0	0	0	1
19	Koriya	52	27	24	0	1	0	0
20	Mahasamund	200	94	99	3	4	0	0
21	Mungeli	59	21	37	1	0	0	0
22	Narayanpur	2	1	1	0	0	0	0
23	Raigarh	207	81	109	8	8	1	0
24	Raipur	593	135	393	44	14	6	1
25	Rajnandgaon	178	63	110	3	1	1	0
26	Sarguja	92	43	45	3	1	0	0
27	Sukma	0	0	0	0	0	0	0
28	Surajpur	64	29	33	1	0	1	0
	TOTAL		3125	1129	1853	88	39	12	4

Source: Govt of Annual Progress Report (2020) of ministry of Micro, Small, Medium Enterprises

Analysis: To analysis the data table and percentage method used and graphically presented in Pie chart. There are six parameter taken to assess robust ecosystem for startup of state, are mentioned below:

S.No	Parameters	Planned	Implemented	Gap
1	Incubation centres and Accelerators	100%	60%	40%
2	Access to the market	100%	65%	35%
3	Funding and Support system - Government funding for development of Start-Up	100%	87%	13%
4	Funding and Support system-Non Government funding for development of Start-Up	100%	45%	55%
5	Institutional Development	100%	60%	40%
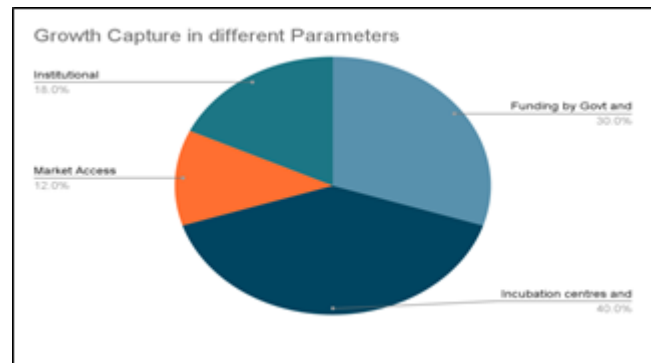
Figure 2 : growth capture in different Parameters
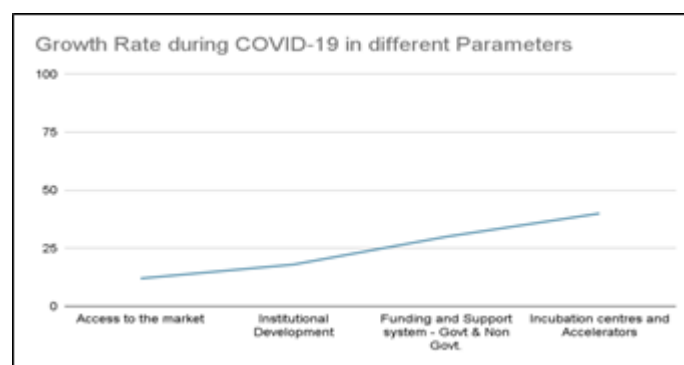
Figure 2: Growth rate during Covid-19 in different parameters

FINDINGS

1. Lack of awareness and importance of Startups among people.

2. In spite of the deficit of infrastructure and various barriers like funding, proper Infrastructure they tried to make a positive effect on the society.

3. Remarkable works are being performed by Entrepreneurs in this outbreak situation.

4. By facing the problem of regardless availability and reliability on Start ups but they significantly marked implement in Chhattisgarh

5. Govt. promotes university-business collaborations to facilitate industry applications of innovation and university-to-entrepreneurship transitions.

6. Govt promotes entrepreneurship training, also in combination with benefits for displaced workers and lifelong learning, to facilitate (un)employment-to-entrepreneurship transitions, with particular attention to disadvantaged groups.

7. Lack of Support short-term financial needs of existing start-ups (e.g. with loan guarantees, direct lending, grants or subsidies.

SUGGESTIONS-

1. Government should focus on Small Scale Industries right now as they have performed unpredictable work for the support of people in crucial periods of pandemic.

2. Proper financial assistance must be ensured from the end of government for the growth and development.

3. Favorable marketing strategy should be formulated for the unorganized sector.

4. Government should appreciate the outstanding performance of members of Incubators who played a heroic role from the back screen for combat like warriors with corona.

5. The government should make concrete policies for Entrepreneurs to merge them with the mainstream of economic growth and development.

6. Favorable marketing strategy should be formulated for the Start up sector.

CONCLUSION

In many of the developing nations, small and medium firms play an important role as life blood for the livelihood security of population and economic welfare of the country, This study is tried to analyse the growth and development of Start ups in Chhattisgarh which impacted the over all growth and development of Country. In this pandemic outbreak we saw high de-growth rate and structural changes of the economy, In many of the cities in Chhattisgarh, Start Ups face a series of constraints that often limits their ability to participate competitively in production and marketing chains and services but Government promote and provide number of programmes, schemes and funding which made it bit easier for entrepreneurs. However, much more policy action needs to be taken for developing Startups and Entrepreneurs for long-term basis.

Implications: Findings of this study will provide insights for future startups and help them avoid growth barriers. This study will help government bodies to enhance funding and support system for coming startups.

REFERENCE

*   Attaining, T., Growth, I., & Economy, M. (2019). *INDUSTRIAL POLICY 2019-2024*.

*   Cfti, T., Cfti, T., Citd, T., Ctr, T., Cttc, T., Cttc, T., Idemi, T., & Idtr, T. (n.d.). *Government of India DC (MSME), Ministry of Micro , Small & Medium Enterprises Support for Entrepreneurial and Managerial Development of MSMEs through*.

*   DPIIT. (2020). *States' Startup Ranking 2019*. *September*, 132. https://www.startupindia.gov.in/content/dam/invest-india/compendium/Startup India - National report_Final Version_web.pdf

*   Frohlich, E. D., Ré, R. N., & Navar, L. G. (1999). Annual Progress Report. *Hypertension*, *33*(1), 1–6. https://doi.org/10.1161/01.hyp.33.1.1

*   Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Morales Reyes, C. A., Prochotta, A., Steinbrink, K. M., & Berger, E. S. C. (2020). Startups in times of crisis – A rapid response to the COVID-19 pandemic. *Journal of Business Venturing Insights*, *13*(April). https://doi.org/10.1016/j.jbvi.2020.e00169

*   Mukherjee, S. (2017). *Start – up enterprise of Chhattisgarh with special reference to Bastar Arts , Arts*. *6*(10), 8–11.

*   Trade, I. (2020). *STATES RANKING 2020 On Support to Startup Ecosystems*.

*   Xavier, S. (2019). *Start-Up Initiatives : an Overview*. *6*(1), 254–262.

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ABOUT THE BOOK

Multidisciplinary collaborations have proven to be an effective way of establishing a new network of scholars and meeting people from different fields. Multidisciplinary projects make it easier to communicate with colleagues from other fields. Multidisciplinary projects significantly broaden one's network of contacts.

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