CRITERIA III - Research, Innovation & Extensions

3.2.1.1 List of Research Publications - 2019-20 (Total No.: 10)

Sr. No.	Title of the Paper	Name of Author/s	Department of Teacher	Name of the Journal	Year of Publication	ISSN Number	Pg.No.
01	Application and Recalibration of Altman Z-Score Model for Forcasting the Bankruptsy in India	Mrs. Reshma Prabhy Verlekar, Dr. Manoj S. Kamat	Commerce	Wealth - International Journal of Money Banking and Finance	July-December 2019	2277-9388	01
02	An Application and Comparison of Bankruptsy Models in Indian Banking Sector	Mrs. Reshma Prabhy Verlekar, Dr. Manoj S. Kamat	Commerce	International Journal of Financial Management	December, 2019	2229-5682	02
03	Spatial-temporal Divident Appropriation by Indian Engineering Industry	Dr. Manoj Kamat & Dr. Manasvi Kamat	Commerce	TEST Engineering and Management Journal - Scopus Peer Reviewed	March - April, 2020	0193-4120	3-5
04	Measurement of Credit Risk in Indian Banking Sector using Financial Ratios	Mrs. Reshma Prabhy Verlekar, Dr. Manoj S. Kamat	Commerce	Aegaeum Journal, UGC Care Approved Group II	2020,	1617-1640	6
05	A Spatio-Temporal Overview of Livestock Resources in Goa, 1988 to 2016	Dr. C. P. Hiremath	Geography	The Goa Geographer	December, 2019	0976-786X	7 - 19
06	Information Seeking Behaviour and Gender: A Study of M. Com. Students of Goa University	Mrs. Padmavati Tubachi, Mr. Sudhir Halvegar and Mr. Avinash Humbare	Library	Our Heritage	January, 2020	0474-9030	20-34
07	Endurance Atheletes and their Dependence on Energy Drinks to Enhance Performance	Mr. Savio Leitao	Sports	Studies in Indian Place Names - UGC Care Journal	March, 2020	2394-3114	35-42

08	Coastal Tourism and its Impact on the Goan Environment	Dr. F. M. Nadaf	Geography	Mukt Shabd - A Peer Reviewed Journal	May, 2020	1247-3150	43 - 59
09	Covid-19: The Upside of Lockdown	Dr. F. M. Nadaf	Geography	Juni Khyat	May, 2020	2278-4632	60 - 69
10	Impacts of Changing Coastal Regulations on Sustainable Tourism in Goa: A Case Study of North Goa Shoreline using Geospatial Techniques	Dr. F. M. Nadaf	Geography	Juni Khyat	May, 2020	2278-4632	70-80
Total Number of Research Publications = 10							

Application and Recalibration of Altman Z-score Model for Forecasting Banking Bankruptcy in India

Reshma Prabhu Verlekar[1]   Manoj S. Kamat[1]

ABSTRACTS

Significance: Banking system affects the economic performance of different country. The failure of one bank has a spillover effect on the other bank and throughout the world economy. In other words, the effect of bank becoming insolvent often leads to adverse consequences for many stakeholders, thus the prediction of bankruptcy may be highly beneficial to the individual bank, Government, Auditors, Creditors, owners, society and other stakeholders. A proper prediction of firm bankruptcies might therefore be extremely important and of grant of interest wide range of relevant financial actors. To avoid the risk of bank failure, banks should find the reliable ways to predict bankruptcy.

Method: Literature review shows different methods available for predicting bankruptcy. One of the methods for bankruptcy study is scoring model. Altman Z-score is one of the pioneers in the bankruptcy prediction model. Hence present study applied this model on forty four public, and private banks, but due to time factor - the said model lose its importance. When an old original model is applied to a more recent sample the predictive power of the model is very low and the bankruptcy is over predicted. Therefore, the model is recalibrated by changing coefficients using multiple linear regression techniques.

Result: The result shows that, recalibrated Altman model performs better than the original Altman model.

Conclusion: Thus recalibrated model shows the increased accuracy compared to original Altman model. This proves the work of other researchers who criticizes the original Altman model is not working in the current period.

Keywords: Bankruptcy, Prediction, Altman Z-score model, India

1.0 INTRODUCTION

Bank failure is a major concern to economy around the world as it creates high cost and heavy losses to the individual bank and society. It affects individual bank in terms of direct and indirect cost. Direct cost will be in terms of legal and administration cost associated with bankruptcy proceedings and indirect cost will be in terms of loss of depositor's confidence, withdraw of amount from the bank, avoidance of investment by customer. Similarly it affects global economy in different context. Banking system affects the economic performance of different country. Failure of Giant banks may traumatize not only the domestic economy but also put the global at stake (Sharma & Mayanka, 2013). The failure of one bank has a spillover effect on the other bank and throughout the world economy. According to (Lawerence et al., Nov2015), the failure of business organization has significant economic effect for its owners, creditors and to society overall. In other words the affect of bank becoming insolvent often leads to adverse consequences for many stakeholders, thus the prediction of bankruptcy may be highly beneficial. Some prediction may have large utility to the individual bank, Government and also to the other stakeholders. If bankruptcy could be predicted with reasonable accuracy ahead of time, banks could better protect their business and could take action to minimize risk and loss of

business perhaps even to prevent bankruptcy (Kingsalata et al., Dec 2004). Bankruptcy Study is important to auditors as they are acknowledging the probability in the going concern of the bank (Jourbarkarta 2013). Bankruptcy study will provide information on variables that will influence the health of bank (Sinjuk & Warshun, 2014). A proper prediction of firm bankruptcies might therefore be extremely important and of grant of interest wide range of relevant financial actors. There is a need of early warning of financial distress due to change happening in the recent economic environment. To avoid the risk of bank failure, banks should find the reliable ways to predict bankruptcy.

Literature review shows different methods available for predicting bankruptcy. One of the methods for bankruptcy study is scoring model. Scoring model is a linear combination of the factors (accounting variable), weighted by coefficients which provides relevant score. The output of scoring model is compared with a standard value to determine the financial health of a bank. Score value calculated using models is useful to public sector banks to demand loan from RBI or any other funding agency (Pradhan, Dec 14)

An Application and Comparison of Bankruptcy Models in the Indian Banking Sector

Reshma Prabhu Verlekar*, Manoj Kamat**

Abstract

In today's era, banks are more serious about their success and survival due to increased Non-Performing Asset (NPA) over a period of time. An increased number of NPA's shows that banks are facing huge credit risk. This calls for a proper assessment of credit risk. There are many techniques available for credit risk assessment and one of the most popular approaches is using a scoring model. In the current paper, Altman Z-score, Springate and Grover and Zmweskis model are applied to assess credit risk of public, private and merged banks. The aim of this paper is to apply and compare these scoring models for credit risk assessment of public, private banks and merged banks in India. The data collected during the period 2005-2017 were tested 44 Indian banks. The result shows a similarity in Springate and Grover scoring model and has implications in assessment of banks credit risk in India. As per the ranks given by these models, Dena bank and Catholic Syrian bank in case of public and private banks, respectively, achieved the first rank, depicting a highly secured financial position of these banks.

Keywords: Bankruptcy Model, Altman Z-score Model, Springate, Grover, Zmweskis, India, Banking Sector

Introduction

Bank failure is a major concern to economy around the world as it creates high cost and heavy losses to the society. Banking system effects the economic performance of different countries. Failure of giant banks may traumatize not only the domestic economy but also put the global economy at stake (Mayanks, June 2015).

The failure of one bank has a spill over effect on the other banks and throughout the world economy.

According to (Lawerence, 2015), the failure of business organization has significant economic consequences for its owners, creditors and society overall. In other words, the effect of bank becoming insolvent often leads to adverse consequences for many stakeholders, thus the prediction of bankruptcy may be highly beneficial. Some predictions may have large utility for the individual bank, government and the other stakeholders. If bankruptcy could be predicted with a reasonable accuracy ahead of time, banks could better protect their business and could take action to minimize risk and loss of business, perhaps even to prevent bankruptcy (Pongsatata, 2004). Bankruptcy study is vital for auditors as they are acknowledging the probability in the going concern of the bank. There is a need of early warning of financial distress due to the change happening in the recent economic environment. To avoid the risk of bank failure, banks should find the reliable ways to predict bankruptcy.

Literature review shows different methods available for predicting bankruptcy. One of the methods for bankruptcy study is the scoring model. The scoring model is a linear combination of the various factors (accounting variable), weighted by coefficients which provides a relevant score. The output of the scoring model is compared with a standard value to determine the financial health of a bank. Score value calculated using the model is useful to public sector banks to demand loan from the RBI or any other funding agency (Pradhan, 2014). The scoring model has the ability to classify banks into different predefined groups through an appropriate tool, which replaces the human assessment. The scoring model has become very popular during last 40 years in credit risk applications, forming a vast and fast-growing literature. In the past,

2

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Spatial-temporal Dividend Appropriations by Indian Engineering Industry

Dr. Manoj S. Kamat, Professor and Principal. DPM's Shree Mallikarjun and Shri. Chetan Manju Desai College at Canacona, Goa, India.

Dr. (Mrs.) Manasvi M. Kamat, Associate Professor. Dept of Economics. Goa Multi-Faculty College. Goa. India

Abstract:
This paper attempts to actualize the trends and implications of the profit appropriation and dividend payoff decisions in the context of Indian Engineering Industry. By analyzing the unit-level data of the engineering units divides across five select sectors, the objective is to provide a spatial-temporal analysis as to how this heavily capital intensive industry has appropriated their profits over the period. The analysis of the financial behaviour of the engineering firms over the pre-liberalization (before reforms and post-liberalization periods provides an interesting financial perspective. We find extensive support for the theories of Market Signaling, Dividend Irrelevance, the Pecking Order and the Dividend Smoothening in India. Our findings suggest the varying pattern of dividend payout across inter and intra-sectoral cross-section within Engineering Industry in India during the study periods.

Keywords: Profits, Dividends, Engineering Industry, India, Liberalization

1. INTRODUCTION

The decisions about profit and dividend appropriations are not only important for the firm or the industry they belong to but they have implications on the economy [1] Such decisions in addition to having long-standing effects are also vital for they have to be taken consciously, constantly. Since dividends are to be appropriated from the profits (net earnings) the magnitude of dividends distributed is inversely related to the earnings retained, usually used for self-funding the future growth requirements of the firm. The study of profit and dividend appropriations are thus important from the perspective of enhancing the stakeholders value, and well documented in the financial literature by [2]-[5] in the most recent years.

This study presents the relevance and implications of the profit appropriation and dividend decisions in the context of the Indian Engineering industry. Profit and dividend-related studies might have received ample attention in the existing literature of engineering finance, but its context to literature of engineering finance, but its context to

the most capital-intensive and technology-oriented industry like that of engineering is found to be abysmally missing.

Since it is empirically proved that the industry-type to which a firm specifically belongs to, and the specific business division in which it operates have a homogeneity of financial decisions in spirit of studies like that of [6]-[9] we attempt to seek these sectoral differences for the Engineering industry in India. This is the second novelty. Also since the earlier studies on the relation between the profit and dividends within a particular industry are mostly focused in the developed market context the work like this, analyzing the behaviour of profits and payout of dividends over a larger time-frame within the engineering industry in a developing economy like India are an extreme rarity. We try to fill the gaps.

We find evidence that the specific sectors within the Indian engineering industry have common financial characteristics with regards to profit appropriations and dividends, and such financial decisions remain fairly consistent over the time

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Measurement of Credit Risk using Financial Ratios

Reshma Prabhu Verlekar & Dr. Manoj Kamat
SVS Sridora Caculo College of Commerce & Management Studies, Mapusa Goa - 403507

Abstract

The credit risk is a curse for banks from decades as it has a devastating impact in terms of financial loss to the banks. This demands banks to deploy powerful Credit Risk Management Practices (CRMP), which in turn triggers the measurement of credit risk.

Method: Credit risk measurement in the present study is done using nine "Financial Ratios" to measure the liquidity, profitability and leverage position of the 21 public and 18 private banks in India. Further, time series data and cross sectional data is used Independent sample t-test is also used to compare the position between public and private banks in India

Results: The result of independent sample t-test shows no difference between the public and private banks with respect to liquidity position; however it shows a significant difference in the profitability and leverage position between public and private banks. These results are supported by the trend of time series and cross sectional data.

Keywords: Liquidity, Profitability, leverage, Credit Risk Measurement, Indian Banking Sector

1 Introduction

The growing complexities of the bank's business due to liberalization, deregulations, technical up-gradation and the dynamic operating environment, gave rise to credit risk. Credit risk refers to the probability of counterparty failing to repay a debt to an organization and arises due to lending activities The credit risk is a curse for banks from decades as it has a devastating impact in terms of financial loss to the banks. This demands banks to deploy powerful Credit Risk Management Practices (CRMP), which in turn triggers the measurement of credit risk. Measurement of credit risk means quantification of risk from credit operations using quantitative variables such as financial ratios. It is an essential mechanism for preventing financial losses and maintaining continuity of the banking business. It provides a mechanism for monitoring credit risk and reliable reporting

Credit risk measurement perceives higher significance due to the higher NPA level of Indian banks compared to the global benchmark. As per the RBI report, the facts state that Gross NPA to Gross Advance ratio of a public bank is 11.59 % (March 2019), as against it is 2.99% of foreign banks. For the last few years, NPAs have emerged as an inevitable burden on the

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7

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$$\boxed{\text{CONTENT}}$$

Volume XVI	No. 1	Dec. 2019
Sr. No.	Article and Author	Page No.s

Volume XVI	No. 1	Dec. 2019
Sr. No.	Article and Author	Page No.s

A SPATIO-TEMPORAL OVERVIEW OF LIVESTOCK RESOURCES IN GOA, 1988 to 2016

C. P. Hiremath
Emails : cphiremath20@gmail.com

Abstract

Livestock resource plays a vital role in the lively hood of people in general and economic development of the people of a region or a nation in particular. The study area, Goa displays selective livestock resources and its distribution i.e. cattle, buffaloes, pigs and other animals. One of the reasons of the study was to explore spatial distribution and periodic development in the taluks from 1988 to 2016. The study reveal taluka wise and year wise distribution of livestock in the state is mostly confined to interior taluks, viz. Sattari, Sanguem, Canacona and Quepem. Initially rearing of livestock was meant for farm activities,later on the attention of the people lead to intensify the same to get gainful employment and to supplement the economic standard through milk, manure and sale at the time of urgency in these taluks. In course of time people found out the scope in dairy farming, market-based livestock rearing with the incentives given by the central and state governments.

Introduction

Livestock is a combination of two words, viz. "Live" and "Stock" meaning domestication of animals. Livestock refers to any breed or population of animals kept by humans for useful commercial purpose. The rearing was focused on getting food stuffs, milk, meat, etc., which plays an important role in healthier living and economic development in general and specially for rural households. The importance of the search for organic manure, hides, skin, bones, fibres for the industrial sectorhave further channelized the livestock rearing in   supplementing family income, generating gainful employment in the rural sector particularly among the landless labourers and marginal farmers in the taluks of the state.

Objectives of the Study

The prime objectives of the study are to know the composition and concentration of livestock resources in Goa at taluka level, to find out periodic changes, if any in the distribution of livestock resources in the state and its talukas from 1988 to 2016 and to understand the problems of animal rearing in Goa.

Sources of Data and Methodology

The required data had been obtained from various sources such as Directorate of Planning, Statistics and Evaluation, Government of Goa, Goa at a glance, government Website (1988 to 2016). The data obtained had been processed by simple statistical tools like percentage, which has been employed for the comparison for the period 1988 to 2016. The data has been categorized into high, moderate and low concentration of the livestock resource. The study area has noticed variation in livestock resources distribution and growth; this change has been examined on the basis of numerical and empirical observations.

Hypotheses

It is assumed that livestock resources in Goa are confined to some specific geographic pockets (space).Over the years, livestock resource has witnessed remarkable changes and   People

have selected live stock farming as a preferred occupation in some localities.

Study Area

Goa, a small and 25thIndian state lies in the western coastal belt between 14° 53' 54'' to 15°40'00'' N. Latitudes and 73°40'33'' to 74°20'13" E longitudes. The state shares boundary with Maharashtra and Karnataka statesspreading over an area of 3702 Sq. Km. (1429Sq. Miles) with two districts, namely North Goa district with 1736 Sq. Km area and South Goa district has 1966 Sq. Km. Area. The length from north to south is 105 Km and width from west to east is 60 Km. The coastline consists of 118 Km.

Figure 1: Study Area With Taluka and District Boundaries
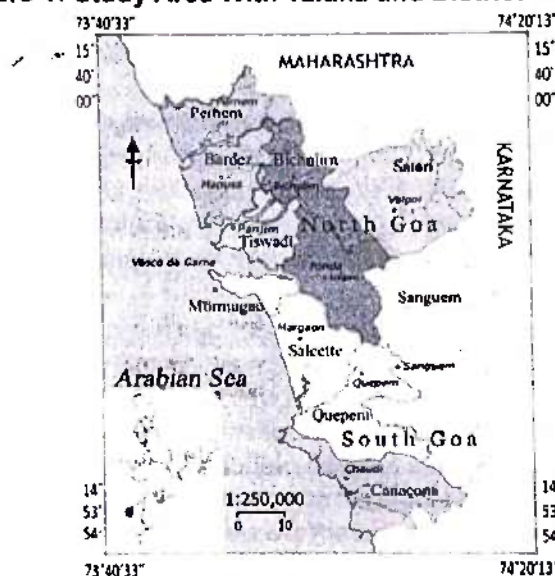
Source: Government of Goa / India Copy right.

Due to the proximity to sea, about 60% humidity is recorded throughout the year with an annual rainfall occurring during June to September varying from 250 to 350 Cm.. The temperature ranges from 200c to 350c. The state comprises nearly of 14,58,545 persons(Census, 2011) in which North Goa district shares nearly 8.18 Lakh population against South Goa district's 6.40 Lakh. The Sex ratio was 968 females per 1,000 males(Census, 2011), which is above the national average of 960. The density of population is 316 persons per Sq. Km. Goa is one of the state with higher proportion of urban population with 62.17%.

Basis for the Study and Limitations

Goa, has relatively high volume of livestock resource in spite of its small geographical size, which hasencouraged us to choose and know the detailsregarding selected types and varieties of livestock resources, especially cattle, buffaloes, pigs and other animals from 1988 to 2016. One of the reasons for people to rear of livestock was for sale followed by meat, manure and milk products etc. The demand for the meat in Goa especially from the urban and predominant hotel areas encouraging people of the hinterland to attempt the rearing of livestock. The people of hinterland localities have an advantage to rear the animals and find needed logistical support in the form of forest land and in-cultivable fodder land. The farmers, land less labourer find an alternate advantage for domesticating animals as a companion and as a part and parcel of rural

life. Easy availability of fodder, livestock shed (back yard), common knowledge and skill, availability of workers and matching allied activities, etc.are some of the factors to initiate livestock rearing in the study area. The following discussion brings out the spatial and temporal distribution and changes in various live stock resources of Goa from 1988 to 2016.

Spatial Distribution of Cattle

The study area poses sizable presence of cattle; its distribution in the taluks varies from 0.7% to 17.4% (Table 1). Such variation within 11 taluks reveal spatial inequality over a period of nearly three decades (28 years). Nearly 65% of the cattle are confined to 30% of the taluks, viz. Sattari, Canacona, Sanguem and Pernem.Rest35% of the taluks comprise 70% of the total cattle population. Over the decades, these taluks continued to show high concentration. Dharbandora is a recently formed new taluka carved out of Sanguem taluk; hence data has been shown only for the years starting from 2013. The data for 1994 was not available. It is observed that the growth of cattle remains constant over the years largely due to new schemes and accomplished policies of the state government. The taluks of Sattari, Sanguem, Canacona and Quepem have more than (14.5%) each against Tiswadi (1.8%), Marmugao (2.2%) taluks over the period 1988-2016 in the state.

Spatial Distribution of Buffaloes

The presence and distribution of buffaloes in the state was relatively low against cattle, pigs and other animals in the taluks over nearly three decades (1988 to 2016, Table 2). Among the 11 taluks, Ponda (15.3%) Pernem (13.4%) and Bicholim (14.9%) together comprises nearly 50% of the total against Mormugao (3.2%) and Tiswadi (3.4%). The changes has been observed from 2000 to 2014, where in-consistency could be scene in the spatial and periodic distribution of buffaloes in the state in spite of less share in the livestock resources.Dharbandora is a recently formed taluka; hence data has been shown only for latest years of the study. The data for 1994 was not available. The lowest distribution of buffaloes is seen in Mormugao and Canacona talukas.

Spatial Distribution of Pigs

The Table no. 3 indicates taluka wise distribution of pigs from 1988 to 2016 for nearly around three decades. The rearing of pigs indicates its confinement to the taluks of Salcete (50%) fallowed by Tiswadi and Bardez; these three coastal heartland talukas together constitute nearly 75% of the state's total, whereas the taluks of Bicholim, Ponda had less than 1% of the pigs total in the state.Over the decades,these taluks, viz. Salcete (55.5% in 1988), Tiswadi (25%) and Bardez (12%) continued to retain the position against the interior taluks like Sattari (0.14%) and Bicholim (0.13%). However, taluks of Sattari, Ponda, Sanguem, Dharbandora comprise much lesser against rest of the taluks. The taluks of Sattari, Sanguem and Bicholim continued to have very low percentage (0% - 2%) over the years. Dharbandora is a recently formed taluka; hence data has been shown only for latest years of the study. The data for 1994 was not available.

Spatial Distribution of Other Animals

The spatial distribution of other animals in the state (Table 4) displays distinct pattern over the period from 1988 to 1992. In many taluks, other animals, viz. sheeps and goats could be seen in Salcete (19%) and Sattari (4%) more so in coastal taluks. However, from 1988 to 2003,the spatial distribution of other animals was by and large uniform with an exception of Tiswadi, Bardez and Salcete taluks, which together comprise more than 55% of the state. This kind of concentration need to be seen in the light of multiple factors i.e. transport connectivity, ready

market, usage for commercial purposes, customised facilities, etc. in the state. The table no. 4 reveals uneven distribution in the state; Salcete (34%), Bicholim (20%) and Bardez (16.9%) are ahead of the rest. In these taluks, the rearing of the animals remains preferred activity with the help of the various types of the schemes and the incentives and active participation of the people. Dharbandora is a recently formed taluka; hence data has been shown only for latest years of the study. The data for 1994 was not available. The taluks of Sattari, Dharbandora, Sanguem and Canacona have been contributing less than 20%. The people reared the other types of the animals like goats, sheep, cow, etc. for the purpose of meat, milk products etc.

State Government Schemes to Encourage Livestock Resources In Goa

Animal husbandry sector plays an important role in the state's economy. Special schemes have been initiated by the agencies of central and state governments over the decades. Some of the major schemes listed under Kamdhenu Sudharit Scheme of Government of Goa. Its aim is to increase the milk production, to organise livestock melas and fairs to disseminate and to share the knowledge. There are incentives to milk production and cattle feed based on milk procured at Dairy Cooperative Societies to increase average milk collection about 72000 litters per day during 2018 – 2019. The objective of the scheme is to encourage local youth to grow green fodder wherein barren and surplus land to cultivate green fodder. There is composite subsidy scheme for the sale of milk at co-op societies and to get cattle feed from the societies through bank transfer. Under the dairy equipment scheme to setup the new dairy farm shed and the essential facilities and to expand the existing one is also available. There is a scheme meant for calf to cow PASHUPALAN to provide necessary inputs through subsidy up to 27 months to rear animals up to 75% subsidy to purchase of cow/ cattle. There is also Small animals rescue management scheme towards sterilization, vaccination, treatment. There is stray cattle management scheme adopted by Civic consumer forums, Goshalas, Animal welfare organisations, etc. There is a government piggery farm to encourage farmers to give subsidy to establish piggery units in which piglings have been supplied by the government to the piggery farms.Extension and training schemes are available especially for poor and tribes. Mobile veterinary clinics are there to provide the veterinary services to the door steps of the farmers and to promote timely delivery of the services.At livestock farm at a place named Dhat, government had initiated cross bred heifers have been provided to adapt the hybrid varieties to adapt to the local environment.

Issues Associated with Livestock Resources in the state

Government had initiated various measures to encourage and train the stake holders specially youth in Sheep, Goat, Poultry and Pig rearing as an alternative to dairy activities and the advantages of rearing of domesticated animals to cater the needs of the self as well as state. ICAR Centre, lla Goa and specially arranged centres in both North and South Goa districts are in the fore front to motivate the local youth.

1) The sheep, goats, poultry and pigs are being reared in selected interior pockets of the state. In this regard Goa Meet complex had been selected to upgrade and to support the livestock resource-based activitiesin the state.

2) Government Poultry farm to promote poultry products, subsidy to the farmers who are involved in the production of chicks to the interested individuals, rather than the organised activities, a miss match prevailed between the demand and supply of the livestock products in the state.

3) A sizable human population as well as tourists in the state consumes the meat products of sheep, goat, poultry and pigs. Whereas the major source of supply of goat, poultry and sheep-based meat was from neighbouring states need to be addressed.

4) Government need to make an attempt to assess the quantity of livestock-based meat being produced and consumed in the state, even an estimated quantity needs to support.

5) In order to ensure the sustainable livestock resource Government agencies, need to make all efforts to re-vitalise all forms of livestock rearing activities in the rural area's special youths to take-up in the state.

6) Attempts to be made to asses and estimate the presence and flow of livestock resources in state.

7) Farmers to be encouraged trained and incentivised to get involve in the rearing of sheep goat, poultry and pig farming in the state so far steps taken seems to be insufficient. The Extension programmes, training and study tours to be organised within and outside the state to understand and realise the scope of the livestock-based activities.

8) To encourage local breeds varieties in the rearing of livestock which can enable to see the sustainable activities in accordance with local natural conditions.

Marketing of Live stock products and Future of live stock in Goa

The collection of milk is done by Goa Dairy, a subsidiary cooperative unit of Govt. Of Goa. The refining, treatment and product upgradation and marketing of the dairy products is carried out by Goa Dairy. The cattle, buffalo and pig meat products are handled and marketed by State Government run Goa Meat Complex while the marketing of Goat, Sheep and Poultry meat and egg procurement and marketing is carried out by private parties.

Though the demand for milk and meat product in Goa is very high due to the economic well being of its population and tourism related demand, the supply is quite inadequate. The gap between the demand and supply is minimized by getting the supply from the neighbouring states at present. The future of live stock resources in Goa do not look encouraging despite several boosters by government agencies and territorial advantages because the local population is not interested in any primary land based activities and looking out for earning from secondary and tertiary activities due to the involvement of hard work in primary activities on one hand and demonstration effect of other's short term prosperity. More over, livestock rearing is a full time activity with un-assured return due to many natural, animal health related and market related risks and responsibilities.

Summary

The spatio-temporal distribution of cattle, buffaloes, pigs and other animals in the taluks of the state from 1988 to 2016 display variation. Inland talukas,namely Sattari, Sanguem, Canacona shows better figures. The distribution of cattle and buffaloes reveal more or less similar pattern. The spatial distribution of pigshas a concentration in the coastal talukas and other animals has a concentration in the midland taluka in the study area.These pockets exhibit the interplay of natural and logistical support for the specific livestock services in the respective taluks. Two-three taluks together constitute around 3/4th of the total livestock resource in the state. The state was experiencing the traditional practices of livestock rearing in the confined localities and continued to do so. The inconsistency in its spatial distribution in the state was mainly due to factors of support of market, financial assistance, logistical support, transport connectivity etc.

Table 1: Spatial Distribution of the Cattle in Goa (in%) from 1988 to 2016

YEARS	TALUKA												
	TISWADI	BARDEZ	PERNEM	BICHOLIM	SATTARI	PONDA	SANGUEM	DHARBANDORA	CANACONA	QUEPEM	SALCETE	MORMUGAO	TOTAL
1988	3.0	8.6	12.8	9	11.8	11	11.8		10.5	11.2	8.3	2	99.5
1989	3.5	9.9	12	8.4	11.2	9.9	11.4		10	10.5	10.8	1.9	99.5
1990													0.0
1991	3.5	9.9	12	8.4	11.2	9.9	11.4		10	10	10.8	1.9	99.0
1992	3.5	9.9	12	8.4	11.2	9.9	11.4		10	10	10.8	1.9	99.0
1993	3	9.3	11.1	9.9	10.8	9.7	10.1		12	12	9.4	2.2	99.5
1994													0.0
1995	3.2	9.9	11.1	9.2	10.8	9.7	9.8		12.4	12.4	9.3	2.2	100.
1996	3.2	9.9	11.1	9.2	10.8	9.7	9.3		12.4	12.4	9.3	2.2	99.5
1997	3.2	9.9	10.9	9.2	10.8	9.7	9.6		12.4	12.4	9.3	2.2	99.6
1998	3.2	9.9	11.1	9.2	10.8	9.7	9.8		12.4	12.4	9.3	2.2	100
1999	3.2	9.9	11.1	9.2	10.8	9.7	9.8		12.4	12.4	9.3	2.2	100.
2000	3.2	9.9	11.1	9.2	10.8	9.7	9.8		12.4	12.4	9.3	2.2	100
2001	3	10.2	12.1	8.1	11.6	8.7	14.1		11.2	12.4	6.7	1.1	99.2
2002	3	10.2	12.1	8.1	11.6	8.7	14.1		11.2	12.4	6.7	1.1	99.2
2003	2.7	8.1	11.8	9.2	13.8	8.8	12		13.2	13.2	6.3	1.3	100
2004	2.8	8.2	11.7	9.2	13.9	9.1	12		13	13	6.2	1.4	100
2005	2.8	8.2	11.7	9.2	13.1	9.1	12.5		13	13	6.2	1.5	100
2006	2.8	8.2	11.7	9.2	13.1	9.1	12.5		13	13	6.2	1.5	100.
2007	2.8	8.2	11.7	9.2	13.1	9.1	12.5		13	13	6.2	1.5	100.
2008	1.8	7.7	9.6	7.6	17.1	8.5	10.8		14	14	8.7	0.7	100.
2009	1.8	7.7	9.6	7.3	17.1	8.5	10.9		14	14	8.8	0.7	100.
2010	1.8	7.3	9.6	7.1	17	11	10.8		13	13	8.7	0.7	100.
2011	1.9	7.5	9.5	7.3	17.4	8.7	11.1		13.6	13.6	8.9	0.7	100.
2012	1.9	7.5	9.5	7.3	17.4	8.7	11.1		13.6	13.6	8.9	0.7	100.
2013	4	6	8.5	9	14.7	9	5.3	4.8	13	13.6	11.5	0.8	100.
2014	4	6.1	8.7	9	14.5	8.8	5.3	4.7	13	13.6	11.3	0.8	99.8
2015	4	6.1	8.7	9	14.5	8.8	5.3	4.7	13	13.6	11.3	0.8	99.8
2016	4	6.1	8.7	9	14.5	8.8	5.3	4.7	13	13.6	11.3	0.8	99.8

Source: Directorate of Animal Husbandry, Panjim, Statistical data.

Table 2: Spatial Distribution of the Buffaloes in Goa (in%) from 1988 to 2016

YEARS	TALUKA												TOTAL
	TIS WA DI	BA RD EZ	PE RN EM	BIC HO LIM	SA TTA RI	PO ND A	SAN GUE M	DHA RBA NDO RA	CAN ACO NA	QU EP EM	SALC ETE	MO RM UG AO	
1988	6.8	8.6	13.2	11.8	10	15.3	9.1		3.8	6.8	10.9	3.2	99.5
1989	4.9	9.3	12.4	11.2	9.4	14.4	8.9		3.8	6.3	15.9	3	99.5
1990													
1991	6.1	9.2	12.2	11.1	9.2	14.3	8.8		3.7	6.2	15.7	2.9	99.4
1992	6.1	9.2	12.2	11.1	9.2	14.3	8.8		3.7	6.2	15.7	2.9	99.4
1993	5.6	7.8	11.5	10.9	17.8	12.4	8.4		4.2	5.5	12.2	3.1	99.4
1994													
1995	6.8	9.1	12.7	11.5	8.41	13.5	9.3		5.1	6.1	13.5	3.5	99.5
1996	6.7	9.2	12.7	11.5	8.3	13.1	9.5		5.3	6.1	13.5	3.5	99.4
1997	6.7	9	12.5	11.3	8.3	13.3	9.1		5	6	14.7	3.4	99.3
1998	6.8	9.1	12.7	11.5	8.4	13.5	9.2		5.3	6.1	13.5	3.5	99.6
1999	6.7	9	12.7	11.5	8.3	13.5	9.2		5.3	6.1	13.4	3.5	99.2
2000	6.8	9.1	12.7	11.5	8.4	13.4	9.2		5.1	6.1	13.5	3.5	99.3
2001	5.8	10.1	13.5	10.9	9.1	11.9	12.8		3.6	6.4	12.1	3.1	99.3
2002	5.8	10.1	13.5	10.9	9.1	11.9	12.8		3.6	6.4	12.1	3.1	99.3
2003	5.8	8.7	13.5	14.1	9.4	14.1	11.3		3.6	8.2	9.8	1.1	99.6
2004	5.8	8.6	13.4	14.1	9.4	14.1	11.2		3.6	8.2	9.6	1.1	99.1
2005	5.8	8.6	13.4	14.1	9.4	14.1	11.2		3.6	8.2	9.6	1.1	99.1
2006	5.8	8.6	13.4	14.1	9.4	14.1	11.2		3.6	8.2	9.6	1.1	99.1
2007	5.8	8.6	13.4	14.1	9.4	14.1	11.2		3.6	8.2	9.6	1.1	99.1
2008	3.6	8.6	10.5	12.4	12	12.8	10.6		3.6	7.6	16.7	0.7	99.1
2009	3.4	8.6	10.5	12.4	12	12.7	10.6		5.3	7.6	16.2	0.7	100
2010	3.5	8.8	9.8	12.5	11.3	12.8	10.9		5.4	7.8	16.7	0.5	100
2011	3.5	9	10	12.5	11.5	13	11.2		5.5	7.8	14.5	0.5	99.0
2012	3.5	9	10	12.5	11.5	13	11.2		5.5	7.8	14.5	0.5	99.0
2013	12	7.3	10.8	12.9	8	9.9	3.4	5.1	5.5	7.3	17.2	0.6	100
2014	6	7.8	11.6	14	8	11.3	4	5.5	4	7.8	18.5	0.6	99.1
2015	6	7.7	11.6	14	8.8	11.4	3.5	5.6	4	7.9	18.5	0.6	99.6
2016	6	7.7	11.6	14	8.8	11.4	3.5	5.6	4	7.9	18.5	0.6	99.6

Source: Directorate of Animal Husbandry, Panjim, Statistical data.

Table 3: Spatial Distribution of the Pigs in Goa (in %) from 1988 to 2016

YEARS	TIS WA DI	BA RD EZ	PE RN EM	BIC HO LIM	SAT TARI	PO ND A	SAN GUE M	DHA RBA NDO RA	CA NA CO NA	QU EP EM	SAL CE TE	MOR MUG AO	TOTAL
1988	16.1	12.1	5.1	0.29	0.14	5.1	4.1		5.1	5	40	7	100.0
1989	13.5	12.5	4.5	0.23	0.1	4.1	3.2		4.4	4.3	47.1	6	99.9
1990													
1991	13	12	4.5	0.23	0.1	4.3	4.1		4.3	4.3	47.1	6	99.9
1992	13	12	4.5	0.23	0.6	4.3	4.1		4.3	4.3	46.4	6	99.9
1993	12.6	14.2	3.6	0.21	0.09	3.4	4.1		6.3	4.1	44.1	7.1	99.8
1994													
1995	13.1	14.1	3.2	0.13	0.09	3.4	4		6.3	4.2	43.5	8.2	99.5
1996	13.1	14	3.2	0.13	0.09	3.4	4		6.3	4.2	43.5	8.2	99.5
1997	13.1	14.1	3.2	0.13	0.09	3.4	4		6.3	4.2	43.5	8.2	99.5
1998	18	24.5	6	0.24	0.16	5.7	5.9		6.3	10.5	7.9	14.8	100
1999	13.7	11.6	3.6	0.13	0.09	3.4	4		6.7	4.7	44.9	8.2	99.3
2000	13.7	11.5	3.6	0.13	0.09	3.4	4		6.3	4.7	44.3	8.2	99.9
2001	13.2	11.3	3.6	0.13	0.05	3.6	4.3		6.3	5.7	44.9	6.7	99.8
2002	13.2	12.4	3.6	0.13	0.05	3	4.3		6.3	6.7	45.6	6.7	99.3
2003	14.8	8.7	4.7	0.09	0.11	4.2	3.7		3.6	5.6	46.1	7.9	99.5
2004	27.5	15.2	8.1	0.15	0.19	7.6	6.4		3.6	9.8	7.5	11	99.1
2005	13.2	8.7	4.6	0.09	0.11	4.3	3.6		5.7	5.5	46.4	7.9	99.9
2006	13.2	8.7	4.6	0.09	0.11	4.3	3.6		5.5	5.5	46.4	7.9	100
2007	13.2	8.7	4.6	0.09	0.11	4.3	3.6		5.6	5.5	46.4	7.9	100
2008	8.3	8.3	2.4	0.09	0.04	3.8	6.7		5.6	6.1	50.1	7.4	99.6
2009	8.1	8.4	2.4	0.09	0.04	3.6	6.7		6.4	6.1	50.2	7.4	99.4
2010	7.6	7.7	2.4	0.24	0.03	3.9	2.8		6.4	5.5	50.3	13.2	99.7
2011	7.6	7.7	2.4	0.24	0.03	3.9	6.1		6	5.6	52.6	7	99.2
2012	7.6	7.7	2.4	0.24	0.03	3.9	6.1		6	5.6	52.6	7	99.2
2013	7.1	4	2.3	0.3	0.05	5.5	3.1	0.27	6	6.1	55.1	6	100
2014	7.1	4	2.3	0.3	0.05	5.5	3.1	0.27	10	6.1	55.1	6	99.8
2015	7.1	4	2.3	0.3	0.05	5.5	3.1	0.27	10	6.1	55.1	6	99.8
2016	7.1	4	2.3	0.3	0.05	5.5	3.1	0.27	10	6.1	55.1	6	99.8

Source: Directorate of Animal Husbandry, Panjim, Statistical data.

Table 4: Spatial Distribution of the Other Animals in Goa (in%) from 1988-2016

	TALUKA												
	TIS WA DI	BA RD EZ	PE RN EM	BIC HO LIM	SA TT AR I	PON DA	SAN GUE M	DHA RBA NDO RA	CAN ACO NA	QUE PEM	SAL CET E	MOR MUG AO	TOTAL
1988	11.0	16.9	9.4	6.8	4.2	7.8	6.8		5.6	5	19.1	7	99.6
1989	10.1	18.5	9.2	6.2	3.7	6.9	6.7		4.8	4.6	22.4	6.4	99.5
1990													
1991	10.6	19.9	9.7	6.5	3.9	7.2	7		0	4.8	23.6	6.7	99.9
1992	10.1	18.5	9.2	6.2	3.7	6.9	6.7		4.8	4.6	22.4	6.4	99.5
1993	6.7	11.4	4.3	3.2	2.2	44.3	0		6.7	2.4	15	3.4	99.6
1994													
1995	12.3	20.7	7.6	5.2	4	7.7	6.9		5.2	5.1	18.1	6.7	99.5
1996	11.6	19.5	7.1	4.9	3.8	7.2	6.5		4.9	4	23.6	6.3	99.4
1997	11.6	19.4	7.1	4.9	3.8	7.2	6.5		4.6	4.7	23.5	6.3	99.6
1998	11.5	19.3	7.1	4.8	3.9	6.9	6.5		4.9	4.7	23.4	6.3	99.3
1999	11.9	19.8	7.3	5	3.8	7.4	6.6		5	4.9	21.4	6.4	99.5
2000	11.6	19.5	7.3	5	3.1	7.2	6.5		4.9	4	23.6	6.3	99.0
2001	11.7	19.7	6.7	5.2	3.1	7.2	6.4		3.9	5.5	24.3	6.1	99.8
2002	11.7	19.7	6.7	5.2	3.2	7.2	6.4		3.9	5.5	24.3	6.1	99.9
2003	10.1	15.4	7.2	5.2	1.5	9.2	7.1		5	7.6	24.6	6.3	99.2
2004	1.3	3.3	3.6	2	0	2.5	1.1		1.7	3	80	0.7	99.2
2005	1.1	8.2	0	23.5	0	29.4	0		1.1	2.3	34.1	0	99.7
2006	1.1	8.2	0	23.5	0	29.4	0		1.1	2.3	34.1	0	99.7
2007	1.1	8.2	0	23.5	0	29.4	0		1.1	2.3	34.1	0	99.7
2008	9.5	9.5	4.7	0	0	0	4.7		28.5	38	4.7	0	99.6
2009	0	0	0	0	0	0	0		0	0	0	0	0.0
2010	0	9.1	6.5	4.9	9.8	5.1	12.2		6.3	7.5	35.9	2.2	99.5
2011	0.7	0	0	3.6	0	84.6	0		4.3	5.8	0.7	0	99.7
2012	0.7	0	0	3.6	0	84.6	0		4.3	5.8	0.7	0	99.7
2013	2.5	5.1	0	0	0	12.8	15.3	23	7.6	15.3	17.9	0	99.5
2014	2.5	5.1	0	0	0	12.8	15.3	23	7.6	15.3	17.9	0	99.5
2015	2.5	5.1	0	0	0	12.8	15.3	23	7.6	15.3	17.9	0	99.5
2016	2.5	5.1	0	0	0	12.8	15.3	23	7.6	15.3	17.9	0	99.5

Source: Directorate of Animal Husbandry, Panjim, Statistical data

Government schemes, incentives, subsidies and one-time assistance, etc. were some of the encouraging steps for the distribution of livestock resource in the state.

Conclusion

The diverse composition in the study area is well known for dominance of the specific livestock, i. e. pigs in Salcete and Bardez), cattle in Sattari and Bicholim, other animals in Tiswadi and Quepem). This reveal the usage of the livestock product linked with the religious beliefs or product consumption habits of the living communities. A strong belief or bondage with the type of livestock could be seen in the study area. The livestock resource concentration is inversely related to the concentration of human population. The high density population area has low density of livestock resources in the state of Goa.

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Contact Details of the Author

Dr. C. P. Hiremath
Assoc. Professor of Geography
Shree Mallikarjun and Chetan Manju Desai College,
Canacona, Goa
Email: cphiremath20@gmail.com
Mob: 9923410204.

Declaration

I hereby declare that the above article is original and has not been published by me or by any one in any journal or book.

Dr. C. P. Hiremath

19

Information Seeking Behavior and Gender: A Study Of M.Com Students of Goa University

1. Mrs Padmavati S. Tubachi
   Librarian
   DPM's SHREE MALLIKARJUN & Shri Chetan Manju Desai College
   Delem, Canacona-Goa
   E-mail-padmashalvegar@gmail.com
   Contact No:9422444410

2. Mr Sudhir B. Halvegar
   Librarian
   Murgaon Education Society's college of Arts and Commerce
   Zuarinagar Goa
   E-mail: halvegarsb@rediffmail.com
   Contact No:9623421563

3. Mr. Avinash Humbare
   Anantrao Pawar College
   Pirangut Malshi
   Dist Pune
   E-mail: avinash.humbare@gmail.com
   Contact No 9373325123

Abstract

Information Seeking behavior can broadly be defined as that which is concerned with determining user's information needs, searching behavior and subsequent use of information. It is concerned with understanding how people seek and make use of information, the channels they use to gather information, and the factors that influence Information Seeking behavior.

Our Heritage

According to Wilson (1999) study of Information seeking behavior depends on different variables like Psychological, Demographic, Interpersonal, and Environmental and source characteristics. Gender is one of the variables that has influence on Information seeking behavior process.

1. INTRODUCTION:

Information is power. It is one of the important needs like other needs of human being such as Food, Clothing and shelter. Information is also treated as fact, idea or data.

Information means the transmission of knowledge about an occasion or happening of a particular situation or the spread of knowledge derived from observations, study or experience (Balasubramanian, 2011). Every person needs Information for his day today's activities.

The information produced due to human activities is documented and made available to the Information users either in print form or non-print form. Periodicals, books, conference proceeding, research reports, articles encyclopedia, thesis and handbooks are some print form of Information. Print forms. Again technology has made the production of Information recorded and stored in devices which comprises of the non-print form. These documented forms of Information are referred as Information sources. An individual who needs information is expected to use these Information sources to get information. An individual tries to acquire needed information from a variety of sources that are available in different forms and formats.

Information communicated with others formally or informally in different ways like speech and writing. Information may be obtained by discussing with friends, experts, printed books, and serials, audio visual methods Information is acquired by people according to their purpose; experience and environment. The awareness of a person that he needs information or awareness about something is missing in his state of knowledge and tries to fill that information gap is

Information Need. Taylor (2008) viewed that information need is a personal. Information need leads to Information seeking.

Information seeking is a basic action where in an individual interacts with manual information systems. Due to technology there is boom in information formation which has resulted in Information Explosion. Scattering of information has caused the problem for the user in identifying their Information needs. There is no single system which will help the Information user to find the needed information. The condition has given rise to the concept of information searching and the manner of determining the pattern of searching is said to be Information Seeking Behaviour. The concept of Information Behaviour was coined in the late 1990s. Individual who need information, search for information through a process of awareness. comprehension, evaluation and assimilation according to their personal interest. The search for the Information varies from an individual to individual.

Information seeking Behaviour is a set of actions that an individual takes to express information needs, seek information, evaluate and select information and finally uses the this information to satisfy his/her information needs. (Sinha, 2016) (Bhatia, 2011)

Information seeking behaviour is an important aspect which helps library professionals to build library collections, to introduce new services and infrastructure that helps in Information seeking. Information seeking behavior is an individual's way of collecting and using information for personal use, to update the existing knowledge.

Gender is the range of characteristics of pertaining to and differentiating between the masculine and feminine. According to FAO "the relations between men and women, both perpetual and material. Gender is one of the variables that influence the Information seeking behavior. According to Haider, S and others (2010) Gender is a possible variable that influences the Information seeking. It may be useful for better understanding of the cognitive and social

| 12117

background of human information processing and may have important implications for related information services.

There is a paradigm shift in Education. Today's education is more students oriented. There is shift from teacher centric to learner centric. the teaching has been more interactive session where in students are expected to participate actively in learning process. which has created situation where in students are given reading material along with the topic that will be taught in the classroom so that they can prepare themselves before attending the lecture. This situation has made the students depend more on the libraries to get relevant information. In an academic library set like University library Students, Researchers and Teachers are major users of the library. Though they belong to same organization the information needs vary from category to category. Students need Information for study purpose, to prepare for their exams, to prepare for the competitive exams etc. they mainly require books, textbooks and general books. They also need periodicals, conference proceedings etc. to some extent to prepare the assignments.

2. REVIEW OF LITERATURE:

Pathak, P and Malty, G (2017) attempted a study of validity of the construct regarding Gendered Information Seeking Behavior through survey of Teacher, Student, Skilled and Unskilled Labours from both urban and rural areas.

Haider, S, and others (2010) opine that study of gender as a factor influencing human behavior may be helpful to have better understanding about the cognitive and social bases of human information seeking and may help Librarians to design Information services and systems.

Padma, P Ramasamy, K and Sakthi Renugadevi conducted a study on a sampling population of 50 post graduate students of School of Economics, Madurai Kamaraj University with a specific purpose to trace out their information needs and information seeking behavior.

3. OBJECTIVE OF THE STUDY:

Information seeking behavior is a cognitive process. It is a known factor that thinking process varies among the genders. This is an attempt to study whether there are any differences in Information seeking behavior of Post Graduate students based on gender.

4. SCOPE: The study is focused on influence of gender on Information seeking behaviour of Post Graduate students studying in Goa University

5. LIMITATIONS: Since this study is based on the survey and the student population studying in Goa University being large, it is not possible to cover whole student community. So the study is made on sample survey of Choosing Students belonging to Department of Commerce by choosing 100 respondents.

6. METHODOLOGY:

Giving equal importance to each gender 100 questionnaires were distributed among M.Com Students studying in Goa University. 90 questionnaires were selected. From each gender 45 questionnaires were selected.

7. DATA ANALYSIS

1) **Information Gathering:** Information is required by each and every person. It can be gathered by discussing with classmates, teachers, reading books, searching over the Internet

Sources of information	Male Respondents	Female Respondents

Our Heritage

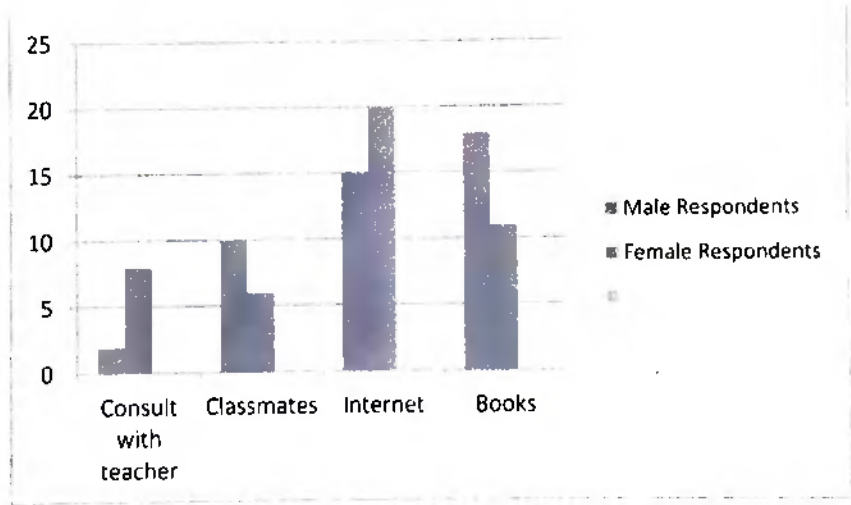|	Frequency	Percent	Frequency	Percent
Consult with teacher	02	4.44	08	17.7
Classmates	10	22.2	06	13.3
Internet	15	33.3	20	44.4
Books	18	40	11	24.4
Total	45		45	

Table 1.The way Information is Gathered

Fig 1: The way Information is Gathered

Above table indicates that most preferred source of gathering information by Male respondents is books while that of Female respondents is Internet.

Library is a center of knowledge with diversified collection of Information sources and services to support teaching, learning and research activities of the University. As the libraries

invest huge amount on infrastructure development, procuring information sources and to provide services. It is expected that library should be utilized to the maximum. In order to understand the habit of using the library by the Post Graduate students, attempts have been made.

2) Frequency of Library Visit

	Male		Female	
No. of Visit	Frequency	Percent	Frequency	Percent
Daily	15	33.3	12	26.6
Several times	06	13.3	15	33.3
Once in a week	09	20	03	6.66
Twice a week	04	8.88	07	15.5
Once in a month	06	13.3	06	17.7
Once in a year	05	11.1	02	4.44
Total				

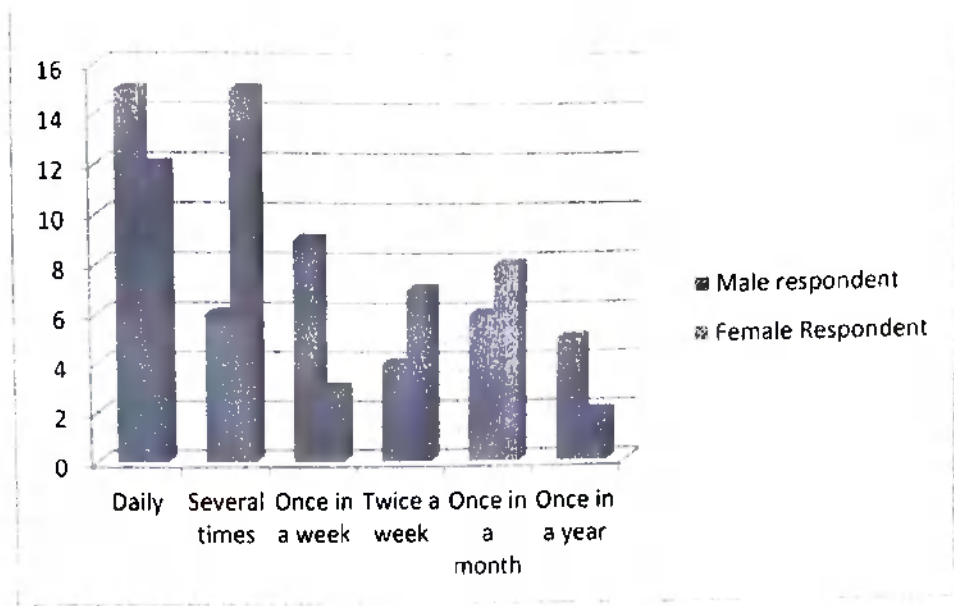**Table.2 Frequency of Library Visits**

| 12121

26

Fig 2: Frequency of Library Visit

Table 2 Indicates Male respondents visit library daily and Female Respondents visit library several times.

3) Purpose of Visiting Library

Purpose of Visit	Male		Female	
	Frequency	**Percent**	**Frequency**	**Percent**
To study	24	53.3	24	53.3
To borrow books	25	55.5	45	100
To read newspapers/ Periodicals	10	22.2	11	24.4
To consult reference sources	18	40.0	08	17.7
To refer projects/thesis	35	77.7	15	33.3

27

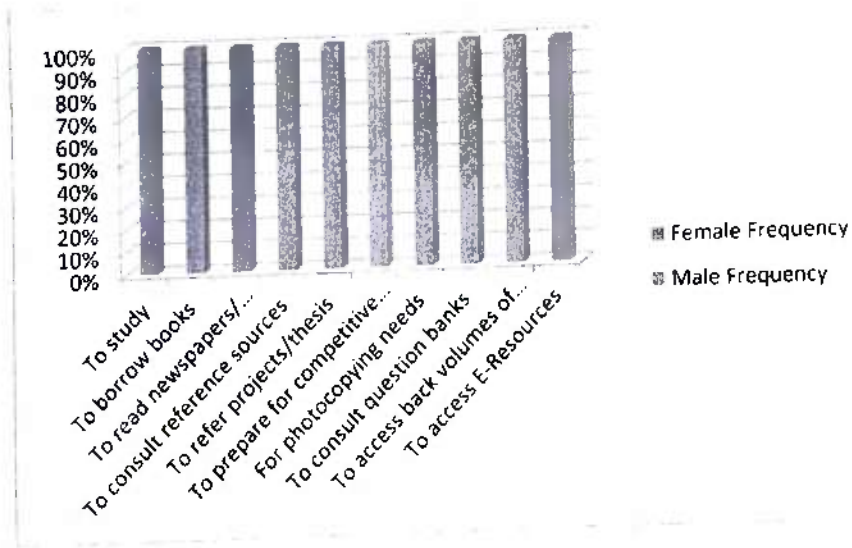| To prepare for competitive exams	09	20.0	13	28.8
For photocopying needs	42	93.3	43	95.5
To consult question banks	31	68.8	42	93.3
To access back volumes of periodicals	25	55.5	37	82.2
To access E-Resources	34	75.5	47	104.

Table 3.Purpose of Visiting Library:

Fig.3: Purpose of Library visit

Above table shows that to study, to read periodicals, for photocopying. Table also reveals that there is significant difference across the gender. The ratio of the male respondents and Female respondents borrowing books,(55.5:100), Consulting Reference Books (40:17.7), Referring thesis(77.7:33.3), preparing for competitive exams(20:28.8), Consulting question papers(68.6:93.3), Accessing back volumes of periodicals (55.5:82.2)

| 12123

Students visit the library to get material for to complete the assignments, prepare for exams and competitive exams and other career related activities, they often use different Information sources in different forms and formats. There is no much difference in purposes like to study, to borrow books.

4. Familiarity With Library

Library is a place for the library user to get required information. Familiarity with library set up helps the user to make use of the library to the maximum. Library collection is organized based on classification schemes. Information users are expected to be a-familiar with set up aware about the collection. Attempt has been made to know about the familiarity Awareness about library collection and the modes of locating Information source.

Familiarity with the setup makes the user to feel comfortable with the set up.

Familiarity	Male Respondents		Female Respondents	
	Frequency	Percent	Frequency	Percent
Yes	31	68.8	30	66.6
No	14	31.2	15	33.3
Total	45	100	45	100

Table 4. Respondent's familiarity of library setup
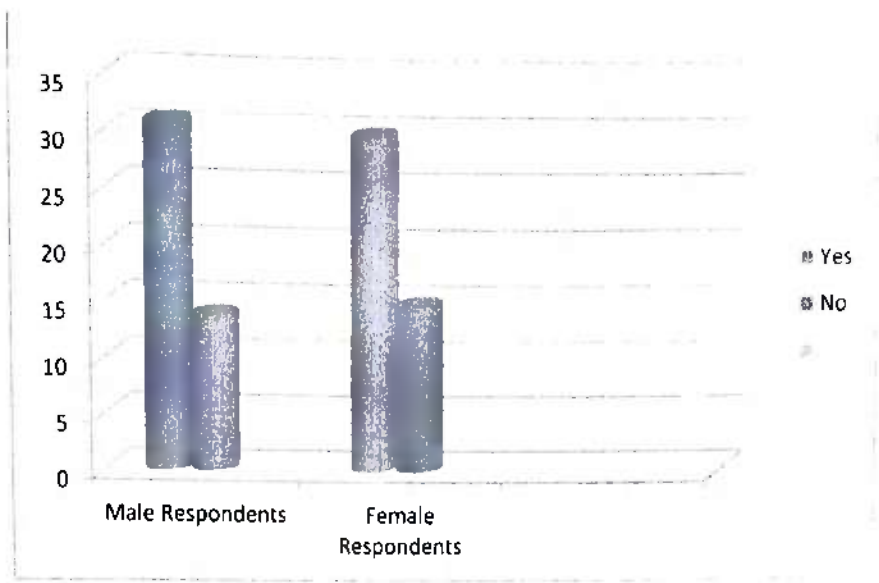
Our Heritage

Fig.4: Familiarity

Table 4 indicates respondents' familiarity with the library setup. There is no much difference among the both genders regarding library setup

5) **Awareness about Library collection development helps the users to make maximum usage of the Information sources**

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Awareness	Male Respondents		Female Respondents	
	Frequency	Percent	Frequency	Percent
Yes	23	51.1	29	64.4
No	38	84.4	18	40.0
Total	45	100.0	45	100.0

Table 5. Respondent's awareness about collection development
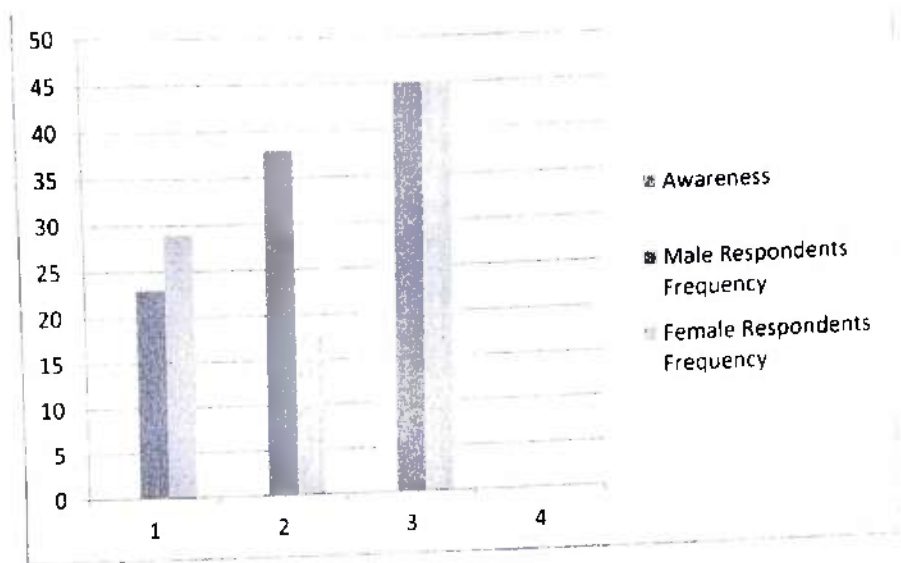
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Our Heritage

Fig. 5 : Awareness about Library Collection

Table 5 indicates that awareness of Female Respondents about library collection development is higher than that of Male respondents.

6) Mode of locating information

Modes of Locating Information	Frequency	Percent	Frequency	Percent
Searching shelves/ own effort	35	77.7	28	62.2
Consulting catalogue/ OPAC	04	8.88	07	15.5
Consulting staff	02	4.44	07	15.5
Notification of new arrivals	04	8.88	03	6.66

Table 6. Mode of Locating Information

Table 6 reveals that there is difference among the gender in the ratio Male: Female with respect to Searching shelves is (77.7:62.2) Consulting Catalogue (8.88:15.5), Consulting library staff (4.44:15.5) and Notifications of New Arrivals (8.88:6.66)

7. Preferred Information Sources

Resources	Male Respondents		Female Respondents	
	Frequency	Percent	Frequency	Percent
Books/ Textbooks	45	100	45	100
Reference books	45	100	45	100
Reference tools	24	53.3	32	71.1
Handbooks	02	4.44	00	00
Periodicals/ Journals	45	100	45	100
Govt. publications	13	28.8	26	57.7
Patents/Standards	03	6.66	08	17.7
Thesis/ Dissertations	45	100	45	100
E-Resources	40	88.8	43	95.5
Newspapers	45	100	45	100

Table 7. Preferred Information Sources

Table 7 indicates that there is no significant difference with reference to preferred information sources like Books, Reference books, periodicals, Thesis/ Dissertations and Newspapers. There is difference with respect to reference tools (53.3:71.1), Handbooks (4.44:00). Govt. publications (28.8:57.7), Patents (6.66:17.7), E-Resources (88.8:95.5)

8) Relevant, adequate sufficient Information Sources save the time of the Users and make the library more efficient center of Information sources. An attempt was made by the Researcher to

know the opinion of Respondents about the relevancy of the library collection and the adequacy of the collection.

Resources	Male		Female	
	Frequency	Percent	Frequency	Percent
Relevance of Information Resources	43	95.5	41	91.1
Adequate	42	93.3	44	97.7
Sufficient	39	86.6	43	95.5

Table 8. Respondents opinion about relevance of library resources.

It is evident from table 8 that there is no much difference of opinion among Male and Female respondents with respect to Relevance of Information sources (95.5:91.1), Adequacy (93.3:97.7) and Sufficiency (86.6:95.5)

8. FINDINGS:

1) Most preferred source of gathering information by Male respondents is books while that of Female respondents is Internet.

2) Male respondents visit library daily and Female Respondents visit library several times.

3) Students visit the library to get material for to complete the assignments, prepare for exams and competitive exams and other career related activities, they often use different Information sources in different forms and formats. There is no much difference in purposes like to study, to borrow books.

4) There is no much difference among the both genders regarding library setup.

5) Awareness of Female Respondents about library collection development is higher than that of Male respondents.

| 12128

6) There is difference among the gender in the ratio Male: Female with respect to Searching shelves is (77.7:62.2) Consulting Catalogue (8.88:15.5), Consulting library staff (4.44:15.5) and Notifications of New Arrivals (8.88:6.66)

7) There is no significant difference with reference to preferred information sources like Books. Reference books, periodicals, Thesis/ Dissertations and Newspapers. There is difference with respect to reference tools (53.3:71.1), Handbooks (4.44:00), Govt. publications (28.8:57.7), Patents (6.66:17.7), E-Resources (88.8:95.5).

8) There is no much difference of opinion among Male and Female respondents with respect to Relevance of Information sources (95.5:91.1), Adequacy (93.3:97.7) and Sufficiency (86.6:95.5)

9. CONCLUSION:

The study attempted to examine the gender and Information seeking Behaviour. Information use and information seeking behavior is almost same among the both genders since the need for Information seeking of both genders is same that is for academic purpose. It can be concluded that when the purpose of information seeking is same there is no much difference among both the genders.

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3)

"Endurance Athletes and Their Dependence on Energy Drinks To Enhance Performance"

BY MR SAVIO LEITAO

COLLEGE DIRECTOR OF PHYSICAL EDUCATION

SHREE MALLIKARJUN COLLEGE, CANACONA –GOA.

INTRODUCTION :

Energy Drinks (EDs) are among the most common beverages consumed by young adult population. They typically contain carbohydrate (ie 10-15 g/100ml or 10% -15 % solution) electrolytes and caffeine, along with nutrients purported to improve mental focus, attention ,alertness and energy level.

Most are considered as beverages and, therefore, have nutrient panels, while others are considered as dietary supplements and, therefore, have supplement fact labels. Most companies also offer a lower calorie version of energy EDs that are flavored with artificial sweeteners. On the other hand, energy shots (ESs) are typically 2–4 oz. servings of concentrated fluid containing nutrients purported to improve mental focus and alertness. Most are classified as dietary supplements.

Because EDs and ESs contain carbohydrate, caffeine, and nutrients that may affect cognitive function, they are often consumed by individuals who are tired and need to stay awake for work or school, as well as athletes prior to, during, and/or following exercise as an ergogenic aid or recovery drink.

Even though the mechanism of action is still unknown, caffeine remains a highly utilized supplement for those looking to increase both anaerobic and aerobic performance.

REVIEW OF LITERATURE

Ready-to drink (RTD) pre-workout supplements and energy drinks have been purported to improve exercise performance and/or cognitive function [1, 2, and 3]. These supplements typically contain combinations of various purported ergogenic nutrients including carbohydrate, caffeine, amino acids, creatine, beta-alanine, vasodilators (e.g., nitrates, L-citrulline, L-arginine), nutrients purported to improve concentration (e.g., citicoline), and various vitamins [3,4,5,6].

OBJECTIVES .

The main objectives are-

- To study the popularity of Energy Drinks among Long distance endurance athletes.
- To study the Patterns of consumption of EDs at pre workout during workout and post workout and also during competition.

35

- To study the habits associated with EDs.


METHODOLOGY

The study explored the pattern of Sports Drinks (SDs) usage and performance of Endurance athletes.50 Participants (*N*=50) were chosen equally randomly between men and women among top 200 finishers that participated at All India Inter University Cross-country Championship (10kms).The participants were given a 10 point Self Administered Questionnaire (SAQ) regarding their consumption and dependence on EDs. The timing of the consumption like during practices, before event, during event and after event. Whether they feel its beneficial Physically and /or psychologically. If they are considering it merely as Dietary Supplement .Negative opinions like dependence and addiction to the EDs. Lastly a survey of the most popular EDs.


10 point Self Administered Questionnaire (SAQ) and the findings:

Some common examples of Energy Drinks (ED),Supplements, Energy Shots (ES),Sports Drinks, Sports Beverages are Gatorade, Powerade, Electral, Energel, Red bull ,etc.
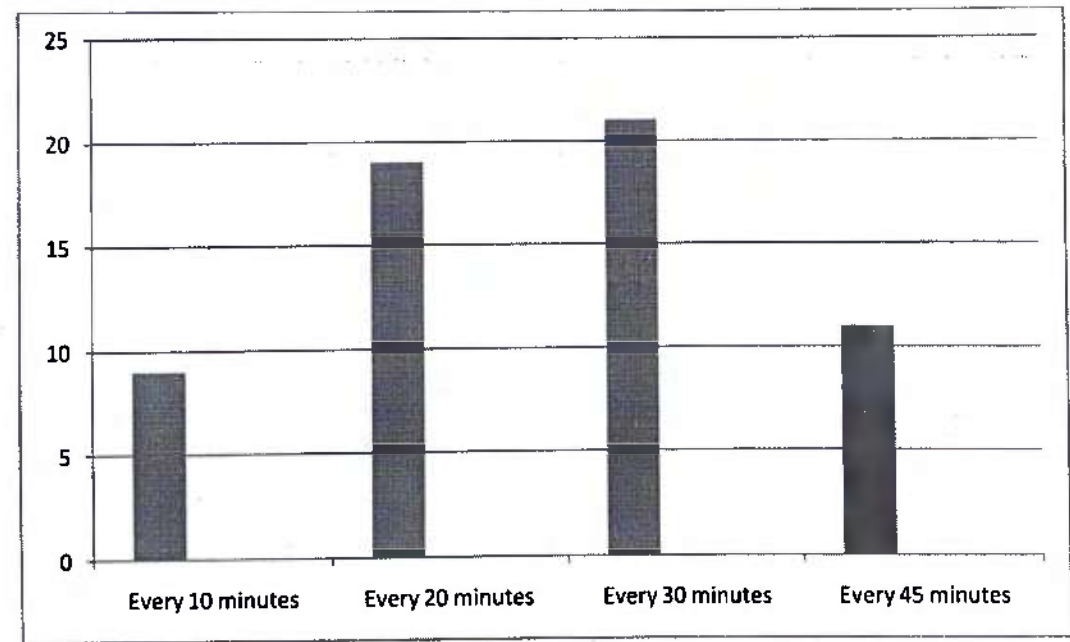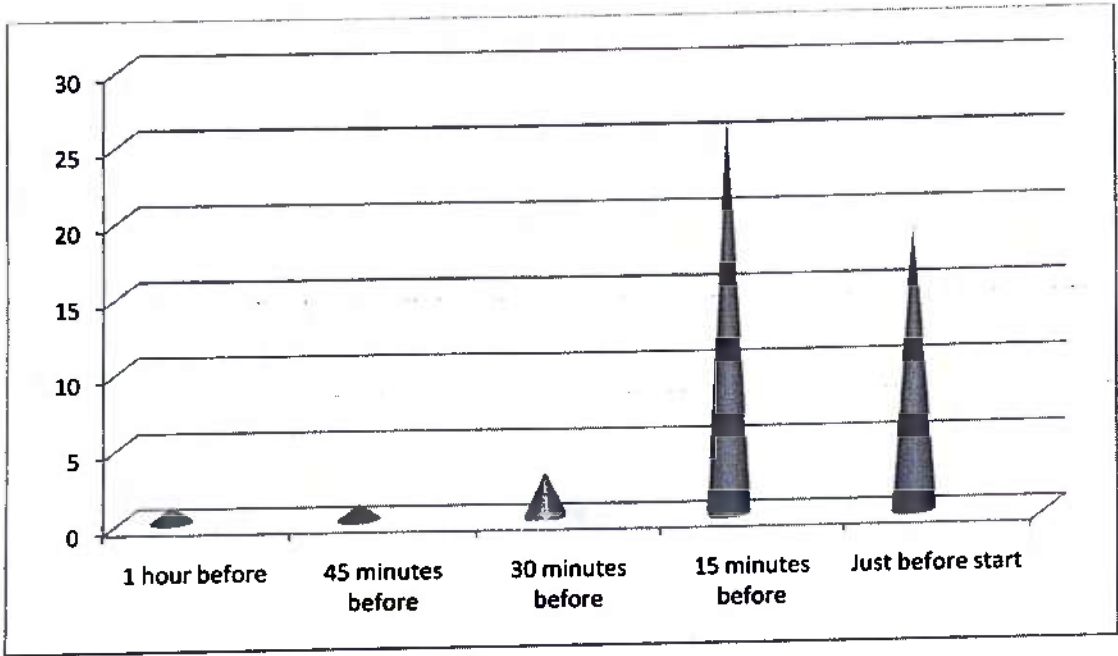
1. Do you consume any/some of the above
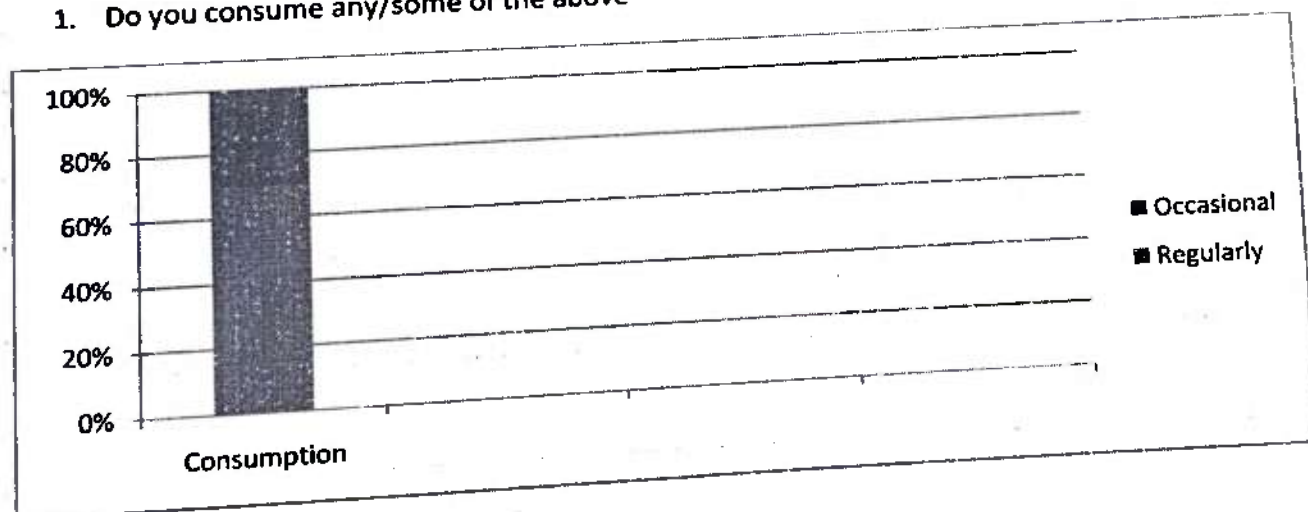
2. Are you dependent /addicted on the above

36

Dependant/Addicted

- Fully agree
- agree
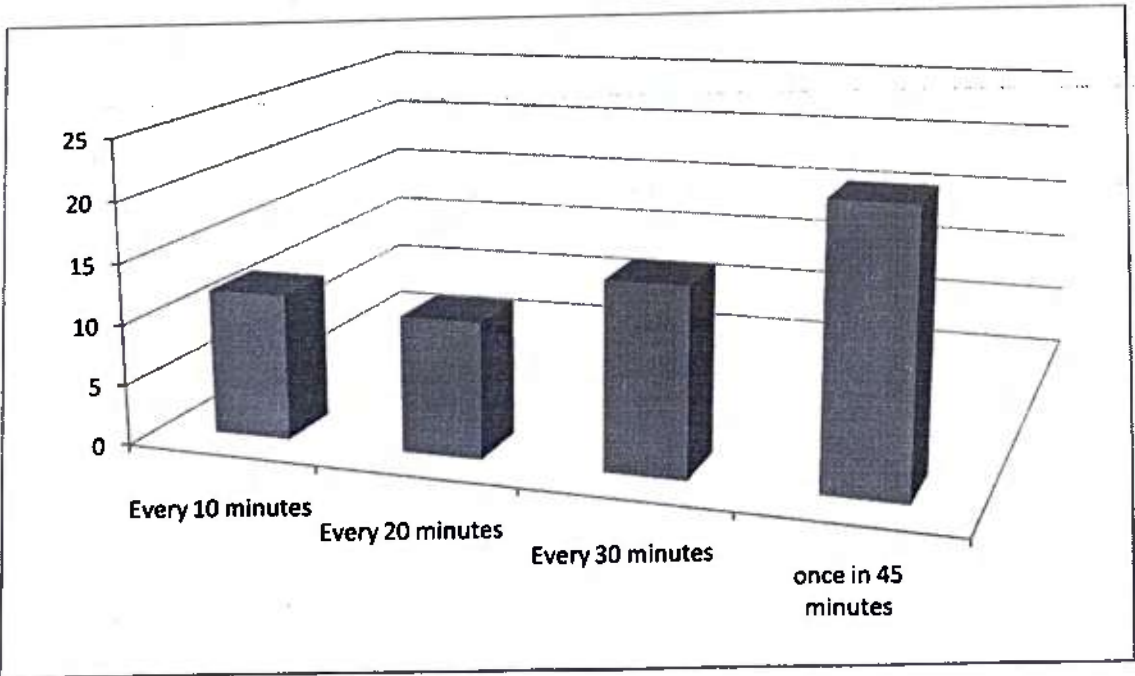- neutral
- don't agree
- fully disagree
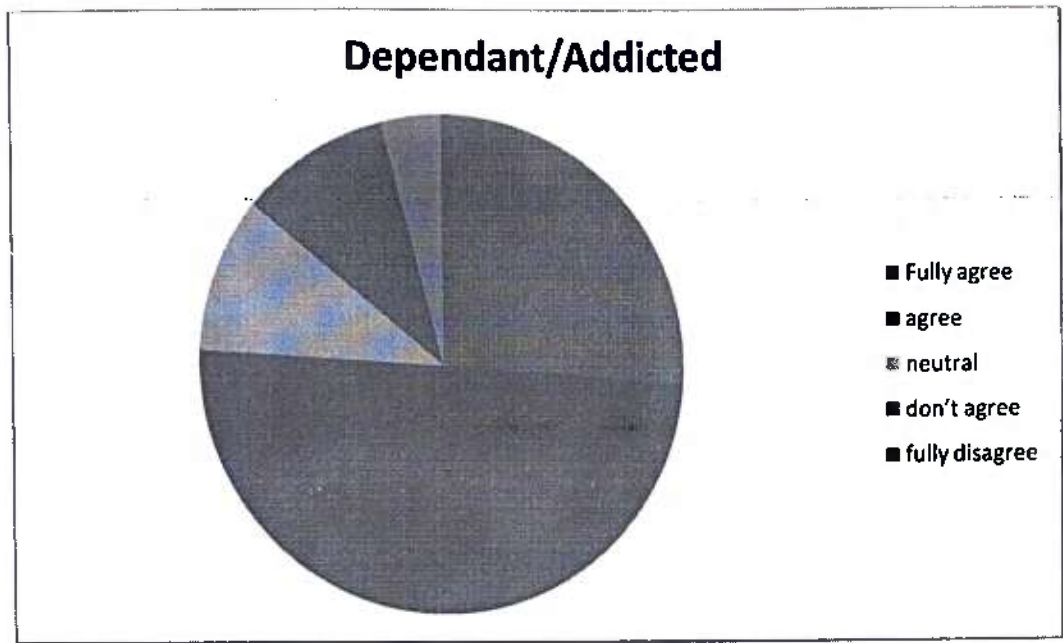
3. The timing of the consumption like during practices
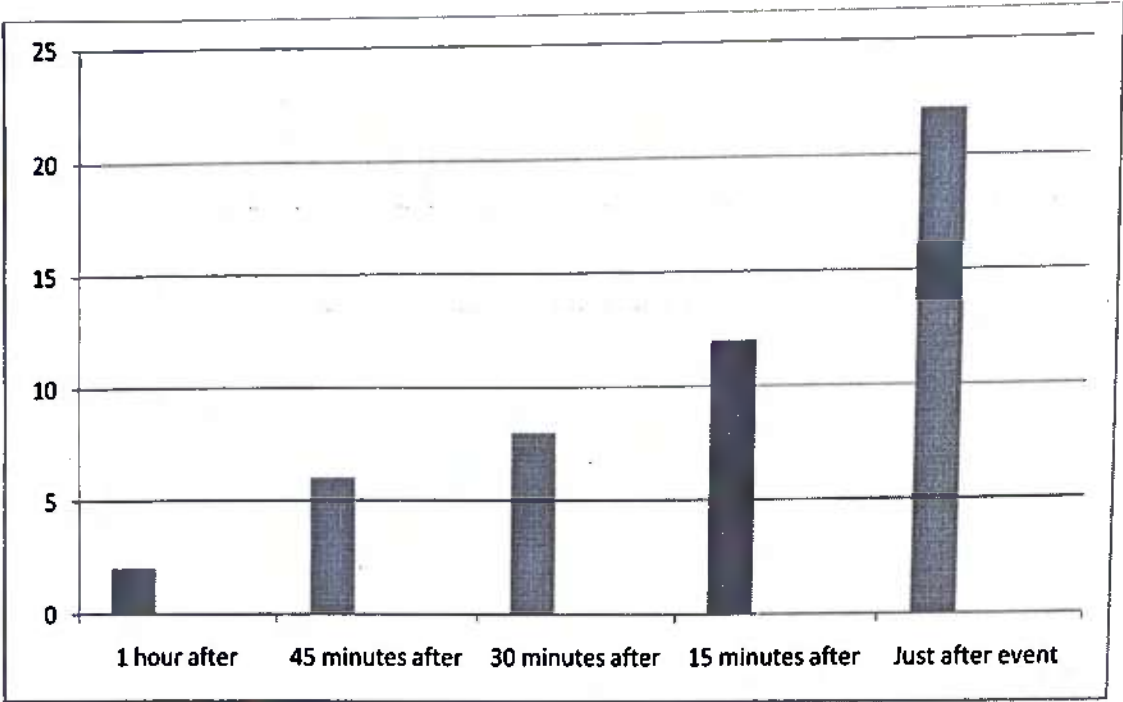

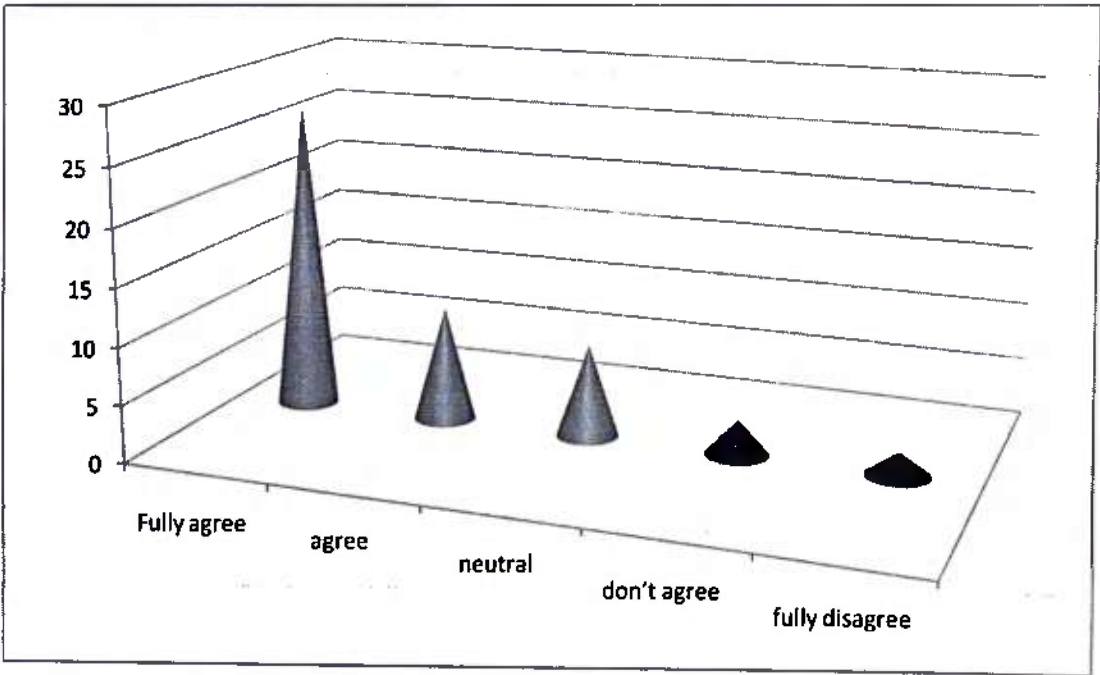4. The timing of the consumption before event

37

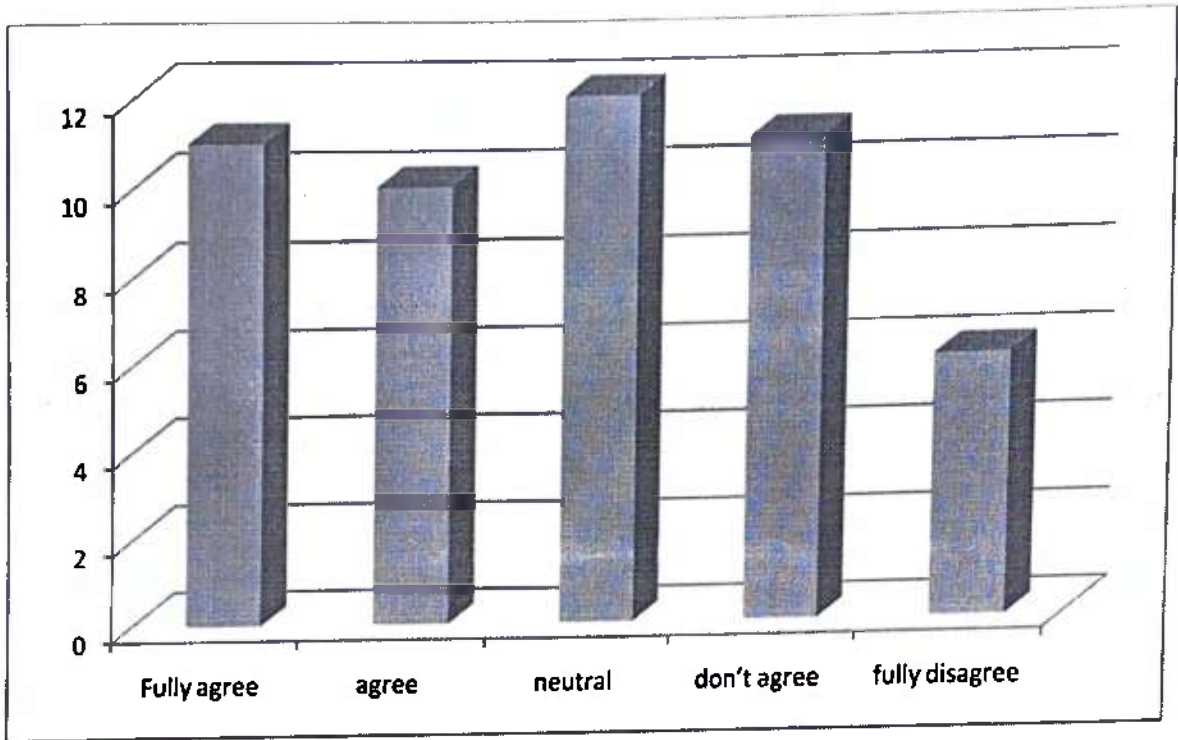5. The timing of the consumption during event
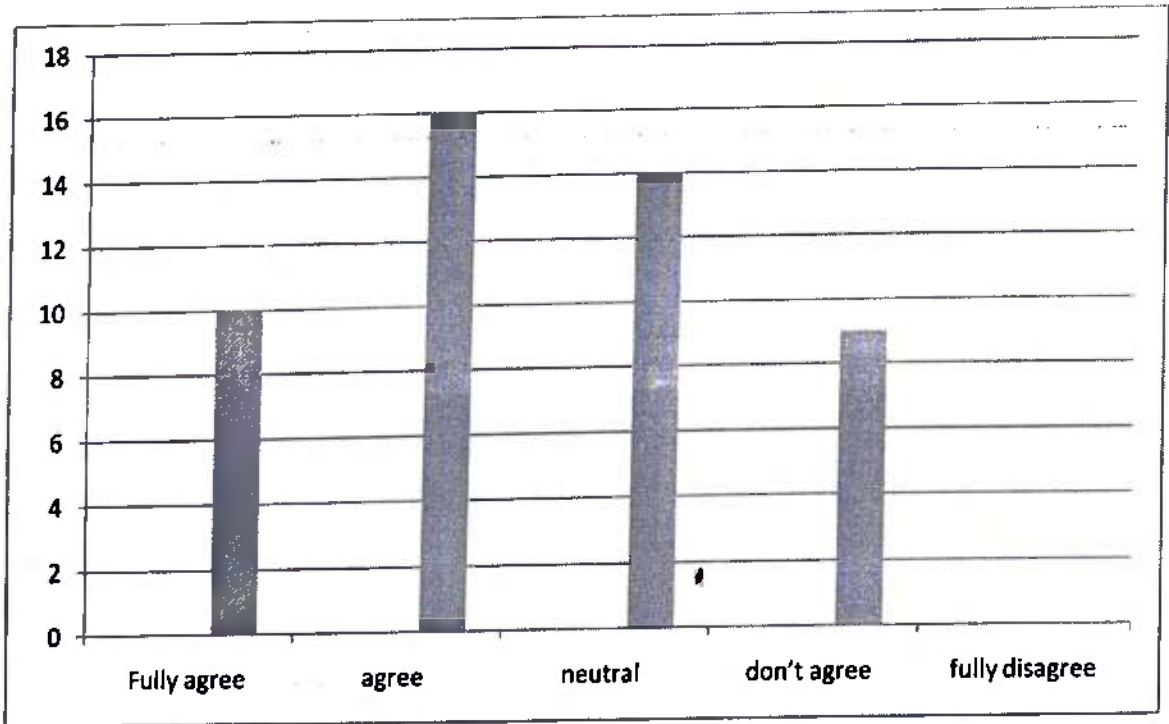

6. The timing of the consumption after event

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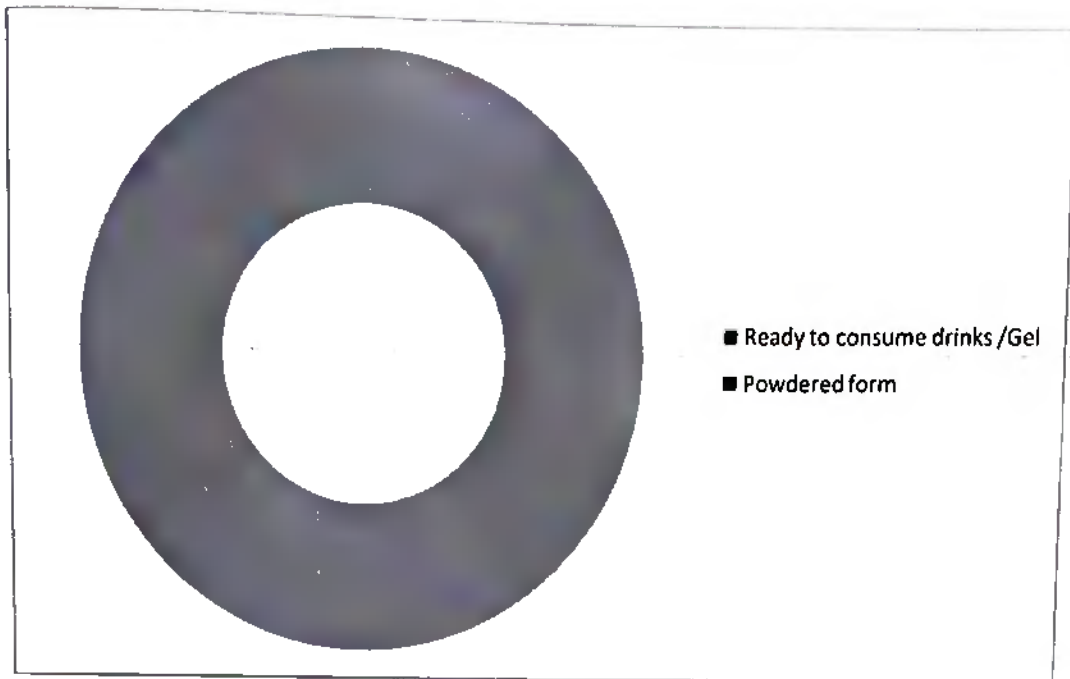7. Whether they feel its beneficial Physically/Physiologically

8. Whether they feel its beneficial psychologically.

39

9. If they are considering it merely as Dietary Supplement

10. The most popular type of EDs.

40

- Ready to consume drinks /Gel
- Powdered form

RESULTS & FINDING: The results show majority of the athletes consuming EDs, The timing being before the event, Majority also agrees that it improves their performance timing. That they consume in additional to normal Diet. Electral in powder form was most favoured ,ready Electrolyte drinks then it was Gatorade and Red Bull.

CONCLUSION: The findings indicated that there is significant relationship between EDs and Endurance performance. However a scientific Experimental Research needs to be done to verify facts.

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42

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COASTAL TOURISM AND ITS IMPACT ON THE GOAN ENVIRONMENT

Dr. F. M. Nadaf
Associate Professor of Geography
Shree Mallikarjun and Shri. Chetan Manju Desai College
Canacona-Goa

Abstract

Tourism is a billion-dollar thriving industry working to offer people with jobs and other opportunities across the world. For a layperson, Tourism is nothing but sightseeing, visiting the places of interest for fun and pleasure. Tourism, correctly understood is of a recent origin. The thought of visiting the attractions began in the late 18th century mainly after the Industrial Revolution in Europe, when people started taking annual holidays for relaxation and amusement. Whereas, in Goa, the idea of Tourism arrived with the appearance of 'Hippies' in the late sixties. However, today tourism has acquired the position of an industry.

For the vigorous growth of tourism physical landscape, historical and cultural heritage are of immense significance. In the current era, 'beach tourism' has magnetized a massive amount of tourists both in India and the world.

The coastal areas are the most admired tourist destinations on the globe, and in most of the coastal areas, tourism has become the spine of the economy. Coastal tourism brings both constructive and undesirable changes to the coastal areas and their economies.

The coastlines, across the planet, are attaining a catastrophe. Terrorisation of the seashore and coastal societies is on the increase due to the large scale growth of beach tourism. Goa is a tiny state covering an area of about 3702 sq. Km, with 105 km of coastline that includes about 74 km of sandy beaches. The growth of Tourism in Goa is very rapid, unplanned and haphazard. This is putting a great deal of stress and considerable strain on limited coastal resources. Hence this paper aims to highlight the influence of the tourism industry on the coastal environs of Goa.

Keyword: Coastal Zone, Solid Waste disposal, Eco-tourism,

Introduction

Tourism is a billion-dollar thriving industry working to provide people with jobs and other opportunities across the world. For a layperson, Tourism is nothing but sightseeing, visiting the places of interest for the sake of fun and pleasure. Tourism has been defined in a variety of ways.

According to the Tourism Society of Britain (1976), "Tourism is the temporary short-term movement of people to destinations outside the places where they normally live and work

and their activities during the stay at these destinations; it includes movement for all purposes, as well as day visits or excursion".

In the views of Schullard H.V. (1910), Tourism is the "sum total of the operators, mainly of an economic nature, which directly relates to the entry, stay and movement of foreigners inside and outside a certain country, city or region".

Hunziker & Krapf (1942) defined Tourism as "the totality of the relationship and phenomenon arising from the travel and stay of strangers, provided the stay does not imply the establishment of a permanent residence and is not connected with a remunerated activity".

Though we think that Tourism is a very recent phenomenon but in a real sense, Tourism as an activity has a long past. People in the past have travelled for various reasons like Alexander the Great travelled to conquer the world, Gautam Buddha for Truth, Ashoka the Great for Peace.

Tourism, Economics and Environment are very intimately connected to one another. Tourism as an industry is, of course, most beneficial in economic terms to the inhabitants, but it exerts great pressure on the scarce resources and constitutes a constant threat to the coastal environment. Hence, an attempt has been made in this paper to highlight the environmental problems faced by coastal Goa due to tourism.

Objectives of the Study
· To understand the growth of Tourism in Goa.
· To examines the impact of Tourism on the Coastal Environs.

Study Area
Goa, the land of captivating shoreline and cultural heaven has eco-geographically occupied a vital position in the foothills of Shyadri ranges and alongside the west coast of India. There is something romantic about the state of Goa, with its beautiful and eye-catching surroundings that made the people call it a 'heaven on the earth'.

Astronomically, the province of Goa is extended amid the parallels of 15o 48' 00" North to 14o 53' 54" North and 74o 20' 13" to 73o 40' 33" east meridians, covering an area of about 3702 Sq.Km. In dimension, Goa is almost six times larger than Bahrain, three times of Hongkong and 12 bigger than the Maldives, whereas, it is eight times smaller than Belgium and it tolerates the pressure of 1,458,545 persons (2011). Presently with its 105 Km. length, 65 Km. width, 105 Km. long coastline and 250 Km. long navigable inland waterways,

Goa shares its border with Maharastra, and in the south and east with Karnataka and waters of Arabian Sea in the west. Of the total physical area, 36.28% is covered with the net cultivated area, 29.16% by forest, cultivable wasteland including fallow land is about 24.86%. The altitude of the territory ranges from sea level to 1000 meters above sea level (Figure 1).
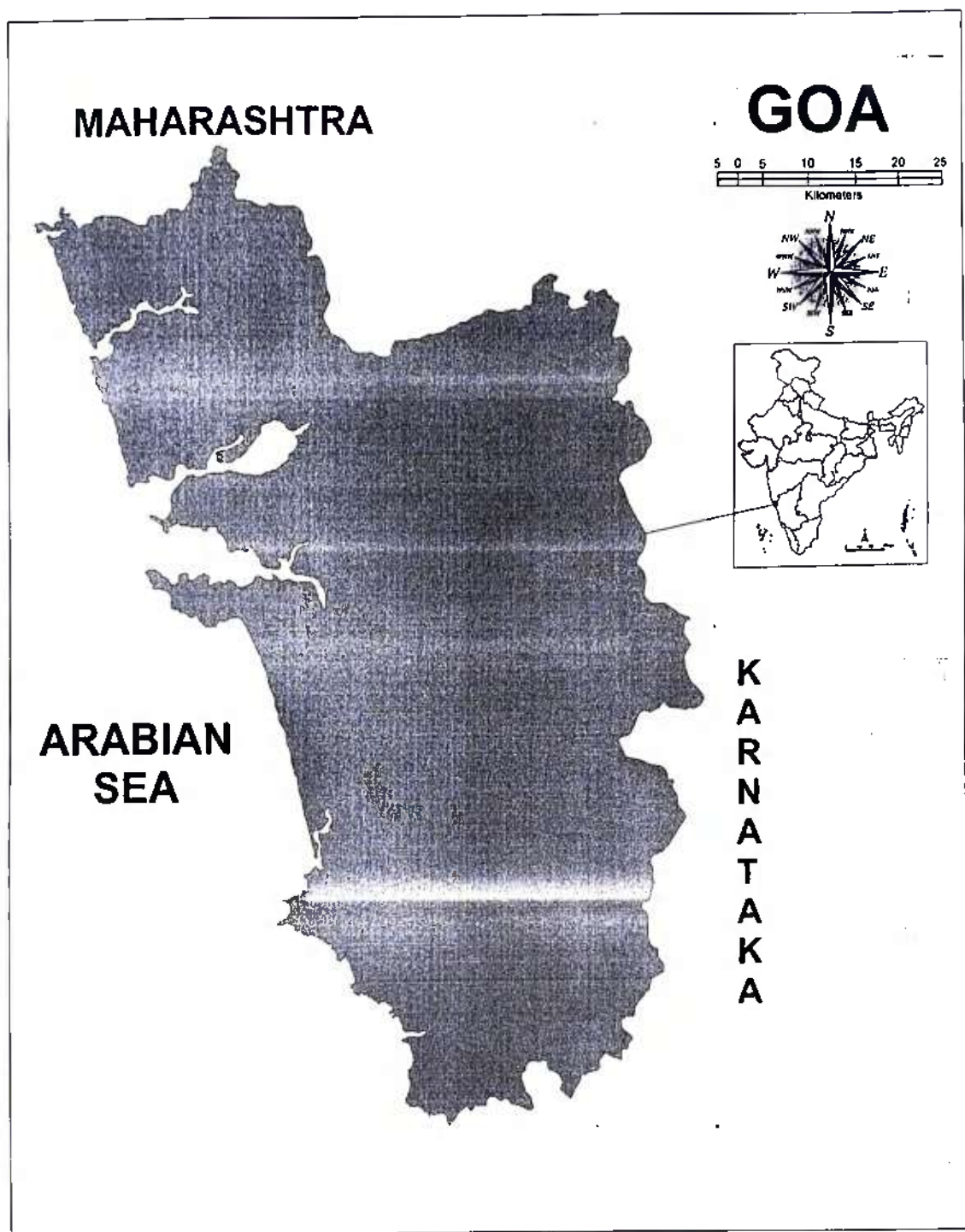
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Figure 1

46

Methodology and Data

The study is exclusively based on both primary and secondary facts. The primary data is gathered from various sources like field work and field observations. On the other hand, secondary data is collected mostly from Topographical Maps, Geo-coded false colour composite of IRS IC LISS III acquired on 5th April 1996 at 11:13:53 to the scale of 1:50,000 having an approximate resolution of 23.5 meters. Similarly, GIS portals such as Google Earth, Wikimapia, and Bhuvan Earth are also used for various purposes.

Coastal Belt

The Coastal areas are sensitive ecological units. The definition of Coastal Zone varies from place to place, and there is no consensus view on the term 'Coastal Zone' but generally it is considered that it is a space in which physical environment greatly influences the aquatic environment or it is a broad geographic area in which both terrestrial and marine factors are found influencing each other, thus forming unique landforms and ecological systems.

According to E.C.F.Bird (1984), the coast is a zone of varying width, including the shore and extending to the landward limit of penetration of marine influences: the crest of a cliff, the head of a tidal estuary or the solid ground that lies behind coastal dunes, lagoons, and swamps. The coastline is usually taken as the land margin in the backshore zone. It is useful to refer to the sea area adjoining the coast, comprising the near-shore, and offshore zone, as coastal waters.

In India, for the legislative purpose, Coastal Zone is considered as "the coastal stretches of seas, bays, estuaries, creeks, rivers, and backwaters which are influenced by tidal action (in the landward side) up to 500 meters from High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the High Tide Line. The High Tide Line means the line on the land up to which the highest water line reaches during the spring tide.

The Coastal Region of Goa is just 105 Km long with non-uniform shape and width. It is a varied and pleasing region of great delightful beauty. This is a slim strip of land intimately related to beaches, sand dunes, estuaries, river catchments, lonely hills, mangroves, swampland, flood plains, islands etc.

Along the Goa coast, sandy beaches cover about 73.30 sq. km of the total geographical area. Colva beach is the longest beach which is that is about 25 km and the world-famous Calangute beach is just 7 Km. long. The Coast changes its outline according to seasonal changes. This region is marked by two big estuaries i.e., the estuary of Mandovi and Zuari. Mangrove vegetation is a widespread sight in this region especially beside estuaries and tidal influence of rivers. All the foremost rivers like the Mandovi, Zuari, Chapora, Galgibag, Talpona, Sal, Saleri and others drain this coastal Plain. Saltpans, wetlands, spits, bars, islands, etc also distinguish this dynamic zone of Goa. Anjadev, Grindi, Palolem, Divar, Charao, are the key islands of Goa.

47

Tourism in Goa

The state of Goa has a unique environment due to which it has created a special place on the tourist map of the World. The growth, expansion and development of tourism largely depend on Physical, Cultural/Social and Economic factors.

Beaches, Forests, scenic beauty, Lakes, Wildlife Sanctuaries, Waterfalls, Botanical Gardens, Hills, Valleys, Mountains, and other physical features have always fascinated man since ancient times.

Infrastructural facilities like hotels, means and modes of transport and communication, and other services are the key economic factors.

Historical buildings, places of worship, entertainment and recreational facilities and other artificial and man-made objects are the prime cultural factors.

Fortunately, the territory of Goa freely gifted by nature with five rich wildlife sanctuaries like Bhagwan Wildlife Sanctuary, Molem National Park, Cotigaon Wildlife Sanctuary, Bondla Wildlife Sanctuary, and Dr Salim Ali Bird Sanctuary, Large number of golden sandy beaches likes Tirakhol, Baga, Vagator, Calangute, Varca, Benaulim, Colva, Betul, Palolem and others, thick, dense, evergreen jungle, enchanting waterfalls like Dudh Sagar, etc.

Goa also has a large number of temples with a long history like Shree Mangueshi, Shree Mallikarjun, Shree Shanta Durga, Shree Damodar, Shree Chandreshwar, Shree Kamakshi, Shree Tambadi Surla, Shree Partgali Math, Shree Brahama Temple and others, Churches like Mae de Desu Church, St Xavier Church, and a couple of mosques like Safa Masjid, etc.

Apart from the above important structures Goa also has other significant forts and cultural heritages like Aguada Fort, Alorna Fort, Corjuem Fort, and Cabo de Rama and others.

The Transport and Communication networks are highly developed in Goa; the smallest hamlet is connected with the taluka headquarters by tar road. A large number of hotels of different categories are found scattered throughout the state to cater to the needs and requirements of tourists according to their spending habits.

As a result of the above factors, tourism in Goa has been growing by leaps and bounds and it has emerged as a favourite place of domestic and international tourism. Tourism is vital because it assists to sustain Goa's economy and also greatly contributes to foreign exchange. Table 1 given below displays the trajectory of Goa's Tourism since 1980:

48

Table 1
Growth of Tourism in Goa

YEARS	DOMESTIC		INTERNATIONAL		Overall Growth Rate
	Arrivals	Growth Rate	Arrivals	Growth Rate	
1980	332534		34288		
1985	682545	105.25	92667	170.26	111.33
1990	776993	13.83	104330	12.58	13.68
1995	878487	13.06	229218	119.70	25.68
2000	976804	11.19	291709	27.26	14.51
2005	1965343	101.20	336803	15.45	81.48
2010	2201752	12.02	441053	30.95	14.79
2015	4756422	116.02	541480	22.76	100.46
2018	7081559	48.88	933841	72.46	51.29

Source: Department of Tourism, Govt. of Goa, Panaji

The number of visitors both domestic and international visiting the state of Goa has climbed steadily from 3.67 lakhs in 1980 to 80.15 lakh in 2018, recording an extraordinary increase of 2085 per cent in almost 4 decades showing an average increase of 55 per cent per annum.

During 1980-85, tourism grew at a rate of 111.33 per cent with domestic showing 105.25 and foreign 170.26 per cent growth. The period from 1985-90 witnessed an abrupt downfall i.e. 13.68 per cent. This is supposed to be the lowest growth ever recorded in the history of tourism in Goa. Goa's tourism has witnessed another 2 lows during 1995-2000 and 2005-2010. During these years, the growth of foreign tourist was more·than domestic tourists. This low growth is attributed to many internal and external factors.

Tourism has left both the negative and positive effects on Goa. Tourism has brought closeness between Goans and other citizens of the world. It has provided employment opportunities. Tourism has improved the living standard of the people. On the other hand, its ill effect is untold like drug abuse, sex abuse, HIV/AIDS, etc., Tourism has also caused irreparable damage to our immediate environment.

Tourism and Emerging Concerns
1. Physical Changes and Habitat Damage
The Coast of Goa is dotted with nearly 30 enchanting beaches covering an area of 24,90,580 square meters, that is visited by more than 80 lakh tourists apart from the locals. About 3835 different categories of hotels provide basic accommodation facilities to the tourists of which 63 are Stared Hotels. These Stared hotels are built on a large expanse of land. Some of these hotels are located right on the beaches and sand dune or they are within 200 meters to 500 meters from the High Tide Line. The main tourist attraction on beaches is the shacks or coco-huts. Tourisms Department annually allocates about 364 shacks and a good number of shacks also come on private properties.

49

The beaches of Goa are overcrowded and they have exhausted their carrying capacities. The huge influx of tourists puts tremendous pressure on the beaches thereby brings both major and minor physical changes in the immediate ecosystem. Some of the physical changes include coastal landscape changes, the building of Starred Hotels, Shacks and Huts on beaches, erection and upkeep of jetties, dredging, sand mining, sand dune dressing, destruction of mangroves and saltpans etc.

Pix showing Lawns grown on Berms and Sand Dunes, Palolem
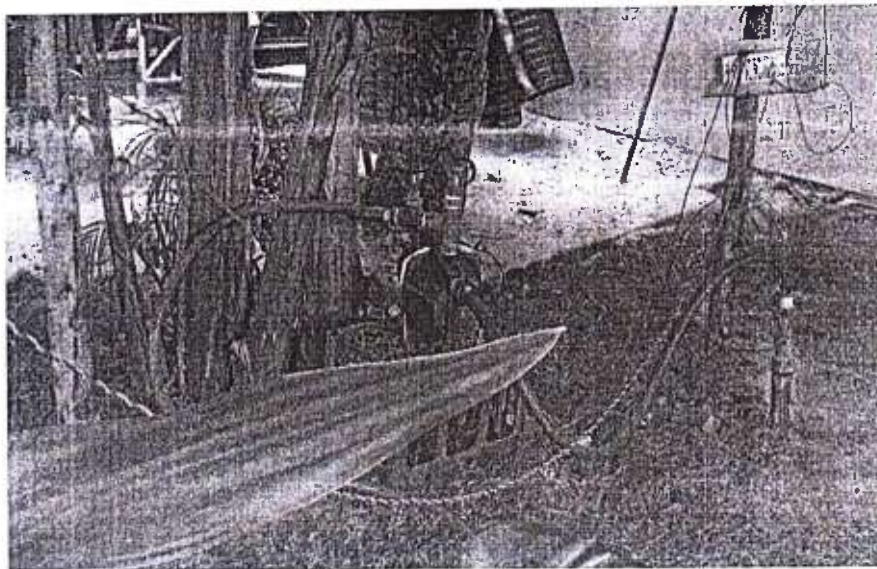
Illegal bore-well behind Beach Shack

50

Though beach shacks are temporary structures, it has been observed that many of these shacks exploit water from bore wells which are banned as per the Coastal Regulation Zone Act. Such activities may lead to intrusion of saline water into the freshwater. Similarly, to keep the surroundings clean and green and to attract tourists, many shack owners have put lawns on beaches. To keep the turf not to turn brown, a lot of water is sprinkled. Similarly, fertilizers, pesticides, herbicides and toxic chemicals are used excessively which results in the contaminated fish, water and fertilizers make their way to coastal ecosystems

2. Solid Waste Generation and Disposal

Solid Waste Generation (SWG), Solid Waste Disposal (SWD) and Solid Waste Management (SWM) have become main concerns in towns, cities, metros and villages. Tourism is responsible for generating waste direct and indirect. According to the estimates of the United Nations Environment Programme (UNEP), tourists produce about 4.8 million tonnes of solid waste annually.

Table 2
Total number of Hotels / Paying Guest House, Rooms and Beds

Total number of Hotels / Paying Guest House, Rooms and Beds as on 31.03.2019 (including Star Category and Heritage Hotels)			
Category	No. of Hotels	No. of Rooms	No. of Beds
(I)	(II)	(III)	(IV)
A	84	9034	15189
B	252	10156	17467
C	715	11450	20495
D	2784	12508	20516
TOTAL	3835	43148	73667

Source: Department of Tourism, Government of Goa

The coastal Goa has 3835 hotels of different categories with 43148 rooms and 73667 beds. In addition to this a good number of beach shacks and coco-huts. As per the report of Goa Waste Management Corporation, Goa presently generates about 766 tonnes of waste every single day. It is projected that Goa will be in a position to generate 888 tonnes, 992 tonnes, and 1,108 tonnes per day by 2025, 2030 and 2035 respectively. This is highly alarming for a small state like Goa. The bulk of the waste is generated in along the coast during tourist season. The present North Goa District is 467 tonnes whereas the share of South Goa District is 300 tonnes of waste daily. Following table throws light on the solid waste generated in different taluka in relation to population.

51

Table 3
Solid Waste Generation

Taluka / District	Waste Generated per day in tonnes	Total Population	Per person Waste Generated in kgs
Tiswadi	110	177219	1.61
Bardez	196	237440	1.21
Pernem	35	75747	2.16
North Goa	467	818008	1.75
Salcete	149	294464	1.97
Mormugao	82	154561	1.88
Canacona	18	45172	2.50
Quepem	29	81193	2.79
South Goa	300	640537	2.13
Goa	767	1458545	1.90

Source: Goa Pollution Control Board

It is very interesting to note from the above table that the per head waste generation is more in forested coastal talukas namely Quepem, Canacona and Pernem with 2.79, 2.50 and 2.16 kgs per persons respectively. Whereas, in coastal talukas such as Tiswadi, Bardez and Salcete per head waste generation is 1.61, 1.21 and 1.97 respectively. Among all the talukas, lowest per head waste is generated in Tiswadi taluka. In average, every Goan generates about 1.90 kgs per day. December to May is normally regarded as tourist season in Goa during this time the solid waste generated increases by about 40 per cent.

3. Destruction of Sand Dunes

Sand dunes in any coastal ecosystems signify a state of equilibrium between physical forces which threaten to the coast and the resistance from the land. Sand dunes area nothing but a heap of sand on the beach covered by coastal vegetation. Sand dunes protect as a barrier between sea waves on one hand and the hinterland on the other hand. The coast of Goa is blessed by some of the stable sand dunes. About 23,20,918 square meters of the coastal area of Goa is covered by sand dunes. Most of the sand dunes are concentrated in Bardez, Canacona, Salcete and Mormugao talukas. The following table shows the distribution of sand dunes in coastal Goa:

52

Table 4
Important Sand Dues of Goa

Talukas	Panchayats	Area of Sand Dunes within 200m (in Sq m)	Area of Sand Dunes in %
Bardez	Anjuna-Caisua	4183	0.18023
	Calangute	46009	1.982362
	Candolim	87949	3.789406
Canacona	Poinguinim	559886	24.12347
Salcete	Betalbatim	208409	8.979593
	Colva	196776	8.478369
	Cana-Benaulim	123149	5.306047
	Varca	363438	15.65923
	Cavelosim	613175	26.4195
Mormugao	Cansaulim, Arossim, Culim	86217	3.71478
	Pale-Valsao	31727	1.367002
Total Sand dune area		2320918	100

Source: National Centre for Sustainable Coastal Management

It is apparent from the above table that two areas namely Cavelosim in Salcete taluka and Poinguinim in Canacona taluka account for the 50.54 per cent of the total sand dune areas of Goa. Betalbatim (8.98%) and Colva (8.48%) are the other rich areas characterized by sand dunes.

Pix showing sand dune come spit eroded at Galgibag Beach in Canacona

Such an important ecosystem is subjected to large scale destruction due to construction of Starred hotels, Resorts, shacks and coco-huts. During tourist season, mining of sand from dunes, and misuse by tourist and locals, the sand dunes in Goa are on the verge of destruction and disappearance.

Pix showing Beach Shack right on Beach at Palollem

4. Extraction of Sand from Beaches

The sand on the beach acts as a 'shock absorber' to the pressure exerted by waves and the same sand protects the coast from the erosion. The sand extraction, sand mining and sand dune dressing are the major threats to coastal ecosystem in Goa. Such an action of man can trigger erosion of beaches and coastal areas. The following table shows the sand extracted from the beaches of Goa:

TABLE SAND EXTRACTION

Year	Quantity of sand extracted in tones	Year	Quantity of sand extracted in tones
1969	18900	1977	46056
1970	27217	1978	48036
1971	30400	1979	41315
1972	40226	1980	49307
1973	46518	1981	47218
1974	45944	1982	37815
1975	50576	1983	59385
1976	50516	1984	66211
1977	46056	1985	30670
1978	48036	1986	30000

Source: Directorate of Industries and Mines.

54

Officially from 1969 to 1986 about 766310 tonnes of sand was removed from the beaches of Goa with an average of 4258 tonnes of sand annually. This shows the enormous amount of damage done to the coastal environment by this irrational action. Legally mining of sand is completely banned but unfortunate even today the extraction of sand from the beaches and sand dunes is continuing unabated.
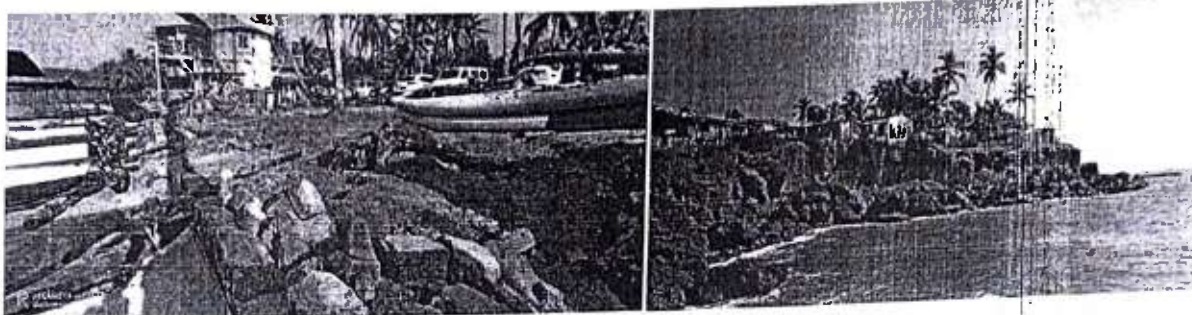
5. Pressure on Local Resources

Land and Water are two important resources that are subjected to tremendous pressure due to tourism because these resources are fixed.

Geographically, Goa accounts for just 0.11 per cent of the total area and 0.12 of the population of the country. Goa is a destination for 0.38 per cent of the domestic and 3.23 per cent of the foreign tourist (2018). It appears that there is a mismatch between the man-land ratio with additional pressure from tourism.

According to the Central Public Health and Environmental Engineering Organisation's standards, the per capita domestic water usage is 135 litres per day. As per 2011 Census, Goa's population is 114,58,545 which infers that we require about 197 million litres per day. In 2018, about 8015400 tourists visited Goa

Pix showing over crowded Calangute Beach

55

In an average domestic tourist stay for 2.13 days whereas foreign stay for 8 days. Hence, both domestic and international tourists in an average spend about 5 days in Goa. Similarly tourist visit all the months. In 2018, at an average, about 21960 tourists visit Goa per day. Considering 5-day stay, the tourist population worked out would be 109800.

As per the norms, per bed per day water prerequisite is 800 litres. Hence the water requirement for tourists works out to be 87 million liters per day. The total water requirement of the local population and tourists is about 284 million litres per day. Whereas the total available capacity is 517 million liters per day. Apart from domestic and tourist consumption, water is also needed for agriculture, industry, mining etc. Today it may appear that Goa is able to meet the needs of locals, tourist and other sectors but in future Goa is required to build more water reservoirs.

Energy consumption is another major issue that the state needs to tackle because Goa's internal generation of power is negligible. The energy requirement of the state is met by Central Sector Power grids.

1. Aesthetic Contamination

Tourism and Nature are inseparable from one another. Hence, while planning tourism infrastructure, one has to assimilate its structures with the surroundings and ethnic designs. But unfortunately, much importance is not given. Our tourist destinations have become concrete jungles and local culture is commercialized, hence, over a period of time, tourism in such areas will lose its shine. For sustainable tourism, we need to integrate nature-culture-architecture.

Concretization of Beaches, Calangute

56

6. Loss of public access

In every coastal village of Goa, the elders had provided public access to beaches through their properties. Hence, people could visit beaches from any point but with the sprawling of shacks and coco-huts access to beaches has been stopped. Similarly, a big chunk of Non-Goans and foreigners (illegally) have been investing in properties at prime locations along the shoreline to build Luxury Resorts, Hotels and Club Houses etc. They have further complicated access to beaches and other public places. At many places, there is a big opposition from the Civil Societies for blocking traditional paths to beaches.
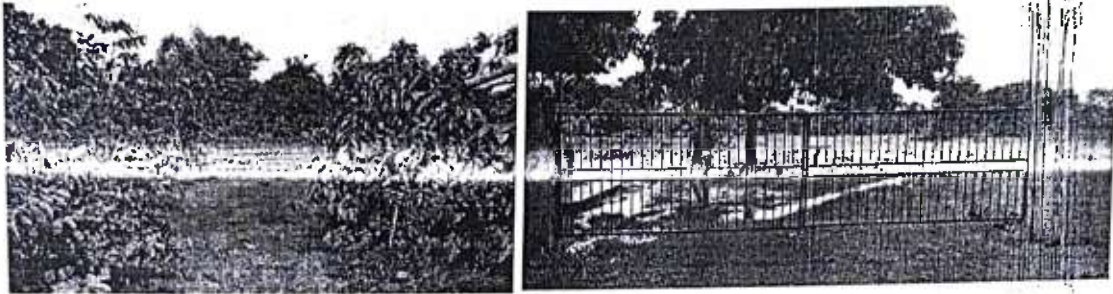
The traditional entry for villagers to Kupak Beach is blocked by new property owner

7. Social Issues

Tourism has caused some irreparable damage to the social fabric of society. Drugs, Human Trafficking, HIV AIDS are some of the side effects of tourism. In Goa first HIV positive case was detected in 1987. Over a period of 30 years, about 16,115 HIV/AIDS positive cases have been detected in Goa. Most of these cases are from coastal areas. The coastal villages such as Candolim, Anjuna, Baga, Vagator, Calangute have become the heavens of Narcotic Drugs. The then Chief Minister of Goa Shri. Laxmikant Parsekar had admitted in the Goa Assembly that Narcotics Drugs are sold outside educational institutes.

Conclusion

The negative impact of Tourism cannot be prevented completely but it can be minimized.

Though Goa is a small state but ecologically and culturally it is very wealthy. Goa has five Wildlife Sanctuaries, and a large number of temples, churches and other historical monuments. Hence more emphasis should be given on promotion of eco-tourism and cultural/religious tourism.

The law bans the use of plastic. People still use plastic without fear on beaches. Plastic is a major accountable cause of the degradation of the environment. Therefore, government agencies must enforce the law with its machinery in true respect. Equally, there is an urgent need to educate the local population and visitors regarding the ill effects of plastic on Man and Environment.

Coastal Regulation Zone Act itself is a very big guide in protecting rare ecosystems. Unfortunately, politicians have used this act to meet their own needs. Hence there is an urgent need to use this Act in an effective manner.

Every beach should have a master plan keeping the local needs and requirements in mind.

It is already pointed out that the Goa has largely beach tourism, unfortunately, no basic facilities like drinking water, bathing places, toilets, gardens, parks and other areas of fun and pleasure are not found on most of the Goan beaches. On a priority basis, they must be made available to the people.

Shacks (Temporary Hotels) have become a common scene on the beaches of Goa. On a 105 Km long coast there are nearly 4000 odd shacks. Many of these shacks are constructed by dressing sand dunes. However, CRZ bans any structure including temporary, but still the government is issuing licenses. Shacks are definitely needed because they cater to the needs of low-class tourists, but they should not be allowed right on the beaches.

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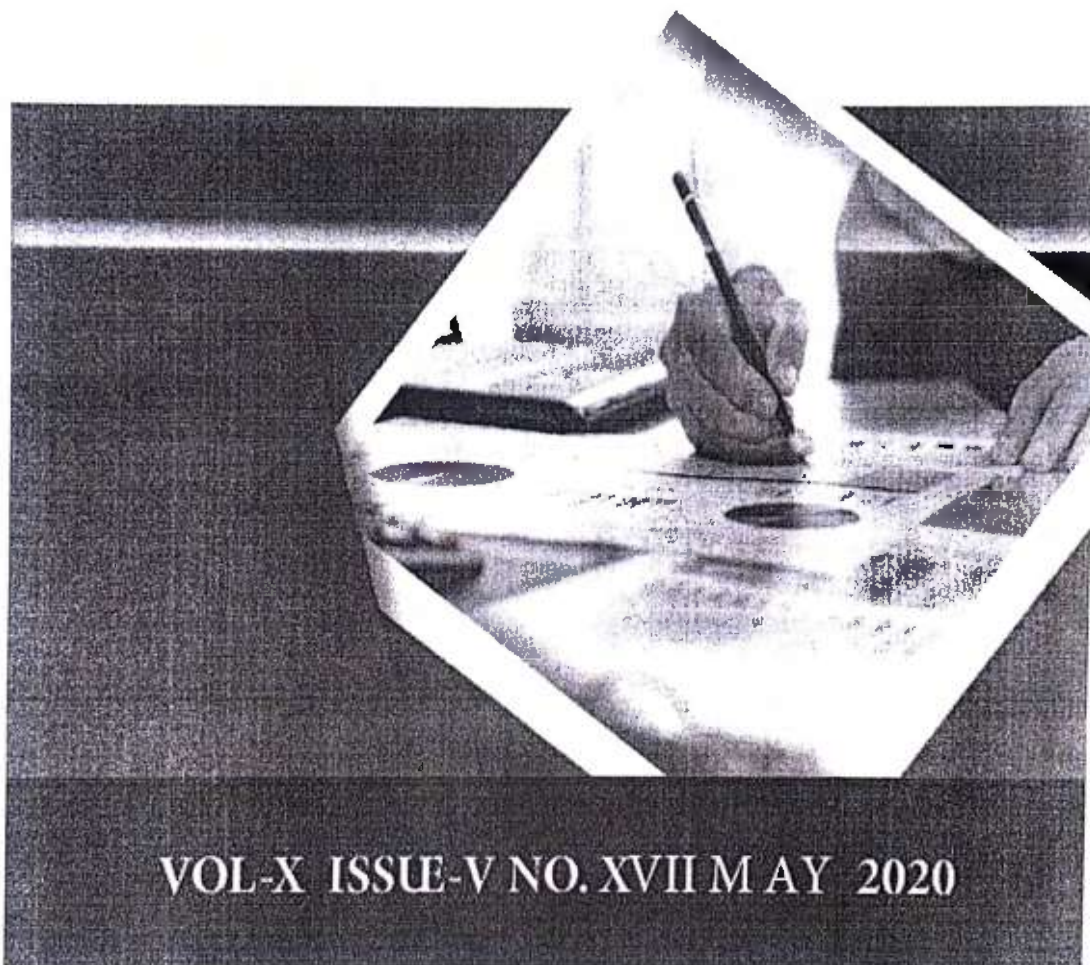
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Covid-19: The Upside of Lockdown

Dr. F. M. Nadaf
Associate Professor of Geography
DPM's Shree Mallikarjun& Shri. Chetan Manju Desai College, Cancaona-Goa
fmnadaf@gmail.com
Mob- 9765459914

Introduction:

Man: the most intelligent animal is regarded as the youngest species on the Earth. His journey (Hominini) that began about six million years back is full of adversities. During his journey, nature was very cruel and harsh. He had faced challenges such as Biological, Climatological, Geological, Hydrological, and Meteorological. Despite of odd circumstances he overcame them.

In the last 120 years, in 221 countries of the world, man has faced 13,757 Biological, Climatological, Geological, Hydrological, and Meteorological disasters with 3,25,83,037 deaths. About 40 per cent of the disaster (5469) and 80 per cent of the deaths (2,61,83,130) occurred in Asia alone.

Following Table 1 depicts some of the important biological disasters faced by the humans:

Table 1
Biological Disasters

Period	Name of the Diseases	No. of deaths	Area of spread
165-180 CE	Antonine Plague	5 million	Mediterranean World
541-542 CE	Plague of Justinian	50 million	China and North East India
1347-1351	Black Death	200 million	Around Black Sea
1665	Great Plague of London	1 lakh	England
1918-19	Spanish Flu	50 million	1/3rd World including USA
1981	HIV/AIDS	25-35 million	Entire World
2002-2003	SARS (SARS-COV)	774	China
2014-2016	Ebola	11000	West Africa
2015	MERS (MERS-COV)	850	Saudi Arabia

Source: inshort

Objectives of the Study:

This study is carried out with a single objective i.e., to discover the positive influence of lockdown on the Environment.

Data and Methodology:

As a result of lockdown, this study is predominantly based on secondary sources of information. Most of the information is collected through online sources.

Novel Corona Virus Diseases-19:

Corona viruses belong to a family of viruses that are responsible for common cold like situation resulting in upper-respiratory tract illnesses with different intensity like the. Corona viruses are found in both humans and animals.

62

Bats, Camels, Cats, Pigs and other animals carry hundreds of corona viruses. Sometimes due to human interactions these strains jump to humans and result in disease. Corona viruses among the domesticated chickens was discovered for the first time in the 1930s whereas, about 30 years after i.e., in 1960, corona virus was discovered in human.

According to scientists, there are seven known corona viruses, four of which can cause serious health issues. They are as follows:

- 229E (alpha)
- NL63 (alpha)
- OC43 (beta)
- HKU1 (beta)
- MERS-CoV
- SARS-CoV
- SARS-CoV-2 (COVID-19)

The first Covid-19 case was detected in India in Kerala on 30 January 2020, whereas world's first case was detected on 17 November 2019 in Wuhan City of China. Due to many fold increase in cases of Covid-19 in a very short period of time, World Health Organization declared this emergency as global pandemic.

A virus of a size of 125 nm has forced the entire Planet to shut. This kind of total shutdown involving 7000 million people has never happened in the past. Coronavirus has badly affected all the sectors of economy irrespective of developed or developing countries. Millions of people have been displaced, lost their livelihoods and large scale migration of workers back to their villages is taking place, where migrants are forced to walk on foot hundreds of kilometers without basic necessities.

As on 24 May 2020, the world was infected with 54,17,932Covid-19 cases with 3,44,196deaths. United States of America alone accounted for 31 per cent of the global cases (16,66,828) with 28.67 per cent of the deaths(98,683). (worldmeters).

It is evident from the following table 2 that the Covid-19 cases are widespread in Europe (34.97 %) and it also accounted for almost half of the deaths (49.23) of the World. It is interesting to note that the prevalence of Covid-19 in Africa is very less. Otherwise, when it comes diseases Africa is most prone but not in case of Covid-19.

Table 2

Continent-wise distribution of Covid-19

Continent	% of Cases	% of Deaths
Europe	34.97	49.23
North America	34.25	32.96
Asia	17.36	7.87
South America	11.20	8.93
Africa	02.00	0.95
Oceania	00.16	0.04

Source: Based on data gathered from Worldmeters

63

In India despite of lockdown from 25th March 2020 onwards, the cases are growing rapidly. With a single case on 30 January 2020, cases increased to 519 on 24 March 2020. Similarly, cases increased to 5864 on 9 April 2020. On 7 May 2020, it further increased to 52952 cases. 19 May 2020 there were as many as 101139 cases in India and on 24 May 2020 the figure climbed to 1,32,029. Currentlycases in India are growing at a rate of 5-6 percent per day and double in 13 days. India account for only 2.43 per cent of the world infections and 1.12 per cent of the deaths (worldmeters).

Various countries of the World are busy in carrying out impact Covid-19 on their economies but only a few efforts are made to understand the positive effects of Covid-19 on Environment and Wildlife. This paper is an attempt to study the benefits of Covid-19 on the Nature.

POSITIVE IMPACT OF COVID-19 ON ENVIRONMENT

1. Improvement in the Air Quality:

For a very long time, human beings are living in a contaminated world. The poor quality of air has resulted into thousands of premature deaths globally. According to the WHO Report 2016, air pollution is accountable for nearly 8 per cent of total deaths in the world.

As a consequence of global lockdown; industries, transport, trade, commerce, movement of people came to a halt and suddenly world appeared cleaner with exceptional blue skies. Following Table 3 shows the Air Quality during lockdown periods in the ten most polluted cities of the world prepared by IQAir as a part of Covid Air Quality Report 2020:

Table 3 Air Quality in selected Cities

City	Average PM2.5 during lockdown 2020 (/m3	Reduction compared to 2019	Reduction compared with prior 4 year average	3 week lockdown dates, 2020
Delhi, India	32.8	-60%	-55%	Mar 23-Apr 13
London, UK	16.2	+09%	+06%	Mar 23-Apr 13
Los Angeles, US	05.5	-31%	-51%	Mar 23-Apr 13
Madrid, Spain	06.4	-11%	+02%	Mar 23-Apr 13
Mumbai, India	28.8	-34%	-43%	Mar 23-Apr 13
New York City, US	04.4	-25%	-29%	Mar 23-Apr 13
Rome, Italy	16.7	+30%	No data available	Mar 09-Mar 30
Sao Paulo, Brazil	10.1	-32%	-26%	Mar 23-Apr 13
Seoul, South Korea	21.1	-54%	-32%	Feb 26-Mar 18
Wuhan, China	35.1	-44%	-50%	Feb 03-Feb 24

Data for Sao Paulo is based on a 3-year average, rather than 4-year average

PM2.5 (µg/m³): 12.0 35.4 55.4 150.4 250.4

Level of Concern | WHO Guideline | Good | Moderate | Unhealthy for Sensitive Groups | Unhealthy | Very Unhealthy | Hazardous

Source: Covid Air Quality Report, IQAir 2020

64

It is evident from the above table 3 that except Rome, all the other cities have witnessed drop in PM2.5 both in comparison to same period in 2019 and 4 years average. New Delhi benefitted maximum from the lockdown showing a maximum reduction atmospheric particulate matter (PM2.5) by 60 percent in comparison with 2019 and 55 percent in comparison with last four years average. Similarly, Mumbai also experienced reduction in PM2.5 but comparison with New Delhi results were not satisfactory.

In India due to lockdown, all major and minor cities experienced best air quality in March, April and May. Since, the lockdown is partial lifted and industries have started their production, hence, the above statistics may change soon.

2. Reduction in Carbon Emission

United Nations Organization is working day in and day out to reduce Carbon emissions across the globe. It has formulated numerous frameworks but countries are unable to meet the set targets. Never mind because according to the research paper published in the Journal Nature Climate Change, global lockdown has caused significant reduction in daily releases of GHG by 17% by equated with 2019 levels. This is a good sign for the good health of Earth and human beings.

3. Reduction on Noise Pollution

Noise can be defined as unnecessary, unpleasant, or intolerable sound, whereas any sound, which is tolerable and sweet, is called 'music.' Human beings cannot hear anything that is less than 20 kilohertz, but animals can hear anything less than this.

Industries, construction works, advertisements, elections canvassing, generators, televisions, mobiles, telephones, automobiles, festivals rails, etc. largely create the noise pollution. The upper limit of human tolerance to sound is 110 decibels. The upper noise intensities are very harmful and troublesome for normal life. It has been calculated by the scientists that the street traffic causes 60-90 decibels and the mobile ring tone causes 90 decibels. Following table 4 shows important noise makers and the level of noise they create:

Table 4
Noise Levels

Noise created in decibels (dB)	Type of sound
10	Breathing
20	Wind in the trees
20-30	Quiet conversation
30.	Tickling clock
50-60	Radio music
60	Loud conversation
60	Office noise
60-80	Children playing
60-90.	Traffic noise
80-95	Sports car
90-100	Heavy truck traffic
110	Thunder storm
120	Beat music electrically amplified

65

90-120	Aircraft noise
120	Jet take off (at 100m distance)
140 db	Jet engine (at 25m distance)
140-170 db	Space vehicle launch (from a short distance)

Source: Manorama Year Book, 1997.

Noise Pollution is one of the main causes of uneasiness for humans, animals and environment alike. Partial deafness, permanent deafness, irritation, loss of concentration, decrease in work efficiency and other physiological disorders are some of the end results of sound pollution on man.

With the imposition of lockdown and quarantine, people were forced to stay at home and human activities decreased resulting into substantial drop in noise levels across all cities. During lockdown period societies were in peace with less stress.

4. Improvement in Water Quality

India is land where rivers are worshipped. Among all the rivers of India, rivers Ganga and Yamuna are viewed as the divinest of the divine and a dip in river Ganga achieves Moksha gets rid of sins. Overall the years, due to industrialization and urbanization these rivers are highly polluted and at many places their water is not suitable for drinking purpose.

The Modi led NDA Government took the reins of India in 2014 and renamed Ministry of Water Resource as Water Resources, River Development and Ganga Rejuvenation. To bring life back into river Ganga a new scheme was introduced namely NamamiGange with a financial allocation of Rupees Twenty Thousand Crores for five years. Similar efforts were also made by the earlier Governments but River Ganga could not be cleaned.

Similarly, a study, published in International Journal of Engineering Sciences & Research Technology, states that River Yamuna is 'close to death' water is 'toxic' even after treatment and should not be used for drinking or irrigation.

Lockdown acted a blessings in disguise. Due to absence of industrial pollutants and garbage, the quality of River Ganga and River Yamuna has improved unbelievably. At many places it was suitable for drinking purpose. What Governments could not achieve in last so many decades, lockdown made it happen in just weeks.

5. Sparkling Beaches

Nature has gifted India with 7516.6 km of shoreline which passes through states of West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat. India's coastline is dotted with some of the beautiful beaches. When we think of Goa, we think of golden beaches. Goa has more than 33 enthralling beaches with 80 lakh footfalls which indicates that they are over-crowded. Due to trampling by lakhs of tourists, the coastal vegetation on the beaches, sand dunes and berms gets destroyed resulting into erosion. For the last 50 days these beaches were free from any torture and getting rejuvenating.

6. Spotting of Wildlife

66

People pay visits to wildlife sanctuaries and National Parks with an intention to see animals in wilderness but many a times we are not fortunate. After days of trekking, we end up seeing few monkeys and birds. When humans were locked in the houses, many wild animals were freely roaming in our towns, cities and villages. Following are some of the important breathtaking incidences:

- A Deer crashed through roof in Mumbai in Mahatma PhuleChawl.
- Black Panther was spotted in Goa. It was first time captured in Camera.
- Sloth Bear was spotted in Cashew Plantation in VajrapuKotturuMandal in Andhra Pradesh.
- Thousands of migratory flamingoes flocked to Navi Mumbai Creek
- Leopard attacked truck drivers in Hyderabad in broad day light
- Dolphins appeared near Mumbai shores
- The elephants stroll through Dehradun
- Herd of Deers was found on a highway in Japan
- Whales were spotted in Indonesia
- A Sambar deer was spotted in Chandigarh
- In Kozhikode, a critically endangered civet was spotted.
- Nilgai was freely trotting in Noida
- One horned rhino ambled in near Guwahati
- Deer was spotted in Tirupati
- Black Panther was spotted after seven years in Chhattisgarh

Similarly, wild animals and birds were also spotted in other parts of the world.

It was observed during the nationwide lockdown that population of birds and butterflies surged significantly across the country. People every day woke up to tweeting and chirping of birds.

7. Himalayan Magic

Himalayas are the youngest folded and the tallest mountains in the World. They are believed to be 70 million years old. Himalayas are as beautiful as Alps. Kashmir, Himachal and Uttarakhand are more scenic and eye-catching than Switzerland. One who visits Himalayas will surely be infatuated withHimalayas. Our earlier generation living in Punjab, Haryana, Bihar and West Bengal had an opportunity to see charming and captivating Himalayas from hundreds of kilometers but due to air pollution Himalayan view vanished during our times.

The current generation is fortunate enough to witnesses Himalayas from far distance as a consequence of lockdown. There are reports that Mount Everest was visible from Kathmandu after years from a distance of 200 km. Similarly, Mount Everest was seen from Bihar's Singhwahini after decades. People in Saharanpur, Jalandhar could see snowy peaks of the great Himalayas. From Siliguri in West Bengal one could see the most prominent peak of Himalayas the Kanchenjunga. People of Saharnpur had an opportunity to see Gangotri from their rooftops.

8. Decrease in Solid Waste

67

About 7000 million people are locked in houses for the last 60 days. During this time, the production and supply chain has badly affected. It was observed that during this pandemic time people are managing their daily chores with basic necessities. Hence, it can be established that there is a considerable fall in the generation of solid waste.

Conclusion:

There are many depressing stories of lockdown especially in India. The migrant workers walking on foot, bicycle, and auto rickshaw from different parts of India to Uttar Pradesh and Bihar without food and water. There are instances of women giving birth on the roads. Many migrant workers have died on the way to their homelands due to starvation and dehydration. These are distressing and terrifying stories.

The positive side of the global lockdown in the wake of coronavirus pandemic is healing of the earth. To give therapeutic treatment to the bleeding earth, we must ponder on declaring lockdown of world at least for one week in first half of the year and another week in the second half of the year.

Governments, across the world are spending in billions of dollars to protect health of their citizens from air pollution, water pollution, carbon emission, wildlife conservation etc. The total loss incurred in the wake of lockdown may be less than what Governments spend on above problems.

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68

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69

Impacts of Changing Coastal Regulations on Sustainable Tourism in Goa: A Case study of North Goa Shoreline using Geospatial Techniques.

*Dr. Pravina Kerkar, Associate Professor of Geography, Govt College Khandola Marcela Goa.
Dr. F. M. Nadaf, Associate Professor of Geography, DPM's Shree Mallikarjun & SCMD College, Canacona-Goa
** Ms. Siddhi Gaonkar, Assistant Professor in Geography, Govt College Khandola Marcela Goa.
pravina567@gmail.com, fmnadaf@gmail.com, siddhigaonkar312@gmail.com

Abstract

Goa is a coastal paradise blessed with a long coastline of 105km in length consisting of number of pristine beaches. It is this lengthy coastline which has put Goa on the world map as an important tourist destination. To sustain long time tourism in the State there is a need of proper implementation of plans and action with regards to CRZ. The changing CRZ will not only take away the area of traditional fisher folk and bifurcate coastal zones along rural area based on population density but Goa will be lost to development making coastline a concrete jungle. The land-ocean interaction in the coastal zone produces a complex range of landforms and organisms which evolve special forms of adaptation. The 2019 notification of the MoEF which has proposed to reduce the existing HTL from 200mts to 50mts will change not only the fragile coastal zone of Goa but will put Tourism at stake. The pristine beaches will be lost for development leading to coastal hazards. A question arises whether a small State like Goa will be able to withstand the pressures of handling CRZ regulations due to influx of tourist which is far more than the total population of Goa. More over whether the State can afford to do away with the biggest industry called tourism. An attempt is made in this study to understand and highlight the implication of changing CRZ if implemented, on the existing coastal zone and its impact on tourism.For research, primary data has been collected through personal interviews and field observations were made for ground truthing. The Secondary data includes, the reviews of existing publication available through books and tourism brochures and Satellite images from GloVis and Earth Explorer. Toposheets and NIO data were used to demarcate the existing HTL. A handheld software like Erdas Imagine, ArcGIS 10.3 and Idrisi Selva has been used to get the results more accurate. GIS generated maps and Statistical diagrams like bar graphs, pie is drawn to provide bird's eye view of the data used in the study.

Key words: Coastal Regulation Zone (CRZ), Coastal Zone, High Tide Line (HTL), Sustainable Tourism.

70

Introduction: The coastal zone is particularly important from a human perspective. A large proportion of the world population is concentrated in the coastal zone, including almost all of the major cities. The State attracts tourists within and internationally due to its pristine beaches and places of worship. Tourism in Goa is generally focusedin the coastal areas rather than as a hinterland activity. The sea front is marked by a combination of beaches, rocky shores and headlands. Out of 105km long coast, more than 70km comprises of linear and wide sandy beaches all backed by 1 to 10 meters high dunes; sandy pockets and secluded coves backed by rocky cliff are also found (Mascarenhas, 2005).

Till early 70's,coastline remained pristine. Human pressure on the coastal ecosystem started in late 1970's when tourism became a major source of revenue. Thus, leading to a substantial change in the coastal area. Unchecked tourism pressure resulted in 80% of the urban growth in coastal talukas of Goa.

The main purpose CRZ notification was to control and minimize environmental damage to coastal ecosystem. Ministry of Environment and Forest, Government of India enacted the Costal Regulation Zone (CRZ) notification issued under Environment Protection Act of 1986, which was notified through Gazette in 1991. The No development zone was confined upto 500mts from HTL in the 1991, with respect to imposed restrictions on setting up and expansion of Industries, operations or processes etc., in the said Coastal Regulation Zone (CRZ) (Government of India, 2018).

Subsequently, the CRZ was brought to 200mts from HTL through a notification in 2011. Recently, the new affirming rule of reducing HTL from 200mts to 50mts will procure the ecological area into urbanization. Monitoring the LULC change along the Coastal Regulation Zone (CRZ) areas is essential to understand the current status of ecologically sensitive areas in order to conserve the ecosystems from deleterious impacts (Guru B., 2014).

In recent era, Remote sensing and GIS techniques are excessively used to inventory, monitor and management of natural resources in the coastal areas due to its repetitive, multispectral andsynoptic nature. Geographic Information Systems (GIS) at other side provide suitable platform for data analysis, update and retrieval (Dale, 1997). Space borne remotely sensed data may be particularly useful in developing countries where recent and reliable spatial information

is lacking (Deng et al., 2009). These tools will help in studying the change in any form of land use through both the external forces and the pressure built-up within the system.

Justification: The coastal areas of North Goa are already stressed with development implicated to boosts tourism in the state. Coastal Zone is not only a concrete jungle but water is highly turbid, polluted due to other tourism related activities. Ministry of Environment and Forest's (MoEF) Draft CRZ Notification 2018, which has reduced the CRZ area, measured from HTL, from the current 200 meters to just 50 meters. This will affect fragile and overburdened coastal ecosystem of Goa.

The stakeholders of tourism have already encroached the public spaces and with the new notification the stakeholders will encroach the waters too. The study will help to understand how much area will remain sustained and how much area will be in gain for commercialization in the name of development.

Objective: The main purpose of paper is to understand and highlight the implication of changing CRZ if implemented, on the existing coastal zone and its impact on tourism as the local media, local newspapers, environmentalist are continuously buzzing on this issue where tourism industry is draining the State's economy in terms of environment protection and resources. Tourists visiting the State also have also raised issues related to ecology of Goa hence a study was undertaken on changing CRZ with objective in mind.

Study Region: The study area consists of coastal zone of North Goa, mainly Pernem and Bardez Taluka, Goa. The full-fledged areas characterized by sandy stretches and an intricate network of water bodies across lowlands.The talukasextend from $15^0 30$'N to $15^0 50$'N latitude and $73^0 40$'E to $74^0 00$'E longitude with a total area of 510.28sq. kmsand is flanked by Arabian seaon the western side. The coastal zone is undergoing constant changes either naturally or due to anthropogenic interferences. Hence constant monitoring is required to understand the constantly changing coastline and the influence of anthropogenic activities on environment especiallyin ecologically sensitive areas.
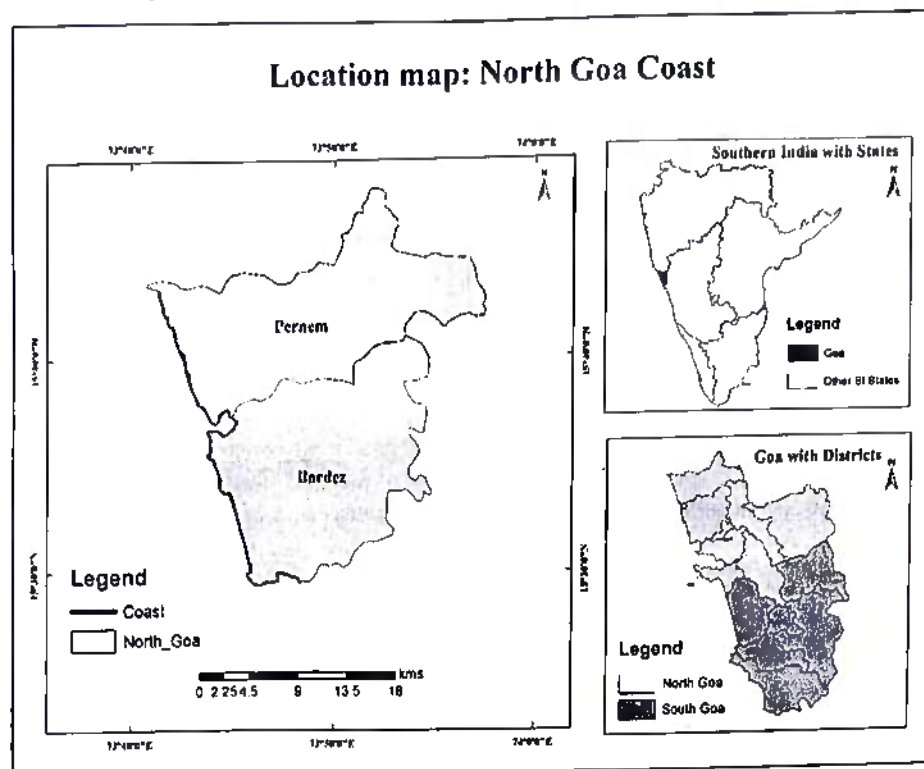
72

Figure 1: Location Map of Study Area (2019)

The North Goa comprises of high flexibility in terms of coastal tourism. The flourishing coastline with major beaches namelyArambol, Mandrem, Morjim, Vagator, Anjunem, Baga, Calangute, Candolim etc. are flooded with local, national and international tourists who frequent visit these areas for leisure activities. It is the frequency of tourists that have altered the coastline drastically.

Database and Methodology: The present study is a collaboration of primary and secondary data. Primary data consist of opinions gathered, personal interviews, visits to North Goa Coastline and tourist spots.Various research documents, research institutes, satellite images, multi-temporal satellite data has been used as a secondary source (Table 1).The required satellite imageries were obtained from http://earthexplorer.usgs.gov. Level 1 classification has been followed to determine the coast as per the guidelines of Ministry of Environment, Forest and Climate Change and National Centre for SustainableCoastal Management (NCSCM). ERDAS Imagine 14 version, a strong GIS desktop application having powerful potentials in image processing have been used for classifying land use land cover classes and comparative study of

75

Spatio-temporal changes of an area. Google earth has been used as a base reference to do the classification.HTL data of 2003 has been opted from National Institute of Oceanography, Dona-Paula, Goa. Toposheets also has been used as a base map to validate coastal landscape. Processing satellite utilized with geometric calculation and symmetrical difference field option to understand land cover units. The data is presented in terms of GIS based maps, tables and graphs.

Table 1: Data Source

Sr. No.	Satellite	Sensor	Acquisition Date	Resolution	Data Source
1	LANDSAT 4-5	TM	17-02-1991	30m	USGS, Earth Explorer
2	LANDSAT08	OLI_TIRS	19-02-2015	30m	

Result and Discussion

Coastal Zone is ecologically sensitive and it is a confluence of land and water. Coastal Zone Management is a major consternation for decision-makers, land use planners and environmentalists. Coastal zones fluctuate between the land-water interfaces, due to influences of climate, physiography, ecology on land and water. All the tourism related activities in the coastal areas have given rise to violations of CRZ. Implementation of CRZ regulations on the part of the government will lead to loss of fragile coastal environment which is the major attraction of the State.The land use land cover change along the coastline is an peer view to appreciate the spatial distribution and CRZ violation from HTL.

Land use Land Cover change with a buffer from HTL: 1991 and 2015

The tabulated data, figures and maps were generated and used for further analysis to understand the changing scenario of LULC and CRZ violation along the coast for the period of 1991 and 2015.

74

Table 2: LULC change detection: CRZ violation within 200mts and 50mts from HTL of Pernem.

Pernem (Area in sq.km.)								
Years	Classes/ CRZ zones	Built-up	Agriculture	Vegetation Cover	Water Bodies	Others	Category-wise Total	Overall Total
1991	200mts from HTL	0.63	0.069	0.864	0.239	0.994	2.797	5.59
	50mts from HTL	0.15	0	0.181	0.051	0.330	0.710	
	50mts-200mts	0.48	0.069	0.683	0.187	0.665	2.087	
2015	200mts from HTL	1.29	0.01	0.92	0.14	0.44	2.795	5.59
	50mts from HTL	0.28	0	0.18	0.03	0.23	0.710	
	50mts-200mts	1.01	0.01	0.75	0.11	0.21	2.08	

Pernem 1991

	Built-up	Agriculture	Vegetation Cover	Water Bodies	Other
50mts-200mts	23.09	3.33	32.74	8.97	31.84
50mts from HTL	20.94	0.00	25.48	7.23	46.41
200mts from HTL	22.55	2.48	30.90	8.53	35.54

Pernem 2015

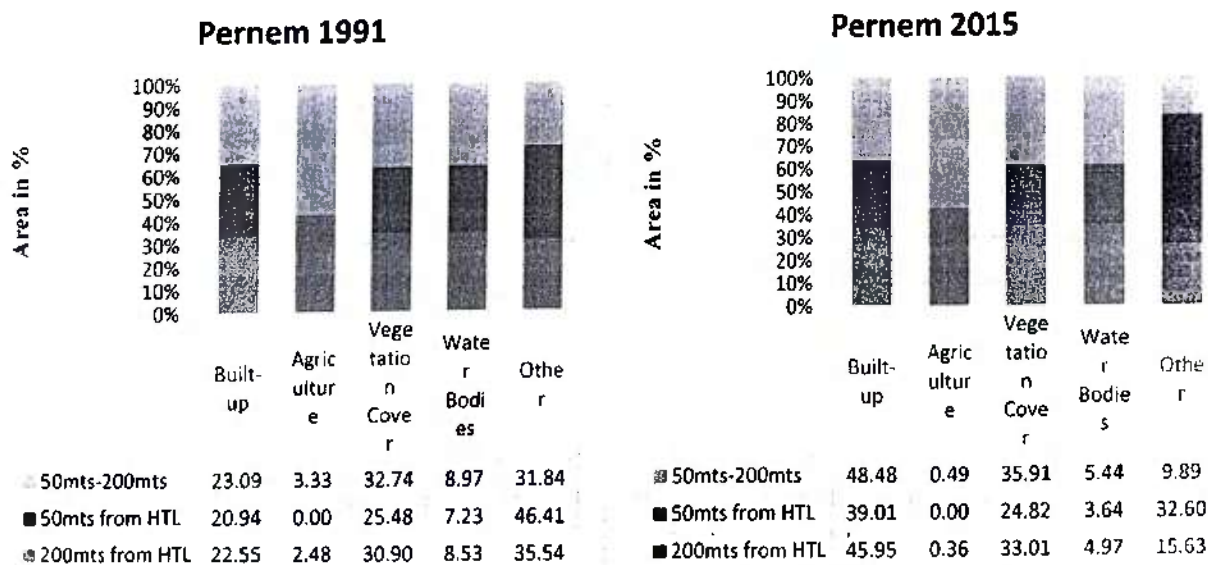|	Built-up	Agriculture	Vegetation Cover	Water Bodies	Other
50mts-200mts	48.48	0.49	35.91	5.44	9.89
50mts from HTL	39.01	0.00	24.82	3.64	32.60
200mts from HTL	45.95	0.36	33.01	4.97	15.63

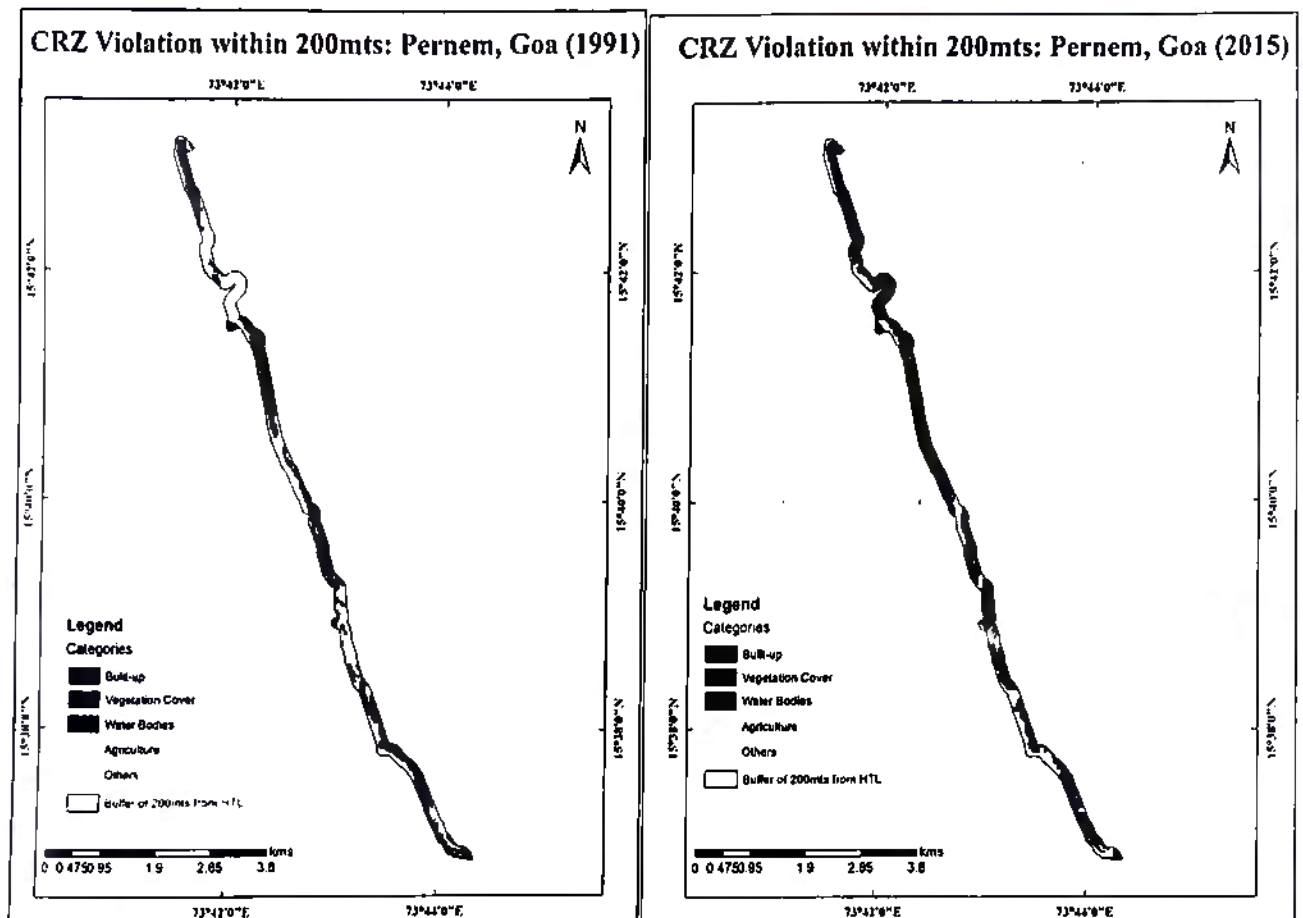Figure 2: Graph, Pernem Coastal Area in % Figure 3: Graph, Pernem Coastal Area in %

75

Figure 4: LULC with CRZ violation of Bardez for 1991 and 2015

It can be inferred (table 2 and figure 2, 3 and 4) that built upand vegetation has increased over a period of 1991 to 2015 from 23%to 45 % and 30 % to 33% respectively. The declined in agriculture and other category can be observed from the LULC. The implication of No development zone of 50mts from HTL shows that it will procure loss to almost 32 percent of the vegetation. Asthe remaining area from 50mts to 200mts will be probably convertedto developmental zone. Similarly, the already existence of pollution near coast will increase in abundance. The minor existence of agricultural land turning into commercial zone has highest implications.

Table 3:LULC change detection: CRZ violation within 200mts and 50mts from HTL of Bardez.

Bardez (Area in sq.km.)								
Years	Classes/ CRZ zones	Built-up	Agriculture	Vegetation Cover	Water Bodies	Others	Total	Overall Total
1991	200mts from HTL	0.83	0.04	1.55	0.19	5.21	7.82	15.64
	50mts from HTL	0.16	0.00	0.15	0.14	1.48	1.93	
	50mts-200mts	0.67	0.04	1.40	0.05	3.73	5.89	
2015	200mts from HTL	2.46	0.01	1.41	0.18	3.77	7.82	15.64
	50mts from HTL	0.40	0.00	0.17	0.13	1.23	1.93	
	50mts-200mts	2.06	0.01	1.24	0.05	2.54	5.89	

Bardez 1991

	Built-up	Agriculture	Vegetation Cover	Water Bodies	Other
50mts-200mts	11.43	0.60	23.70	0.91	63.35
50mts from HTL	8.22	0.00	8.02	7.01	76.81
200mts from HTL	10.64	0.45	19.83	2.41	66.67

Bardez 2015

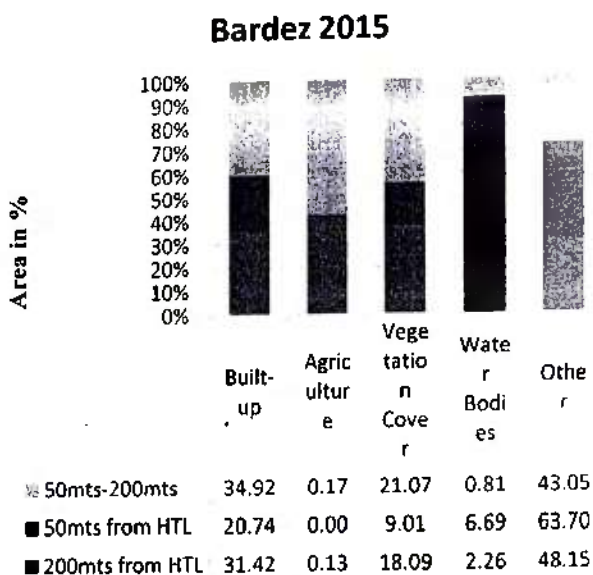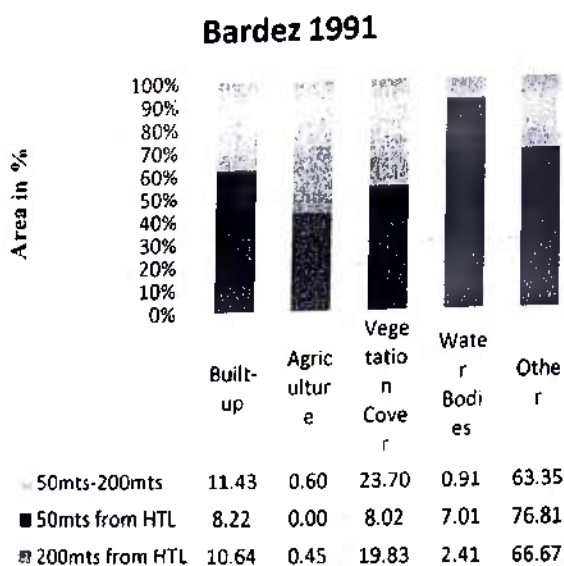|	Built-up	Agriculture	Vegetation Cover	Water Bodies	Other
50mts-200mts	34.92	0.17	21.07	0.81	43.05
50mts from HTL	20.74	0.00	9.01	6.69	63.70
200mts from HTL	31.42	0.13	18.09	2.26	48.15

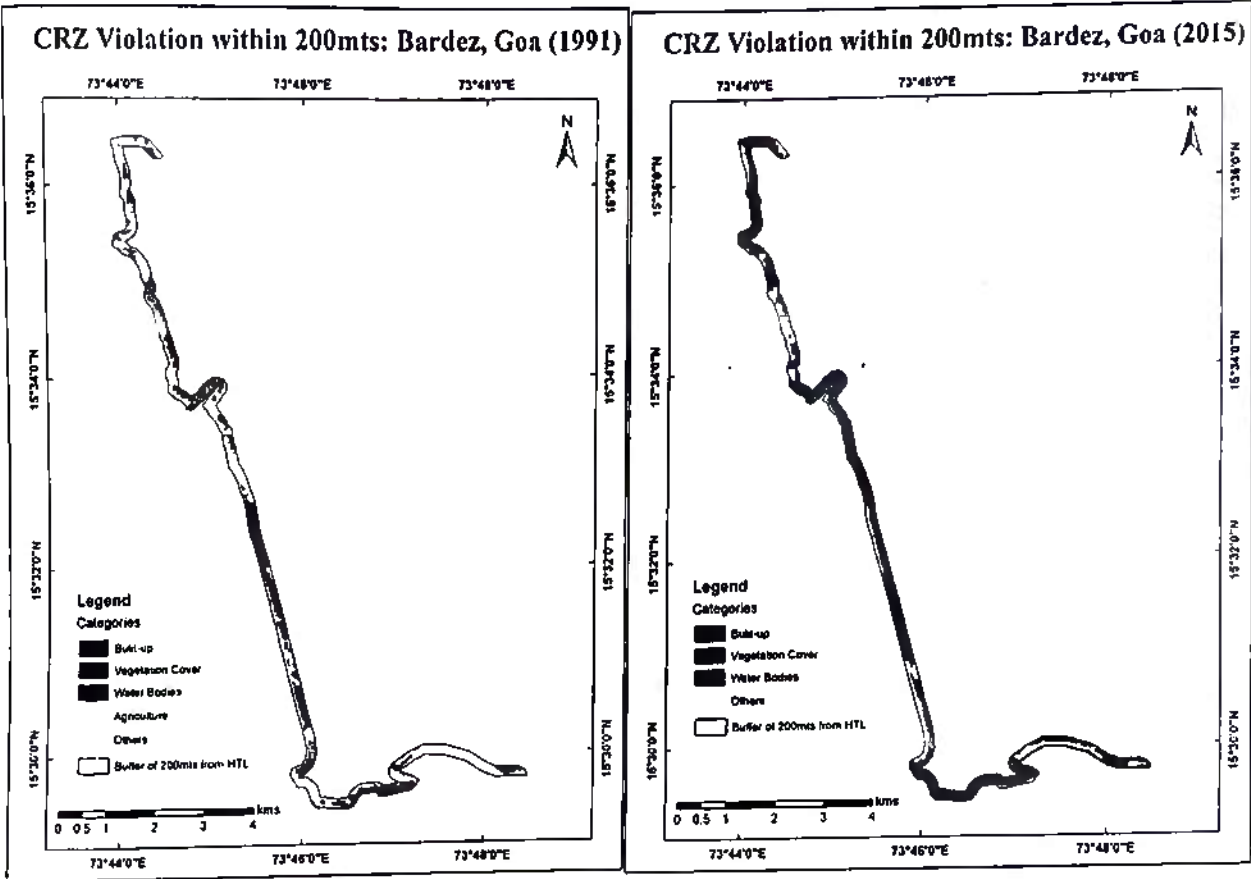Figure 5:Graph, Bardez Coastal Area in %   Figure 6:Graph, Bardez Coastal Area in %

77

Figure 7: LULC with CRZ violation of Bardez for 1991 and 2015

The violation of CRZ can be clearly seen (figure 7), even though there was No development zone under HTL from 200mts for Bardez.Inspite of decreasing the commercial or residential developmental activity, the built-up has increased from 11% to 31% respectively from the year 1991 to 2015. This includes permanent residents and temporary shacks. Whereas, rest of the classified areas shows decline in the percentage of spatial cover as per the 200mts buffer. The 50mts from HTL shows that built-up and vegetation 12%and 1%respectively.

The study shows that if the CRZ declines from 200mts to 50mts the presence of vegetation and other category beyond 50mts of around 21%while 43% can be susceptible to be used for commercialization (table 3, figure 5 and 6).

Conclusion

Man and Environment interaction are more interactive in the coastal ecosystems and its effects are seen on basically on coastline. The study of coastline of Pernem and Bardez taluka has a grave violation not only interms of geomorphology but also with reference to CRZ.The recent notification has changed this scenario completely. The long considered no development zone of the coastal areas will be brought under development bring the public spaces into private domain. The general public, be it locals or tourists will not be able to get access to the beaches. Therefore, the question arises as to whether the Government has any right to stop people from enjoying and appreciating the beauty of the nature.In an effort to attract more and more tourist and to earn more profit sprawling resort are built by bulldozing thousands of Casuarina trees along the coast beaches. These resorts have destroyed scenic beauty of a place and ecology. The study clearly showed the loss of natural habitat at the higher scale. The 35 percent of vegetation in Pernem and 21 percent of vegetation in Bardez are more susceptible to lossesof harsh commercialization. Similarly, Commericialization and residential needs of the beaches will not only led to erosion but also CRZ violation which in long run could affect beach formation itself.

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80