Inspira- Journal of Commerce, Economics & Computer Science(JCECS) Vol. 08 No. 04 October - December, 2022

ISSN: 2395-7069
Impact Factor 6.289
UGC Valid Journal (The Gazette of India,
Extraordinary Part III, Section 4, Dated July 18, 2018)

Inspira-

Journal of Commerce, Economics & Computer Science(JCECS)

(A National Quarterly Peer Reviewed Refereed Journal)
Vol.08 | No.04 | October – December, 2022

Journal of Inspira Research Association

Indexing Status: Inspira - JCECS is Indexed and Included in:
COSMOS Foundation & Electronic Journal Library EZB, Germany || Directory of Journals indexing (DOJI)
International Institute of Organized Research (I2OR) || Global Society for Scientific Research (JIF)
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International Innovative Journal Impact Factor (IIJIF).

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ISSN : 2395-7069 || Impact Factor: 6.289

INSPIRA- JOURNAL OF COMMERCE, ECONOMICS AND COMPUTER SCIENCE

(A National Quarterly Peer Reviewed Refereed Journal of Inspira-IRA)

VOLUME 08 NO. 04 OCTOBER-DECEMBER, 2022

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ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 01-08

EMERGING TECHNOLOGIES IN INSURTECH: CHALLENGES AND RISK IN THE INSURANCE SECTOR

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Dr. Poonam Bewtra**

ABSTRACT

The pace at which technological advancements are leading to digitalization is bringing major shifts in all the sectors of the business. These changes are for the benefit of the society at whole making it easier for all the consumers to buy the products and services online at a much competitive and cheaper price with greater convenience. In the Insurance sector, the emergence of new technologies especially online platforms is going to benefit the insurers and the insured in a big way. With these changes moving so fast it has become a challenge for most of the insurers to innovate their digital platforms and the products to build up customer confidence. Today's startups and new businesses are investing millions and billions of rupees in insurance. Tech innovation programs are modernizing the insurance industry using business Automations, chatbots, machine learning, blockchain and internet of things. This gradual digitalization of the insurance portals is helping the insurance companies in minimising the human involvement and optimising the work space and minimising the time to convert a prospect into an insured. It not only minimises the time to underwrite a policy but also minimises the time for the settlement of the claim with the ease of digital platforms. In India, Insurance penetration is very less and to ensure that it increases at rapid pace there is a need to bring big changes in the Insurance sector. This paper will focus on the emerging technologies in insurance sector with the main focus on wearable and smart watches for risk assessment in health and life insurance policies apart from other technologies.

***KEYWORDS**: Artificial Intelligence (AI), Fintech, Information Technology (IT), Insurtech, IoT.*

Introduction

What is Insurtech

The term InsurTech refers to, the use of innovative Technologies and digital tools to assess the risk and improve the performance of insurance companies to deliver a good customer experience. The term insurance check is very much related to the term FinTech as it is a step to modernize the digital platforms and take the benefits of the new technologies such as artificial intelligence, internet of things, machine learning, big data or use of portable smart devices in the Insurance sector.

Recent analysis by McKinsey and company on the future of Insurance sector, according to the recent research, insurtech is bringing Innovations and development of new insurance products and services and expanding the insurance model and thereby increasing the efficiency in the insurance industry. This will not only help in innovation; but will also help in distribution, deeper penetration of insurance.

Objectives of the Study

InsurTech is a growing concept in the field of Insurance sector especially with reference to India. It is still an untapped sector in the insurance businesses with regard to insurance brokers and insurance agents. This technology will help the insurance businesses to reduce the human efforts in actual working of estimating the insurance premiums, underwriting insurance policies, risk assessment of various

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insurance policies which are specific to a particular business or entity. Today we have fixed parameters which define the premium of the underwriting patterns for any policy but with the growth of InsurTech this could be made customer specific and will lead to better underwriting and deep penetration of the insurance as it will help the companies to reduce the insurance premiums drastically. Today's customers are comfortable using Technology as they can procure the insurance simply from their smartphones through various insurance companies' apps. We can obtain the data about the customers through their details given on various online platforms through Technology such as smart watches as a very good tracking tool to understand or assess the risk. In short it will also help to customise the policies according to the customer requirement simply by a few clicks of mouse on the online platforms and the customer can easily customise the policy and decide the coverages which he or she wants. Policy coverage, consumer information and premium quotes will be transparent; apart from that customer can also experience good claim settlement process through these online platforms and get latest updates. There are a number of start-ups already which are working on it for providing a good solution and experience to the customer in terms of underwriting & claim processing. These platforms will also provide good opportunity to various brokers, agents, business analysts and consumers.

- To identify and evaluate the practical feasibility of wearable and other technologies in underwriting policies.
- To measure the levels of customer satisfaction and experience with the usage of wearables for insurance risk assessment
- To identify financial feasibility of these technologies in terms of cost
- To find out the functional feasibility of wearable and other technologies for all types of insurance products

Methodology

- The study is based on the data available on various insurance portals and based on customer reviews and feedback.
- The Study is descriptive in nature and the data collected is analysed to give useful feedback and solution.
- Over 20 Insurance digital platforms including insurance companies, brokers, and web aggregators were used for the purpose of study.
- The study is based on secondary data collection procured from Tech teams of various insurers.

Findings of the Study

There has been a significant growth in Insurance sector due to the growth of emerging technologies in insurance sector namely; artificial intelligence, internet of things (IoT), data analytics and smart wearables which have made the world of insurance more digital. As given in fig.1and fig.2 below.

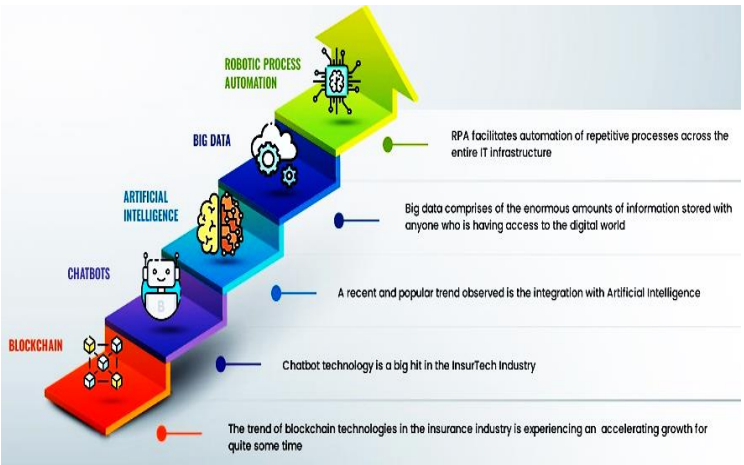

Fig. 1: Emerging technologies in InsurTech
Source: https://www.serole.com/blog/insurtech-trends-2019/

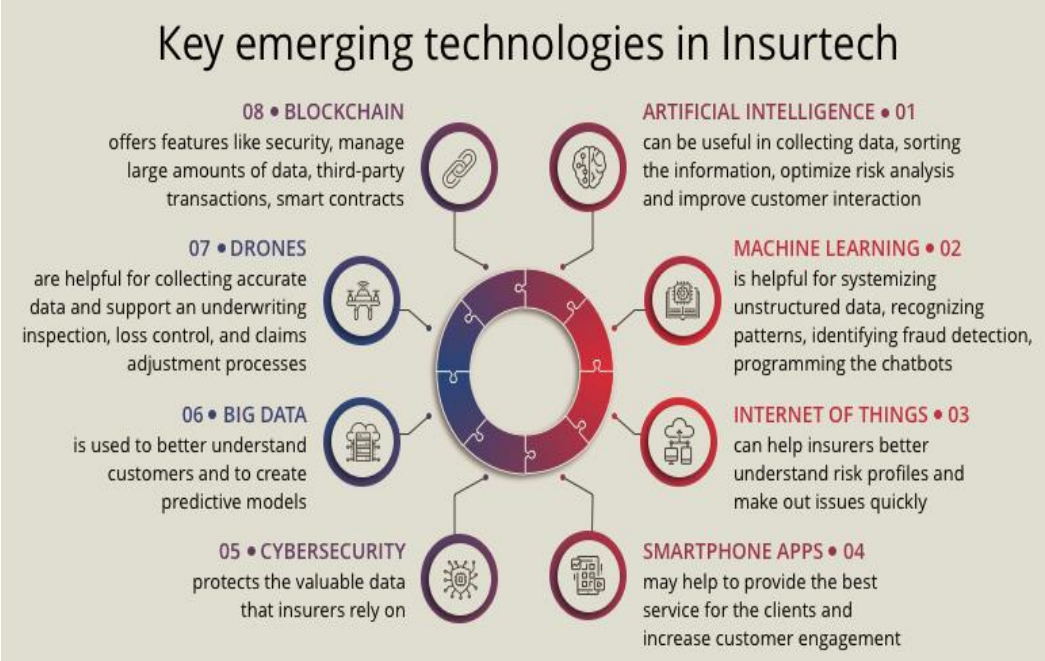

Figure 2: Key Emerging technologies in InsureTech

Source: https://4tifier.com/what-is-insurtech-what-you-should-know-about-emerging-technologies-in-the-insurance-sector/

Artificial Intelligence

This technology is based on a repetitive, optimising risk analysis and improving customer interaction. Bots are used that would review the claims of the consumers instead of the human intervention and will also provide instant claims settlement for the customers with the use of various online platforms such as WhatsApp, bots or instant chat. They also provide various trackers and applications for the health segment, they also help in tracking the vehicles. The technology uses dynamic and intelligent underwriting algorithms. In the insurance industry it is not possible for the agents and the brokers to interact with the customers on regular basis and do the risk assessment therefore, the bots extract the data of the customers on daily basis which gives very useful insight for analysing the risk for the underwriters. Artificial Intelligence is a kind of revolution in the digital world. However, there are various risks which Artificial Intelligence can bring in the Insurance sector:

- Theft of client information from the online portals
- Cyber-attack or technical failure on the insurance portal can lead to larger losses and destruction at the time of procuring policies and making online payment.
- It does not give a personal touch to the customer as they are interacting with a bot on digital platform or some other similar platform who tries to replicate a real person.
- All the aspects of insurance risk cannot be understood through artificial intelligence and requires a personal face-to-face interaction especially in areas where psychological factors are involved.
- It is also not possible for all types of insurance products.
- It requires the involvement of people who are well versed with the artificial intelligence technology who can convert this digital data into something useful for the underwriters for risk assessment of various insurance products.

Machine Learning

Machine learning is a technology through which software collects important customer information from various IoT sensors. For example, understanding the history records of the customer on chatbots and trying to speak like a real person. However, there are various areas where machine learning is used by insurance companies for risk assessment, underwriting & claim handling.

Internet of Things

It is a mechanism by which various sensors or devices are interconnected through the internet which have memory and the processors that allow transfer of data from one device to another. IoT is a technology which is being used by various online platforms such as insurance company. There are various devices which track and use sensors to capture the geographic information or physiological information about the customer. IoT helps to capture not only the quantitative data but also the qualitative data for in-depth analysis.

Smartphone App

This has become a very common and most used platform ever since the Covid pandemic. With huge potential of growth and rising population in India and ever-increasing use of mobile devices in everyday life and the transformation in the digital sector, the customer looks to experience various Smartphone apps; for example facebook, google, etc.

Mobile application is very convenient for a customer as they can easily procure a policy, customise a policy, and can also get a speedy claim status along with latest updates on the mobile app itself. However the important thing to remember is that it is not possible for all the customers to download the apps of all the insurance companies. Hence, there is a need to have an integrated application so that on a single platform itself a customer can review and compare various insurance products of various insurance companies according to their requirement and paying capacity. A full-fledged InsureTech app can however be useful in:

- Finding more information about the company and services;
- Integrating marketing technology;
- Selecting suitable insurance packages;
- Calculating the premium;
- Buying an insurance package without visiting the office;
- Contacting the insurance agent.

Cyber Security

With huge growth in the users of Internet there is an increased exposure to cyber risk from people who have criminal intent and want to misuse the customer's information. Since each and every information about the customers is available on the internet platforms database so, it is very important to save people from severe digital attacks.

Innovations in Wearable or Portable Devices

Wearable technology has significantly improved in the last decade or so. From simple pedometers used to track steps, we now have medical grade technology based wearables, which can track advanced health and biometric parameters like oxygen intake (VO2), heart rate and rhythm, blood pressure, and sleep quality, amongst others. Fitness trackers like Apple watch, Fitbit, and many others like them, can now track many advanced health parameters real time. A majority of the smart phones have capability to capture some of these parameters themselves and also are interconnected with the wearable devices through various apps. They can be useful for the underwriters of motor and health policies.

- **In Context of Life Insurance**

Health information forms a critical part of risk assessment. A person's health indicators, such as heart rate, exercise habits, blood pressure and other information obtained from wearable devices can be used to determine the health and fitness of the insured. These metrics can greatly aid in the assessment of life insurance risk, going beyond the traditional methods of risk assessment. Insurers could develop framework/ models using wearable data throughout the life cycle of the insured to not only build attractive product propositions but also to monitor their experience throughout the policy term. These frameworks/ models can be used to better the health and fitness of a person, particularly if s/he is leading a sub-standard life. This will also help in significantly improving the mortality over a period of time.

- **In Context of Health Insurance**

Today, in Health Insurance too, the same technology provides resources to regularly monitor and measure almost anything - from the number of steps taken by an individual on a given day, to his/her pulse rate, among other things, and these measures can then be stored digitally. With recent advancements in big data and analytics, these trivial measures can provide critical risk insights to an insurer regarding the health condition of the prospect. The data obtained serves both the end customer and the insurer. While the customer benefits from healthier lifestyle, the insurers in turn can reduce their risk and incentivize the customers for good or healthy behaviour. Therefore, wherever required, the insurers can nudge the customer towards a healthier lifestyle; and moreover, they also will have the tools to better price their products with a high degree of predictability, based on the multitude of input parameters.

- **In Context of Non-Life Insurance**

Main applications are Connected Cars, Advanced Driver Assistance Systems (ADAS), and Home Monitoring, apart from health monitoring etc. They also include the use of fitness bands, real-time weather observation etc., that include sensor analysis of the gathered data that can identify impending health problems and much more.

Big Data

Big Data is another reporting software that captures customer data, their behavioural preferences which companies use for underwriting purposes and to design insurance policies. Big Data provides a customer database using various social media platforms such as Facebook, Twitter, Instagram, and insurance apps. This data enables and uses predictive models in the risk assessment of various insurance products.

Drones

Drone is yet another technology which is nowadays used in Insurance sector, though it is not just confined to the insurance industry. It is a very useful technology which helps to collect accurate data and evaluate the same based on the event. Drone captures the images of various residential, commercial property by giving a Birds panoramic view of all around and the data is stored in cloud based space which allows customers to sort or Store or analyse the captured images any time. It helps the underwriters for loss assessment and settlement of insurance claims.

Blockchain

It is again another step which provides automation to the insurance industry by protecting, managing, and sharing large volumes of data. In Insurance sector, one of the most challenging jobs is the pricing of the insurance product. Blockchain is like a digital notebook which records the complete database of a customer. For example, when one is going to prepare a mediclaim policy, he has to have a complete access to customers' medical history. However this vital information a customer can hide to avoid paying high premium, but with the use of blockchain this substantial and crucial information about any past claim or any recent surgery or operation of a customer could be easily tracked and accordingly the insurance company can set the quote for the customer. There are various benefits of blockchain

- It helps to detect any fraudulent behaviour such as theft of identity of the customer.
- It also helps to identify the authenticity of the customer and validates the ownership of the policy, attests various documents such as medical reports, any previous claim, etc.

Driverless Cars

The development of artificial intelligence will greatly influence the car insurance industry. As there will be more unmanned vehicles, the very need for insurance is questioned if the human factor can be excluded from the driving process. If driverless cars become the norm, hacking can be one of the most common insurance claims, so Cybersecurity will be a key factor here. However, a recent Research by KPMG forecasts that the rise of autonomous car technology could reduce the car insurance industry by 71% by 2050.

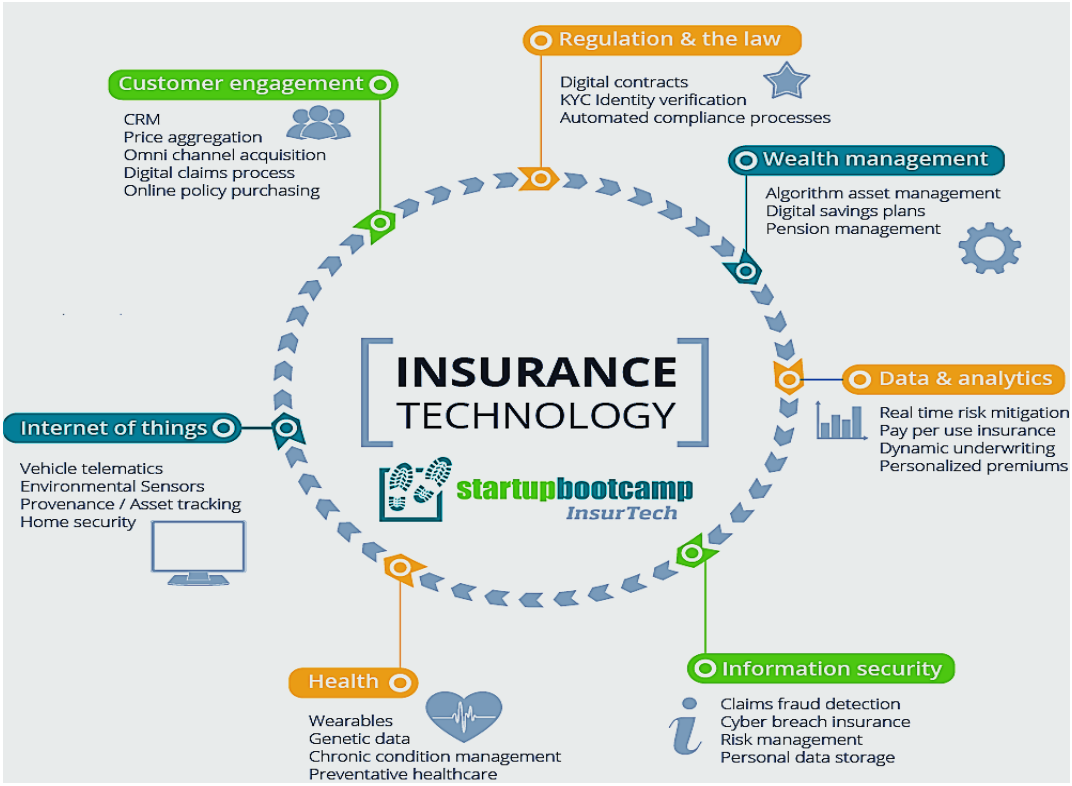

Figure 3: Analysis of Insurance Technologies

Source:https://www.slideshare.net/BrentonCharnley/insurtech-sydney-launch-event-7-september-2016

Criticism of InsureTech

- Numerous Legal rules and regulations for insurance agents and brokers
- Risk of financial losses due to faulty underwriting
- Technology should be reliable specially the digital platforms, which stores customers database
- Risk of cyber-attack, hacking, misuse of customer database
- It is really difficult to find a reliable outsourcing company which can provide the insurance partner with good software and customised software according to the specific requirements
- It is very difficult to find out the quality or scalability of the insurance product. In the development stage there is a need for specified professionals who can understand the product
- There is a need of a professional team which can actually do the test-checking of the software to ensure that it is free from any bugs and ensure smooth functioning
- Regulatory Framework for insured tech -The InsureTech are regulated by laws and regulations which govern their business operations and activities as such they are governed by AML5 or 5AML (5th Anti-Money Laundering) directive.

Conclusion and Solutions

There are various models of insurance which have emerged in meeting the customer demands. Financial Services are growing at a very rapid pace day by day. The innovations in InsureTech are coming from different sources especially with the growth of digital platforms, big-data, machine learning, artificial intelligence, internet of things, sensor based wearables and so on. Today insurers are very much interested in spending on the technology so that they can and reduce the involvement of human, compile the consumer data in a simplified manner which can be accessed and analyse easily using risk assessment and business analytics softwares which will help them to deliver better services and products

to their customers. There are multiple predictive models and Data Analytics today which are a boon for the insurance companies and they can use that to mitigate or minimises the risk in InsureTech business. Especially when it comes to underwriting, Artificial Intelligence and machine learning has helped the insurance and the agents in underwriting very effectively as they collect the data of the customers from multiple sources. Smart wearables play a very important role in underwriting both health insurance policies as well as life insurance as it can track the health habits of the customer. Motor insurance also uses IoT devices and telematics techniques to know the driving habits of the customers to make an assessment of the chances of claims and accordingly underwrite motor policies. It also play an important role in detection of the fraud specially where there are number of people who are misusing the customer information available on various digital platforms. However it faces multiple challenges also as the number .of concerns regarding the safety and security of the database which is collected using these digital platforms.

We cannot ignore the fact that Technology has brought a tremendous change in the way we live, there is also a need to create awareness among the customers regarding the same. With the increased awareness regarding the financial health among the people there is a greater scope for the advancement and improvements in the Insurance sector as these models bring innovation in the insurance industry. No long can we run and continue our business only in the traditional form. We need to think a step further and bring some major changes in the way the insurers were doing their business. It is also advised that the various policymakers and the people framing the laws should also participate and help people in in regulating the insurance industry to take it a step further and have a deep penetration in this untapped market. India's digital Insurance landscape is approx. 3-4% of the market. This is upcoming sector for all the stakeholders in the society. So today is a right time where the insurance companies and the insurers should come up with some good customised solutions which actually provide them the solution based on their risk assessment profile which is possible only with the use of these technologies to provide a seamless and an error free solution to the customers? Emerging Insurtech technologies will bring some of these significant advancements in the insurance industry like:

- Automated Underwriting- it will streamline the gathered information and reduce human touch points with technology like robotics and artificial intelligence to import and correct the data, assess risk, how much coverage a client should get, premium amount and so on.
- Automated Claims: Streamlined claims management practices will result in faster settlement of claim through machine learning to analyse claim data using pre-programmed algorithms, improving processing speed and accuracy.
- Cost saving-Using conversational AI based Chatbots will save cost of life and health insurance and Natural Language Processing.
- Machine learning for fraud detection- it will be highly valuable for insurers to detect and prevent fraudulent claims
- Improvement in claim efficiency- Drones and Robotics insurance technology will improve claim efficiency especially in commercial property insurance, farm insurance. Drones and robotics can get into spaces where humans can't enter, dangerous areas and gather data through 360 degree camera.
- Gather critical health and fitness information-Health wearables is booming in insurance which allows people to monitor their healthy living, track fitness such as IoT wearables can proactively alert people with diabetes on possible foot ulcers, excessive pressure so they can get treatment before things get worse.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 09-17

ARTIFICIAL INTELLIGENCE AND DETECTION OF FINANCIAL FRAUDS IN BANKING SECTOR OF INDIA

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Dr. Rajkumar S Topandasani**

ABSTRACT

A major part of development in banking industry can be attributed to the adoption of Artificial Intelligence. This groundbreaking technology is the latest buzzword in the world of technological science, and it has taken top industries of the world by storm. The banking industry is one of the first industries to adopt artificial intelligence and it is expected to change its future. In less than five years, several banks have adopted robotics and related AI tools to ease their business, bring more efficiency, and ultimately optimize profits and achieve their business goals. Artificial Intelligence is one of the branches of computer science that attempts to simulate human intelligence and human capabilities with the help of machines, software, and computer platforms. This paper highlights on the primary based questionnaire collected from the bank officers.

***KEYWORDS**: Artificial Intelligence, Banking Sector, Non Performing Assets and Financial Frauds.*

Introduction

Artificial Intelligence is a theory and development of computer systems which is ready to perform tasks normally requiring human intelligence, like speech recognition, decision-making, and translation between languages. AI is the simulation of human intelligence processes by machines, especially computer systems. It helps to make smarter machines capable of doing human activity in a sensible way. AI work similar to an individual's brain, can think and make decision with more accuracy rate. Computing is now becoming more widespread within the current market. It's utilized in various sectors; banking sector is one of them. Banking system is using AI in an exceedingly very innovative way that saves lots of time and money. AI programming focuses on three cognitive skills: learning, reasoning and self-correction. A continuous process in technology today has changed the way of working of banking industry. If we compare it to the time when visiting a bank was the only way to withdraw or deposit money. The modern banking era where one click on an app of mobile banking does all the transaction what is needed. The banking industry has come a very long way in a few years. Every few minutes, there is a new technological innovation being adopted to make the banking space better and better. Nevertheless most of changes are aimed at making customer experience and services better, satisfactory and more enriching.

Review of Literature

Researcher has studied following reviews of literature related to the selected title.

Meryem Duygun Fethi (2010) The study presents a comprehensive review of 196 studies which employ operational research (O.R.) and artificial intelligence (A.I.) techniques in the assessment of bank performance. Several key issues in the study are highlighted. The paper pointed number of directions for future research. They discussed on numerous applications of data envelopment analysis which is the most widely applied O.R. technique in the field. They also discussed on the applications of other techniques such as neural networks, support vector machines, and multi criteria decision aid that have also been used in recent years, in bank failure prediction studies and the assessment of bank

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creditworthiness and underperformance. **Raj &Portia (2011)** Analyzed that artificial intelligence is one of the various techniques to be used for detecting credit card fraud explosions. Along with detecting credit card fraud explosions, artificial intelligence is also been used to operate effectively. To cut down the operating expenses and to improve the efficiency, banking sector is adopting updated technologies like AI, cloud and block-chain. Moreover, digitalization is also rapidly growing and influencing banks to adopt new technologies for better customer service. Even technological changes are been adopted by the banks to control cybercrimes. **Dipasha Sharma, Anil K. Sharma, Mukesh K.Barua (2013)** the purpose of the paper was to discuss a comprehensive literature survey of studies focusing on the efficiency and productivity of the banking sector using parametric and non-parametric frontier techniques. Critically reviewing 106 studies published across the world from 1994 to 2011, a conceptual framework was developed for the studies assessing the efficiency and productivity of the banking industry using non-parametric DEA frontier approach. These findings were based only on the critical review of 106 studies. **Skinner (2014)** Stated that digital social network have large effects on the digitalization process of various industries. As a result digital solutions are increasingly becoming an extension of traditional social interactions. During this conversion consumers are increasingly expecting that financial services are continuously digitally available in a customer friendly manner. Thus, one field which is supposed to leverage AI technologies are customer services. **Praveen Kumar Donepudi (2017)** Machine learning techniques are used in many sectors for the better performance. Most of the time these are used for the prediction purpose so that the organization can take the necessary steps. The work of different researchers is discussed in his literature review to prove the importance of Artificial intelligence for the banking sector. It is also discussed how machine learning techniques can be helpful in the banking sector to deal with the risks especially the credit scoring process. **Ali (2017)** studied the satisfaction level of banking customers of five different states of India. They were Uttar Pradesh, Chennai, Haryana, Maharashtra and Madhya Pradesh. According to the study, there were five basic components to identify satisfaction level of consumer for the services rendered by the banks which includes empathy, tangibles, responsiveness, assurance and reliability. The study found that by incorporating latest technologies in the system, the customers can get sanctioned their loan comparatively quicker and deposit their money faster as compared to the days when Artificial intelligence was not prevalent in banking sector. But there is low level of deliberation of individual attention to customers; especially in rural area and still customers have to wait long to get things done. The study advised banking sector in India to focus on responsiveness and empathy of the employees as these are main cause of dissatisfaction among customers. **Latimore (2018)**. The adoption of AI in Indian banking sector is gradual when compared with the other sectors because the reason could be the banking sector requires human involvement. A constant need of AI is seen as it helps banking sector to retain their customers, digital documentation and enabling virtual assistance to offer real time solutions. Moreover, banks are adopting AI based anti-money laundering, anti-fraud and credit-underwriting in their operations. As said by **Latimore (2018)** "Banking artificial intelligence is technology that makes inferences and decisions that used to require direct human involvement." An online survey was conducted on 112 respondents on artificial intelligence and **National Business Research Institute** during the period of April- May 2016 analyzed that 32 percent respondents confirmed using AI technologies, whereas 12 percent groups were not using AI as they felt that this technology is too new and not sure about the security of it. The report also highlighted that the adoption of cognitive system in the industry would generate revenues approximately $47 billion in 2020 with banking named on top. **Maskey (2018)** Founder of Fuse Machine wrote a post on how artificial intelligence is helping financial institutions, which was published on the website of Forbes. The article mentioned that artificial intelligence is helping financial institutions to grow and it has been estimated that AI would save more than $1 trillion to banking industry by 2030. **Vedapradha and Hariharan (2018)** suggested that innovative techniques like chat bots and artificial intelligence have been adopted by banking industry for improving customer satisfaction.

Title of the Study

Artificial Intelligence and Detection of Financial Frauds in Banking Sector of India.

Objectives of the Study

Researcher has set the following objectives to justify selected title.

- To review and analyze the trend of financial frauds in the banking sector of India.
- To study the impact various stages like credit evaluation, credit appraisal, sanctioning and documentation, credit monitoring and recovery process stage on NPA in banking sector of India.

- To examine the role of artificial intelligence in detecting financial frauds and reducing NPA in banking sector of India.
- To give findings and suggestions for policy making in banking sector.

Research Methodology

Researcher has done study on primary data collection through structured questionnaire. It is a descriptive research. The time period for the study was from 2020 to 2022. The size of the sample is 300 respondents conveniently selected. Researcher has used Cross tabulation and Chi-square test.

Hypothesis of the Study

H_0: Credit evaluation stage does not have significant impact on NPAs in the Indian banking sector.

H_1: Credit evaluation stage has significant impact on NPAs in the Indian banking sector.

H_0: Credit appraisal stage does not have significant impact on profitability of the Indian banking sector.

H_1: Credit appraisal stage has significant impact on profitability of the Indian banking sector.

H_0: Sanction/Documentation stage does not have significant impact on profitability of the Indian banking sector.

H_1: Sanction/Documentation stage has significant impact on profitability of the Indian banking sector.

H_0: Credit monitoring stage does not have significant impact on profitability of the Indian banking sector.

H_1: Credit monitoring stage has significant impact on profitability of the Indian banking sector.

H_0: Recovery process stage does not have significant impact on profitability of the Indian banking sector.

H_1: Recovery process stage has significant impact on profitability of the Indian banking sector.

H_0: AI and detection of financial fraud do not have significant impact on profitability of the Indian banking sector.

H_1: AI and detection of financial fraud has significant impact on profitability of the Indian banking sector.

Data Analysis

- **Demography Analysis**

From the table about educational qualification of respondents, there are total 300 respondents, out of them 60 are graduates, 180 are post graduate and 60 are from others. It is concluded from the table that post graduate respondents are maximum. Out of the total 300 respondents, 90 are under the age group of 20-35 years, 151 respondents are falling the under the age group of 35-50 years and 59 respondents are under the age group of 50-60 years. Maximum respondents are from the age group of 35-50 years. Gender wise distribution of respondents reflects that out of 300 respondents, 234 are male respondents and 66 are female respondents. Marital status of the respondent's shows that there are 249 married, 44 are unmarried and 7 are divorced. Present monthly salary of the respondents reflects that maximum 247 respondents are having monthly salary above rupees 40000.

- **Analysis of Credit Evaluation Stage**

22.3% and 61.3% respondents are strongly agreed and agreed that unverified income tax return of clients affects to NPA. 16.3% and 31% respondents are strongly agreed and agreed with unexamined statement of bank accounts and confidential report from other existing bankers of client affects NPA. 21% and 37 % respondents are strongly agreed and agreed that improper examined CIBIL and external credit information about client affects to NPA. Here majority 14.5% and 65% respectively strongly agreed and agreed with the statement that means if employment/business verification is not conducted properly, residence verification is not conducted as per site map /approved plan/ original title deed documents affects NPA. 45.3% of the respondents are neutral which means that market report of borrower including its suppliers/clients which does not impact NPA.

- **Analysis of Credit Appraisal Stage**

55.7% respondents are disagreed that delay in endorsing of advance (shortfall of TAT - completion time tracker) in many banks/FIs influences NPA. 31.7% and 10.7% respondents respectively are strongly agreed and agreed with the effective internal rating by appraiser because of individual inclination influences NPA. Cumulative percent 80.70% of the respondents for strongly agree and agree indicates faulty external credit rating by rating agencies affects NPA. 44.7% respondents disagreed, which means unverified KYC does not affect NPA. Cumulative percentage 56.3 % of strongly agree and agree which indicates that ensured copy of title deeds not confirmed from particular registrar office gives the ascent to NPA. Cumulative Percent is 96.7% for strongly agree and agree which says that overvaluation of mortgaged property by a valuer with bias gives rise to NPA. 70.3% of the respondents are strongly agreed which means that faulty legal search report by advocate affects NPA. 28.3% and 43% of the respondents are strongly agree and agree which means that cautioning signals in title clearance report not appropriately investigated influences NPA.

- **Analysis of Sanction/ Documentation Stage**

Out of 300 respondents, 6% strongly agreed, 53% agreed while 32.7% remained neutral, 6.3% disagreed and 2% strongly disagreed. For the statement about financing the same assets fraudulently more than once affects the NPA. Form the total 300 respondents 5% strongly agreed, 51.7% agreed, 38.3% were neutral, 3% disagreed only 2% strongly disagreed with the assets that are not created considering the terms and conditions, influences NPA. Here 57.5% disagreed and 22.3% strongly disagreed with the statement about bank approach to court, because of absence of legitimate documentation, the recuperation activity is postponed, henceforth the amount remains NPA. For the statement sanction credit terms acknowledgement, not seriously taken by borrower create problems in NPA, here 6% respondents strongly agreed, 54.7% respondents agreed, 10% respondents neutral rest are disagreed and strongly disagreed. From the total respondents, 5% strongly agreed, 4% agreed, 12.7% neutral, 61.3% disagreed and 17% strongly disagreed with the conditions by bank which is not appropriate designed according to credit scheme impacts NPA.

- **Analysis of Credit Monitoring Stage**

Here 2.7% respondents agreed, 36.7% neutral, 59.3% respondents disagreed and remaining are disagreed for the statement about A/c transactions not verified periodically, that affects NPA. Out of 300 respondents, unawareness regarding late payment, about correct installment, approval conditions like presenting of statement of stock etc influences NPA, here 42% remained neutral and rest are disagreed and strongly disagreed. Majority of respondents 67% remained agreed while 29% are neutral with the disbursement done without consistence of approval agreements influences NPA. From the total respondents 4% strongly agreed, 5.7% agreed, 55.7% neutral, 32% disagreed and 2.7% strongly disagreed for correction of errors that is no handled while data cleansing influences NPA. According to the response of respondents, 78.3% agreed and 21.7% are neutral for the periodical inspection not done by appraiser from time to time affects NPA. Out of 300 respondents majority of the respondents that are 76.7% disagreed with the unendorsed insured property mortgage in favour of bank influences to NPA.

- **Analysis of Recovery Process Stage**

At the stage of recovery process, 75.7% percent respondents agreed with the statement that NPA has an impact on the recovery call notice if it is not given in the right time. Here 22% respondents remained neutral. For the statement, individual bias with borrowers and delayed for appropriate steps by recovery officer here 46.7% strongly agreed and 48.3% agreed. 58% respondents strongly agreed and 38.3% agreed with the statement about the delay of court/authority for getting permission of recovery which affects NPA. Out of 300 respondents 2.7% strongly agreed,27.7% agreed, 58.3% are neutral 4.7% disagreed and 6.7% strongly disagreed with influence on NPA due to expire of validity of document signed with borrower. Majority respondents that are 57.7% agreed that if borrowers files complaint against bank, it affects NPA. Here 31% remained neutral and 8.3% disagreed.

- **Analysis of role of Artificial Intelligence in Detection of Financial Frauds**

Integration of Bank Data through AI with various external agencies like credit Scoring & Rating agencies enable the Banks to prevent financial frauds. AI tool can be used to provide Market information about the loan applicant which can further help in increasing credit quality, thereby reducing the financial frauds. The use of AI algorithms such as an individual's banking transactions, their past decisions, their spending and earning habits and, familial history, mobile data etc. which reduce financial frauds. Interactive

chat bots can be used to make customers aware that reduces financial frauds. Repayment habit patterns of a particular customer known through Artificial Intelligence helps bankers to reduce frauds. Artificial Intelligence helps to know about individual's spending data and behavior which controls fraud. Transaction Monitoring through AI technology helps in reducing frauds. Risk Management done with the help of AI, reduces financial frauds. Credit scoring done through AI technology reduces financial frauds. Through AI there should be a check on Loan Appraiser Credibility Record which prevents financial frauds. The AI technologies are capable of raising red flags in systems which prevents financial frauds. AI prevents ATM frauds like card shimming; card skimming, card trapping, jamming of keyboard. AI prevents popular UPI financial frauds. AI prevents bank transfer financial frauds. AI prevents fraudulent message frauds.

Hypothesis Testing through Chi-square Test

Sr.	Hypotheses	Calculated Value of Chi-square	p-value of chi-square	Accepted/Rejected hypothesis	Result
1	Credit evaluation affects NPA	1529.435[a]	0.000	Alternative hypothesis is accepted	Significant
2	Credit appraisal affects NPA	1062.084[a]	0.001	Alternative hypothesis is accepted	Significant
3	Sanction/Documentation affects NPA	777.825[a]	0.000	Alternative hypothesis is accepted	Significant
4	Credit monitoring affects NPA	2321.814[a]	0.000	Alternative hypothesis is accepted	Significant
5	Recovery process affects NPA	1150.388[a]	0.000	Alternative hypothesis is accepted	Significant
6	AI and detection of financial fraud affects NPA	2768.957[a]	0.000	Alternative hypothesis is accepted	Significant

Suggestions

- **Credit Evaluation Stage:** This stage is very important and a small mistake at this stage creates NPA. Verified income tax return, Statement of bank accounts and confidential report, CIBIL and External credit information, Employment/Business detail, Residence information, Site Map, approved plan/ original title deed documents and market report should be taken seriously and examined properly.
- **Credit Appraisal Stage:** It is also an important stage before any type of lending's. Researcher has suggested that proper attention should be given to the defective internal rating by appraiser. Proper investigation should be done for the ensured copy of title deeds not confirmed from particular registrar office and submission of KYC form should be checked. There should be a check on the valuer.
- **Sanction and Document Stage:** Lending on same assets being financed more than one time. So it is suggested that there should be proper check on documents before sanctioning/financing. It is also suggested that proper assessment of terms and conditions for lending should be verified otherwise it impacts on N.P.A. Clarification about acknowledgement of sanctioned credit terms, should be done with the borrowers which helps the recession in N.P.A.
- **Credit Monitoring Stage:** Researcher suggests that before disbursement of any type of approval, consistency of agreements should be checked properly. Bankers should pay attention towards the errors and data cleansing process. For bankers, periodical inspection is very much important and it should be done time to time to avoid the impact on N.P.A.
- **At Recovery Process Stage:** Bank should issue the recovery call notice in time. Appropriate steps delayed by recovery personnel because of individual bias with the borrower influences NPA. So it is the responsibility of the recovery officer that without any bias, should take initiative about the recovery process. Also validity of legal documents should be checked properly.
- **Suggestions about the Role of Artificial Intelligence in Detection of Financial Frauds:** Bank should approach rating agencies and with the help of A.I it will be possible to share integrated data with them to prevent frauds. A.I. tools, Algorithms should be used for getting market information of the borrower. Use of interactive chat bots can reduce financial frauds. Monitoring the transaction history of borrowers should be done carefully. In today's time period UPI frauds are happening frequently. To prevent frauds, use of AI technology is strongly suggested.

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Annexure

Demographic Profile

1	**Educational Qualification**	**Graduate**	**Post Graduate**	**Other**	**Total**
	Frequency	60	180	60	300
2	**Age**	**20-35 Years**	**35-50 years**	**50-60 years**	**Total**
	Frequency	90	151	59	300
3.	**Gender**	**Male**	**Female**	**Other**	**Total**
	Frequency	234	66	0.00	300
4	**Marital status**	**Married**	**Unmarried**	**Divorced**	**Total**
	Frequency	249	44	7	300
5	**Monthly salary**	**Less than 25000**	**25000-40000**	**More than 40000**	**Total**
	Frequency	9	44	247	300

Subject Specific Questionnaire

Credit evaluation stage and NPA		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
6.	Proof of Income / IT Returns of borrower not verified affects NPA	67	184	12	28	9	300
7	Statement of Bank Accounts of the borrower not studied/verified; Confidential Report from other Existing Bankers not obtained affects NPA	49	93	105	49	4	300
8	CIBIL /External Credit Scoring Report not scrutinized properly affects NPA	63	111	79	15	32	300
9	Employment/Business verification not conducted properly; Residence verification not conducted as per Site Map / approved plan/ original title deed documents affects NPA	44	195	29	26	6	300
10	Market Report of borrower including its suppliers/ customers not taken properly affects NPA	72	24	136	48	20	300
Credit appraisal stage and NPA		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
11	Delay in sanctioning of loan (absence of TAT – turnaround time tracker) in many banks/FIs affects NPA	79	24	17	167	13	300
12	Faulty Internal Rating by Appraiser due to personal bias affects NPA	95	32	37	122	14	300
13	Faulty External Credit Rating by Rating Agencies affects NPA	109	133	15	27	16	300
14	KYC documents not verified affects the NPA	65	24	58	134	19	300
15	Certified copy of title deeds not verified from respective Registrar Office gives the rise to NPA	40	129	96	33	2	300
16	Overvaluation of Mortgaged Property done by valuer based on influence/personal bias affects the NPA.	157	133	4	0	6	300
17	Faulty Legal Search Report by advocate affects NPA	211	45	26	11	7	300
18	Warning signals in Title Clearance report not properly scrutinized affects NPA	85	129	18	52	16	300
Sanction/Documentation stage and NPA		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
19	Multiple financing done on same asset fraudulently affects NPA	18	159	98	19	6	300
20	The assets not created as per terms and conditions of sanction affects NPA	15	155	115	9	6	300

21	Bank approaches court of law, due to lack of proper documentation, the recovery action is delayed, hence the account remains NPA	15	21	24	173	67	300
22	Acknowledgement of sanction credit terms not seriously taken by borrower create problems in NPA	18	164	30	81	7	300
23	Sanction Terms & Conditions not properly defined as per loan scheme affects NPA	15	12	38	184	51	300
Credit monitoring stage and NPA		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
24	A/c transactions not checked from time to time affects NPA.	0.00	8	110	178	4	300
25	Borrower is unaware about delays in repayment, correct EMI amount, sanction terms like submission of stock statement etc. affects NPA	0.00	0.00	126	164	10	300
26	Disbursement carried out without compliance of sanction terms and conditions affects NPA	3	201	87	5	4	300
27	Periodical inspection not done by appraiser from time to time affects NPA	0.00	235	65	0.00	0.00	300
28	Insurance of property mortgaged/hypothecated not endorsed in favour of the bank affects NPA.	0.00	1	13	56	230	300
Recovery process stage and NPA		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
29	Recovery Recall Notice not given at the right time affects NPA.	0.00	227	66	07	0.00	300
30	Suitable action delayed by recovery officer due to personal bias with the borrower affects NPA	140	145	12	1	2	300
31	Delay in getting permission for recovery of assets by competent court or authority affects NPA.	174	115	0.00	4	7	300
32	Expiry of validity of legal documents signed with borrower affects NPA.	8	83	175	14	20	300
34	Borrower files complaint against the bank affects NPA	5	173	93	25	4	300
Role of artificial intelligence and detection of financial frauds		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
35	Integration of Bank Data through AI with various external agencies like credit scoring & rating agencies enable the banks to prevent financial frauds	28	141	0.00	124	7	300
36	AI tool can be used to provide market information about the loan applicant which can further help in increasing credit quality, thereby reducing the financial frauds	1	216	78	0.00	5	300
37	The use of AI algorithms such as an individual's banking transactions, their past decisions, their spending and earning habits and, familial history, mobile data etc. which reduce financial frauds	127	112	57	0.00	4	300
38	Interactive chat bots can be used to make customers aware that reduces financial frauds	0.00	226	19	54	1	300
39	Repayment habit patterns of a particular customer known through artificial intelligence helps bankers to reduce frauds	83	206	10	0.00	10	300

40	Artificial Intelligence helps to know about individual's spending data and behavior which controls fraud	0.00	20	179	59	42	300
41	Transaction Monitoring through AI technology helps in reducing frauds	92	138	24	0.00	46	300
42	Risk Management done through AI helps to reduce financial frauds	0.00	217	42		41	300
43	Credit scoring done through AI technology reduces financial frauds	79	45	162	14	0.00	300
44	Through AI there should be a check on loan appraiser credibility record which prevents financial frauds	86	45	164	5	0.00	300
45	The AI technology is capable of raising red flags in systems which prevents financial frauds	124	118	49	9	0.00	300
46	AI prevents ATM frauds like card shimming, card skimining, card trapping, jamming of keyboard	118	182	0.00	0.00	0.00	300
47	AI prevents popular UPI financial frauds	0.00	215	85	0.00	0.00	300
48	AI prevents Bank Transfer financial frauds	0.00	114	186	0.00	0.00	300
49	Artificial Intelligence prevents fraudulent message	133	121	39	7	0.00	300

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 18-24

GROWTH OF FAMILY BUSINESS WITH PROBLEMS AND STRATEGIES

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ABSTRACT

The family business is the most important pillar in the life and growth of any economy in the world. The Indian economy and the state economy have been facing a major challenge for the existence of an informal industry and the illicit sector is dominated by small domestic businesses that are important as housing for large economic enterprises. There is a need to understand the growth characteristics of the Family Business. So, this current study sheds light on the growth of the Family Business with hopes, problems and strategies.

***KEYWORDS**: Growth, Family, Family Business, Problems, Economy, Strategies.*

Introduction

The word 'business' has innumerable meanings by different authors and the scope of the business cannot be measured by words. Business itself is a very broad name; it covers everything from a small grocery store to a family hotel or small operating company to an international conglomerate like Reliance Industries. The changing phase of the Indian economy and the growth of the sectors has increased the scope of business in India. The World Bank ranks 189 economies in a recent "Doing Business 2016" report in which the Indian economy ranks 155th for easy start-up business, the 130th position for easy trading and the 133rd position for easy cross-border trading. A business can be divided on a different basis; here the business is divided into a family business and a non-family business.[1]

Concept of Family Business

The family as a social center is one of the oldest survivors (Goode, 1982), but in recent years the family business, its most important arm, has begun to receive academic attention. After a detailed review of the available literature, Zahra and Sharma (2004) concluded that family business research has a long way to go from a separate and descriptive current situation. There are differences of opinion between family and business, although opinions about treating them as conflicting programs differ.[2]

Family businesses are found to be fragmented as amoeba as they grow, and very few of them live for more than three generations, supporting the old saying, "shirt sleeve to shirt sleeve for three generations" (Carlock and Ward 2001, McCulloch 2004). In many developing countries, including India, it is still a black box; Scholars and industry observers were surprised to see the recent split of the second-generation Ambani family, the largest private sector worth more than $ 20 billion. Even mythological evidence is limited to a few drawings of human history and the emergence of a link. The Sharma and Manikutty (2005) study of different family groups is one of the few pieces of research from India in this region.[3]

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Growth of Family Businesses

A family firm is sometimes seen as a barrier to modern economic assets. In 1959, economist Edith Penrose argued that corporations and research firms were transformed from corporations into complex corporations (Penrose 1959). Alfred Chandler, on the other hand, in his book Visible Hand (1977) stated that in the United States, the combined effects of technology and growth transformed business strategy and structure.[1]

In 1990, in Scope, Chandler said that a relative of Britain, compared to the United States and Germany, and "personal capitalists": " This unwillingness to lose control of their firms has led British businessmen to fail to make the three-dimensional investment needed for the production, distribution, and management needed to fully exploit the macroeconomic economy and industry."[5]

Chandler's capitalism has been controversial and has provoked various criticisms. He pointed out that they do not have both the money and the human resources to pursue sustainable business growth in big industries and technologies. Changing markets and technologies brings new processes and business needs. In the United States, during the war, the combined pressure of large retail markets, new technologies, and new, cheaper, more mass-produced products, such as the Model T Ford, transformed the lucrative business, new patent patterns and management, it seemed to leave the family business story. Business was out of money and the family ceased to be the main source of human activity. In addition, the idea that family control was based on improper choice, that along with extended family resources diverted from investment to personal use, was widely used in the late nineteenth and twelfth centuries in Britain.

Family businesses are among the most important sources of wealth and job creation in almost every country in the world. This is also true in the case of India and the Indian region. According to Chrisman et al. (2003) Family business is defined as “a controlled and / or controlled enterprise with a view to creating and pursuing the idea of a corporate governance entity controlled by members of one or more family members in a manner. which can be sustainable for all generations or families”. [2]

Some experts suggest that the competitive advantage of the family business lies in the combination of business, traditional and human resources, and distinct family identity. According to Habbershorn et al (2003), a family business plan consists of the interaction of a family unit, a business unit, and each family member. Zahra, (2003) states that Zahra's family impact on profitable business.[3]

Tagiuri and Davis (1996) developed a model that introduces the various interactions that occur in the family business involving three related concepts, namely business, ownership and family as three sub-systems integrating over time, which they call the Three-Circle model. This model was modified by Gersick et al. (1999) to develop their Development Model that incorporates the features of the Three-Circle model and the various stages of development in the family business proposed by them. This model provides a comprehensive and integrated framework for assessing the interaction between the business life cycle of the family, the family itself, and ownership characteristics. The model consists of three dimensions: family development, ownership development and business development.[4]

Although family businesses are the most common type of business in the world, only a few of them survive the next generation. Birley (1986) and Ward (1987) reported that 30% of family businesses survive to the next generation and only 10- 15% reach the third generation. Although many family businesses fail due to marketing, financing, and / or other reasons related to small and medium enterprises, family firms also have a unique feature — family, and they fail due to sequential problems.

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Problems Related to the Growth of Family Business

There are some problems related to the growth of family business which are discussed as under:

- **Lack of Succession Planning**

Businesses in Indian families face a major challenge to planning. Succession means the transition from one generation to the next. It means a change of leadership. It also includes a set of emotional stories, accepting new responsibilities, transforming leadership issues. It is a transformation where the organizational culture is reorganized by the next generation, bringing new ideas about how the business should be run, how to develop new work habits, new employees, new credibility etc. So, succession represents a great deal. a change in the fortune of the firm depending on how successful the negotiations will be. Many times due to a lack of planning succession violates the family business causing uncertainty between employees, suppliers, customers and the family.

- **Brotherhood Competition**

One of the biggest challenges family businesses face is sibling conflict. This is mainly due to the participation in the family business that each member receives. This is especially true when a business begins to thrive and grow during that time. Competing with each other is often the same as dragging each other down in the cost of organizational resources. It leads to feelings of unfair and unfair treatment.

- **Family Women Joining Family Business**

Indian family businesses are still full of men. Now a day the role of women in business and hiring women is widely accepted and encouraged in India. Whenever the issue of women arises in the family business she must balance between her homework and work responsibilities. Now this great source of talent should be taken seriously by family businesses.

- **Attracting and Retaining Non-Family Employees**

Non-family workers may also have difficulty adjusting to a family business culture. They are used to work in a formal business environment. In family businesses there are limited opportunities for growth and development because family workers hold all leadership positions within the business.

- **Internal Family Conflicts**

Often family businesses face internal conflicts due to the different interests of each family member, personal selfishness, personal competition that disrupts business relationships. The interest of a family member may not be in line with the interests of the business or the interests of the whole family may be incompatible with the interests of their business.

- **Lack of Training for Family Members**

In many family businesses there is no direct training provided for family members joining the business as teenagers. Due to the lack of training the family members who join the business are unaware of the organization's goals, expectations, growth and set skills needed to continue business continuity.

- **Hostile takeover of the Board of Directors to the Family Business.**

Although many family businesses own 100% ownership of their businesses, it cannot be denied that such businesses require additional funding to grow and expand. This means that the family business can sometimes take on foreign investors to raise the money needed to expand the business. Foreign investors can sometimes take up 51% of the business and leave the remaining 49% in the family. When this happens, a violent takeover by foreign investors is very likely.

- **Family Business Owners Sometimes have no Legal Followers**

While a family business can be successful, it cannot be sustainable in certain situations when there are no legal successors to take over and continue the family business legacy. In other words, family businesses sooner or later may fall into the hands of foreign investors or key employees who have no blood relationship with the family.

- **Differences between the Legal following of the Family Business**

This happens when there are a lot of legal followers in the family business. If the owners of a family business have 5 or more children, the potential for conflict in business decisions is likely to arise. They all have an equal share in business ownership. This means that some of those who will take on official positions must take sides when making business decisions. This is dangerous as it will create divisions in the management of the family business.

- **Arranged Marriages to Strengthen the Reputation and Position of the Family Business are Possible**

In some cases the children of business owners in families are forced to marry in order to have a combination of wealth and communication between the two families. This arrangement can sometimes cause problems in a family business as the two children do not really love each other. Fake relationships will have negative consequences sooner or later in business decisions, and family business will be affected.

Growth Strategies for Family Business

Family businesses that work with the goal of growing up are more likely to enjoy continuous success than those that do not. The business family with the goal of growing will have a legitimate marketing plan, marketing plans, tracking tools and other technologies invested to generate leads, create new business for existing customers, track results and refine their business development strategy accordingly.

Oral production and marketing are good. They are the leading sources of bread and butter for many local small and medium businesses. According to the Ogilvy Cannes survey, 74% of consumers identify verbal words as an important factor in their purchasing decision. At some stages of the business life cycle, overconfidence in oral sources and marketing becomes risky. In other words, successful family-owned businesses do not rely solely on their image and word of mouth to stimulate growth. The sources of business-driven business and reputation are incredibly important and powerful. But, like most things in life, a balanced approach is often the most effective. Here are some strategies for growing a family business that your family business can use as it seeks to market and produce sales with greater purpose and more order. Here given are the steps to overcoming Family Business Challenges and Problems:

- **Family Constitution**

A written document that describes family values and previously agreed rules on how family members can participate and be recognized in the family business.

- **Developing a Sequence Plan**

A succession plan is one of the biggest challenges family businesses face and in many cases its process is challenged. Succession becomes a problem when the older generation does not allow the required room for the younger generation to grow successfully. Includes sequence procedures, transition period timing, emergency plans in case of an unexpected occurrence. Ideally a family business should begin the process of arranging a sequence ten or more years before the event. The choice of the next decision should be based on the study without family variability.

- **Family Reunions and Gatherings**

There are many opportunities for the family to get together i.e. holidays, birthdays, memorials, special events, and weekends at the summer home, going to the movies, sporting events, celebrating celebrations etc. This helps to balance and strengthen family relationships and family relationships

- **Appointment of an External Advisory Board**

Succeeding in disputes over the appointment of a third party independent business as an advisor who will act as an impartial mediator. This maintains a balance between family and business disputes.

The organization should have a place to do special scheduled training programs when any family members enter the organization. This training should provide specific information related to the organization's goals, expectations and position responsibilities in the organization.

- **Free and Open Communication**

There should always be free and open communication between family members to discuss family and business matters. If there is a strong connection, it will not affect the family and business environment. It will maintain a healthy work balance between family and business.

Review of Literature

PwC (2015)[1] conducted this study to determine the US family corporate vision and practice in terms of efficiency, and the report reflects the US findings on family business ideas on various issues, as reported by 154 key decision-makers in various companies. industrial. The interviews were conducted over the phone and online by the independent agency Kudos Research from April 29 to August 29, 2014. -40. This study found that family firms differ from other business firms in a good mix of heart and head of doing business and their responsibilities in society. The study concluded that US firms were innovative and professionally engaged in running their business.

Ramachandran, K.K., Madhumathy, M., (2016)[2] attempted to explore and understand a key factor namely family unity that affects family business with the aim of knowing issues where the family stands together or is divided. The survey was conducted in two phases in the first phase, with 21 participants' discussions on the family business education program and the second questionnaire being handled by family business conference participants or the family business management program. The study found differences in the level of integration at different levels as in the case of a business with a small number of members involved, disputes over financial decisions are a sign of downgrading. With the changes that are taking place in the business environment, the mix continues to decline due to differing perspectives. Over time a different view of business growth may question family reunions that affect family business. Research has concluded that for the well-being and growth of the business it is important to take timely corrective measures and setting a family business framework can have a positive effect on a business.

Lampel, J., Bhalla, A., Ramachandran, K. (2014)[3] evaluated family firms as an inter-institutional system with differing views between institutions and this study using secondary data and corroborative data from existing studies and revised theory and discussions of 36 new organizations from eight factories of Indian families were formed. The study discussed conflicting family ideas and corporate views that influenced business decisions and revealed that unless there is a weird and strong family preference given to economic gain and consideration of firm thinking. The paper concludes with 4 elements - economics, technology, dignity and adherence that ensure survival, growth, stability and business sustainability in traditional communities.

Indirapriyadharshini (2013)[4] focuses on the unique qualities and challenges of the family business. This research paper was natural and based on secondary data. The focus of the study was on family business diversity and discussed misconceptions about business weaknesses that were actually strengths and opportunities. The study addresses the need to understand the culture and appreciation of different perspectives and relationships between family and non-family members in business.

Objective of the Study

- To study the problem and strategies in relation to Growth of Family Business

Research Methodology

The present study is designed descriptive in nature. This study is accomplished with the help of primary sources i.e. self-prepared questionnaire and secondary sources i.e. books, magazines, newspapers, websites etc. For this purpose data has been collected from 155 respondents those are family businesses in Textile Industry of Punjab. Data analysis has been done using a non-parametric test- chi-square test of Association between the demographical variables i.e. age, qualification and experience with the stage of development and the relation with the founder.

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1 PwC (2015), “Family firm: A resilient model for the 21st century”, PwC family business survey.

2 Ramachandran, K.K., Madhumathy, M., (2016),”A study on Capital Structure and Financial Performance of India Textile Industry”, Internation Journal of Management, Vol. 7(3), pp. 313322.

3 Lampel, J., Bhalla, A., Ramachandran, K. (2014), “Family Values and Inter-Institutional Governance of Strategic Decision-Making in Indian Family Firms”, Indian School Of Business, Hyderabad

4 Indirapriyadharshini (2013), “SWOT Analysis of Indian Family Business”, IOSR Journal Of Humanities And Social Science, pp 37-42

Data Analysis and Interpretation

Data analysis and interpretation with the growth of family business along with problems and strategies has been discussed on the basis of demographical variables i.e. age, qualification and experience with the following tables with interpretation:

Table 1: Views of Respondents on Stage of Development would Business is in at Present

		Stage of development would business is in at present						Chi-Square	p-value
		Early startup stage		Growth stage		Total			
Age of the principal	35-40	6	35.3%	11	64.7%	17	100.0%	4.577	.206
	41-50	16	57.1%	12	42.9%	28	100.0%		
	51-60	23	48.9%	24	51.1%	47	100.0%		
	>60	39	61.9%	24	38.1%	63	100.0%		
Qualification of entrepreneur /managing partner	Undergraduate	17	54.8%	14	45.2%	31	100.0%	2.149	.341
	Graduate	36	48.6%	38	51.4%	74	100.0%		
	Post graduate	31	62.0%	19	38.0%	50	100.0%		
Experience	6-15	11	52.4%	10	47.6%	21	100.0%	8.890	.031*
	16-25	28	48.3%	30	51.7%	58	100.0%		
	26-35	26	49.1%	27	50.9%	53	100.0%		
	>35	19	82.6%	4	17.4%	23	100.0%		
	Total	84	54.2%	71	45.8%	155	100.0%		

Source: Primary data

Table-1 reveals the information regarding stage of development of the business in present and it is found that majority of respondents from 35-40 years age group (64.7%) and 51-60 years age group (51.1%) respond in growth stage whereas majority of respondents from 41-50 years age group (57.1%) and more than 60 years age group (61.9%) respond in early startup stage. Chi-square value (4.577) was found insignificant which means there is no association between age of the Principal and stage of development of the business.

On the basis of qualification of entrepreneur/managing partner, it was found that majority from undergraduate group of respondents (54.8%) and post-graduate respondents (62%) respond in early stage whereas majority (51.4%) respondents from graduate group respond in growth stage of the business. Chi-square value (2.149) was found insignificant which means there is no association between qualification of entrepreneur and stage of development of the business.

On the basis of experience, table further shows that majority of respondents i.e. 52.4% having experience 6-15 years and 82.6% having experience more than 35 years respond in early startup stage whereas 51.7% respondents having experience 16-25 years and 50.9% respondents having experience 26-35 years respond in growth stage. Chi-square value (8.890) was found significant at 0.01 level which means there is significant association between experience of entrepreneur and stage of development of the business.

Table 2: Views Regarding Spending Lifetime with the Founder of the Firm

		Views regarding spending lifetime with the founder of the firm						Chi-Square	p-value
		Yes		No		Total			
Age of the principal	35-40	5	29.4%	12	70.6%	17	100.0%	12.656	.005*
	41-50	8	28.6%	20	71.4%	28	100.0%		
	51-60	22	46.8%	25	53.2%	47	100.0%		
	>60	40	63.5%	23	36.5%	63	100.0%		
Qualification of entrepreneur /managing partner	Undergraduate	13	41.9%	18	58.1%	31	100.0%	4.001	.135
	Graduate	32	43.2%	42	56.8%	74	100.0%		
	Post graduate	30	60.0%	20	40.0%	50	100.0%		
Experience	6-15	8	38.1%	13	61.9%	21	100.0%	7.471	0.058
	16-25	22	37.9%	36	62.1%	58	100.0%		
	26-35	30	56.6%	23	43.4%	53	100.0%		
	>35	15	65.2%	8	34.8%	23	100.0%		
	Total	75	48.4%	80	51.6%	155	100.0%		

Source: Primary data

Table-2 shows that when it is asked about the spending time with the founder of the firm then it is found that majority of respondents from the age group of 35-40 years (70.6%), 41-50 years (71.4%) and 51-60 years age group (53.2%) respond in no whereas majority of respondents belonging to more than 60 years age group (63.5%) respond in yes which means most of the respondents had not spent their life time with the founder of the firm. Chi-square value (12.656) was found significant at 0.05 level that means there is significant association between age of the Principal and spending time with the founder of the firm.

On the basis of qualification of entrepreneur/managing partner, it was found that majority from undergraduate group of respondents (58.1%) and graduate respondents (56.8%) respond in no whereas majority (60%) respondents from post-graduate group respond in yes. Chi-square value (4.001) was found insignificant which means there is no significant association between qualification of entrepreneur and spending time with the founder of the firm.

On the basis of experience, table further shows that majority of respondents i.e. 61.9% having experience 6-15 years and 62.1% having experience 16-25 years respond in no whereas 56.6% respondents having experience 26-35 years and 65.2% respondents having experience more than 35 years respond in yes. Chisquare value (7.471) was found insignificant which means there is no significant association between experience of entrepreneur and spending time with the founder of the firm.

Conclusion

Members of the family business should learn that no generation is wrong but each generation has different abilities and cultures. Once families understand these changes and need to value different ideas whether they are young or old, they will be able to work in harmony with artists and generations after generation. Parental generation needs to embrace the involvement of the new generation. The next generation should learn to value parental wisdom and understand that nothing can replace hard work. Therefore, if family businesses are able to manage these changes, they will have more opportunities to develop in the Indian economy.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 25-28

NATIONAL EDUCATION POLICY 2020: A VISION FOR INDIA

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ABSTRACT

The NEP 2020 is the first education policy of the 21st century and replaces the 34 years old national policy on education. The world is undergoing rapid shifts in the knowledge with various technological advances such as the rise of big data, machine learning, and artificial intelligence, many unskilled jobs worldwide may be taken over by machines, while the need for a skilled workforce, particularly involving computer science, mathematics, in conjunction with multidisciplinary abilities across the sciences, social sciences, and humanities, will be increasingly in greater demand. NEP 2020 attentions on ensuring general approach to school education at all level pre-school to secondary, infrastructure support, innovative education centre to bring back dropout into the main stream, tracking of students and their learning level, promoting multiple pathways to learning involving both formal and non-formal education modes. This policy proposes the redesigning of all aspects of the education structure, including its regulation and governance. The national education policy focuses on the development of the creative potential of each individual. About 2 crore out of school children will be brought back into the main stream under NEP 2020. National Education Policy 2020 aims to ensure that no child loses any opportunities to learn and excel because of the circumstances. Special emphasis will be given to Socially and Economically Disadvantaged Groups (SEDGs). This includes setting up of Gender Inclusion Fund and Special Educational Zones for disadvantaged groups. The teacher must be at the centre of the fundamental reforms in education system. The new education policy must help re-establish teachers at all levels as the most respected and essential members of our society. National Education Policy 2020 must do everything to empower teachers to do their job as effectively as possible.

***KEYWORDS**: NEP, Technological Advances, Artificial Intelligence, Multidisciplinary Abilities.*

Introduction

Pedagogical Structure

The highest priority of the education system will be to achieve universal foundational literacy and numeracy in primary school by 2025. This policy emphasis on Early Childhood Care and Education (ECCE), 10 + 2 structure of school curricular is to be replaced by 5 + 3 + 3 + 4 curricular structure corresponding to age 3-8, 8-11, 11-14 and 14-18 years respectively.

The new system will have 12 years of schooling with 3 years of Anganwadi/pre-schooling. A new and comprehensive National Curricular Framework for School Education will be developed by NCERT. This policy has emphasized mother tongue /local language /regional language as the medium of instruction at least till grade 5 but preferably till grade 8. No language will be imposed on any student. Students can participate in a fun project activity on 'The language of India'. Sometimes in grade 6-8, such as, under the 'Ek Bharat Shreshtha Bharat' initiative. Several foreign languages will also be offered at the secondary level. All students will take school examinations in grade 3, 5 and 8 which will be conducted by the appropriate authority. Board exams for grade 10 and 12 will be continued, but re-designed with

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holistic development. A New National Assessment Centre, PARAKH (Performance Assessment, Review, and Analysis of Knowledge for Holistic Development) will be set up as a standard setting body. Every district will be encouraged to establish 'Bal Bhavans' as a special daytime boarding school to participate in career-related, play- related and art-related activities. One of the primary goals of the schooling system to bring dropout children back into the educational fold as early as possible with a goal to achieve 100% Gross Enrollment Ratio in preschool to secondary level by 2030.

The vision of this policy: School Education Part-1

- The foundation stage (in two parts, that is, 3 years of Anganwadi/pre-school + 2 years in primary school in grade 1 & 2: both together covering ages 3-8) will consists of 5 years of flexible, play-activity based learning.
- The preparatory stage (Grade 3-5, covering ages 8-11) will consists 3 years of education building on play, discovery and activity-based pedagogical and curricular style of the foundation stage.
- Middle stage (Grade 6-8, covering ages 11-14) will comprise 3 years of education, with the introduction of subject teachers for learning and discussion of the more abstract concepts in each subject that student will be ready for at this stage across the sciences, mathematics, arts, social sciences and humanities.
- The secondary stage (Grade 9-12, covering ages 14-18) will comprise of 4 years of multi-disciplinary study with greater depth, greater critical thinking, and greater flexibility and student choice of subjects.

The Vision of this Policy: Higher Education Part-II

Higher education plays an important role in promoting human well-being. As India moves towards becoming a knowledge economy and society, more and more young Indians are likely to aspire for higher education.

The policy's vision includes the following key changes to the current system:

- Moving towards a more multi-disciplinary under-graduate education.
- Moving towards faculty and institutional autonomy.
- Governance of HEIs by high qualified independent boards having academic and administrative autonomy.
- 'Light but tight' regulation by a single regulator for higher education.
- Moving towards a higher education system consisting of large, multi-disciplinary universities and HEIs clusters, with at least one in every district that offer medium of instruction in local languages.
- Establishment of a National Research Foundation to fund outstanding peer- reviewed research.

Firstly by 2030 all higher education institutions to become multi-disciplinary institutions and then gradually increase students Gross Enrollment Ratio (GER) in higher education including vocational education from 26.3(2018) to 50% by 2035. Institutions will have the option to run Open Distance Learning (ODL) and online programs in order to enhance GER. All ODL programs, and diploma or degree will be of standards and quality equivalent to higher quality program run by the HEIs on their campus. Top institutions accredited for ODL will be the supported to develop high-quality online courses. All colleges currently affiliated to a University shall attain the required benchmark over time to secure the prescribed accreditation benchmark and eventually become autonomous degree-granting colleges.

NEP 2020 proposes a 4-year multi-disciplinary bachelor's degree in an undergraduate program with multiple exit options. These will include professional and vocational areas and will be implemented as follows:

- A certificate after completing 1 year of study
- A diploma after completing 2 years of study
- A Bachelor's degree after completion of a 3-year program
- A 4-year multidisciplinary Bachelor's degree (the preferred option)

An Academic Bank of credit (ABC) shall be established which would digitally Store the academic credits earned from various recognized HEIs so that the degrees from on HEI can be awarded taking into account credits. HELs will have the flexibility to offer different designs of master's programs:

- They may be 2 year program with the second year devoted entirely to research for those who have completed the 3-years Bachelor's Degree.
- For students completing a 4-years Bachelor's Degree with research, there could be a 1-year Master's program.
- Undertaking Ph.D shall require either a Master's degree or a 4-years Bachelor's Degree with research.
- The M.Phil programs hall be discontinued.

Students Activity and Changing role of Teachers

Students are the prime stakeholders in the education system. Student will be given plenty of opportunities for participation in sports, Arts-Club, culture-activity clubs, community service projects, etc. In every education institution there shall be counseling system for handling stress. All HELs will ensure quality medical facilities for the students. The most important factor in the success of higher Education institutions is the quality and engagement of its faculty. The teacher should move from the role of an information provider to a knowledge facilitator, where they actively engage youself to offer high quality learning opportunities and supports in the learning process. A teacher is required to engage with learners individually and collectively with their ideas, questions, arguments, and classroom discussion to explore diverse investigation pathways.

Teaching duties will also not be excessive and student-teacher ratios are not too high so that the activity of teaching remains pleasant. Faculty will be given the freedom to design their own curricular including textbook and reading material, assignments and assessment. The teacher must be at the centre of the fundamental reforms in the education system. The new education policy must help re-establish teachers at all levels as the most respected and essential members of our society. It must do everything to empower teachers to do their job as effective as possible by 2030.

Holistic and Multi-Disciplinary Education

Holistic education refers to all round development of personality. It is a more philosophical notion. In a democratic country, holistic education refers to the citizenship values. The purpose of all education, whether disciplinary or multi-disciplinary, is holistic education. Two or three disciplines come together with ideas and methods from respective disciplines which could be used full to understand a problem under consideration. For example, Economics and Statistics are useful as they help to apply economic theory for empirical testing for which statistical tools are useful. To take another example, students of management are taught Economics as well as Statistics. Management of a firm is concerned with profit maximization principle derived from Economics, and statistics help in market survey research. In this example, Economics and Statistics have instrumental role in management. The syllabus of management is an example of multi-disciplinary education.

Vocational Education, Skilling and Employability

NEP 2020 focuses on the five pillars of building a strong education system: accessibility, affordability, quality, equity and accountability. India's higher education system has undergone rapid changes with increasing emphasis on training and research. The NEP 2020 expects that all HEI's become independent self-governing institutions, introduce multi-disciplinary programs with high quality teaching, research with increased flexibility and choice of subjects across various streams of arts, humanities, sciences, sports and other vocational subjects.

Major Challenges in Implementation

Firstly in our country where parents still prefer their child to accompany them to the fields instead of sending them to school, the target of achieving of 100% foundation literacy and numeracy seems to be a dream. As per the census of 2011, Bihar has the lowest literacy rate of 63.82%, whereas the average literacy rate of our country is 74.04%. Keeping these data in mind, the policy makers need to formulate alternative methodologies where education is not restricted to infrastructure. Radio-programs, TV-programs in addition to modern aids must be used to achieve the 100% target. Quality books should be made available to the needy through government provision. Adequate stocks should be there in public libraries which can be accessed by all.

Secondly, the NEP would largely hinge on the extent of cooperation between the centre and States. While the NEP has been drafted by the union government, its implementation largely depends on the active cooperation of the states. A number of opposition-ruled states have been raising strong objections to several key provisions of the NEP.

Thirdly, the role of private sector, particularly in higher education system is extremely critical for the translating the inclusionary vision of the NEP. It may be noted that 70% of higher Education institutions are run by private sectors and private sectors have not sufficient finance resources. Therefore, it is imperative for the Government and regulatory bodies to create workable institutional mechanism that could harness the contribution of private sectors and recognize them as equal partner in the NEP process.

Finally, the successful execution of the NEP 2020 requires availability of adequate financial resources. In this regard, the NEP has stated that to achieve the goal of new policy, the country has to rise public spending on education to 6% of GDP. But in reality the 1968 national education policy has recommended 6% of GDP allocated towards education. However, in all these decades, the public spending on education has not gone beyond 3% of GDP.

The NEP 2020 is truly a path-breaking document in every sense. Its effective implementation is critical if India wants to reap the demographic dividends and capitalize the opportunities from a rapidly growing knowledge economy. A number of states have officially launched this policy and others in the process to do the same.

Outcomes of NEP 2020

- All professional education will be an integral part of the higher education system. Stand-alone technical universities, health science universities, legal and agricultural universities, etc. will aim to become multi-disciplinary institutions.
- Policy aims to achieve 100% youth and adult literacy.
- The Centre and the States will work together to increase the public investment in Education sector to reach 6% of GDP at the earliest.
- 100% GER in Pre-School to Secondary Level by 2030.
- Bring Back 2 Crore out of School Children
- Teachers to be prepared for assessment reforms by 2023.
- Inclusive & Equitable Education System by 2030.
- Board Exams to test core concepts and application of knowledge.
- Every Child will come out of School adept in at least one Skill.
- Common Standards of Learning in Public & Private Schools.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 29-34

CONCEPTUAL STUDY ON GROWTH AND CHALLENGES OF FINTECH IN THE BANKING SECTOR

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ABSTRACT

Financial Technology is the technology and innovation that aims to compete with traditional financial methods in financial services. Fintech refers to technology-creation innovation in financial services. FinTech describes new technology that works towards enhancing and automating the delivery and uses of financial services. Artificial Intelligence, Blockchain, Cloud computing, big data are regarded as four key areas of FinTech. This technological change is transforming the financial sector and the broader economy, affecting all aspects of work - from payments to monetary policy to financial regulation. It allows integrating both physical and digital payment methods into a unified user experience. Some applications are there, which shows that Fin Tec innovative and helpful in the banking sector. The paper elaborates on the drivers of FinTech, its implications, and the road ahead for the use of FinTech in the banking Sector. The article takes references to published scholarly literature and web sources.

***KEYWORDS**: FinTech, Banking Sector, Applications of FinTech.*

Introduction

India's FinTech industry has made significant progress owing to the rapid adoption of technology, digital transformation thereby creating new possibilities for companies to offer various financial services. Although FinTech has been gaining significant traction in urban areas with the emergence of several new-age start-ups and digitally used to consumers, there is a huge void regarding the number of FinTech players catering specifically to rural consumers.

Definition

- Fintech is just about innovating and bringing solutions to the banking, lending capital markets. (Jason Raznick)

The above definitions state a few things:

- Companies employ newly developed digital and online technologies in the banking and financial services industries.
- A leading FinTech firm, a new breed of company that offers loans through online platforms.
- FinTech plays a vital role in developing Different Banking Processes.

Research Methodology

Statement of Problem

The FinTech industry changes the financial services is India's fastest growing Fintech industry worldwide. Fintech is an emerging concept in the financial sector. Financial technology innovation in India more advantageous for the Indian economy, and the Fintech services are more secure and user-friendly. The Fintech services reduce their costs for financial assistance.

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Objectives of the Study

The objectives of this research paper will be:

- To study the concept of FinTech
- To study the growth and challenges in FinTech Industry
- How different Technologies are helpful for FinTech

Hypothesis

- FinTech scope in Indian Banking Sector

Method of Data Collection: Secondary Data.

Sources of Data: FinTech websites, Research journals, Online articles, and YouTube videos.

Concept of Fintech

FinTech (Financial Technology) refers to software and other modern technologies used by businesses that provide automated and improved financial services. The fast and innovative signs of progress, such as Mobile Payments changed the way we manage our finances. FinTech refers to an integration of technology by offering financial services. The FinTech sector is attracting growing interest from regulators as it evolves, in developed markets and developing countries.

Growth of FinTech

5 Factors Driving the Rise of FinTech

FinTech is a rapidly evolving industry. As the financial landscape changes in response to new technologies and regulations, so do the products and services that support this industry. While it may be hard to keep up with all of these changes, it is essential for businesses in this field need to stay informed on what's going on. Five factors driving the rise of FinTech.

- **Increased Mobile Usage**

One of the biggest drivers of FinTech growth is the increased use of mobile devices. Now a day's, mobile payment options for nearly every type of transaction, from credit cards to shopping online. Increased usage of smartphones has led to an increased number of apps targeted toward consumers. As technology advances and more people rely on smartphones for daily activities, the need to secure an API to develop mobile apps cannot be underestimated.

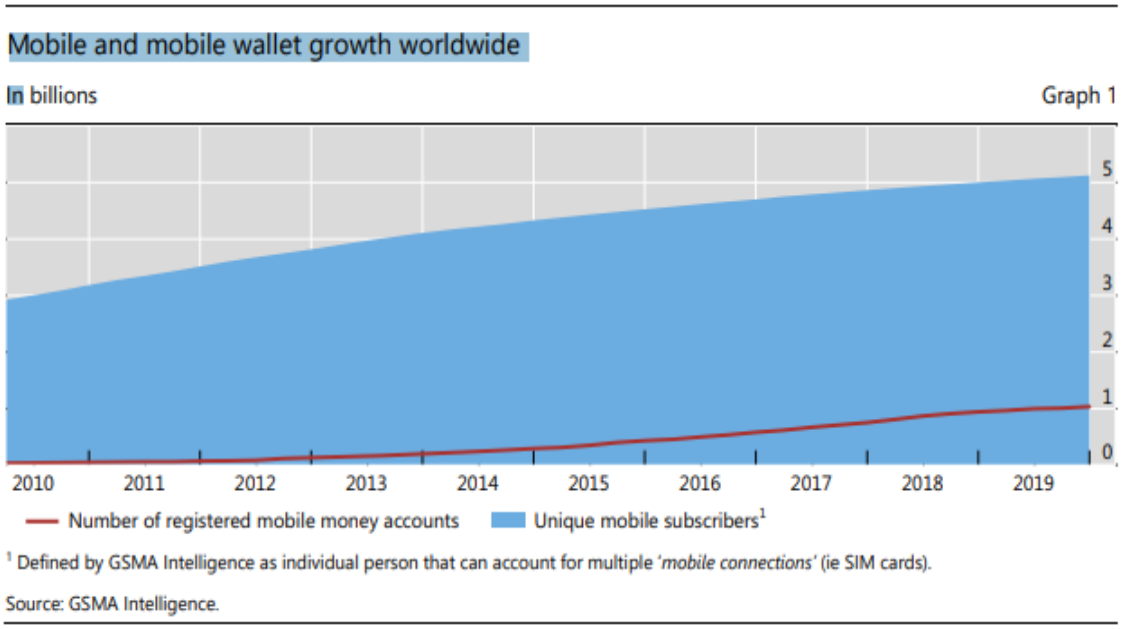

Figure 1: Mobile and Mobile Wallet Growth Worldwide
Source: www.bis.org/publ/bppdf/bispap117.pdf

- **The Rise in Digital Payments**

Another factor driving the growth of FinTech is the increasing popularity of digital payments. This can be seen in the rise of mobile payment options, as well as other forms of online and electronic payments. This trend is being driven by several factors, including the increasing use of smartphones and other mobile devices, as well as the growing popularity of online shopping. In addition, more businesses are accepting digital payments due to the lower costs and increased security offered by these methods. As digital prices continue to grow, FinTech companies that provide innovative payment solutions will continue to thrive.

- **Focus on Underserved Areas of Banking**

Banks have been focusing on specific areas of their businesses that have seen much growth in the past, such as wealth and asset management. At the same time, there are other areas have been neglected due to this focus which FinTech companies are now trying to move into, such as small business lending, student loans, and mortgages. Additionally, the regulatory environment has been changing over the last few years, which has led banks and other companies in financial services to try to make sense of how they can offer their customers products that meet both compliance requirements while being innovative at the same time.

- **APIs**

FinTech companies also use APIs (Application Programming Interface) to build their products and services around existing financial infrastructure which has become a new trend. Application Programming Interface, or APIs, has been a hot topic in the FinTech world. API security is necessary before deciding to use and finance a product. Banks are starting to open up their systems so third-party companies can develop products and services that work with them. It has led increased in startups and venture capitalists getting involved in this space as they see the growth potential.

- **Large Amount of Capital Available**

Another reason there's such a large amount of capital available for FinTech companies is that venture capitalists are starting to see the potential for growth in this space. In addition, banks are also making strategic investments in these startups to try and stay ahead of the curve.

Examples of FinTech

There are some companies such as Personal Capital, Lending Club, Kabbage and Wealth front are examples of FinTech, which provide new services on financial concepts and allow consumers to have more influence on their economic outcomes. Fintech now consist of different sectors and industries such as education, retail banking, fundraising and nonprofit, and investment management. Fintech also includes the development and use of crypto currencies, such as Bitcoin, PayPal is a global financial technology (Fintech) business specializes in online payments, payment processing and money transfers.

Seven common programming languages in FinTech

- **Python:** Python is one of the most popular programming languages and a common choice for professionals who work in FinTech.
- **Scala:** Scala is a coding language that supports functional and object-oriented programming. Scala is a strong statically typed general-purpose programming language.
- **Java:** Java provides a safe and secured platform to build web applications for the FinTech industry.
- **C++:** C++ supports developing software, operating systems, and other products.
- **JavaScript:** Fintech require coding & for this coding purpose java script is helpful in the Fintech industry.
- **MATLAB:** MATLAB is a programming platform creates specifically for engineers and scientists to analyze and design systems and products that transform our world. Financial Data Scientists use MATLAB to develop and deploy various machine learning applications including finance algorithmic trading, asset allocation, sentiment analysis, credit analysis, fraud detection.
- **Ruby:** Ruby is a server-side scripting language. Ruby has a clean and easy syntax that allows a new developer to learn quickly and easily.

Challenges Faced by the FinTech Industry

Digital innovations and trends in financial technology or the Fintech industry are revolutionizing how people, financial organizations, and banks manage their money. In the last five years, modern advances have drastically changed how people engage with their finances. Fintech companies are on a path of enhancing their growth and reputation in the industry. Financial technology is improving and automating process and services in organizations.

The sudden rise of numerous FinTech start-ups in the finance sector has contributed to the growth of many other sectors through their efficient financial strategies. With this scope, the industry can grow better and generate more revenue.

Many prominent FinTech companies face various issues like long-fund raising cycles, missed out targets, and increasing losses. Well, these are widespread issues as well.

Following are many other critical challenges that the FinTech industry faces every day.

- **Data Security**

Data security has become one of the major concerns in the Internet world – be it mobile banking, payment apps, or FinTech. Traditional banking systems are confident with security guards, CCTVs, vaults, and heavy bulletproof doors to keep their data safe and secure.

But when we talk about virtual security, things are not as easy. Insecurities are much more discreet and have potentially impact the customer, as not only their money is at stake but their data too.

So we can establish a high-level security app with the help of the FinTech app development company. The app may consist of the following factors to make it more secure:

  - Two-factor authorization
  - Biometric authentication
  - Data encryption
  - Real-time alerts and notifications

- **Compliance with Government Regulations**

Finance is one of the most regulated sectors. There will always be interference from the government even if you leverage the traditional FinTech software that doesn't use blockchain and other new and crucial technologies. Before creating an application or utilizing the software to check it for legal compliance. To lead through all the essential details and policies, when entering the market, legal department is aware of the latest government policies so it will change them immediately.

- **Lack of Mobile and Tech Expertise**

In the Fintech industry, some finance companies or banks don't have proper or convenient mobile banking services. Some banks try to replicate websites; every user wants a convenient option. A lack of expertise in FinTech mobile app development services results in non-user-friendly applications which don't use mobile devices to their fullest potential. To enable users with FinTech app development services following features must be on your mobile.

  - QR-code for Payments
  - Automatic scanning of a credit card number
  - Two-factor authentication with a fingerprint
  - This can be done using full integration with the hardware of devices.

- **Big Data and AI Integration**

AI will revolutionize the way banks fetch data and interact with customers. Big data and AI have made their impact in every organization. Using big data, organizations can collect personal information about users, social status, financial behaviour, habits, and in-app activity. This data is fundamental to banks, especially when it comes to credit ratings and offering other high-risk banking services. With the help of big data, AI automates the whole process to detecting fraud, perform a risk analysis, and manage transactions effectively.

FinTech organizations face various challenges to implement these technologies. They require expertise and constant maintenance.

For AI and big data to combine, it will need to teach AI through machine learning. It will need large amounts of data to train the system. Most banking apps are unable to process and fetch a large number of data.

- **Blockchain Integration**

FinTech applications which are integrated with blockchain technology, some of the companies don't find blockchain as a feasible solution, while others consider it as a solution for better data exchange. FinTech industry is more trustworthy by implementing a blockchain. It allows for analyze and tracks of all the phases of a transaction and prevents any changes to it. Integrating a blockchain is quite a challenging task for many financial organizations. Now banks and other financial institutions have been slow to pick up on the blockchain trend. On the other hand, fintech startups are more likely to try to disrupt the Fintech sector. It's not easy to integrate blockchain technology. While implementing this, make sure adhere to government guidelines and laws. To avoid any government restrictions concerning mobile services as they are still unable to allow massive blockchain adoption.

- **User Retention and User Experience**

For the FinTech sector, user retention and user experience are major concerns. However, a FinTech app should manage a balance between user experience and security. It is offering a mobile app banking service that is neither easy to break nor too hard to access.

While developing a FinTech app, ensure that the User Interface and User Experience part are secure and user-friendly. Users are ready to access an app with two-factor authentication. But asking details again and again for login may frustrate them.

- **Effective Marketing Tactics to Acquire Customers**

FinTech organizations fail to understand their ideal position, target audience, and strategies. In recent times, where most people still use traditional banking services, FinTech companies have difficulty time overcoming this challenge.

To enhance business and strategies, make sure it is significantly better than competitors, for that, either invest a bunch of money, an effort or put in human resources to offer seamless services to your customers or walk along with the traditional banks. Offering the best product is not what users would expect. To convince customers by telling them what type of services created by the companies. A strong and effective marketing strategy is helpful for advertising. This will not only help to gain popularity but help you boost your brand awareness.

- **Personalized Services**

Personalized services have been the primary and core factor of banking for a long time. Simply personalization means interacting with a user at the right time on their preferred channel with a proper solution to their needs. Customers are open to accepting the Fintech as their financial wellness coach. Some users may feel overwhelmed with a broad spectrum of options, and effective personalization provides them only with the narrowed options they are looking for. To overcome this challenge, FinTech organizations should have precise customer insights. Moreover, FinTech companies must understand the behaviour of users and get insight into the user's health, social interactions, and events. Achieve this goal by developing trust with customers, to keep the user's data secure and safe.

Interferences

The relationship between finance and technology has a long-standing relationship. The FinTech services are transforming the entire banking system it empowers consumers to take charge of their financial decisions, leading to more significant financial literacy than ever before from specific processes to various digital channels like online, mobile etc; the Fintech increases efficiency the overall working of the bank sector. The technology point of view financial services traditionally were an industry that required fixed assets i.e. branches to scale, acting as a barrier to entry for newcomers. Technological advancements now allow upstarts to run complex operations virtually. Fintech also provides value added services and features that can easily be integrated with bank platforms through Application program interfaces. It allows the banks to make efforts to integrate and streamlining their operational capabilities of the banks.

Conclusion

This paper has shown that digital innovation is bringing about economically meaningful changes in the production of financial services, with implications for the industrial finance structure. Improvements in connectivity and computing can help to enhance efficiency and competition. However, there are many challenges faced and yet to be overcome in the FinTech industry. Regulations and various government policies are challenging for FinTech companies. However, we should always keep a balance between new technologies and compliance with the conventional system to disrupt the financial industry. It's not easy for traditional banking to adopt recent trends and technologies. I believe that with time, mobile technologies will become even more common in the financial sector, as they're impactful and convenient for people while helping banks work more efficiently. Improvements in connectivity and computing can help to enhance efficiency and competition.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 35-38

DOES FOREIGN DIRECT INVESTMENT GROWTH IS SIGNIFICANT IN INDIAN COMPUTER SOFTWARE & HARDWARE SECTOR?

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ABSTRACT

Foreign capital is a complement to the domestic capital, vigorous embodying technology and innovations required for the expansion of Indian firms. Foreign promoters have played relatively significant economic roles among firms across production sectors in the manufacturing industry in India. It also facilitates job creation, enhances skill, fosters innovation, and development and +protects intellectual property. FDI contributed positively to sales, profit, employment, and wages of the Computer Software and Hardware in India during the period of Liberalization and This sector is one of the largest industries in the global market. The present paper focused on the growth of FDI inflows in the Indian Computer Software and Hardware sector and studied the Trends of Foreign Direct Investment in Indian Computer Software & Hardware sector through the Government of India's Liberal Policies in this Sector. Linear Regression analysis Tend of Foreign Direct Investment in the Computer Software & Hardware sector in India shows a positive trend. The slope coefficient of the semi-log model is 0.3928 indicating annual growth rates of 39.28 % of FDI inflows in India from 2010-11 to 2020-21. The computer Software & Hardware Sector placed the First position in attracting the highest FDI inflows. The FDI equity inflow received by the Computer S & H sector from 2010 to 2021 is Rs. 426955 Crores and it is 16.03 % of the total equity inflow received by the sectors since 2010 in India.

***KEYWORDS**: Foreign Direct Investment, FDI Policy, FDI Trend, Computer Software & Hardware (S&H).*

Introduction

Foreign Direct Investment (FDI) is not only a substantial non-debt financial resource for India's economic growth, but it also one of the primary drivers of economic growth. FDI is one of the most important phenomena in the world economy. In accordance with the World Bank, "foreign direct investment is the net inflows of investment to acquire a lasting managerial stake (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the Part or total of equity capital, retained earnings, other long-term capital, and short-term capital as shown in the balance of payments". Most developing countries have limited savings to finance their investments. They are also lack in technological advancements. So, they are always working to draw in as much FDI as they can in order to meet these technological and financial needs. FDI helps in creating jobs and providing tax income to the government. The Foreign investment inflow in India has changed and improved considerably since gear up the economy growth in 1991 and more progress was achieved from 2014 onwards. Liberalization of FDI norms played a pivotal role in raising the FDI in different sectors of the economy. India jumped one position to 7th among the top recipients of foreign direct investment (FDI) in the year 2021, despite FDI inflows into the country declining, according to the United Nations Conference on Trade and Development (UNCTAD).There has been a drastic shift in the composition of FDI inflows since 1991. The FDI's have gradually shifted from manufacturing to services sector and service to

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computers H&S sector. Different sectors have been opened up for FDI at different points of time. The shift prominent role of sectors in receiving the FDI, explains the difference in FDI received in various sectors. Since 2010, computers H&S sector has registered growth rate of 18 percent in FDI inflows. The Computers S&H sector in the country has played an important role in enabling improved economic performance on the domestic growth as well as external fronts during the post reform period. FDI inflows in India rapidly increased from 2010 to 2021 evident from the above graph. Growth of FDI inflow has increased by more than three hundred times during the study period that is from 2010 to 2021. India has recorded highest ever annual FDI inflow of Rs. 44256 crores in the Financial Year 2021-22

Review of Literature

Vinay Kumar (2012), has examined into the patterns of foreign direct investment (FDI) coming into the country, as well as the relationship between FDI, FII, and the GDP of the country. According to the findings of the study, the amount of foreign direct investment (FDI) flowing into India has increased from US$ 4029 million in 2000-01 to US$ 36396 million in 2013. In addition, foreign direct investment (FDI) in India increased by 24.2% from 2012 to 2013.

Prema-chandra Athukorala (2009) has examined the trends and patterns of foreign direct investment (FDI) in developing Asia over the past three decades, with a focus on two key issues: the implications of the ongoing process of international production fragmentation, and the alleged 'crowding out' effect of China's rise as a major host to FDI on the other countries in the region. Both of these issues have been given a great deal of attention in the study period.

S. Harish Babu (2012), was investigated that the impact of foreign direct investment and policies on economic development of various sectors of the economy by considering factors that affect FDI, and includes comparative analysis with the help of statistics relating to sectors attracting highest FDI equity inflows for the financial years 2008-2009 to 2010-11.

Soumali Bose and Bindya Kohli (2018), have examined into the patterns and trends of FDI (foreign direct investment) in the economies of the BRICS countries between the years 1990 and 2015. According to the findings of the study, established markets are still believed to be attracting the greater proportion of foreign direct investment (FDI), and they continue to occupy the top rankings in worldwide FDI inflows. Additionally, established markets continue to hold the majority of the top rankings in global FDI inflows.

Kulwindar Singh (2005), has investigated the early beginnings of foreign direct investment (FDI) in India and explored the changes (economic and political) related to the trends in two industries: industry and infrastructure, as well as the subsector telecom.

K. Madhu Babu (2012), has studied the inflows of Foreign Direct investment in India. he has studied that the inflow of foreign direct investment for the period 1963-64 to 2009-10. For analytical convenience this period has been divided into two sub periods (1) The pre-liberalization period and (2) post-liberalization period.

K.Thangamani and K. Kannaimmal (2015), have studied that the investment pattern of foreign direct investment in India increases the capitalization opportunities, job opportunities and also development of countries economy by the equity inflows. Findings of study reveal that the service sector was consistently receiving decent portion of inflows through foreign direct investment over the study period.

Seema Devi (2015) has studied the trends of FDI and FPI in India during the period of 2000-01 to 2012-13. The study highlights country wise and sector wise FDI in India and its major policies. The paper also focused on the relation between FDI, FPI and other economic Indicators like GDP and inflation and provides a platform for future research work. result shows that there is positive correlation between FDI and GDP in India and negative correlation FDI and inflation.

Objectives of the Study

- To study the trends of FDI inflows in Indian Computer Software and Hardware Sector.
- To study the growth of FDI inflows in Indian Computer Software and Hardware Sector.

Hypothesis of the Study

H_{01}: There is no positive trend of FDI inflows in Indian Computer S & H Sector.

H_{02}: There is no significant growth of FDI inflows in Indian Computer S & H Sector.

Data and Methodology

The nature of the study is analytical, and it is based on secondary data that have been extracted from publications from the Ministry of Commerce, Govt. of India, Bulletins of Reserve Bank of India, Economic Survey of Government of India, Department for Promotion of Industry and Internal Trade (DPIIT), Secretariat of Industrial Assistance (SIA) newsletters, CMIE Prowess database and India stat database. The present study is a time-series data and the relevant data have been collected for the period 2011-12 to 2020-21. The trends and growth of FDI inflows are analyzed during the period from 2011 - 2021 with regression analysis.

Tools Applied

Trend Analysis: Bivariate regression model shown below:

$FDI_t = \alpha + \beta * \text{Time (in years)} + \epsilon$

Where, FDI_t = Foreign Direct Investment inflows in t years, t = Time in years

Growth Analysis: Semi log model can be mathematically expressed below:

$Ln(FDI) = \alpha + \beta * \text{Time (in years)} + \epsilon_t$

Data Analysis & Interpretation

Table 1: Regression Results of Trend Analysis

Dependent Variable	Independent Variable	Regression Co-efficient	T-Statistics (P-Value)	F-Statistics	R-Square
FDI inflows in Computers S & H Sector (Rs. Crores)	Intercept	-24884370.7818	-3.37 (0.008)	11.3973 (0.0081)	0.5589765
	Time	12362.69	3.37 (0.008)		

According to the table-1 the prob. value of t-statistics is 0.008. It indicates that the dependent variable FDI inflows are in positive trend at 1 percent level of significance. And the R-square value 0.55 is indicated that model explains about dependent variable by 55%. The overall regression results showing that FDI inflows in computer S&H sector are statistically significantly increasing according to the time. So, the null hypothesis $H0_1$ no positive trend of FDI inflows in Indian Computer S & H Sector has rejected.

Growth Analysis of FDI inflows in Computer S&H Sector

The present study used Semi-log regression model for analysing and testing the stated hypothesis is “significant growth rate of FDI inflows in computers software & Hardware sector”.

Table 2: Result of Log Regression Model to Analyse the Growth

Dependent Variable	Independent Variable	Regression Co-efficient	T-Statistics (P-Value)	F-Statistics	R-Square
FDI inflows in Computers S & H Sector (Rs. Crores)	Intercept	-782.25	-9.26	87.933 (0.000)	0.907
	Time	0.393	9.37		

The results indicate that the p-value of slope coefficient to be lesser than 1 percent level of significance. Therefore, at 99 percent confidence level, the null hypothesis of insignificant annual growth rate cannot be accepted. Hence, it can be concluded that FDI inflows in Indian computers S&H sector has a statistically significant growth rate during the study period. The slope coefficient of the semi log model is found to be 0.393 indicating nearly 39% of annual growth rates in FDI inflows in India.

Conclusion

The study reveal that the growth of FDI inflows in the Indian Computer Software and Hardware sector is significant. Linear Regression analysis show that the trend of Foreign Direct Investment in the Computer Software & Hardware sector in India is positive. The slope coefficient of the semi log model is found to be 0.3928 indicating annual growth rates of 39.28 percent of FDI inflows in India during 2010-11 to 2020-21. Computer Software & Hardware Sector placed First position in attracting the highest FDI inflows. The FDI equity inflow received by the Computer S & H sector during 2010-2021 is Rs. 426955 Crores and it is 16.03 % of the total equity inflow received by the sectors since 2010 in India.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 39-50

RECENT TRENDS IN INDIAN FINANCIAL MARKET

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ABSTRACT

After navigating through a rough terrain and recovering from the lows of 2020 and 1st half of 2021, we march into a new year 2022 with the hope that this year would be the end of pandemic and full normalization. It goes without saying that the Russia and Ukraine war erupted at the inappropriate time when the world was just seeing out of pandemic and the countries are struggling to combat with inflationary pressure. While the impact Covid 19 pandemic still looms, the world economy is paying the high price for Russia and Ukraine war with growth economic dynamics goes unfavorable with each passing day. The important attributable factor contributing in slowing growth momentum is the generalize tightening of monetary policy driven by the more than expected inflation targets. Strict lockdowns associating with China's zero Covid policies have also impacted the Chinese and Global economy. An unconducive global economy, thanks to stubborn inflationary pressure, worsening Russia and Ukraine war and aggressive monetary tightening hampers the prospects of Indian Growth outlook as well. In the middle of an eminent global slowdown, ammunition build overtime in form of better external position, healthier balance sheet of banks and corporates and persistent efforts to push the capex places economic outlook of India in a relatively better position than its emerging peers. In the medium-term policy measures adopted on digitization, manufacturing and durables is likely to bolster the growth prospects making an Indian economy ab alternative long-term investment destination in the world. Financial Services is one of the most important sectors of an economy. Financial Services sector comprises of both Banks and Non-Banking Lending Institutions; Insurance and Asset Management Companies are also part of Financial Services Sector. A strong and well- regulated Financial Services Sector can be critical for the growth of an economy. Asset management companies are one of the domestic institutional investors who play a major role in Indian capital market. Mutual funds and Foreign Institutional Investors (FIIs) have proven their influence on Indian stock market. This research paper tries to identify the different financial products contributing the growth of Indian Financial Market. The data of past 18 months is put to test to bring out a relevant result. The market barometers – SENSEX and NIFTY are considered for analyzing with basic econometric tool.

***KEYWORDS**: Financial Market, Asset Management, Financial Services, Foreign Institutional Investors.*

Introduction

In addition to co-operative credit institutions, the Indian banking system includes 12 public sector banks, 22 private sector banks, 46 foreign banks, 56 regional rural banks, 1485 urban cooperative banks, and 96,000 rural cooperative banks (source: RBI, data as on: 31st March 2021). The majority of investors link banks to the financial services sector. The scope of the financial services sector is wider, though. Term loans, housing finance, commercial vehicle finance, leasing and hire-purchase businesses are a few examples of non-banking lending institutions that exist in addition to banks.

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Over the past ten years, the asset management sector in India has expanded at a compound annual growth rate (CAGR) of 17.5%. (as on 30th June 2021, Source: AMFI). As of June 30, 2021, the mutual fund industry had Rs.33.66 lakhs crores in total assets under management (AUM) (source: AMFI). The general insurance sector has experienced tremendous growth as well. Over the past ten years, life insurance premiums have increased at a CAGR of 8%. (as on 31st March 2020 Source: IRDAI). In FY 2019–20, LIC and private sector life insurance companies collected a combined premium of Rs 5,72,910 crores (Source: IRDAI annual report, FY 2019-20). In India, the expansion of the financial services industry has outpaced that of the country's Gross Domestic Product (GDP). According to the Reserve Bank of India (RBI), during the past few years, the GDP proportion of financing, insurance, real estate, and business services has consistently increased, rising from 17.2% in FY 2010–11 to 23.2% in FY 2020–21.

The share of individual assets in the overall asset composition of the MF industry has been growing steadily. AMFI data shows that the proportion of individual investors which include retail investors and HNIs has increased from 54.5% in September 2021 to 57.1% in September 2022, an increase of 2.5%.

The share of individual investors in mutual fund assets increased by 12% from Rs.20.39 lakh crore in September 2021 to Rs.22.75 lakh crore in September 2022, despite a 3% decrease in key indexes.

The data also reveals that equity-oriented schemes are predominantly held by individual investors. Equity funds hold more than 80% of the assets of individual investors. Additionally, debt funds account for 14% of all individual investors' assets, followed by ETFs/FoFs at 4% and liquid funds at 2%.

From Rs. 37.41 lakh crore in September 2021 to Rs. 39.88 lakh crore in September 2022, the industry's total assets rose.

Of this, 51% of the overall industry assets are comprised of equity-oriented schemes. From 47% in September 2021 to 51% in September 2022—a 9% increase—the share of equity plans.

ETFs' market share has also gone up, from 11% to 13% in just one year. In the meantime, the proportion of debt assets to total AUM dropped from 27% to 20%.

The following figure shows that movement of SENSEX over a period of time from April 2021 to September 2022.

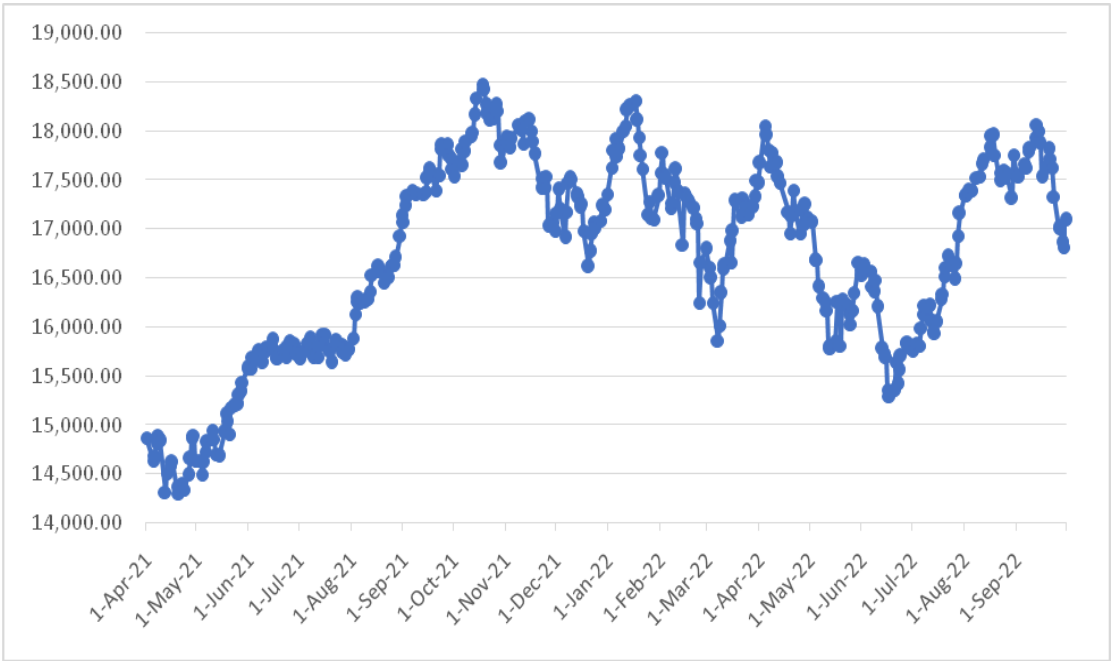

Figure 1: Movement of NIFTY from April 2021 to September 2022

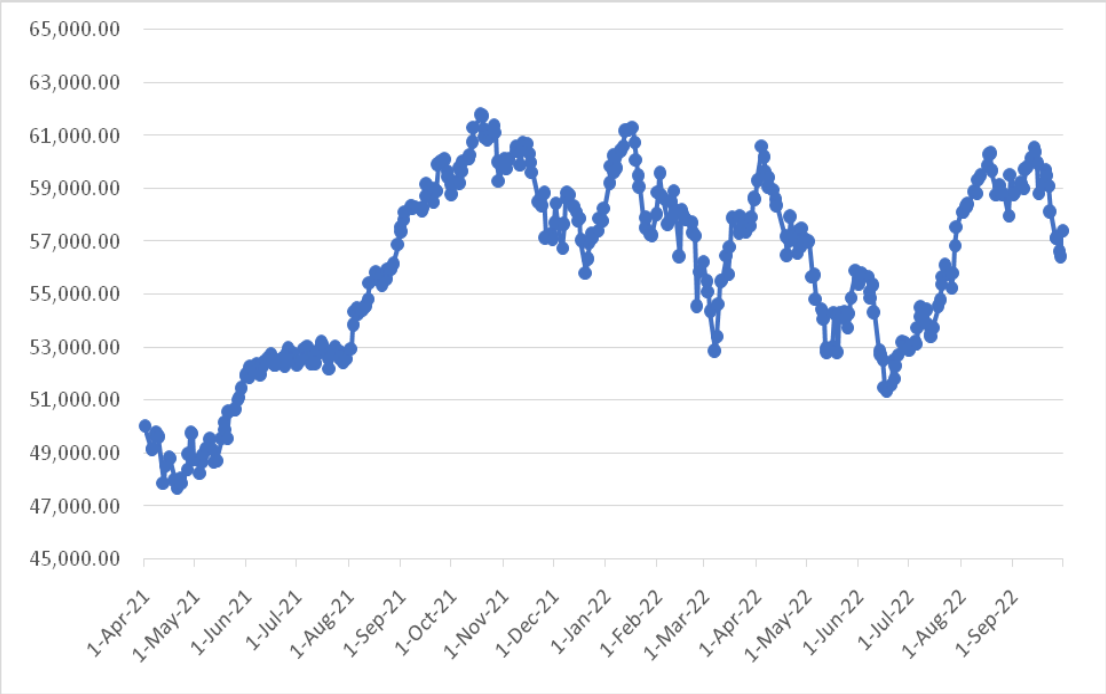

Figure 2: Movement of SENSEX from April 2021 to September 2022

Source: https://www.nseindia.com, https://www.bseindia.com

The equity market has significantly performed in last 18 months where it was seen both NIFTY and SENSEX have generated decent return to the investor. Considering the current growth in India around 6.5% to 7% where is the growth prospect in the developed countries have been significantly challenged, therefore India stands a better prospect in order to attract foreign funds in the country.

Scope of the Study

The present study outcomes are limited to the period of the study and this paper is only concentrated on structured investment in terms of equity segment. The study does not forecast the future movement of the financial market or the fluctuation of the stock market. The study would be helpful to know the movement of structured financial investment in Indian Financial Market.

Objective of the Study

- To study the trends of Indian capital market in last 18 months.
- To understand the growth in mutual fund investment over a period of last 3 years.

Literature Review

Indrajit Kaur and K.P. Kaushik (2016) found that investor awareness, socioeconomic status, and perspective all have a significant role in how they behave while making investments. Additionally, they deduced that increased knowledge of mutual funds' many features had a beneficial impact on investments in mutual funds. Aras et al. (2003) used panel data from 23 OECD nations covering the 18-year period from 1982 to 2000 to study the causal relationship between institutional investors and stock market development. They discovered a strong correlation (0.715) between the growth of the stock market and institutional investors. Ippolito (1992) illustrated in his study how investors evaluate the historical performance of mutual funds and are more likely to invest in those that have historically generated profits. Additionally, he noticed a non-linear link between the flow of funds and a mutual fund's historical performance.

In their study, Arathy B, Aswathy A Nair, Anju Sai, and Pravitha N R (2015) found that the most crucial aspects for investors to consider before participating in mutual funds are capital appreciation and tax benefits, whereas diversity, liquidity, and brand image are less crucial.

In his study of investors' attitudes about mutual funds as an investment choice, Dr. Binod Kumar Singh (2012) found that the majority of investors have minimal knowledge of the many functions of mutual funds.

Goel et al(2014) .'s study looked into the scope of the Indian mutual fund market from 2010 to 2014. They discovered that there have been an increase in the number of mutual fund schemes over this time, with the debt scheme showing the highest growth rate. They came to the conclusion that mutual fund investors buy Indian stock market debt instruments.

With more institutional ownership, especially in companies with more liquid stock markets, research and development investments rise, according to data from Scott (2014).

The gross funds raised by open-ended schemes during August 2022 were Rs.8,94,145 crores as opposed to Rs.8,28,422 crores in redemption or buyback, according to the SEBI report from September 2022. This resulted in a net inflow of Rs. 83,844 crores from open-ended schemes. Of the total funds raised, Rs. 8,28,432 crore were raised through income- and debt-oriented schemes, 27,846 through growth- and equity-oriented schemes, 11,808 through hybrid schemes, 280 through solution-oriented schemes, and 22,784 through miscellaneous schemes.

In September 2022, DSP Investment Managers Pvt Ltd has analyzed the position of Indian Capital market with other developed and emerging stock market and found that Indian stock market is relatively placed better than any other emerging stock market. In their recent research paper, Mirae Asset Mutual Fund AMC have highlighted the growth of different financial products and the impact of such growth on the Indian Financial Market.

Capital Market Overview

The world has caught in a state of flux. Now it seems like a we are in the middle of a permanent crisis. A big question in people mind is that how the economy noddle will move from here. The current economic fundamentals are very strong which reflects through the corporate number, car sales data, airline traffic and other economic indicators. However, the export numbers gradually become slow due to global slowdown. Political stability at this juncture makes Indian economy standout in the World. The growth off course in coming few quarters is expectedly slower than what we have seen so far but it is also important to look at the times which is very uncertain around the globe.

Key indicators in capital market development:

- The long-term trend shows that promoter ownership increased significantly between 2001 and 2010 (to a 20-year high of 56.7% in March 2009), then gradually decreased thereafter. This period of time coincided with the SEBI's decision to raise the minimum needed free float from 10% to 25% in 2010.
- Increasing SIP investments provided support for DMF ownership throughout FY15–20, but this support fell off in FY21 before rebounding later.
- Since 2010, government stake in the NSE-listed market has decreased, while private promoter ownership has increased.
- From Rs. 7,866 crores in August 2022 to Rs. 6,839 crores in September 2022, resources were raised through equity issuances.
- During the month, 22 IPOs raised a total of Rs. 2,414 crores, of which 19 offerings were SME/start-up listings that raised Rs. 289 crores.

Table 1: Investor Category wise Share-Holding in Capital Market

Client Category	Aug 22	Jul 22	Change (%)	Apr22 to Aug 22	Apr 21 to Aug 21	Change
Corporates	4.3	3.6	16.28	3.8	3.6	5.26
Individual investors	39.2	38.2	2.55	37.5	44	-17.33
DII	10.6	12.2	-15.09	10.9	8	26.61
FPI	13.4	14	-4.48	14.3	10.6	25.87
PRO	26.4	26.7	-1.14	27.5	27	1.82
Others	6.1	5.4	11.48	5.8	6.8	-17.24

Source: Market pulse of NSE and www.nseindia.com

Over the past few years, direct retail engagement has significantly gotten stronger. Over the past couple of years, there has been a noticeable increase in retail engagement. Retail investors were drawn into trading in equities markets by a significant market crash that occurred in March 2020 following

the start of the COVID-19 pandemic. A subsequent strong market rebound strengthened these investors' beliefs. After an 11-year absence between 2009 and 2019, retail investors again became net buyers of Indian equities in 2020, substantially boosting their participation over the ensuing 2.5 years. Despite the weak macroeconomic environment and increased market volatility this year, they invested a total of Rs2.85 trillion since the beginning of 2020 in the NSE's capital market segment (secondary market only), of which Rs1.4 trillion and Rs931 billion were invested in 2021 and H1 2022, respectively. After the COVID-19 outbreak, there was an initial surge in retail interest in stocks since they offered greater and possibly simple returns. Over time, this desire steadily changed into a pretty steady level of participation by so-called mature investors.

Figure 3: Retail investors' flows (Rs bn) in secondary markets during FY2021-22 and CY2022

Category	FY 22			CY 22TD		
	Buy	Sell	Net	Buy	Sell	Net
Cash Market	68,225	66,597	1,689	35,964	35,107	857
Equity Derivatives	87,219	86,750	480	65,657	65,501	176
Equity Futures	63,938	63,769	179	42,140	42,243	(82)
Equity Options	23,382	22,981	302	23,537	23,268	259
Currency Derivatives	12,877	12,940	28.00	9,949	9,965	(36)
Currency Futures	12,234	12,846	28	9,870	9,915	(35)
Currency Options	63.2	63.7	(0.6)	59.6	60.7	(1.1)
Interest Rate Derivatives	20.60	20.90	-0.30	9.10	8.30	0.90
Interest Rate Futures	20.6	20.9	(0.3)	9.1	8.3	0.9
Interest Rate Options	0.0	0.0	0.0	0.0	0.0	0.0
Commodity Derivatives	0.20	0.20	0.0	0.10	0.10	0.0
Currency Futures	0.1	0.1	0.0	0.0	0.0	0.0
Currency Options	0.1	0.1	0.0	0.1	0.1	0.0

Source: Market pulse of NSE Sept 2022

Following three years of relatively low involvement, FIIs began to buy Indian shares strongly in FY21, helped by a worldwide risk-on environment and an injection of global money. However, in the second half of FY22, FIIs began to sell heavily. Global risk appetite has been affected over the past few quarters by a number of factors, including ongoing COVID concerns amid the emergence of the second and third waves, escalating inflationary pressures and the ensuing rapid tightening by central banks around the world, China's slowdown, and protracted geopolitical tensions. This caused money to move from riskier asset classes like emerging market equities to safe haven assets like gold and the US dollar. Net withdrawals by FIIs were Rs. 91,625 crores in FY 21–22 and reached a new high of Rs. 64328 crores in FY 22–23 (through September 2022), which led to a decline in FII stake in the NSE listed universe. FIIs, however, have changed their stance and are now purchasers in the current quarter, which has seen net outflows of more than US$8.0 billion thus far (As on September 19th, 2022). This should therefore result in a modest rise in FII holdings.

Table 2: Inflow/Outflow of Funds by FPI/FII (Amount in Crs.)

Month	Equity	Debt	Monthly FPI/FII Net Investments
April-21	-9,659.14	-117.79	-9,776.93
May-21	-2,954.34	-1,706.45	-4,660.79
June-21	17,215.01	-4,828.54	12,386.47
July-21	-11,308.36	-781.55	-12,089.91
August-21	2,082.94	12,144.11	14,227.05
September-21	13,153.69	12,803.50	25,957.19
October-21	-13,549.67	-1,557.74	-15,107.41
November-21	-5,945.10	982.57	-4,962.53
December-21	-19,026.06	-11,798.79	-30,824.85
January-22	-33,303.45	5,194.29	-28,109.16
February-22	-35,591.98	-3,072.99	-38,664.97
March-22	-41,123.14	-5,632.09	-46,755.23
April-22	-17,143.75	-4,438.77	-21,582.52

May-22	-39,993.22	-5,505.55	-45,498.77
June-22	-50,202.81	-1,413.88	-51,616.69
July-22	4,988.79	-2,056.33	2,932.46
August-22	51,204.42	3,844.53	55,048.95
September-22	-7,623.66	4,012.13	-3,611.53

Source: www.nseindia.com/, www.rbi.gov.in

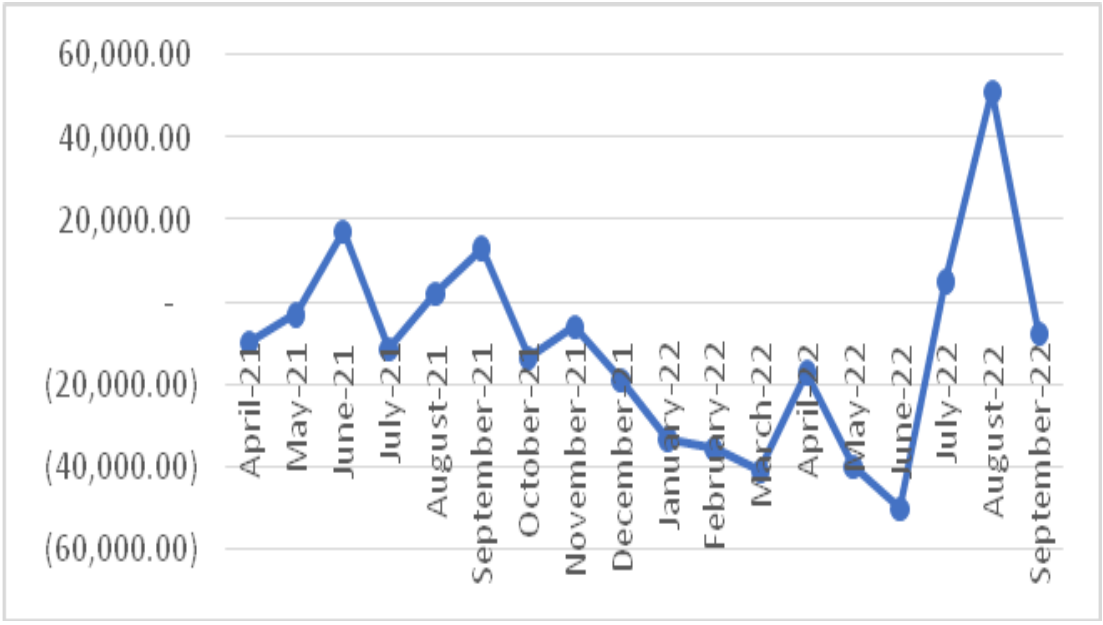

Figure 4: Month Wise details of FPI/FII Net Investments (Equity)

It is observed that Foreign Institutional Investor investors were the net sellers till June 2022, however from July 2022 onwards the investment of foreign funds started flowing in again to Indian Market.

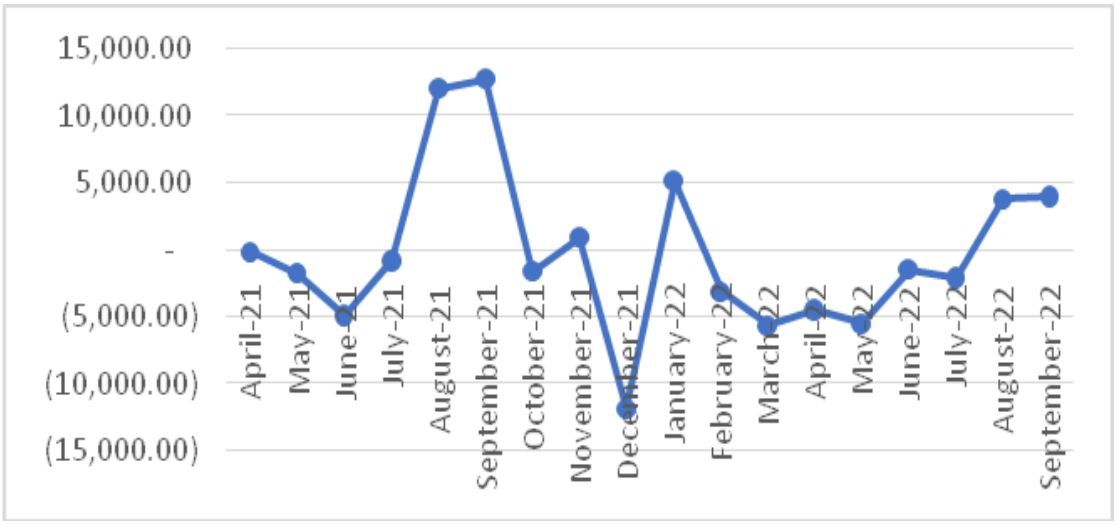

Figure 5: Month wise FPI/FII Net Investments (Debt)

The foreign investment in debt segment started flowing in for the period of June 21 to September 21, however the same remain sluggish on later period. Further, the situation again started looking better since August 2022.

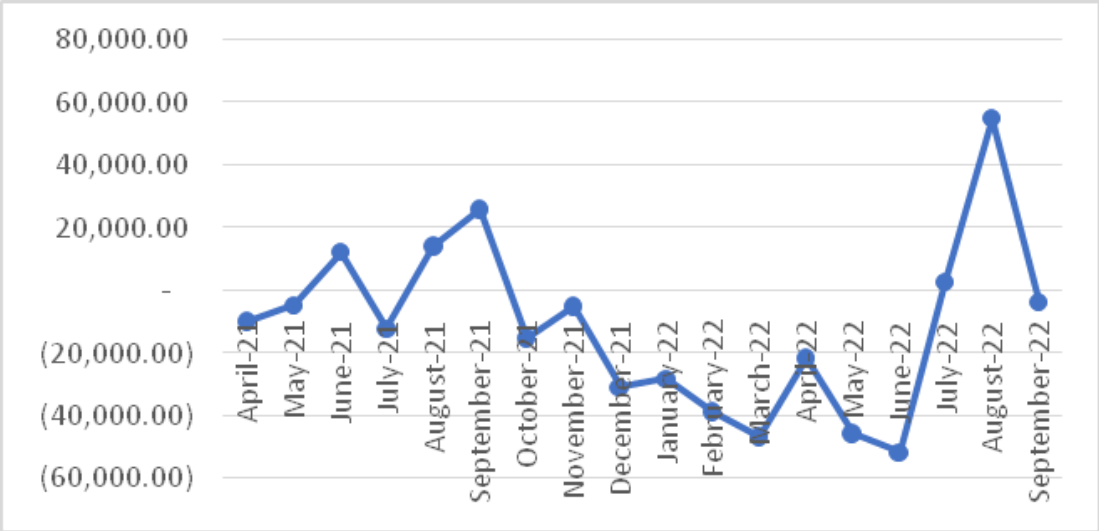

Figure 6: Month wise details of FPI/FII Net Investments (Combined)

Over net investment in foreign funds in Indian Financial market started looking very positive from July 2022 onwards. India might see more inflow in foreign funds in near future considering the growth projection of the country.

Trends in Mutual Funds Investment

Investments in mutual funds have been a major factor in the expansion of the Indian capital market during the past few years. India has the world's fastest-growing economy. It is critical to comprehend how mutual funds contribute significantly to the market's expansion when the nation resumes its growth trajectory. If we look back in time, 1993 was a watershed year for investing in mutual funds. Private players were permitted to engage in the mutual fund sector in India for the first time that year. We haven't looked back since then to see how the industry has developed. Mutual fund growth was slightly different prior to monetization in 2017, however after monetization, retail investors' investments in mutual funds increased several times over. In comparison to fixed income instruments, which have a return cap of 6–8%, mutual funds have a compounding annual growth rate (CAGR) of 16–18% as of 2017.

The mutual fund industry has gone through a big transformation in last 3 years.

- Regulatory body in MF industry like AMFI and SEBI have not only tightened the regulations but also make sure that every investor in the country is aware of the asset class, different schemes, and investment techniques. The same is reflected through the data where retail investors are investing in the MF schemes depending on their goal and understanding the risk and return potential.
- The discipline in form of Systematic investment plan (SIP's) has changed the mindset of the investors and turn them from bank savings investment to SIP investment. This has changed the entire outlook of the MF industry. Now a days retail investors are not looking at redemption at every fall of capital market rather they have adopted a methodology through systematic investment plan to get the cost averaging in their investment.
- An increasing number of investors getting rich every year by investing in mutual funds. Currently the industry is managing around Rs. 37 lacs crore investment under 14 crores accounts.
- Corporate India becomes less reliant on the investment of foreign capital. In last 2 years it has been observed that even though the foreign investors were the net sellers still the investment in mutual fund industry has grown at a staggering rate. This could only be possible due to massive investment in the retail front. MF asset under management in June 2022 has grown by 5.6% on month-on-month basis and stood at Rs. 35.6 lacs crore. The rise of AUM targeting by AMFI to 5 folds growth to Rs. 95 lacs crores and 3 times growth in the number of accounts to 40 crores by 2025.

- Mutual fund industry in Indian market is untapped as well. Only 17% AUM contribution was seen beyond top 30 cities. So, there is a huge untapped opportunity in the country.

Key Figures related to Mutual Fund industry are as follows:

- Average Assets Under Management (AUM) of Indian Mutual Fund Industry for the month of September 2022 stood at ₹ 39,87,990 crore.
- Assets Under Management (AUM) of Indian Mutual Fund Industry as on September 30, 2022 stood at ₹ 38,42,351 crore.
- The AUM of the Indian MF Industry has grown from ₹ 7.20 trillion as on September 30, 2012 to ₹38.42 trillion as on September 30, 2022 more than 5-fold increase in a span of 10 years.
- Over the course of five years, the AUM of the MF Industry increased from 20.40 trillion to 38.42 trillion, or about a 2-fold rise.
- In May 2014, the industry's AUM reached the landmark of ten trillion rupees (ten lakh crores), and in just three years, it had expanded more than twofold, crossing twenty trillion rupees (twenty lakh crores) for the first time in august 2017.
- In November 2020, the AUM size surpassed $30 trillion (30 Lakh Crores) for the first time. On September 30, 2022, the industry AUM was 38.42 trillion rupees.
- As of September 30, 2022, there were 13.81 crores (138.1 million) total accounts (or folios in mutual fund jargon), while there were approximately 11.03 crores folios under equity, hybrid, and solution-oriented schemes, where the majority of investment comes from the retail sector (110.3 million).

Indian mutual fund AUM climbed for the third straight month, rising from Rs 39.5 trillion in August to Rs 39.9 trillion in September, or 1% MoM. With redemptions rising significantly (23% MoM) to Rs. 10.2 trillion in Sep'22, there was a net outflow of Rs 414 billion. Despite a 9% MoM rise in money mobilised, which rose to Rs 9.8 trillion from Rs 9 trillion the month prior, there was a net outflow of this amount. Additionally, monthly SIP inflows surged by a significant 25% YoY/2.2% MoM to Rs 130bn in Sep'22 from Rs 127bn in Aug'22. At the end of September 22, the total number of active SIP accounts reached a record high of 58.4 million.

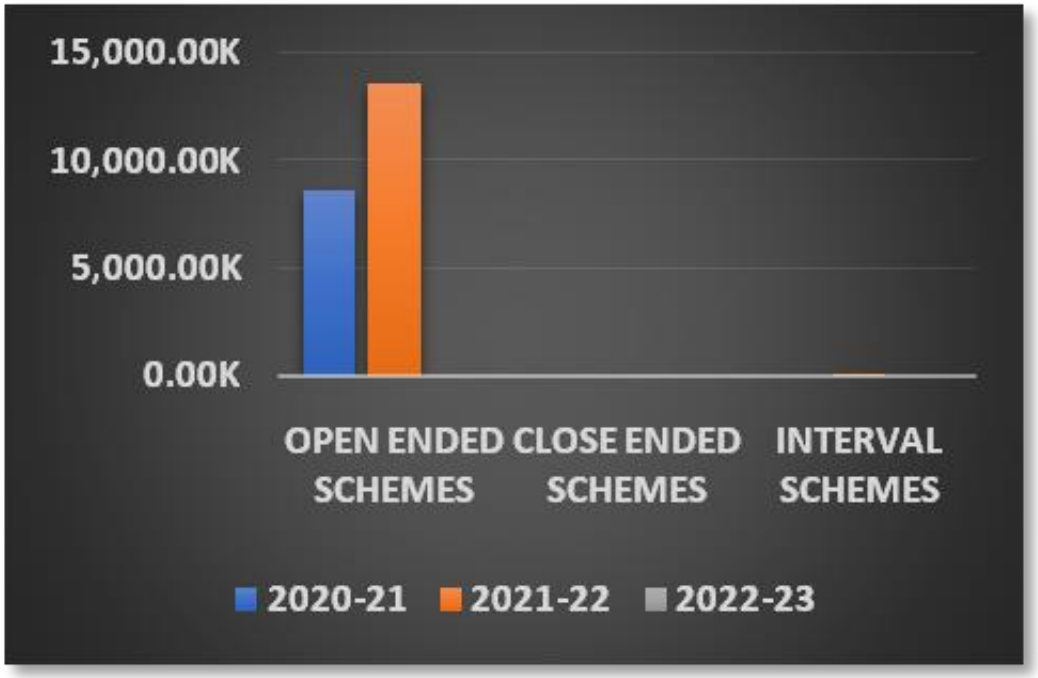

Figure 7: Funds Mobilized for the Period (Repurchase and Redemption)

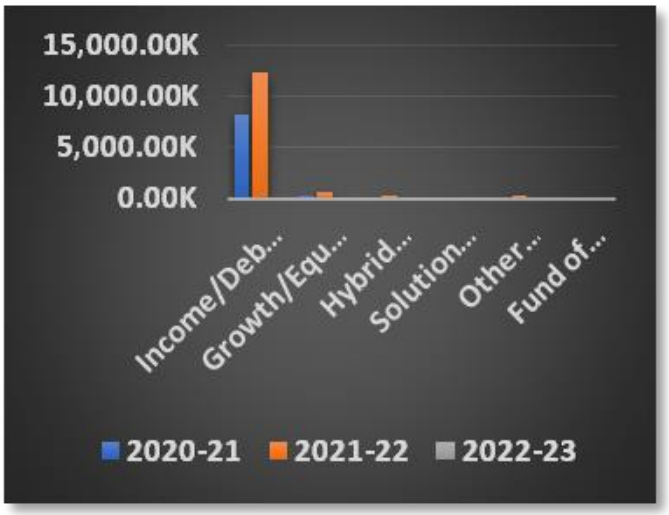

Figure 8: Net Inflow (+ve)/Outflow (-Ve) for the Period

Figure 9: Net Inflow (+ve)/Outflow (-Ve) of Investment Fund wise for the Period

Source: www.amfiindia.com

With the exception of FY20-21, SIPs have been the favoured method for retail investors to invest in equities markets. Inflows into mutual funds via the SIP channel resumed in 2021 after declining in 2020, when retail investors switched from being indirect investors to direct participants in the equities market, with the exception of minor slowing in April and May due to the virulent second wave. Inflows into SIPs increased to an average of Rs123 billion over the first five months of the current fiscal year (April 22 to August 22), up from Rs104 billion on average each month in the previous fiscal year (April 21 to March 22). Following a decline in ownership in 2020, a new surge in SIP inflows has helped mutual funds progressively increase their holdings in Indian equities over the previous six quarters.

Table 3: SIP Contribution Rs. Crores							
	FY 2022-23	**FY 2021-22**	**FY 2020-21**	**FY 2019-20**	**FY 2018-19**	**FY 2017-18**	**FY 2016-17**
April	11,863	8,596	8,376	8,238	6,690	4,269	3,122
May	12,286	8,819	8,123	8,183	7,304	4,584	3,189
June	12,276	9,156	7,917	8,122	7,554	4,744	3,310
July	12,140	9,609	7,831	8,324	7,554	4,947	3,334
August	12,693	9,923	7,792	8,231	7,658	5,206	3,497
September	12,976	10,351	7,788	8,263	7,727	5,516	3,698
October	0.00	10,519	7,800	8,246	7,985	5,621	3,434
November	0.00	11,005	7,302	8,273	7,985	5,893	3,884
December	0.00	11,305	8,418	8,518	8,022	6,222	3,973
January	0.00	11,517	8,023	8,532	8,064	6,644	4,095
February	0.00	11,438	7,528	8,513	8,095	6,425	4,050
March	0.00	12,328	9,182	8,641	8,055	7,119	4,335

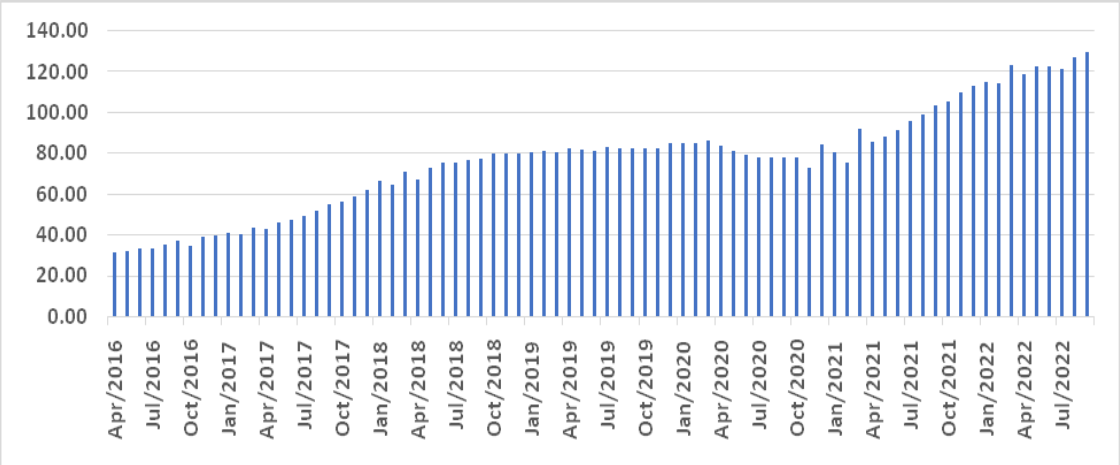

Figure 10: Monthly SIP Flows into Mutual Funds (in Rs. Billion)

Key Observations

- There is a propensity to switch from active funds to passive funds because return has outpaced the performances of active funds. According to the most recent data, the AUM is growing for passive data. The entire industry AUM in 2017 was Rs. 20 lac crores, and the AUM of passive funds was Rs. 5,000 crores. Currently, the industry has a total AUM of Rs. 38 lac crore, of which Rs. 6 lac crore comes from passive funds. Investments that are passive include ETFs, funds on funds, etc. The fact that the cap on foreign investment in active mutual funds has been reached and new foreign investments must now go into the passive side of MF funds is another factor that could explain the rise in the AUM of passive funds.
- In recent years, several high-quality equities have been trading above their fundamental values while still producing respectable returns over time. This is partly due to the fact that the top 50 corporations in India account for 80% of all corporate profits. As a result, despite the fact that these stocks are pricey, MF schemes frequently include them in their portfolio.

- The market always goes through cycles. For a while, some industries are functioning comparatively better than all other industries, however the next cycle may not be as favorable for those industries. For instance, the market had a propensity to favour buying pharmaceutical companies between 2000 and 2003, but very few people were purchasing IT equities at that time. Similar to this, there was a desire to acquire infrastructure and real estate companies from 2007 to 2009, but these equities lost favour after 2010 and 2011. As a result, it is essential to buy stocks while they are low in price. Additionally, mutual fund managers often include international shares in their portfolios to reduce volatility because the stocks of overseas companies are not similarly impacted by Indian macroeconomic factors as those of Indian companies.
- Advisors and distributors have a significant impact on the mutual fund industry's recent expansion. In the last three years, direct investment in MF has not increased much. This is partly due to the fact that during the Covid period, individuals tended to invest directly in stocks rather than choosing to make MF investments. Additionally, the development of inexpensive brokerage services allowed individuals to buy directly in equities at a lower cost. Due to investors' lack of information and confidence, direct MF investment has not increased much. AUM in MF is now 56% owned by individual investors, which is a positive development. However, 80% of those investments are made indirectly through distributors or RTAs. Direct investment in the MF category may increase in the near future due to financial literacy and rising investor confidence among retail investors.

Near term Concern of Indian Financial Market

- **Risk of Global Downgrade:** There is a looming concern that the developed economy like United States and United Kingdom are going into recession. The current situation of Russia and Ukraine war is also impacting the global economy very badly. The supply of crude oil and other minerals have been severely impacted, resulting the increase in cost of living in the European countries. As the winter session in Europe is approaching the cost of crude oil price would make a significant impact in their economy. The current property valuation crisis in China is also not helping the global economy either. The growth has been severely affected due to Covid 19 pandemic and followed by the Russia Ukraine war. Therefore, downside risk would be larger.
- Financial tightening measure by Central bank of India to curb the inflation rate of the country. Due to that the lending rate has gone up significantly which has resulted in increase in cost of capital. As per latest RBI guideline the rate hike might also continue for another 6 quarter till the inflation is completely under control. The corporates are becoming skeptical before making any new investment due to uncertain outlook in near future.
- Another major concern in near term future is the strengthening of US $. Since, India is an import-oriented country where crude oil import is the major contributor of $ outflow in the country. However, due to external demand may get weaker in coming days there may be significant impact on the export of the country. Further, strengthening of $ would make more hard times in the Balance of payment (BOP) of India.

Silver Lining for India

- At the current juncture the growth of India stood at 6.1% which is near to its potential. The growth rate perceived to be quite good considering the growth in China has slowed down and Europe and US are growing at 1% rate. That is why India stands in a bright spot in the world.
- Financial market in India is less susceptible to the inflow/outflow of foreign investment. Thanks to the investment generated by the big institutional domestic investors. Therefore, the investment would continue to be channelized to the financial market through mutual funds and other market related products.
- In India a fair degree of deleverage is possible in corporate balance sheet. The corporates are sitting on cash piles. Currently, the uncertainty is holding them back for investment due to geopolitical global scenarios, tighter financial norms adopted by central bank of India and monitory policies overseas.
- State Government capex budget should also be very important to revive the economy because it adds on the central government capex budget. Currently, 8-9 states have significant capacity to increase the capex budget. Further, the collection efficiency of micro finance loan has gone up significantly to 99% has helped the state government capex budget.

- Lower commodity prices like crude, metals and food prices, higher capacity utilization might help Indian economy to accelerate the growth in near future. India has observed 4th consecutive year of more than expected monsoon which has resulted better than expected growth in Ravi crop. Going forward food inflation may not give us major risk.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 51-53

IMPACT OF CUSTOMER SATISFACTION IN BANKING SECTOR: A STUDY ON PRIVATE AND PUBLIC SECTOR BANKS

Arun Mondal*

ABSTRACT

Customer Satisfaction is the major concern for public and private sector banks to survive in the competitive environment of banking sector. Urban people avail banking facilities more than rural people. The service quality of private banks is better than public banks. The employees of banks should be appropriately trained and they should provide banking services properly to the customers. Rural people are not aware about banking facilities. Highly educated people prefer e-banking more than traditional banking. The number of bank branches in rural areas should be increased. The study is based on primary and secondary data. Primary data has been collected from the customers of public and private sector banks in west Bengal. Secondary data has been collected from journal articles. In this paper, an attempt has been made to find out the impact of customer satisfaction in banking sector.

***KEYWORDS**: Bank, Banking, Customer, Customer Satisfaction.*

Introduction

Customer Satisfaction plays very important role behind Customer retention. Customer Satisfaction is the major concern of banks to survive in the competitive environment of banking sector. Urban customers avail e-banking services more than rural customers. Highly educated people prefer e-banking more than moderately educated people. The employees of private sector banks provide better service than the employees of public sector banks. The employees should be properly trained so that they can provide banking services appropriately to the customers. Rural people are not able to avail banking services properly due to lack of awareness. Banks have very few branches in rural areas. The Public and Private sector banks should increase the number of branches in rural areas. The objective of the study is to analyse the impact of customer satisfaction in public and public sector banks.

Literature Review

Customer satisfaction is very important for banks for various factors such as technological development, customer awareness and global competition (Esmaeilie et al., 2013) Many customers use mobile phones and they can avail mobile banking facilities through mobile phones. Banks must take necessary actions to increase customer awareness about mobile banking (Deshwal, 2015). Banks focus on customer satisfaction as it helps to increase customer loyalty (Suleiman et al., 2012). Customer Satisfaction plays major role behind the retention of customers. The level of customer satisfaction depends on e-banking service quality (Madavan and Vethirajan, 2020). Banks have immense impact on economic activities (Nandini et al., 2021) Literacy is the main problem of rural banking. Involvement of rural people is required in digital transaction in rural banking sector (Das et al.,2017). The nature of banking sector in India is changing very fast (Anita et al., 2018). Rural people such as Labourers, farmers and artisans face problem to avail credit facilities (Ahmed, 2020). Banks deliver financial services to the rural masses. Rural masses avail banking services from rural banks. Many people of villages are not interested to avail banking services due to bank charges (Kuddus et al., 2020). The growth of Indian economy is based on rural development. Regional rural banks play vital role behind the development of rural India (Tigari and Gaganadeepa, 2019). Customer awareness is very important for the improvement of banking sector (Puttaswamy, 2018). Security factor is very important for the development of internet

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banking (Yadav, 2016). Banks are forced to adopt modern technologybased services due to digital revolution in banking sector (Mansuri, 2021). The cost of e-banking is less than branch banking. E-banking deliver better banking services than traditional banking (Hada, 2020). The preference of customers towards e-banking has increased as the customers can avail banking facilities without visiting the branch through e-banking (Peter, 2020). Urban people are more aware about e-banking than rural people. Customers are not aware about e-banking system which creates difficulties for them to avail banking facilities properly (Singhal, 2017). Customer Satisfaction depends on various factors such as cost effectiveness and security. The success of e-banking depends on customer satisfaction in public and private sector banks (Prasad et al., 2019). Rural economy is the prime Factor for the development of Indian economy (Kher, 2013). Regional rural banks play vital role in the economical development of rural areas (Karunakarun, 2020). Regional rural banks assist in the financial development of rural areas (Deb, 2020).

Methodology

The study is based on primary and secondary data. Primary data has been collected from the customers of public and private sector banks in West Bengal. The sample size of the study is one hundred. 60% of the respondents are male and 40% of the respondent are female.

Data Collection and Data Analysis

The employees of private banks provide better customer services than the employees of public banks:

Agree : 72%
Disagree : 28%

72% of respondents agree and 28% of respondents disagree.

The banking facilities of private banks are more technology based than public banks:

Agree : 83%
Disagree : 17%

83% of respondents agree and 17% of respondents disagree.

The security factor of public banks is better than private banks :

Agree : 61%
Disagree : 39%

61% of respondents agree and 39% of respondents disagree.

The infrastructure of private banks is better than public banks:

Agree : 92%
Disagree : 08%

92% of respondents agree and 08% of respondents disagree.

The number of bank branches of both private and public sector banks in rural areas is not adequate.

Agree : 96%
Disagree : 04%

96% of respondents agree and 04% of respondents disagree.

The level of customer satisfaction of private banks is better than public banks:

Agree : 76%
Disagree : 24%

76% of respondents agree and 24% of respondents disagree.

Conclusion

Customer satisfaction plays key role behind the success or failure of banking system. Bank should take necessary steps to increase customer awareness. Banks must take proper steps to increase the banking habits among rural masses. Private banks provide better services than public banks. The infrastructure of private banks are better than public banks. The number of bank branches of both private and public sector banks in rural areas should be increased. The employees of private sector banks provide better banking facilities than public sector banks. Banks adopt modern technology to provide better banking services to the customers. Banks emphasize to increase the level of customer satisfaction to enhance customer loyalty. Customer satisfaction plays important role for customer retention in public and private sector banks.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 54-66

INTEGRATED ECONOMICAL AND ENVIRONMENTAL APPLICATIONS AT NATIONWIDE LEVEL

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ABSTRACT

Worldwide, there is a dedication by Government regulators to sustainable development, yet economic development is constantly on the degrade the organic resources and pollute the surroundings in both city and non-urban places. Current thinking about sustainable development suggests that organizers and development professionals should attempt to integrate community, economic, and environmental measurements, at all preparing stages. The purpose of this document is to analyze environmentally friendly measurements in development plans performed by governments, especially in Arabic countries (West Asia), and to evaluate one of the fifth seasons plans in Oman against the Millennium goal of sustainable development. Findings show that all governments often have typical failings in such as environmentally friendly measurements in development plans. Creating on the typical success aspects and improving on the typical weaknesses is proposed to enhance the incorporation preparing strategy. The Sultan sets 'Five-Year Plans' to take care of community and Economic developments which focus on particular places such as knowledge, wellness, real estate, the economic system, trade & market, farming, emails, youngsters, females passions, details, travel and leisure and atmosphere. Attempts are logically developed and moving to coordinate the nation's specifications.

***KEYWORDS**: Environmental Plans, Economic, Governments, Incorporated Preparing, Parts of Japan, Sustainable Development, National Plans.*

Introduction

"Economic policies" are those developed to impact the development, submission, and intake of products or alternatives. "Environmental policies" are those developed to impact the high quality of organic techniques supporting and conditioning life. To oversimplify, economic policymaking issues government choices pertaining to the framework and functioning of the marketplace, with objectives including full employment and material well-being for all. Environmental policymaking encompasses government choices affecting the high company's surroundings and of individual wellness, with objectives ranging from intangible principles associated with nature's aesthetics to healthful air and nutrient water and sustainable efficiency of soils and renewable resources.

Integration of environmental concerns into economic technique choices requires (i) institutional framework to facilitate such incorporated strategy, (ii) efficient connections between the surroundings and economic technique creators to enable for meaningful technique creating, as well as (iii) efficient technique resources which cause economic actors to integrate environmental aspects into determinants of their economic selection. Institutional techniques, which comprise formal guidelines and specifications, informal standards, and the business framework that describes and enforces the guidelines, are important, and indeed crucial, because they offer government at all stages, government, provincial and regional, with equipment to frame and apply recommendations. The credibility, transparency and predictability of the institutional atmosphere reduces transaction expenses and describes the incentive structures in; the economic system for the appearance of competitive markets. The efficacy of the institutional techniques and the connections between them is dependent to a degree on: (a) the abilities and functions delegated to each company with well-defined tasks; (b) the scope of the projects specified; (c) the resources, both financial and individual, available for executing the tasks; and (d) the degree of dedication and government will exhibit by the leadership.

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To date, development companies have been under attack by environmentalists for ignoring or conveniently overlooking environmental damages of development projects. Explanations for this consist of insufficient institutional dedication to link resource efficiency with economic development, short time period horizons, filter assessment criteria, issues of monetary assessment, and issues with execution of environmental effect research EIAs. There is a need to take projects to adopt fundamental and long-term alternatives. Therefore, incorporation of environmental concerns into the socio- economic development expert plans is a crucial task. It has been noticed that organic resources and environmental aspects have cross-cutting effects. Therefore, organic resources and atmosphere are not issues of any one market but typical issues of many areas and places. Since environmental resources are materials and feedback into many manufacturing and livelihood actions, disputes relating to the employment of such resources often are available in socio-economic expert preparing. It is, therefore, necessary to have an expert way of submission of the use and growth and development of environmental resources to get to know the overall purpose of the whole socio-economic development expert way of achieving effectiveness in all three areas: economic system – community – environment. Master preparing of resource and environmental actions is important because it creates not only economic but also community and environmental principles. Of course, expert preparing of resource and environmental development should emphasize not only on the creation of monetary but also more importantly on community and environmental-ecological principles. It is argued that resource and atmosphere are used in manufacturing and residing actions. Thus when preparing for enhancing each market, one can also technique resource and environmental usage in that market rather than having an individual expert technique on resource and environmental issues. Sectoral expert plans should pay interest to resource and environmental issues in enhancing the market. However, many inter-sectoral, multi-sectoral, multi-purpose resource and environmental issues cannot be taken in the system of any market. Master preparing for resource and environmental development is not synonymous with expert preparing for resource and atmosphere use. Apart from use, resource and environmental preparing also needs to deal with environmental resource efficiency, issues of restoration, regeneration, and creating resources and the surroundings more diversified and sustainable.

As regards expert preparing for resource and atmosphere use, each market cannot solve intersectoral disputes. Such disputes can only reasonably be solved by expert way of resource atmosphere for overall development purpose of the whole community and economic system. Master way of resource and environmental development is an indispensable part of the socio-economic development expert technique of the nation, regions, provinces and districts. Thus, as mentioned previously this has been noticed in the NSEP by asserting "NSEP is a part of the NSDS and a foundation for growth and development of sectoral, regional and regional methods for environmental protection". Due to close linkages between socio-economic development expert technique (SDMP) and resource-environment issues, expert technique of resource and environmental development (MPRE) must be included in the whole expert technique. (See Determine 1)

Literature Review

Governments and development professionals are struggling with a new paradigm. In one century, the globe appears to have gone from a condition of boundless features to one restricted by resource boundaries (Hueting 1980, Catton 1982, Vitousek et al. 1986, Ponting 1990, Postel 1992). The appearance of international and national environmental degradation of an unmatched range has triggered a belief that past development methods and preparing techniques were too filter and short-sighted (Turner 1988, Jacobson 1988, Caldwell 1990, ADB 1994a).

The complicated intertwining of monetary aspects, organic resources, and environmental security is no longer effectively handled by traditional preparing methods. Development organizers and decision-makers are now expected to integrate community, economic, and environmental aspects at all stages of preparing (UNCED 1992). Of course, preparing alone, no matter how incorporated, will not be sufficient for sustainable development to appear. The fruits of incorporated economic and environmental preparing are only likely to be enjoyed in a community, social, and government milieu that is supportive (Parnwell & Bryant 1996).

Over the period of the last decade, it has become clearer that economic, community and environmental aspects must be thoroughly incorporated at all stages of community, to avoid the unintended consequences of unilateral improve any one factor (Costanza 1991, Noorgaard 1988, 1989, Munasinghe & Shearer 1995), and to contribute to sustainable development (Sadler & Verheem 1996,

Partidario 1996, Costanza et al. 1997). Extreme focus on economic development can cause to significant contamination issues, which tend to have greatest effect on poor areas (Lecomber 1975, Daly 1980, Daly & Cobb 1989, Martinez-Alier 1987, 1991). On the other hand, excessive interest to features efficiency at the expense of monetary development may not produce enough earnings to secure organic environments (Goodland et al. 1991, Pearce & Warford 1993).

Planning is performed because a community wishes to impact the lengthy run rather than simply let it appear through the vagaries of the market. Sadler & Verheem (1996) define a technique as a purposeful, ahead looking technique or design, often with coordinated main concerns, options and actions that elaborate and implements technique. Planning includes success stories methods or targets, refining recommendations, establishing minimum specifications, allocating resources and offering resources for actions to achieve the mentioned aims and objectives (O'Riordan & Turner 1983, Ortalono 1984). Implementation includes choices about which programmes or projects should receive scarce resources (Braden & Kolstad 1991).

The Study: Rationale, Objectives and Methodology

Economic and environmental recommendations inevitably overlap. Providing products or alternatives essential to life's sustenance (food, real estate, transportation), acculturation (education, training), and enjoyment (entertainment, recreation) is main to economic technique. Exploiting organic resources--such as soil, nutrient water, forests, fossil and fuels, --is basic to offering these goods; some resources are used consumptively; others can be reused or recycled. As inhabitants and specifications of residing rise, stages of exploitation also tend to rise. This business actions, and individual biological procedures, in turn effect organic techniques and produce waste materials that can impair individual wellness and the surroundings as well as the lengthy run accessibility to productive resources. Thus the connections of monetary and environmental recommendations can be synergistic or-often attracting the most attention-antagonistic. Policy disputes are especially intense when initiatives to foster economic well-being pose threats to wellness and environmental quality--and, conversely, when specifications to abate contamination impose expenses on businesses that endanger their viability. At existing, development methods in the Arabic place are heavily focused on fostering economic growth, using the personal market as the primary vehicles for challenge the related economic actions. Such focus often does not pay due interest to the detrimental environmental effects of the modalities used to apply the technique. Increasingly, the need to secure the fragile atmosphere, and thus make economic development sustainable in the full sense of the phrase, is receiving the interest of technique creators. Ways of balance environmental issues with the promotion of monetary growth are becoming a significant aspect of government recommendations and plans, although those methods are restricted by a combination of aspects.

The overall purpose of this document is to integrate socio-economic and environmental issues in the decision-making procedure with a wide range of community contribution. The existing research addresses three objectives. The first purpose is growth and development of incorporated and participatory methods for sustainable development at the national stage. The second is development and use of particular policy-making resources and equipment that help to integrate atmosphere and improve decision-making, such as environmental effect assessment and signs. The third is to conduct a national review of monetary, sectoral and environmental recommendations, methods and intends to ensure the progressive incorporation of environmental and developmental issues.

Historical Perspective

The incorporation of monetary and environmental preparing has a lengthy history, possibly starting with the French sociologist Le Play (Le Play 1877), who recognized the need to integrate "folk-work-place" or in modern parlance "communities-economic activities-ecosystems". In the delayed nineteenth century, Geddes (1915) saw similar ingredients of "ecosystem-function-organism" and coined the phrase "valley section" to encapsulate this integrative classification, later encompassed by the phrase "human ecology". Mumford (1938) prolonged the non-urban individual environment research by pointing out that cities are an extension of the countryside. McHarg (1969) applied the ideas of Geddes (1915) and Mumford (1938, 1968) to design ecological areas in suburban USA, using methods that anticipated enhancing computerized Geographic Information Systems. The modern environmental consciousness in popular preparing actions dates from a string of environmental mishaps in the Sixties highlighted by mercury poisoning in Minamata, Japan, the pesticide revelations of Carson's (1962) "Silent Spring", the Torrey Canyon oil spill and others. These mishaps captured the imagination and issue of the community through vigorous media interest (Goudie 1990, Brenton 1994).

Previous environmental mishaps, such as the Dust Bowl of the 1930s, had created similar outpourings of issue, but environmentally friendly issues of the 60s and 70s did not fade as quickly as past environmental issues had done (Downs 1972, Stone 1987, Gardner & Stern 1996). The institutional response to such crises predictably led governments to set up new companies, such as the US Environment Protection Agency and Authorities on Environmental Quality (Caldwell 1982), but also spawned new preparing resources and methods, most notably environmental effect assessment (EIA) (ERL 1988, Sadler 1994).

However, throughout the nineteen seventies and 1980's, the effects of several environmental mishaps demonstrated that contemporary preparing methods and the new environmental organizations (even armed with their new resources and techniques) were incapable of properly defending the surroundings.

Planning for Maintainable Development

Since the 1970's, a growing expectation has been that preparing should recognize the linkages between human-made and organic capital and integrate community, social, government, economic and environmental issues (Slocombe 1993, Serageldin & Steer 1994). The Stockholm Meeting on the Human Environment in 1972 known as for extensive preparing to integrate environmental issues (Bartelmus 1986, Nicholson 1987).

In 1980, the U. S. Nations Environment Program (UNEP), the Worldwide Union for the Preservation of Nature (IUCN), and World Wild animals Fund (WWF) launched the World Preservation Strategy (IUCN 1980), linking residing resource efficiency and sustainable development. This was followed by the U. S. Nations (UN) Common Assembly adoption of a World Charter for Nature in 1982.

The World Percentage on Environment and Development (WCED) (1987) concluded that sustainable technique paths require the ecological size of way to be regarded simultaneously as economic and other measurements. Consequently, the U. S. Nations Meeting on Environment and Development (UNCED) at Rio de Janeiro in 1992 created Plan 21, which known as for national sustainable development methods to be developed which would integrate community and economic development with the surroundings. Plan 21 and earlier methods did not recommend methods for generating incorporated plans (UNCED 1992), but believed that durability would be built into current preparing procedures. As exposed by the 1987 Brundtland Commission's review, Our Common Upcoming, these excellent environmental methods and plans were hardly ever connected to economic development plans, were never effectively funded, had little government support, and hardly affected significant facilities or organic resource development plans (Carew-Reid et al. 1994).

National Plans in Arabic Region

National Initiatives

In 1999, only five Arabic countries had national sustainable development methods NSDS. By 1992, nine Arabic countries have involved in national sustainable development (SD) preparing exercises; namely The red sea, The air Jordan, Kuwait, The other agents, Oman Syria, Egypt, U. s. Arabic Emirates UAE & Yemen. Lebanon & the Palestinian procedure by completing environmental baseline research and methods that served as the basis for SD preparing. By 2003, most of the Arabic countries have involved in some stage of SD preparing or planning.

Conceptual Framework of SD in the Arabic Region

Environmental management thinking in the Arabic Region has undergone significant modification over the last three decades. Much of these parallels the international reorientation of environmental objectives & ideas.

- **Evolution of SD Ideas at the Nationwide Level**

  Environmental ideas in most Arabic Countries have evolved into three distinctive phases:

  - Support for sanitary engineering, cities and community wellness (1920s – 1960s);
  - Shift from community and environmental wellness to environmental management (1970s – mind. 1980s); and
  - Gradual move from environmental management towards SD (mid 90's to present). This modification can be witnessed at the national as well as the regional stages.

- **Challenges & Constraints**

  Most national environmental companies in the place suffer from:
  - Their relatively latest company and/or restructuring;
  - Power politics (which sideline environmental organizations relative to economic and community ministries);
  - Limited institutional require (little or no legislative, management or certification authorities);
  - Advisory potential (limits enactment & Implementation);
  - Limited potential to earn money (including from certification fees or other economic instruments); and
  - Overlapping institutional jurisdictions (which cause to technique disputes, system replication & inefficiency).
  - Political Constellation
  - Limited budgets

- **Planning for SD in the Arabic Region**

Most Arabic countries have started or finished the task of making a national environmental technique NES and/or national environmental technique NEAP; however, enhancement in formulating an umbrella NSDS or Nationwide Agenda-21 remains obscure. This is because arrangements for NES & NEAP were (conceptually) regarded as sufficient substitute for NSDS ingredients. This misconception has in a few cases led to national methods & activity plans focusing on environmental management, rather than on SD. However, on the positive side, most of the NES and NEAP, particularly in the ESCWA Region, were ready using the participatory bottom-up strategy with the participation of most stakeholders & appropriate areas such as the national socio-economic development areas. Great strides have been taken in the Arabic place over past times two decades in the development and building up of environmental companies and regulation. Initiatives to secure the surroundings at the national stage have depended mainly on command and management techniques, particularly regulation. The main avenues for the execution of environmental technique in the place have been national companies co-coordinating environmental management and enforcing guidelines (e.g., Ministries, Common Directorates and the Environment Protection Local authorities or Secretariats) and the establishing of specifications and standards through regulation. Recent socio-economic changes have also brought technique changes that had environmental effects. Unprecedented city and commercial improve the place, particularly in the Gulf Declares, has led to enhanced demand for organic resources and prices of spend creation (both household and industrial). Moreover, structural adjustment programs have led the governments of some countries in the place to suspend many government-supported actions, such as environmental preparing. In inclusion, the hostilities in the place over the last two decades have caused popular migrations towards marginal place and rivers. This, along with the deficiency of sufficient spend disposal and/or treatment, has also posed a serious threat to the surroundings and individual wellness in the place.

Environmental Institutions

All countries of the place now have environmental companies or ministries in position, with many countries having updated these companies in past times. (See Figure 1.) In some countries the newly recognized or updated companies were given higher government standing. At the moment four countries have ministers for atmosphere in their cabinets, namely Oman (Ministry of Regional Municipalities and Environment), the air Jordan (Ministry of Public and Rural Matters and Environment), Bahrain (Ministry of Housing, Municipalities and Environment), and Syria (Minister of State for the Environment heading the Common Percentage for Environmental Affairs). Of these countries, Oman was the first to set up a Ministry for Environment and Water twenty six decades ago. This Ministry, along with the Authorities for Preservation of the Environment and Protection of Pollution were then merged into a new Secretary of condition for Regional Municipalities and Environment in 1991. The Syrian Government developed a Secretary of condition for State for Environmental Matters to act as the advisory body for coordinating environmental issues between the Ministries, establishing environmental specifications, carrying out environmental research, tracking contamination, and developing environmental recommendations. Most other countries of the place have also recognized environmental companies, although not necessarily at Cabinet stages. Common Directorates for atmosphere or similar government techniques were recognized in Iraq, the U. S. Arabic Emirates, and Yemen. Environmental Protection Local authorities have been replaced by Environmental Authorities at the Common Directorate stage in Bahrain and Kuwait.

The U. S. Arabic Emirates issued a government law in 1993 creating the Federal Environment Agency, which is the first country-wide company with legal abilities to secure and maintain your surroundings (UNEP, 1995). Lately, the Western Economical Company and Gaza Power also recognized a main company for environmental management and presented regulation for resource security.

In Lebanon, the Secretary of condition for Environment was recognized in 1993. Saudi Arabic recognized the Meteorology and Environmental Protection Administration (MEPA) by Royal Decree almost 30 years ago. MEPA is now the main company accountable for atmosphere at the national stage. Saudi Arabic has also recognized environmental sections in other appropriate ministries, namely, in the Secretary of condition for Agriculture and Water, the Secretary of condition for Petroleum and Mineral Resources, the Secretary of condition for Municipalities and Rural Matters, the Secretary of condition for Industry and Electricity, and the Secretary of condition for Health. Some countries in the place have also developed individual techniques to deal with particular environmental areas (for example, the national committees and commissions for wildlife efficiency and improve Saudi Arabic, Bahrain, Oman, The air Jordan, Kuwait, and Syria).

Despite the improve variety of new companies, however, programs, guidelines, and companies have often been developed haphazardly and are generally sectoral. In most countries, different companies are accountable for farming, nutrient water, fisheries, nutrient resources, development, individual settlements, market, transport, and travel and leisure.

Recent recognition of the inter-sectoral features of many environmental issues has led to many Government regulators developing cross-cutting technique companies. These commonly take the form of inter-ministerial or interdepartmental committees, and national environmental methods developed with sectoral divisions.

Only a few Government regulators, however, have developed high-level, cross-cutting techniques under the direct management of the Head of Government (in Oman, for instance) or a senior reverend (ESCWA, 1996). Due to this weakness in business framework, as well as shortcomings of the consultative machinery, there has been a deficiency of national incorporated environmental technique in some countries. Furthermore, environmental divisions almost everywhere have restricted staff and costs in relation to the requirements created on them. There is therefore a deficiency of resources for implementing agreed technique or management of law (ESCWA, 1996).

Environmental Legislation

The countries in Arabic place have approved several guidelines working with the surroundings. In Kuwait, as early as 1964, the first law was approved to secure navigable nutrient water from oil contamination. Articles 15, 16, and 21 of the constitution of Kuwait were subsequently revised in 1976 and in 1980 to integrate environmental security ideas and to set up techniques to enforce the execution of environmental guidelines.

Despite the often-fragmented features of business responsibilities for the surroundings, regulation in the place has been fairly cross-sectoral and all-encompassing since the 1980's. These guidelines, sometimes known as framework guidelines, have helped countries reorder fragmented techniques to environmental management.

Framework guidelines in the place include:

- The Decree for Establishment of the Environmental Protection Panel in Bahrain (1980);
- Iraq's Environment Protection and Improvement Act (1986);
- The Law Protecting the Environment in Kuwait (1980);
- The Decree Creating the Authorities for Protection of Environment and Pollution Control (1979) and the Act for Environment Protection and Pollution Control in Oman (1979, revised 1985);
- Saudi Arabia's Environmental Protection Standards (1982); and
- The Decree Concerning Establishment of the Supreme Panel for Environment and Its Mandate in the U. S. Arabic Emirates (1981).

Latest attempts at harmonization of environmental regulation and companies have also taken position. For example, the Jordanian Parliament ratified a green law in 1995 establishing an individual Common Organization for Environment Protection. Yemen has elaborated and ratified environmental guidelines and recognized national or individual regulators for environmental security. Lately, the

Palestinian Power recognized a main company for environmental management and presented regulation for resource security. Lebanon has also reviewed all current environmental regulation. A legal atmosphere program code and a law for the security of organic sites and monuments were developed. Moreover, a green effect assessment decree and procedural recommendations have been ready. All these guidelines have been discussed in national discussions.

The management of current guidelines is critical for the security of the area's atmosphere. Many states have imposed new types of liability or enhanced penalties for environmental offences to be able to secure better environmental high quality. In Bahrain, for example, any person in prison for causing oil contamination in the marine atmosphere or of dumping in territorial rich waters waste materials from ships or land-based resources is liable to huge fines. Violators are also accountable for the cleanup of the contaminated place within a particular time (UNEP, 1995).

Although most countries of the place have sufficient regulation, there remains a need for modification, amendment, and the release of new regulation. Norms, specifications, and tracking are generally insufficient, and most countries and the place require support to rectify the problem and put into position efficient management techniques (UNEP, 1995).

Environmental Action Applications

Arab countries have created substantial initiatives at the national stage to integrate environmental measurements into their development schemes and methods. While prior to the 90's these plans simply concentrated on development methods, some countries now integrate environmental recommendations and resource management ideas. However, while most countries have developed methods and activity plans, they continue to absence sufficient resources for their execution.

In Jordan's five-year development way of 1986-90, the surroundings appeared for initially as an individual market. Moreover, in 1996 a Nationwide Environment Action Plan was formulated for the Kingdom. Oman also has an extensive environmental preparing and management system that ensures that development takes into account environmental issues. With desertification being a significant issue in the place, countries have responded by launching national activity intends to fight desertification. Their primary elements consist of assessment of desertification and enhanced place management, community corrective actions against droughts and their effects, institutional arrangements for building the potential of personnel, and international co-operation. The Nationwide Action Prepare for Combating Desertification in Bahrain, for example, emphasizes appropriate place management practices, nutrient water management actions, building up of technological innovation, and international activity and co-operation.

Similarly, because nutrient water issues are a significant issue, several national activity plans have been started and applied. For example, in Oman, the Government has started several regional actions to preserve and secure rivers from contamination and to improve attention of such pressing environmental issues as the scarcity of rivers and the importance of defending bio-diversity. In Kuwait, a nutrient water high quality tracking system was recognized in 1986 in similar with an air high quality tracking system. Sea nutrient water high quality tracking sites have been recognized in the seaside places, especially around desalination plants. A monthly tracking system of drinking-water high quality is applied in accordance with World Health Organization (WHO) drinking-water tracking recommendations. The countries of the East Mediterranean place, such as Lebanon and Syria, have started to elaborate incorporated seaside management programs and regional environmental assessment projects, in line with environmental assessment projects and main concerns in their specific countries.

Syria has started the planning of background documents on environmentally friendly situation at all seven national river basins to be used to gather a sustainable development technique and to create appropriate activity plans required to respond to the identified needs and main concerns. The documents are being ready through an entertaining participatory strategy involving various governments, academic, and research companies, as well as regional regulators and groups. The environmental effects of commercial, agricultural, and household actions, as well as socio-economic issues, are assessed in these documents.

To help fight the pressures on the area's bio-diversity, particularly due to habitat destruction, some countries of the place have started to set up secured places. Protected places now complete over 24 million hectares, some 6 per cent of the complete place of the Western Asia place (ESCWA/FAO, 1995). (See Desk 2.)

Economic and Economical Instruments

Various economic equipment is also in use in the place to help enhance sustainable development. In Bahrain, Oman, UAE, and Kuwait, for example, soft loans are available for introducing water-saving watering methods (e.g., drip irrigation) to relieve some of the pressure on groundwater resources. Some countries have also applied programs to advertise intensive secured farming (e.g., greenhouses) to be able to help enhance nutrient water efficiency.

Instruments using the polluter pays principle also are available in the place. In Syria, for example, a municipal service function levy has been presented for household and personal companies with regard to the selection of strong waste materials. These prices differ according to quantities of spend created and collected. In Lebanon, arrangements are underway to introduce economic resources, such as taxation and incentives, for air contamination management. These resources will be incorporated within the technique and regulation for air contamination.

Public Participation and Capacity Creating

A growing variety of non-governmental companies (NGOs) are found in most countries of the place. However, their role in preparing and execution needs to be strengthened. Moreover, there is a need for potential building to improve the participation of NGOs as well as other companies and the personal market in environmentally friendly policy-making and activity cycle. Although in most countries projects for potential building are in position, these need to be turned into reality (UNEP, 1996). The U. S. Nations Development Program (UNDP) has started various programs in the place for environmental management that are more specifically addressing potential building issues in the perspective of UNDP's Capacity 21 initiatives. The UNDP Regional Bureau for Arabic Declares has assisted in the initiation of projects funded by the Global Environment Facility, with strong potential building components in the places of bio-diversity, climate change, and international rich waters.

Environmental technological innovation exchange is still at a restricted stage in the place. Some projects, however, are in existence. One initiative is to circulate successful illustrations of environmental technologies by the Authorities of Arabic Ministers Accountable for Environment (CAMRE). Adequate technological innovation exchange should be regarded in similar with enhancing enhanced capabilities and recruiting.

A latest research of tertiary-level environmental coaching companies in the Arabic place revealed that more than 35 university research and coaching companies are involved in environmental coaching programs. Collectively, these companies teach more than 290 regular undergraduate and graduate student atmosphere programs as well as offering coaching programs and seminars. Graduate research of environmental issues is available at 12 colleges in the place. Courses on atmosphere have also been incorporated into the teaching programs of schools in most countries of the place (UNEP/ ROWA, 1994).

Environmental Information

There is a standard deficiency of details and details on the surroundings in Arabic place. Where details are available in the place, there is a deficiency of continuity and cohesion in environmentally friendly tracking and reporting. Much of the details created are also under-utilized (UNEP, 1996).

At the national stage, some countries have ready condition of the surroundings reviews (SOE) or environmental profiles of some form. Kuwait, for example, has finished four SOE-type reviews (1984, 1986, 1988, and 1992) (Environment Protection Authorities, 1992). Most of the countries of the place have not regularly published such reviews.

Specific environmental reviews working with certain environmental issues are also available in some countries. For example, reviews on desertification and plans of activity to fight desertification have been ready in Oman, Bahrain, and UAE, The air Jordan, Syria and Yemen. These reviews also consist of some details on the condition of atmosphere in the specific countries.

Another prevalent problem in the place is that environmental details are scattered among several community and private-sector companies, with little or no collaboration or co-ordination. As a result, there are gaps and replication in details and the countries of the place need to gather and standardize their details (Olivier and Tell, 1995). There is also little social networking and incorporation of details for environmental assessment, except occasionally at the sectoral stage, such as for nutrient water. Initiatives for enhancing details for troubleshooting and social networking have been performed in

Syria and Lebanon, largely due to UNDP's Maintainable Development Network and Capacity 21 Projects. Nevertheless, efficient atmosphere details networks for the distribution of details nationally and regionally still need to be put in position in much of the place (Olivier and Tell, 1995).

Table 1: Governmental Environment Institutions and Agencies in Arabic Place (West Asia)

Territory	Policy Institutions	Executive Agency
Bahrain	Environment Protection Commission	Ministry of Housing, Municipalities and Environment
Iraq	National Council for the Protection and Improvement of Environment	Ministry of Health
Jordan	Council of Ministers; Ministry of Municipalities Rural Affairs and Environment	General Corporation for Environmental Protection
Kuwait	Environmental Protection Council	Various Ministries
Lebanon	Ministry of Environment	Various Ministries
Oman	Council of Ministers	Ministry of Provisional Municipalities and Environment
Qatar	Council of Ministers (Permanent Commission for Environmental Protection)	Ministry of Municipalities and Agriculture
Saudi Arabia	Ministerial Committee on Environment	Meteorology and Environmental Protection Administration
Syrian Arab Republic	Minister of State for Environmental Affairs	General Authority for Environmental Affairs
United Arab Emirates	Council of the Federation	Federal Environmental Agency
West Bank & Gaza Strip	Council of Ministers	Ministry of Agriculture
Yemen	Council of Ministers	Environmental Protection Council

Source: Complied and provided by the ESCWA Secretariat. 1996. Depending on national resources.

Table 2: Nationwide Parks and Protected Areas in the Arabic Region (West Asia)

Territory	Area (Square Kilometers)	Total Protected Area (Hectares)	Percentage of Area Under Protection
Bahrain	691	1325	1.92
Iraq	434924	541	-
Jordan	83750	119829	1.43
Kuwait	24280	30000	1.24
Lebanon	10452	4512	0.43
Oman	212379	2836900	13.36
Qatar	10360	100	0.01
Saudi Arabia	2144969	21210740	9.89
Syrian Arab Republic	185680	103240	0.56
United Arab Emirates	86449	14650	0.17
West Bank & Gaza Strip	10161	-	-
Yemen	485273	-	-
Total	**3,689,368**	**24,321,837**	**6.59**

Source: ESCWA/FAQ.1995

All Arabic countries signed the Millennium Declaration and dedicated themselves to meet the Millennium Development Goals (MDGs) by 2015. They also participated in the planning of national MDG reviews (MDGRs), publishing 18 reviews by May 2005. The Arabic place faces many particular difficulties regarding the achievement of the MDGs. Often development recommendations are not a priority for Arabic states since they are overshadowed by the complicated government dynamics of the place. Arabic countries have been involved with national liberation plans and regional anti- neocolonial recommendations for decades, while marginalizing the need for national development plans centered on regional needs and main concerns. Arabic leaders and decision-makers have not regarded that building up democratic procedures and sustainable development recommendations at a regional stage might enhance and support sovereignty at regional and international stages. The Arabic place has great

resources which are meant to fuel development. However regional and national disputes have rendered these resources useless. In this perspective, and as the Palestinian-Israeli conflict and the occupation of Iraq carries on, most Arabic states are stagnating or deteriorating, with a controlled and weak civil community, low individual development, and declining socioeconomic styles.

The environmental methods and plans were hardly ever connected to economic development plans, were never effectively funded, had little government support and hardly affected significant facilities or organic resource development plans. Until today, there is little proof that this incorporation has occurred in either popular development preparing or environmental preparing. Economical organizers and ecologists continued to work in individual worlds until very recently.

In the Arabic place, considerable interest has been paid in the delayed 1980's to environmental preparing as a stand-alone activity, especially in the planning of Nationwide Environmental Management Applications prior to the 1992 Earth Peak. Less interest has been paid to execution of these plans and environmentally friendly issues they were intended to address have not gone away. Therefore, while it is encouraging to observe that the notion of incorporated economic and environmental preparing is still on the Arabic agenda, the challenge of actualizing the ideas remains.

There appears to be a missing link in the nested hierarchy of sustainable development plans in Arabic place (see Determine 1), which may be one reason why good intentions at the international, regional, and national stages are not being translated into sustainable development the regional stage. In 1987, there was no consensus on how this incorporation should be performed. As a significant outcome of the U. S. Nations Meeting on Environment and Development (UNCED) at Rio de Janeiro in 1992, Plan 21, which was endorsed by more than 150 countries, known as for national sustainable development methods to be developed that would integrate community and economic development with the surroundings. Plan 21 did not recommend methods of generating such plans, but believed that, in most countries, durability would be built into current preparing procedures. However, there is little proof that this incorporation is occurring in either popular development preparing or environmental preparing. In the case of Arabic place there is deterioration in most countries as have been characterized by environmentally friendly efficiency measurement venture which produces a periodically updated Environmental Sustainability Catalog (ESI). The ESI position countries according to diverse set of socioeconomic, environmental, and institutional signs that characterize and impact environmental durability at the national range. Out of 16 Arabic countries only 5 countries show improve environmental efficiency (see table 3).

In Arabic place, organic resources- place, nutrient water and air- are being degraded at alarming prices in many countries. And environmental aspects such as outdoor and indoor air contamination, waterborne diseases, and exposure to toxic endanger the wellness of many people.

Table 3: Ranks of Arabic Countries According to Environmental Sustainability Index (ESI) 2002 and 2005

Country Name	ESI Rank 2005	ESI Rank 2002	Remarks
Tunisia	55	61	**Up 6 steps**
Oman	83	110	**Up 35 steps**
Jordan	84	53	Down 31 steps
Algeria	96	70	Down 26 steps
Morocco	105	72	Down 33 steps
United Arab Emirates	110	79	**Up 31 steps**
Egypt	115	74	Down 41 steps
Syria	117	107	Down 0 steps
Mauritania	124	-	-
Libya	125	124	Down 2 steps
Lebanon	129	106	Down 23 steps
Saudi Arabia	136	138	**Up 2 steps**
Yemen	137	-	-
Kuwait	138	142	**Up 4 steps**
Sudan	140	103	Down 37 steps
Iraq	143	139	Down 4 steps

Source: Yale and Colombia Universities 2005

Sultanate of Oman

The Sultan sets 'Five-Year Plans' to take care of community and Economic developments which focus on particular places such as knowledge, wellness, real estate, the economic system, trade & market, farming, emails, youngsters, females passions, details, travel and leisure and atmosphere. Attempts are logically developed and moving to coordinate the nation's specifications. Oman shares the international community's issue for the surroundings. Government officials joined the Earth Peak in Rio de Janeiro, Brazil, in 1992 and the Johannesburg summit on sustainable improve Sept 2002. A technique has been drawn up to apply summit resolutions on a national range.

Oman's economic technique is centered on a series of five-year plans that set objectives for all government areas. Efforts were drafted by Oman's Development Authorities, later renamed the Secretary of condition for Nationwide Economy. Economical preparing requirements joint feedback from government and non-government techniques and the Secretary of condition for Nationwide Economy draws up the five-year development plans, after consulting other regulators. By 1995, Oman had finished four five-year plans. Arrived to pause, drawing on experience to produce a new vision of Oman's economic future. Oman 2020 outlines the Sultanate's development over twenty-five decades to 2020. It responds to changes on the globe economic system, and to the way that the revolution in telecommunications and details has transformed international manufacturing and alternatives. The government is dedicated to defending the surroundings from contamination from commercial and development projects, particularly contamination of groundwater, surface nutrient water and air by exploration. An investigation by the Japanese Worldwide Co-operation Agency (JICA) was performed in 2001 to look at exploration places in Sohar with a view to identifying the risk of contamination, and all parties later joined a workshop to analyze alternatives for its prevention.

Research on family earnings and expenses was finished in May 2002. The venture was prolonged to create a database for organizers, choice creators and scientists, offering up-to-date and precise details about residing specifications. Extending the study enhanced the variety of family members involved in the study, enabling scientists to draw a more precise picture of residing specifications in particular geographical places. The details will be less affected by the fluctuations that can take position in the economic system during a single season.

The research seeks to calculate how changes in earnings determine spending on products or alternatives. It will recognize demand for products or alternatives, estimate future specifications for household products and imports, and recognize inhabitant’s submission by earnings and expenses categories. It will analyze how family members spend surplus earnings or cope with a deficit between earnings and expenses, and recognize the earning power of unofficial labor. The research gathered details from a random sample of family members over three decades. The first stage protected 4,160 Omani and non-Omani family members. Phase two protected 2,080 family members a season over two decades.

This aimed to obtain statistical details on nutrient water intake, disposing of household strong spend, air contamination, chemical detergents in spend nutrient water, insecticides used in the home and other household environmental matters. So the outcome of these plans is giving and advance to Oman ahead 37 actions according to ESI comparing between 2002 and 2005 (see table 4). This is because Oman is taking care of integrating environmental issues in economic plans at national stage.

Conclusion and Recommendations

Better synchronization, connections, and details distribution about NSDS, NES and NEAP ingredients and execution can only benefit the sustainable development procedure. However, despite the evident benefits, there is restricted attention of the status of sustainable improve the place and the deficiency of easy access to the methods and activity plans of different countries. There is also a need to enhance synchronization of recommendations and programmers on a regional basis. The procedure of materializing sustainable development should not be a lonely one. Indeed, enhancement is best achieved through cooperative projects and entertaining dialogues between the demanders and suppliers of sustainable development technical and educational funding.

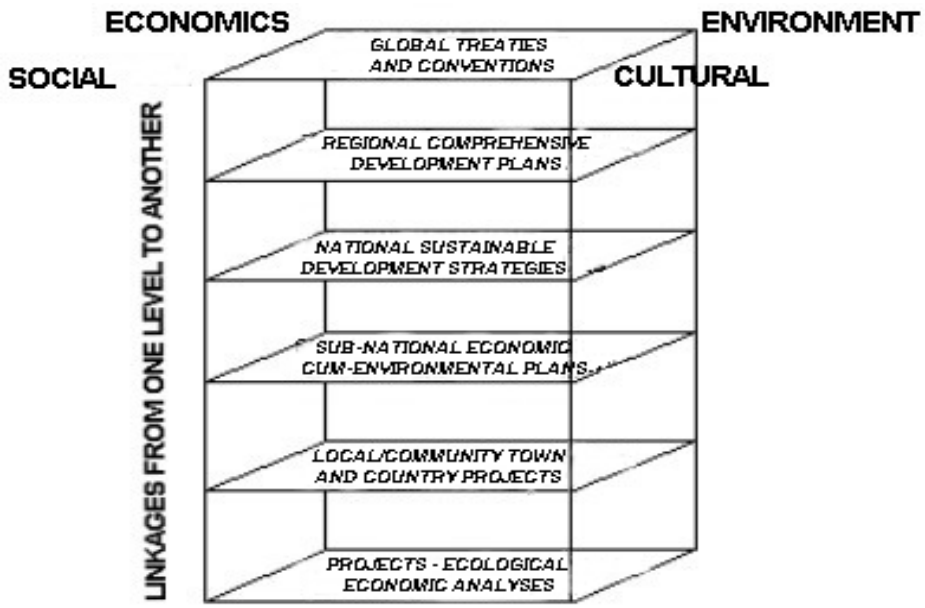
There is no uniform preparing strategy that would integrate economic and environmental issues at all stages from international to projects. However, there are some typical components, such as (I) the need for enhanced stakeholders contribution in the preparing procedure, (II) the concept of life expectancy or sunset clauses to be presented, so that dated plans trigger an appropriate stage of

modification, (iii) the question of affordability, with no technique begin regarded as complete unless this question is effectively addressed, (iv) the need to offer explicit linkages between upper and lower preparing stages, (v) the need to articulate the expenses and benefits of execution in a simple manner, to win the minds and hearts of the community and choice creators, (vi) the need to realistically assess the absorptive potential of companies charged with execution of plans and to offer potential building support as part of the technique, (vii) more robust details and models to back up incorporation of monetary and environmental measurements, and (viii) enhanced specificity in establishing objectives of the technique, possibly using a Logical Framework matrix.

This document proposes a variety of actions to be carried out at the national stage and by regional and international companies that could support the procedure of developing national sustainable development methods. Among these, interest was given in particular to challenge the following, as appropriate:

- Country reviews of current national methods to determine whether or not they could be revised to conform to the ideas and features of national sustainable development strategies;
- Revision of current methods or planning of new NSDS, as appropriate, and company of the requisite institutional framework;
- Organizing meetings between representatives from countries with mature NSDS and those from countries that are just beginning the procedure.
- Comparative research of nation experiences with intergenerational funds;
- Compilation and comparison of illustrations of NSDS from places with am focus on elaboration of the components that make them responsive to national needs and characteristics;
- Preparation of modular manuals for countries to guide them through the procedure of preparing NSDS;
- Preparation of a regional extensive research on both details accessibility and the activity required for potential building in the place of details creation and selection, details high quality and enhancing signs for sustainable development.
- Increased allocation of national resources to create national details for sustainable development, with support from regional and international companies, as appropriate.

Figure 1: A Hierarchical Framework for Analyzing Integrated E-C-E Planning



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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 67-73

RAJASTHAN COOPERATIVE DAIRY FEDERATION: AN OVERVIEW

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ABSTRACT

The dairy industry plays a vital role in the economy of the state of Rajasthan. As such, there is a need to understand the requirements of the milk suppliers at the grassroots level. Several initiatives have already been taken by the government and non-government organisations at various levels so as to increase their reliance on and competency in the system. The Rajasthan dairy industry is characterised by the seasonal patterns in milk production and milk consumption; these variations are due to the rhythmic forces which operate in a regular and periodic manner.

***KEYWORDS**: Dairy Industry, Milk Suppliers, Non-Government Organisations, Rhythmic Forces.*

Introduction

Functions and Management of RCDF

Its main functions are as follows:

- To organise milk producers cooperatives (Societies and the union by sending spearhead teams in the new areas.
- Overall coordination and execution of the dairy projects with assistance from the National Dairy Development Board (NDDB)
- To prepare proposals for obtaining finance from the participating banks for setting up of dairy plants and feed plants.
- To act as a sole procurement agent for goods and services for the dairy projects.
- Construction of dairy plants, chilling plants and feed mills.
- To provide the milk union with marketing services including the market study to determine product mix capability of the dairy plants to be under the dairy projects.
- To develop and operate a bull breeding farm to provide good quality jersey and Holstein bulls to member unions.
- To coordinate the development of dairy operations and livestock production in the project areas.
- To strengthen the women participation in dairying.

Functions of the Unions

The milk unions in the state are working under the overall control of the RCDF. Every milk union has to meet the following obligations.

- To manufacture and market all its products as directed by the federation.
- To adhere to the manufacturing programme decided by the federation.

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- To manufacture dairy products as per the quality and standards fixed by the federation.
- To procure raw material and packing material as may be directed by the federation
- To manufacture dairy products under brand name and trademark as directed by the federation
- To undertake cattle, feed and fodder development programmes including organisation of technical inputs as directed by the federation.

Number of the functionaries have been established to perform the above mentioned functions at union and federation levels. The desired office at the union level has been located in the four unions viz., Ajmer, Alwar, Jaipur and Bhilwara. All these unions are under a project assisted by the International Development Association (World Bank).

Functional Channels of Cooperatives

In this way, the state of Rajasthan has an integrated structure of functional cooperatives to implement all dairy development projects and to work for an overall growth of dairy sector, This system works through four channels

- Milk channel.
- Technical input supply channel.
- Payment channel
- Extension, supervision, traning and supporting service channel.

Flow of these channel, is presented in maintenance of an undistributed flow in these channels and improvement of their efficiency and a responsibility of the different functionaries working at the union and federation level.

Functional Pattern and Performance

There are some very basic elements of the anand model of milk cooperatives, success of this model lies in these in built characteristics. Therefore extent of replication of this pattern and performance of the milk cooperatives. Should be judged on the basis of their evolution or non-compliance-

- Fair price to the farmer
- High quality milk and milk products to consumers
- Cash payment for milk to producers every morning and evening.
- Testing quality of milk (Fat and S.N.F.) in each supply regularly
- First aid service for animals by secretary of D.C.S.
- Weekly visits by mobile veterinary units equipped with medicines and velerinary surgeon.
- Emergency veterinary services round the clock
- A.Isevices at the society level.
- Maintenance of individual pass books and accounts in ledger for milk supply and payment made to farmers.
- Federation should be owned by milk unions
- Milk unions should be owned by milk societies
- Only actual milk producers who regularly supply milk to societies should bemember of milk producers cooperative societies.
- Regular checking and supervision of societies by village extension worker dairy supervisors and assistant project officers.
- Election of executives, societies and Board of Directors of the union year
- Countinuous and concurrent audit (quarterly)
- Sale of milk and ghee by the society to local consumers.
- Professional management every
- Supply of all technical inputs to the farmers at the society level at no-profit - no-loss basis
- Extension of education and proper training to village level functionaries
- Profits made by unions and federation should be shared by individual member of primary societies.

Formation of Societies (DCS)

Milk societies are organised by the farmer's organisation wing in the milk union. It conducts a potential survey in the prospective area after an initial survey. Its potential for establishing a viable dairy cooperatives society (DCS). Then an extension worker is stationed in the concerned village who after initial extension work, starts collection of milk and makes its payment. This is called collection centre and farmers are motivated to join the proposed cooperative society. When a desirable number of milk producers get ready to join the DCS a meeting of the village community is called and a resolution is adopted to form a cooperative society. On the recommendation of the milk union, the society is registered under the Rajasthan Cooperative Act 1965. Only milk producers can become a member of a cooperative society. To conduct routine work of the society a secertary has been appointed. His selection is generally made with the consent of the members. The secretary gets the training at the union training centre. After training the secretary takes over the responsibility of running the society from the extension workers. Through milk union contributes a share capital to the society in the form of necessary equipment for handling and testing of milk.

The history of the dairy cooperative societies is the history of dairy development in Rajasthan. In 1972-73 there were 32 registered dairy cooperative societies (DCS) in the state. The number rose to 3,477 in 1985-86. The milk collection centres were 20 in 1973-74 and increased to 558, in 1985-86.In 1994- 95 there were 4,764 registered DCS the number rose to 5896 and 8285 in 2004-05 respectively.

A farmer who regularly supplies milk for 180 days can be registered as a permanent member of the society. Another condition for getting registration as a permanent of dairy union is to supply 300 litres of milk annually to the dairy society.

Number of Registered DCS

In Rajasthan 4 milk unions were registered in 1972-73, which increased to 12 in 1981-82 year and 16 milk unions in 1985-86. During the year 1972-73, 32 DCS were registered and out of which 27 DCS were working. In the year 1995-96, 4931 DCS were registered and 2967 were functioning with incentives provided by the NDDB. In 2001-2002 year 6306 DCS have registered out of which 4174 DCS were effectively working.

There were 4764 registered societies in Rajasthan in the year 1996. The number of dairy cooperative societies has gone up to 8385 in the state during 2004- 05. Out of it the highest 1183 were in Bhilwara Milk Union, while lowest 166 were in Churu Milk Union.

Number of Milk Pourer to Dcs

The number of milk pourer societies was 2757 in the state in 1994-95. This strength of the pourer societies has reached up to 3949, 6585 during the year 2000- 2001 and 2004-2005 respectively.

- **Number of Registered Members of DCS**

The total registered membership of DCS is increasing constantly. There were 3,62,780 registered DCS member in the state during 1994-95. It has gone up to 5,55,758 during 2004-05. Out of the total strength of the state, highest number 94,755 were registered in Jaipur Milk Union and the lowest 5,820 in Sikar Milk Union

SC/ST Membership

The total membership of DCS in 2004-05 the S.C. (Schedule Caste) members were maximum in Alwar, Jaipur, Bhilwara and Bikaner and minimum in Sikar, Banswara, Churu and Udaipur unions. With regards to S.T. (Schedule Tribe) members of DCS it is found that they were maximum in Alwar, Jaipur, Kota, Banswara and Udaipur unions in descending order. Their minimum membership in the ascending order was reported in Bikaner, Churu, Sikar, Sriganganagar and Jodhpur unions. The significant number of SC/ST members of DCS is due to the incentives given by the state to the SC/ST population in the dairy development, thereby escalating the per capita income of the down trodden section of the society through selling milk. The incentives like loans for purchasing animals, medicals facilties to animals, availability of fodder and feeds at concessional rates etc. are incorporated in the various programme launched by the state. The SC/ST beneficiaries play an important role in this area.

Milk Production

The highest milk production is in Jaipur district 749 thousand tonnes, followed by Alwar 545 thousand tonnes, Bharatpur 377, Bikaner 371, Sriganganagar 374, Sikar 335 thousand tones and the lowest production is 81 thousand tonnes in Jaisalmer district. It is important to note that Bikaner district

produces the maximum the maximum 281 thousand tonnes of cow milk followed Sriganganagar (177), Barmer (147) and Jodhpur (139) whereas Karoli is the lowest producer (11 thousand tonnes). The production of buffalo milk is maximum 559 thousand tonnes in Jaipur district, 337 in Bharatpur, 263 in Hanumangarh, 224 in Sikar and the mimimum 8 thousand tonnes in Jaisalmer district.

It has been calculated by the data that out of the total milk production cow milk sows 27.2%, buffalo milk 62.03% and only 10.95% of goat milk. In milk, Jaipur district is at first with 74 thousand tonnes followed by Jodhpur (72), Chomu (59), Sirohi (58), Nagaur (53) and Barmer (60).

Milk Procurement

Rajasthan has topped in the average milk procurement during 2001-2002 among north Indian states. This activity has registered a growth of 13% and 25% in the year 2000-01 and 2001-02 years respectively. It has significantly improved the viability of majority of the unions. The trend in procurement has shown remarkable increase. The average milk procurement gone up from 1248 thousand kg per day in 2002-03 from 1104 thousand kg per day registering an impressive growth of 13 per cent this growth is the second highest increase in milk procurement in the country. In the year 2003-04 the state withnessed one of the severest drought resulting in reduction in average milk procurement.

During the current year situation has drastically changed for the better. In the state milk procurement in September, 2004 touched an ever high level of 1665 thous.kg per day breaking all previous records.

Milk procurement in the state was 37,305 tonnes during July 2005. This accounted for a 4.33 per cent rise from June 2005. Highest quantity of milk was procured by Jaipur district at 11,800 tonnes. Bhilwara and Ganganagar procured 4,416 tonnes and 3757 tonnes respectively. Sales of milk in the state stood at 32.95 million litres. Jaipur sold the highest quantity of milk at 14.06 million litres. Alwar sold the highest quantity of milk outside the state at 4,728 tonnes followed by Ganganagar at 2,648 tonnes. The milk sold by Alwar was higher by 8.02 percent from June 2005. The average price of milk in the state was Rs. 11.47 per litre.

The unionwise analysis reveals that during 2004-05 year maximum procurement was in Jaipur (467.9 TKGPD) Bhilwara (165.8 TKGPD) Ajmer (109.3 TKGPD) Alwar (108.9 TKGPD) Bikaner (94.9 TKGPD) Sriganganagar (121.9 TKGPD) Unions while the minimum was procured in Banswara (10.3 TKGPD) Bharatpur(14.9 TKGPD), Churu (22.6 TKGPD), Tonk (25.5),unions. The remaining unions are Jodhpur (92.1 TKGPD), Pali (63.5 TKGPD), Udaipur (59.5 TKGPD), Kota (45.8 TKGPD), Jalore (33.6 TKGPD), Sikar (30.6 TKGPD), Tonk (25.5 TKGPD).

Unionwise milk procurement during last three years of 2002-03, 2003-04 and 2004-05 is comparatively reveals that due to the awakening and taking interests in livestock rearing which provides in employment and is a main occupation in rural areas in arid and semi-arid districts. Hence milk production was increasing. A remarkable increase was being noticed in that the quantity of average milk procurement after the year 2002-03 except 2003-04 due to awakening and motivation of the producers. During past three years average milk procurement which was sharing highest in Jaipur (339.8 TKGPD) in 2002-03 and increased (467.9

TKGPD) in year 2004-05. (Table 4.1). These unions are continuously in progress from 2002-03. But due to the migrating tendency of animals in search of grazing during summer milk procurement not takes place at higher level. Banswara, Bharatpur, Churu unions sharing very low level in milk yielding, while the drought conditions were dominating. Sikar, Tonk, Jalore union were also sharing very low level in milk yield during the year of 2002-03 to 2004-05.

- **Milk Supply**

The milk is supplied to DCS by members and non-members, the number of milk supplier is increasing in the state, There were 1,30,673 milk pouring mumbers in the whole state in 1994-95. It has gone up to 2,87,932 milk pouring members by 2004-05.

It is interesting to note that milk is also supplied by non-members to DCS. It is due to he attraction of people towards the dairy section. It is also important note that the strength of the non-supplier is increasing in the region.

- **Milk Collection Centre**

It is interesting to note that the number of milk collection centres is increasing year after year since the year 1994-95, there were 684 milk collection centre in 1994-95 which have increased by 3178

in 2000-01. Out of the total milk collection centre highest number 585 was in Bikaner Milk Union and lowest 47 in Tonk Milk Union. The number of milk collection centres has gone up to 4810 in Rajasthan during 2004-05. Out of it the highest 962 were in Sriganganagar Milk Union while lowest 23 were in Pali Milk Union. It is very important to note that the average milk collection remains high during winters particularly during December to April whereas it remains very low during summer in state.

- **Pricing of Milk**

The payment to the milk producers is made on the basis of fat and SNF content. The milk unions are collecting cow and buffalo milks separately. The price of milk ranges was between Rs. 8.40 to Rs. 11.20 per kg.

- **Payment Made to Milk Producers**

The amount paid to milk producers is constantly rising. The amount of payment made to the milk producers has increased from Rs. 6250 lakh during 1994-95 to Rs. 55,925 lakh in 2004-05. The highest payment of Rs 20,105 lakh has been made in Jaipur Milk Union during 2004-05 while the lowest Rs. 607 Lakh in Bharatpur Milk Union. The total payment made to milk producers by the unions was 62.59 crore in 1994-95 has increased by 224.51 crore in 1998-99, 429.95 crore in 2003-04 and 559.27 crore in 2004.05. The total payment made by the milk unions increased 10.53 times between 1994-95 and 2004-05.

- **Transport Cost of Milk**

Transportation cost of milk is affected by distance from dairy plant, nature of route, mode of transportation, number of DCS, quantity of milk, rates of fuel and frequency of a vehicle from milk society to dairy plant or chilling centre. The transportation cost was 47 paisa per litre in the state during 1994-95 has increased by 50 paisa during 2004-05. It is also important to know that maximum transport cost was 93 paisa per litre in Banswara Milk Union and minimum 29 Paisa per litre in Jaipur Milk Union.

Dairy Plants and Chilling Centres

There are 14 dairy plants in the state. The Jaipur diary plant was established in June 1981, is highest with the capacity of 300 TKGPD while Banswara and Churu are lowest with a capacity of 30 TKGPD. Other dairy plant capacity according to ascending order is Tonk (40 TKGPD), Jalore (50 TKGPD), Kota (50 TKGPD), Pali 60 (TKGPD), Udaipur (60 TKGPD), Ajmer (100 TKGPD), Sriganganagar (100 TKGPD), Jodhpur (100 TKGPD), Alwar (150 TKGPD), Bhilwara (150 TKGPD), Bikaner (150 TKGPD). In some of the dairy plant will manufactures milk product like butter, ghee, cream, panner, milk poweder, etc.

Some chilling have also been established in the state these chilling centre supply milk to dairy plants after chilling it. The major chilling centre in Lunkaransar (Bikaner), Dausa, Barmer, Bilara, Bajju, Nokha, Balotra in Barmer district.

Disposal Method of Milk

The major part of milk collected is sold as fluid to Delhi and urban centres of the state. About 70% of the poured milk is sent Delhi and in local markets. The disposal of milk in the state according to preference is as follows.

- Supply of milk to Delhi
- Local sale
- Conversion into milk products

Milk Supply to National Milk Grid (NMG)

The milk procurement during September, 2002 touched a level of 16.29 lakh kg. In this year NDDB has agreed to aceeptadditonal two lakh litres of milk per day at Mother Dairy New Delhi and additional 1.5. lakh kg at their Pilkhua plant for conversion into milk products to be bought by them up to Dec 2002. Avearge milk supplies to NMG were at an avearge level of 5.05 lakh kg per day in year 2002-2003 gone up from a level of 4.25 lakh kg. per day in the year 2002-03. Average milk supplies to NMG decline in the milk procurment due to severe drought conditions all over state in the year 2003-04. In this year supplies to NMG were 3.60 lakh kg per day but it is again increased 5.58 lakh kg per day in the year 2004-05.

Local Supply

The local sale of milk is increasing due to population pressure in urban areas. The local demand of milk is fulfilled by middlemen, local famers, vendors. It was observed that the highest during May to August due to more demand of milk and milk product owing to numerous ceremonies and social functions, whereas it remains the lowest from January to March. The highest local sale of milk 383,000 LPD is in Jaipur Milk Union while lowest local sale of milk 1000 LPD is in Churu milk Union during 2004-05.

Conversion into Milk Products

Classification of milk products:

- **Condensed Products:** Khoa,Barfi, Gulabgamun, Peda, Kalakand etc.
- **Cultured Products:** Dahi, Makkhan., Chhachh. Lassi, Shrikhand etc,
- **Acid Precipitated Products:** Paneer, chhanna. Sandesh, PantooaRasgulla etc.

Milk Products

During the flush period quatity of milk increased and rates decreased in market. Hence, a significant amount of surplus milk has been converted into various products. The dairy industry has made efforts to convert milk into ghee paneer (cheese), butter, SMP, WMP, chhachh, lassi, shri khand and various other products. During the year 1990-91 ghee production was 1877 M.T., SMP 1581 M.T., WMP 239 M.T., butter 68 M.T. which increased with the demand of urban consumers, tendency of consuming of various milk products. Hence the product of ghee was 11577 M.T., SMP 2448 M.T., W.M.P. 103 M.T. and butter 946 M.T. during the year 2004-05. The dairy industry manufacture butter, ghee, skimmed milk powder and paneer in the state of Rajasthan. Butter is manufactured from the pasteurized cream. It is a source of fat soluble vitamins A and D. Butter has not other preservative except salt normally 2 percent and has 80 percent fat. Butter is manufactured with most modern equipments and techniques which ensures freshness of flavour and nutritional value of butter.

- **Ghee**

It is manufactured from the hygine butter. It is free from germs becauses the latest techniques of manufacturing. The quality of such ghee is better then that available in the market. It has the freshness of flavour and nutritional content.

- **Skimmed Milk Powder**

It is manufactured after making the pasteurized milk fatlen. Liquid Skimmed milk is prepared from the fatless skimmed milk powder which is very useful in dieting. It increases the flavour of tea and coffee and is the best in preparing the sweets.

- **Paneer**

It is also manufactured and is very popular in the market. It is rich in proteins, fat and calcium.

Saras School Parlour Scheme

- **Saras Milk for School Children**

The Rajasthan Cooperative Dairy Federation launched a ‘Saras School Parlour Scheme’ to promote milk and milk products like curd butter milk and flavoured milk among school children. The federation will make its saras milk products available to school children at cheaper rates. The intention is to make children in their eating and drinking habits and to keep them away from the unhealthy food. This is an effort to bring children closer to Indian food traditions. Saras products will be promoted in all schools so that the ill effects of junk food and fast food would not be on children.

Conclusion

In state milk cooperative movement has established an institutional structure in three-tier milk coopeartives successfully. The aim of the dairy development is to implement integrated programme for increasing the production of milk in rural areas through coopeartive development programme by adopting the ‘Anand Pattern’ which also includes aimed at health improvement, cross breeding, improvement of cattle quality, the development of facilities for milk collection, processing and marketing. It is also analysed that the organised dairying made a remarkable achivements in milk collection, milk production, procurement, processing and disposal.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 74-78

PHYSICAL SETTING: GENERAL CHARACTERISTICS OF THE STUDY AREA

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ABSTRACT

Before 1987, Shahpura tehsil was a sub-tehsil of Jaipur. In 1987 status of tehsil was accorded to Shahpura by the Government of Rajasthan. Now Shahpura is one of the prominent tehsil among the sixteen tehsils of Jaipur district. Shahpura tehsil is now reflecting symptoms of fast development. It has now become the web of a transportation system. The evolution of transportation networks are inevitably accentuating economic development. It has created various growth facilities. These nodes have began to influence the nature and form of subsequent development of land use patterns, quality of life and social changes.

***KEYWORDS**: Transportation System, Accentuating Economic Development, Evolution of Transportation.*

Introduction

Location

Shahpura tehsil is located from 27°12'30" to 27°30'30"N latitudes and 75°43'30" to 76°00'45"E longitudes. Total longitudes. Total area of the tehsil is 535.83 sq.km. In In 1981, the population of the area was 1,30,357. There are 74 villages in this this tehsil, one of them is uninhabited. Its boundary touches parts of Sikar district in in the west and Virat Nagar in the east, Chomu in the south-west and Jamwa Ramgarh tehsils in the south.

The study area is located north-east of Jaipur. It is a semi-desert area located in amidst the Aravali hill range. The Delhi-Jaipur National Highway No. 8 crosses in the middle part of this area.

Relief

Relief map shows the network of water features and the position and elevations etc. Shahpura tehsil is traversed by the National Highway No. 8 and seems to be a part of the saucer shaped depression of the Sabi valley. The discontinuous hill ranges of Aravallies form the western rim of this depression. The eastern continuity of these hills is comparatively lower than that of the western side. The heights vary from 500m to 900m.

It is drained by river Sabi and its tributaries. Sand clays and sand stones at the outflow and had been severely eroded by surface channels, with the result this saucer-shaped depression has been carved out and water from all sides come to this area.

Shahpur tehsila enjoys a combination of two diversed terrains like water depression and hills. Both are separated by 480M contour. The water depression exhibits a comparatively level topography and is formed of sand deposits. It gradually rises westward upto the height of more than 500 M, where it

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merges with Manoharpur, Devipura and also Saiwar hills. Due to the flat water depression, water logging is reported during the rains. This condition further aggravates below the contour of 440 M or there about. The water from Sabi forms out the original shallow channel during heavy downpours. The western crestline of the hills generally tend towards north and north-east. The continuity of the range is broken by small non-perennial streams which separate them from each other and also have curved out the total environs. The surface of the hilly tract is rugged in nature with nature with the elevation varying from the 500 to 800 M.

Small seasonal rivers descend from all sides but the area ultimately slopes from south-west to This slope determines the amount of rain water that enters the sub-soil to feed the underground water table every year. It also influences watering of the land. Apart from the general slope, as mentioned above, the land form and texture of the drainage also are responsible for the local slope-orders. The observations in the field shows correspondence between agriculture and level land.

In the low-lying area of river Sabi, the relative relief is negligible and contours appear to be absent. This accounts for the highest percentage of land under cultivation. On the other hand the western rim lands and area doffed with conical hillocks and sand dunes are the regions of higher slope orders, having the lowest percentage of land under cultivation

Drainage

The study of the drainage pattern constitutes an important feature of the ecological expression, because it is one of the main architects of the ecology. Drainage as a chief agent of land erosion and is the medium of nutrient transfer. The drainage map of Shahpura tehsil environs reveals that there are four primary water divides which demarcate the limits of catchment of different rivers.

- Sabi River Basin
- Inland Nala Basin
- Madhobini Nala Basin
- Ravine Basins

Sabi River Basin

The Sabi forms the northern limit of the Shahpura tehsil geographical area. The catchment area of this river occupies about 241 km^2 or 33.8 per cent of the total area. The Sabi appears on the northern border and flows west to east. After its confluence with Ada Nala, it takes north-east course along the feet of Bhadura hills. Many other streams having their source within the western rim of the geographical area joins the Sabi as feeders.

Inland Nala Basin

Bounded by Sabi in the north and Madhobini in the south, there lies another inland Nala Basin. It stretches over about 218 km^2 or 30.7 per cent of the total area. This reflects changes in the fluvial conditions of the Shahpura tehsil environs. It appears that the present course, as shown in the figure 1.3 is a shrunken remant of some former tributary of River Sabi. This change may be attributed either to the flood stages of River Sabi during the rainy season or to the movement of sand dunes that might have closed down the water channel in summer. The river seems to be of extensive width at a time. As of today the river course is filled up with sand dunes and it is incapable in eroding the sand dunes. This must have caused the shrinking of river banks. Grazing, mass movement, stem incision and gullying on the sand spilt must also have reactivated dunes, SO that transgressive dune, sheets spilt into the channels, and increased the stream load. This must have transformed the habit of the river from meandering to braided with the position of the main channel having been closed completely.

Madhobini Nadi Basin

The total area of the basin comes to about 125 km 125 km^2 or about 17.5 per cent. It covers the southern part of the area. This Nala, with its source in the western rim takes an almost south-east course. It is an independent water channel and rather forms the southern limit of the environs. Numerous sub-Nalas which emerge only during the rainy season, cling to the main Nala from both the sides alongwith their sub-tributaries. Karia is the Nala most important tributary. It originates from Surana Hills and after flowing towards south, it meets Madhobini Nadi. It is non-perennial and quite insignificant.

Ravine Basins

With the exception of these three main waters divides the area is travered by umerous small non-perennial rivulets having their own tributary divides. They branch off from the main divides or hillock and determine the catchment areas of respective streamlets. This must have happened because of the deforestation in the originally wooded land scape. Unwise land clearance on artical slopes has taken place in recent years causing serious gullying and sand drifts. drifts. This gullying may largely be considered to have resulted from particularly wet yars when large areas were sown to grains following several years of drought or below average rainfall. About 125 km^2 or 17.5 per cent of the total area is under gullies and ravines. These lands are not suited for agriculture. Soil conservation measures have not so far been taken nor suitable practices have been taken to control gully erosion.

The distribution of drainage lines in the area is comparatively poor. These natural drainage lines are sometimes inadequate to carry out the amount of rainwater. In between the Sabi in the north and Madhobini in the south, there lies an area of detached hillocks. Such hillocks accelerate the process of soil erosion with the result that numerous ravines have developed.

Dense drainage lines can also be marked along the western rim where the area is again well drained, of course with numerous non-perennial streams. They account for fine fine and rapid drainage textures. Another patch of well drained area lies along the Madhobini Nadi. The area lying in the lower Sabi basin represents poor drainage texture which causes water-logging during the rainy season. In the extreme north there lies another area of ill drained texture.

Geology

Shahpura tehsil has established stratigraphic sequence and fault planes within the broad structural framework. Such geological formations found in Shahpura tehsil are broadly divided into three groups:

- Ajabgarh group of the Delhi Super group
- Asammitic rocks of Alwar group
- Formation of water depressions with alluvium.

Ajabgarh Group

Quartzite and mica schists of Ajabgarh group are both prominent and persistent. These units are exposed between Shahpura in the north upto Harwara in the south. Calc-gnesis lie over the Ajabgarh quartzite. It is exposed in the west of Manoharpur along Madhobini river bed. The out crops exposed to the south of Madhobini river were earlier placed under Alwar series by Herson.

- **Alwar Group**

The environs of the urban centre is famous for the prammitic and calcareous prammoelitic metasediments. Besides the metasedimentarious post Delhi Delhi granite, pegmatite and amphibolite sills are also found. The Alwar group is highly fateated and is of light-yellow colour with occasional dull grey patches. These rock types extend from the south of Piplod upto the extreme north of Shahpura.

- **Quartz Veins**

These veins are mainly distributed along the northern side of Ajitgarh-Triveni fault plane.The veins also run within the sericitic quartzite association with of the Alwar group. They are found in the basic sills. These appear to be fresh and milky white in nature. At places they show clusters of Kyanite blades along the discrete fracture planes. Quartz veins are used as glass sands.

- **Faults**

There are many faults in the area. Amongst them Ajitgarh- Triveni faults is the most important. It extends upto north of Manoharpur. Conjugate sets are also found in Bishangarh-Mamtori- Manoharpur area. It trends NE-SW and NW-SE in Khori-Bidra areas, The metasediments display beautiful folds on different orientations. Besides the above sets of folds few rootless reclined to in Khori-Bidara area. The steeply inclined folds are also noticed deformation history of these folds still remain uncertain.

Formation of Water Depressions with Alluvium

Water depressions have been formed by the accumulation of sandy loam deposits since time immemorial. The thickness of the sand deposits increases as one goes away from the hills. The height of the basin gradually rises upto 460 m towards west. The porosity of the rocks allows water to go deeper and deeper causing lower ground water table.

The sandy loam though not very fertile has given rise to an agricultural landscape. It is a huge storage of fresh and sweat water, stored in the in the more porous and coarser strata beneath the level of saturation which can easily be made available by means of wells.

Climate

Climate is an important natural resource which may be tapped, modified, or ignored by the society. It affects human efficiency, activities and their economic status. But the scientifically and technologically advanced societies are are trying to forecast the availability of various components of climatic resources. These resources determine the natural plant species and biological organisms. Every area possesses its own unique topographic and climatic pattern.

The rainfall in Shahpura tehsil is extremely seasonal and more than 90 per cent of it falls during the monsoon period, which is also a season of high evaporation. The commencement of rain and its close up are uncertain. In general, therefore, droughts are the rule but the floods are few and far between. It causes different types of hardships to the local peasants.

The climatic data reveals that this area is characterise by a hot summer, scanty rainfall, a winter season and general dryness of the air except in brief monsoon season.

Temperature

The most widely investigated feature of climatic modification is the air temperature. It affects the magnitude of man's energy energy exchange. The diurnal range of temperature use to differ between 31.1°C to 4.9°C in the month of February, whereas it remains 43.3°C to 23.1°C in the month of June. The period from March to June is one of continuous increase in temperature. May and June are the hotest months. In May and June the highest rise in is recorded 40.43°C as monthly temperature 38.53°C respectively. The night temperature in June is higher than May. In the summer season, scorching heat and dust raising winds add to the discomfort. But during the influence of cyclonic storms from westerlies the sky becomes cloudy and the humidity increased. With the result that diurnal temperature range is reduced. During the winter frost can even occur in the morning. The mean monthly maximum and minimum temperatures reach to 21.84°C 7.62°C respectively in the month of January.

Pressure Conditions and Wind

During the summer, Shahpura tehsil falls under the impact of the trough of low pressure. The low pressure touches its extreme in the month of June and July. The winter condition starts from November and continues upto January when atmospheric conditions are shown by 971, 972 and 973 mbs respectively. In spring and autumn the pressure conditions range between 960 mb and 970 mb. The wind direction in general is from NW to SW in the month of July, from NE to SW in August and from SW to NE in September.

Relative Humidity

The mean relative humidity at Shahpura tehsil in April is 25 percent which rises to 54 percent in June and 73 percent in July. Thus in general the relative humidity remains high during the rainy months. It amounts to 80 percent and 63 percent in August and September respectively. The strong, hot and and dry winds with high velocity in summer keep the relative humidity much lower.

Rain-Fall

The monsoon currents from Bay of Bangal reach the eastern part of Rajasthan by the end of June or even some times in the second half of July. The amount of rain fall over Shahpura tehsil thus naturally becomes small. This amount of rainfall goes on decreasing from East to West. Rain-fall occurs in the first week of July. August records the maximum the maximum (563% 1 mm) (563% 1 mm) rain-fall. Some of the weeks of rainy season may also experience either floods or severe droughts. The rainfall is uncertain and its fall is highly erratic during rest of the year. The rainfall data further reveals that there has been appreciable upward or downward trend in the amount of rainfall. During the recent years there has been definite tendency for the rainfall increase.

Monsoon rains constitute about 86 percent of the annual rainfall. The variation in the annual rainfall from year to year is very high. In the period of last 89 years starting from 1901 to 1989, the highest annual rainfall was recorded in 1983. The lowest (31% below normal) annual rainfall was recorded in 1956. The average annual rainfall in the tehsil is 247.9 mm in year 1989.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 79-83

HEALTH CARE DELIVERY: A STUDY

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ABSTRACT

The spatial epidemiology and disease diffusion patterns of various diseases from the endemic foci are therefore, largely dependent upon the distribution of medical centres in the region. Thus, it is imperative to discuss here the systems of health care in this region and their distribution pattern over time and space. Disease diffusion patterns can meaningfully be analysed only with the help of health care systems revalent in the area. So, in addition to the environmental determinants of sickness, the geography of health also emphasizes the study of areal 1 differentiations and similarities of health care centres.

***KEYWORDS**: Spatial Epidemiology, Disease Diffusion, Endemic Foci, Health Care Systems.*

Introduction

Registration of patients in health care units affects the density of incidence of diseases. Medical centres have their own catchment areas where the patients from nearby colonies or villages come to get the treatment of various diseases. It has usually been observed that patients need the medical facilities at their door- steps in order to get quick medical aid and also to avoid tiring journeys to cover long distances which are also expensive. Another factor associated with the health care delivery systems is the type of medical aid available at the centre which includes the professional excellence of the doctor, the type of diagnostic facilities and the availability of the qualified para-medical staff.

Health care in Rajasthan, as as also in India faces a number of serious constraints in regard to the cost, the quality of care and equitable distribution of modes and standards of service to the population as a whole. Here medical care is delivered primarily through Government hospitals and dispensaries which are of various types and also through private physicians. The Government medical care centres are of four types; viz., allopathic, ayurved, unani and homoeopathic. But by and large, most of the patients report to the allopathic centres which have better facilities of diagnosis and efficacy of medicines and SO the present analysis is based upon them. The highland region of southern Rajasthan is comparatively primitive in regard to the development of health facilities. Owing to the existence of a a large percentage of tribal population, who also use their indigenous methods of traditional medicine, the region is one of the least served region in the entire State. The situation is most dismal in most dismal in the rural areas of of the region where means of communications and transport are very poor. In Dungarpur and Chittorgarh districts the distribution of hospital centres is so low that the work-load factor on every rural centre exceeds 7000 persons which is very high.

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Health services development is a recent phenomenon in Rajasthan. Till the early part of the present century, most of the feudal states existing here had no allopathic medical centre. Recent developments especially after the independence of the country have been most marked and efforts are being made to make these medical services available in the remotest parts of the State. But financial constraints and those of infra-structural facilities to establish a proper health-care delivery system have been the greatest impediments and the desired results have not been attained.

Thus health management is a comparatively recent development as it is an index of mordernity related to social factors such as urbanization and industrialization. There is also a direct relationship between the the need for health care centres and literacy-education increasing the awareness of good living. And naturally, this knowledge makes a conscious that to be maximally efficient, productive and progressive he has to be not only healthy and disease free but also has to guard himself against prospective infections and to prevent disease incidence. With this aim there has been a a mushroom growth in centres responsible for providing health care facilities mostly in towns and cities to those who need medical attention and device and can spend large amounts to avail them.

Medical health centres besides offering medical care also incidence. The larger the provide statistical data on disease number of such centres in an area, the greater will be the accessibility of the population to use the clinical and therapeutic aids provided by them and SO the more will be reportings of diseases. Therefore it is important to assess their distribution pattern in relation to the population load and area served.

It is not imperative here to analyse the different theoretical approaches that have recently been innovated in the West. Such a discussion often leads to the measurement of the locational and behavioural patterns of health care centres which is beyond the scope of the present study. It is also not the aim here to provide a blueprint of the optional health services required for the region. Rather, the main aim is to present a holistic picture of health centres in the area, which provide the health and morbidity data to the Directorate of Medical and Health.

What is indeed our concern is to assess the work load of the various medical centres in the region. Theoretically, the distribution of medical centres is related to some concept of equity, may be of equitable access to service by all sectors of the population or, alternatively, as an even spread of work between available facilities3.

The medical centres in the region under study can be classified under six types. This categorization is by and large typical for the whole of the state of Rajasthan. These types are hospitals, health dispensaries, primary centres, maternity welfare centres, aid-post and sub-centres.

Hospitals are large, more or less residential and primarily urban medical centres. They necessarily provide indoor bedfacilities, specialized physician services, services, pathological laboratory services, X-ray and other facilities. As per the diagnostic government norms, hospitals and primary health centres have better diagnostic and therapeutic facilities as compared to other medical aid units, and this is the reason why they attract a larger number of patients.

To use these facilities people travel long distances, even across district boundaries. The highest number of hospitals is in the Udaipur district (11) followed by Bhilwara (8), Chittorgarh (6), Sirohi (4), Dungarpur (2), Banswara (2). (2). The decrease in number of these big medical centres is directly proportional to the degree of urbanization and the level of population.

Primary Health Centres are the next biggest medical units to be found in rural areas. Each Panchayat headquarter has at least one such unit and each unit comprises both diagnostic and therapeutic facilities. In the region under study Udaipur district has the highest number (54) followed by Banswara (33), Bhilwara (31), Chittorgarh (30), Dungarpur (21) and Sirohi (12). Dispensaries are still smaller units and very often they do not provide indoor treatment facilities. The number of the dispensaries in the southern uplands region is nearly comparable to the number of the primary health centres.

In small villages and district out-posts are located aid- posts and sub-centres. These are usually manned by either a or a compounder who gives primary first aid for minor ailmentsonly. The aid-post are sometimes even located in urban areas where the pressure of outdoor patients is high. Their sphere of operation is barely three km. The sub-centres are a recent development and have been open to promote family welfare programmes and to check epidemics.

It is often found in India that every community, whether less or more advanced, has a system of indigenous medicine which is socially, culturally and environmentally close to the people and is unique and holistic holistic in approach5. This indigenous system of health care is rudimentary and traditional based on past experiences and superstitions of the local people. But side by side there also exist other commonly believed-in systems, practised from time immemorial not only in India but in the whole of the orient.- the Ayurvedic, Unani, Siddha, Homeopathy, Naturopathy and Yogic systems. These systems, though still in vogue, are essentially disorganized and unsystematic. It is not certain how many patients visit these institutions where these systems are practised, nor is it known what ailments are taken care of by these and thus no records are available or enumeration done. Therefore, while taking the growth, number and population catered for into account, only modern allopathic health care centres have been considered here.

Health-Care Centres in the Region

The region has a total of 1643 health-care centres, out of which 33 are hospitals, 181 primary health centres, 157 dispensaries, 56 Aid-posts, 1209 sub-centres and 7 maternity and child welfare centres. The sphere of influence of each centre varies with the facilities provided by it.The number of sub-centres, primary health centres and dispensaries is comparatively more in the rural parts parts of the southern uplands region because of evidently discernable factors. As the population is sparse and scattered, and in nature essentially illiterate and predominantly tribal the felt need for hygienic and medical care is missing and so is the consciousness about disease prevention and cure. Moreover, because of the fewer number of urbanized, industrialized centres, the number of hospitals is also relatively less; and as maternity and child care facilities are very specialized, used by only the very educated and highly conscious sections of society, their ratio is understandably low.

Growth

The number of health centres during the last decade has increased rapidly. From a meagre number of 488 in 1981 they have swelled to 1643 in 1988. Thus, showing an increase of 236.7% in a short span of 7 years. This growth has been on account of the fast growth of smaller medical centres which have been opened mostly in rural areas. Smaller units of aid-posts and sub-centres were established in a large number to meet the primary health protection requirements of the rural people.

As compared to the State average the steep rise is the growth of medical health centres in this region becomes amply evident. hereas the number in the last 7 years increased from approximately 4,000 to 7,000 in the state as a whole, rose it/ from 550 to 1700 in this region an increase of 3000 as compared to 1150, in ratio nearly three times over.

Distribution

District-wise distribution can be analysed in two ways. First, on the basis of population served and secondly on the basis of area served by each medical centre. Both the aspects are significant. If the population is large and the number of medical centre is low the work-load on each centre will be high. Similarly, if the area is large and the number of medical centres low, the work-load on each centre will rise. Besides in large areas having a smaller number of medical centres, people have people have to traverse long distances which may result in lesser reportings.

An analysis with regard to the ratio between population and medical centres has been been done here on the basis of work-load factor (W-L factor). It shows that for the entire region the W-L factor is 95.60 which is significantly high and further, on an average 9,562 people are dependent on each centre. The tehsil-wise distribution shows that only two tehsils viz., Jhadol and Sagwara have less than 25 W-L factor, whereas in Dungarpur and Chittorgarh districts, two tehsils viz., Dungarpur and Bari Sadri, have more than 75 W-L factor. The rest of the tehsils have similar dependency reportings. The area served by each medical centre shows a very dismal picture for the hilly tehsils like Rashmi, Chittorgarh and Bari Sadri. While most of the tehsils have a range from. 20-40 km' a range from 20-40 km^2, the most favoured tehsils are in Dungarpur district where the range is even less than 20 km^2. Elsewhere the range is from 40 to 60 km^2.

Dispersion of Medical Centres

A very significant aspect regarding the medical centres is an evaluation of their dispersion in terms of both the population served and the area covered. These two factors are called the population index (P-Index) and the distance index (D-Index). The dispersion of all the tehsils along the mean line of the region shows their variations from the average. In tehsils tehsils which are farther away from the mean line, the need for establishing more medical centres is greater.

It is evident that in this region the D index (77) higher than the state average (52) and the P index (4253) is lower than the state average (5272). This shows that in this region the distance between one medical centre and another is more and thus there is a need for providing more medical centres to provide medical facilities at the door-steps of the population. We can identify 8 different regions showing the varying intensities of population and dispersion distances. These are:

- **Very High 'P' Index** Only one tehsil, Dungarpur has very high 'P' index. Here the population is approximately 9,800 persons per medical centre which is more than double of the state average.
- **High 'P' Index:** These tehsils have an average population of approximately 8000 persons per medical centre and their D index is nearly equal to the region average. The tehsils that came under this category are Girwa, Bhilwara, Rashmi and Nathdwara.
- **Very High 'D' Index:** Asind is only tehsil in this category and it covers an area of approximately 200 sq.km.
- **High 'D' Index:** The tehsil belonging to this type is Begun. Here the area covered by each medical centre is 50 to 75 km km^2.
- **Verh High 'P' and 'D' Index:** Bari Sadri is the only tehsil which lies in this category. Its population per medical centre is approximately 13,000 and the area served by its medical centre is slightly more than 100 km^2.
- **Average 'P' and 'D' Indices:** The tehsils in this category show averages equal the state average both the regard to P and D index. These are Chittorgarh, Banswara, Shahapura, Kapasan, Kushalgarh and Bhim.
- **Low 'P' and 'D' Indices:** Mavli, Sahara, Jahazpur, Kotra, Reodhar, Raipur, Salumber and Ghatol fall under this category.
- **Very Low 'P' and 'D' Indices:** Sagwara and Ghari belong 'P' to this category. In these tehsils both the area and the population is very much below to the state averages.

Analysis of the above data in regard to the dispersion of medical centres in the region reveals some significant facts. These facts give a clearer picture when compared to the details regarding these medical centres in the state as a whole.

Looking at the area served by each medical unit we find that as compared to the whole of Rajasthan the southern upland region shows a similar dispersion as is found in the rest of the state except in the north and west where because of the vast stretches of barren, desclate areas, devoid of human habitation such centres would be untenable. But otherwise the region shows an average of one medical unit serving 20-40 sq. km. as in all the other districts of Rajasthan. In the more urbanized, industrial, townships and the number of medical centres is quite large, where one unit serves less than 20 km^2.

Looking into the ratio of population served by each medical unit in the State we find that the P and D indices are inversely proportional. proportional. For example, where ever the number of units per sq.km. is more the population served is less and where the distances are large the population served is also comparatively high. Thus, on an average, except in the west, each unit within the area of 20-40 km^2 serves 3000-5000 people. Thus some tehsils in southern Udaipur, Banswara and Chittorgarh which have a higher concentration of medical centres serve only about 3000 people and some tehsils in Bhilwara and Chittorgarh (Asind and Bari Sadri) serve serve over 7000 people. There is a similar reflection in the whole of the state.

When we compare the State average regarding the dispersion of medical centres we find that Jaipur has the highest number of people being served by each medical unit (11,000), whereas in five districts of the southern upland region Dungarpur, Banswara, Bhilwara, Udaipur and Sirohi, the population served by one unit is very small 3300-4500, and this is true of the whole of Rajasthan. But whereas the concentration of units per sq. km. is less in Dungarpur, Banswara, Banswara, Bhilwara, Udaipur and Sirohi (in that order) it is very much more in Chittorgarh.

Such a comparative evaluation reveals the actual status of the region in respect to the dispersion of medical centres. Just as of there is the need for more centres in the whole of Rajasthan so is t true here. Another important fact revealed by the present analysis shows that the higher number of

medical centres are only due to the addition of smaller units like aid-posts and subcentres which have few medical facilities and do not serve the function properly. A detailed study shows that there is need for bigger medical units in this area. Hospitals and primary health centres are comparatively less and concentrated in the urban areas alone. This causes severe imbalances in the rural sector and the rural population has to travel long distances to avail better facilities in the hospitals. Such a ratio has to be lessened in terms of a rational distribution of qualified health personnel and provision of proper diagnostic facilities. But such facilities facilities and specialised medical care must be made available after assessing the needs of the population in terms of nature and intensity of disease. As yet no provision has been made for this kind of medical facility to patients and so they naturally report to the nearest larger medical centres for all kinds of ailments, since there is no other choice.

Therefore, recommendation concerning the kind of health care facilities to be provided and be provided and the number to to be be increased would have to be discerned with regard to disease structure and spread. One obvious constraint in the region is the scattered settlement pattern of the villages and households. Tribal people of the region often live on hill slopes and construct their huts nearer to the agricultural fields. So, the settlements are highly isolated and dispersed and it is difficult to provide a provide a medical centre to every small cluster of houses on the hilly terrain where transport is difficult and only footpaths exist. Therefore, further addition of medical centres should be done at nodal points where footpaths and mule-tracks of various small helmets converge.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 84-90

प्रतिदर्शगांवों का अध्ययनः परती भूमि के उपयोग के संदर्भ में

डॉ. कैलाश चन्द्र खण्डेलवाल*

सार

आधुनिक युग में अधिकतर अनुसंधान प्रतिचयन अर्थात् निर्देशन रीति द्वारा किये जाते हैं, क्योंकि साख्यिकों का विश्वास है कि किसी क्षेत्र में वैज्ञानिक ढंग से चुनी गई प्रतिदर्श इकाईयों में वे सभी विशेषताएं पायी जाती हैं, जो पूरे समग्र में अन्तर्निहित होती हैं इसी विश्वास के कारण हमारे अधिकांश निर्णय, वैज्ञानिक अनुसंधान और दैनिक जीवन की सामान्य क्रियाएं सम्पूर्ण क्षेत्र की कुछ इकाईयों के गहन अध्ययन पर आधारित होती हैं। वस्तुतः "प्रतिचयन – सिद्धान्त एक समग्र और उससे चुने गये प्रतिदर्शो के मध्य पाये जाने वाले सम्बन्धों का वैज्ञानिक अध्ययन है। समग्र की प्रत्येक इकाई प्रतिचयन इकार्ड कहलाती है, क्योंकि उन इकाईयों में से ही प्रतिदर्श चुना जाता है।

शब्दकोशः *अनुसंधान प्रतिचयन विधि, निर्देशन रीति, वैज्ञानिक अनुसंधान, प्रतिचयन – सिद्धान्त।*

प्रस्तावना

वास्तव में प्रतिदर्श समग्र की इकाईयों का वह अंश है। जो पूर्ण के अध्ययन हेतु चुना जाता है। लुन चाउ के अनुसार सूक्ष्म "प्रतिदर्श, प्रतिचयन इकाईयों का वह समूह है, जो समग्र का प्रतिनिधि रूप होता है तथा जिसके आधार पर समष्टि के बारे में निष्कर्ष निकाले जाते हैं। प्रतिदर्श समग्र की विशेषताओं का प्रतिविम्व है, वह एक "लघु समग्र" या उप समुच्चय होता है ।

प्रतिचयन के उद्देश्य

प्रतिदर्श का अध्ययन निम्न उद्देश्यों की पूर्ति के लिए किया जाता है–

- **समग्र के सम्बन्ध में सूचना प्राप्त करना**

प्रतिदर्श का अध्ययन करके पूरे समय के बारे में कम से कम समय में और कम सर्च से अधिकाधिक यथार्थ उपलब्ध करना प्रतिचयन का प्रमुख उद्देश्य सूचना है । समग्र की मूलभूत विशेषताओं का पता लगाने के लिए प्रतिदर्श अनुसंधान किये जाते हैं।

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- **समग्र के स्थिरांकों का अनुमान लगाना**

प्रतिदर्श इकाईयों के सांख्यिकीयः–माप जैसे प्रतिदर्श –माध्य,प्रतिदर्श प्रमाप विचलन आदि की सहायता से पूरी समष्टि केअभिलक्षणों के सांस्यिकीय मार्गों के अनगिनत अनुमान लगाये जाते हैं। प्रतिदर्श इकाईयों के को प्रतिदर्शन कहते हैं और तत्सम्बन्धी समय के सांख्यिकीय माप स्थिरांक या प्राचल कहलाते हैं। संक्षेप में प्रतिदर्शज की सहायता से प्राचल अनुमान लगाना प्रतिचयन का महत्वपूर्ण उद्देश्य है ।

- **विश्वसनीयता की जाँच करना**

एक ही समय से चुने गये अनेक देव प्रतिदर्शो के सांख्यिकीय माप प्रतिदर्शज आपस में भी भिन्न होते हैं और उनका समष्टि के सांख्यिकीय माप ø प्राचल से भी अन्तर होता है। इन अन्तरोंकी जाँच करना प्रतिचयन का उद्देश्य है ।

- **संगणना अनुसंधान की सत्यता की जाँच करना**

संगणना अनुसंधानसे उपलब्ध परिणामों की सत्यता की से भी प्रतिदर्शी अनुसंधान किये जांच करने के उद्देश्यजाते हैं।

प्रतिचयन की रीतियाँ

समग्र में से प्रतिदर्श चुनने की निम्नलिखित प्रमुख रीतियाँ हैंः–

- **सविचार प्रतिचयन या सोद्देश्य प्रतिचयन**

इस रीति के अनुसार अनुसंधानकर्ता सम्पूर्ण क्षेत्र में से छानुसार ऐसी इकाईयाँ चुन लेता है, जो उसके विचार में समग्र का प्रतिनिधित्व करती हो। प्रतिदर्श में किन पर्दों को शामिल करना है, यह पूर्णतया छाँटने वाले की स्वेता पर ही निर्भर होता है। प्रकार छौटी हुई प्रतिदर्श इकाईयों के गहन अध्ययन इस से प्राप्त परिणामों के आधार पर वह पूरे समय के बारे में निष्कर्ष निकाल लेता है ।

- **देव प्रतिचयन**

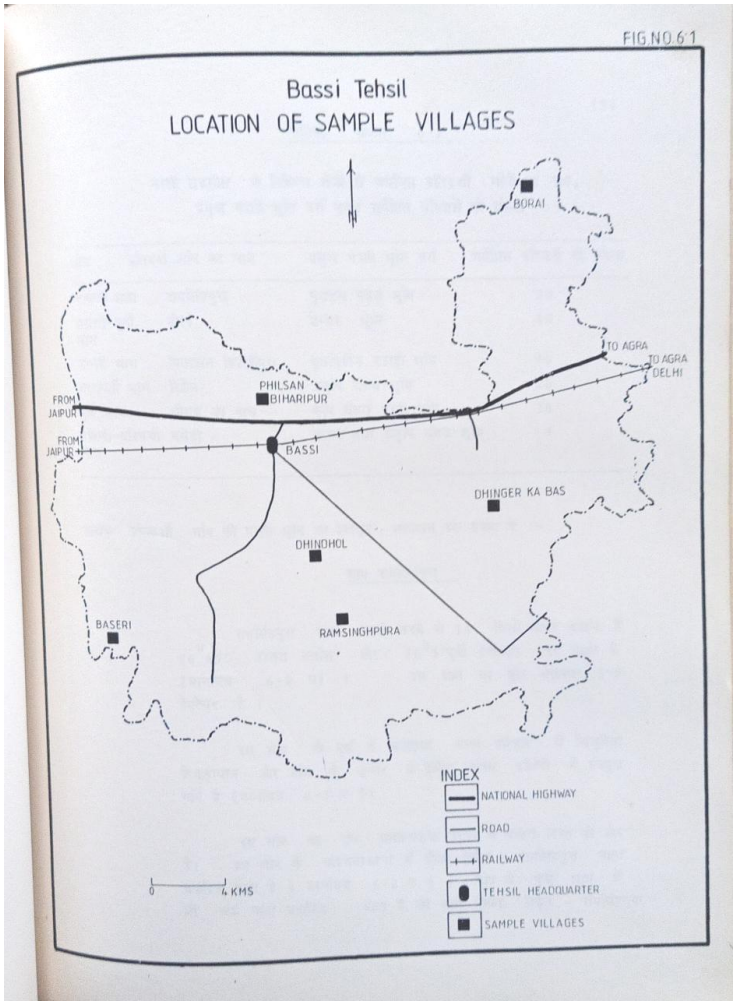
प्रतिदर्श निकालने की यह सबसे अच्छी विधि है, क्योंकि इसमें पक्षपात का प्रभाव नहीं होता वरन् इकाईयाँ अवसर या सम्भावना के आधार पर छाँटी जाती हैं। इस रीति के अनुसार समग्र मैं से इकाइयों इस प्रकार छोटी जाती है कि प्रत्येक इकाई के प्रतिदर्श में सम्मिलित होने की बराबर संभावना होती है ।

- **स्तरित या मिश्रित प्रतिनधन**

दोनों रीतियों का सम्मिश्रण है तथा यह रीति उपर्युक्त दोनों विविध गुणों वाले समय में से प्रतिदर्श छाँटने के लिए उपयुक्त है। इस रीति के अनुसार पहले समग्र को उसकी विभिन्न विशेषताओं के आधार पर सविचार प्रतिचयन द्वारा अनेक सजातीय खण्डों या स्तरों में बांट दिया जाता है तत्पश्चात् उन स्तरों में से अलग अलग देव प्रतिचयन रीति द्वारा इकाईयाँ छाँट ली जाती है।

बस्सी तहसील में परती भूमि के विभिन्न पहलुओं को ध्यान में रखते हुए इसकी उपयोगिता का विस्तृत अध्ययन एवम् विश्लेषण करना एक कठिन कार्य है। तहसील के प्रत्येक गांव की परती भूमि का अध्ययन कर पाना इसकी उपयोगिता एवम् सार्थकता पर कुठाराघात करना है। परती भूमि की इस समस्या के निदान हेतु प्रति चयन विधि द्वारा चयनित गांवों का विस्तृत अध्ययन परिवार स्तर पर किया गया है ।

वर्तमान अनवेषणात्मक अध्ययन हेतु सविचार प्रतिचयन या सोद्देश्य प्रतियन विधि परती भूमि प्रतिदर्श गाँव का चयन किया गया है। तहसील वर्गों से एक एक प्रतिदर्श गांव का चयन किया गया है। – उस अमुस परती भूमि की विशेषताओं का प्रतिनिधित्व और कहीं प्रतिदर्शी गांवों का प्रश्नावलियों के आधार पर परती भूमि का विस्तृत करता है अध्ययन किया गया है। ये प्रतिदर्शी गांव तहसील के विभिन्न भागों से चयनित किए गए हैं। (मानचित्र)



चित्र 1

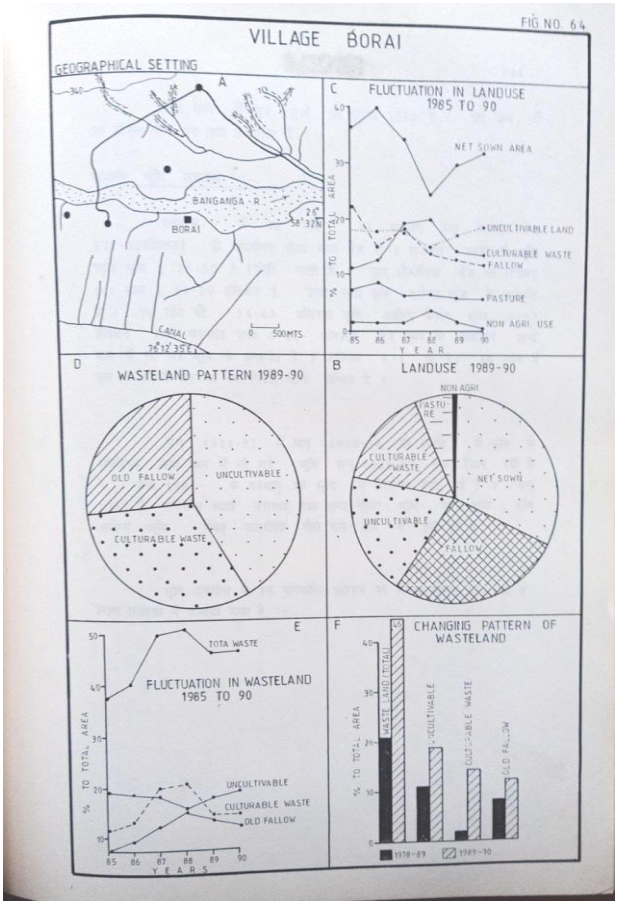
इस गाँव के उत्तरी भाग में रेत के बड़े–बड़े थते हैं, जो गाँव का सर्वाधिक उच्च भू–भाग है। मध्यवर्ती भाग में अपरदन की किया अधिक प्रभावशाली है, जिससे यह क्षेत्र छोटी–छोटी अवनालिकाओं से अपरदित है दक्षिणी–पूर्वी भाग अपेक्षाकृत अधिक समतल मैदानी भाग है

ग्राम बोरई

बोरई ग्राम बस्सी कस्बे से 30 किलोमीटर उत्तर–पूर्व में 26^0 58′32″ उत्तरी अक्षांश एवम् 76^0 12′35″ पूर्वी देशान्तर पर स्थित है। (मानचित्र) इस ग्राम का कुल क्षेत्रफल 457 हेक्टेयर है। इस गांव के पूर्व में दौसा तहसील का चन्दाना गांव व पश्चिम में जमवारामगढ़ तहसील के बांस, कोरीवास, नांगल बेता व वरह गांव तथा दक्षिणी में पड़ासीली फार्म है । बाणगंगा नदी पर चन्दाना गांव के समीप एक बाँध निर्मित करवाया गया है, जिससे बस्सो व दोसा तहसील के गांवों में सिंचाई की जाती है । इस गांव की समुद्र तल से ऊँचाई 331 मी. है। बोरई ग्राम भाग सबसे उच्च भू–भाग कम ऊंचाई वाले क्षेत्र हैं है। दक्षिणी–पूर्वी तथा दक्षिणी का मध्यवर्ती पश्चिमी भाग ग्राम का उत्तरी भाग सबसे निम्न भू भाग है । गांव के उत्तरी भाग का दात पश्चिम से पूर्व की ओर है तथा दक्षिणी भाग का दाल दक्षिण से उत्तर को ओर है । इस गांव के उत्तरी बाण गंगा समतल है। नदी प्रवाहित होती है। गांव का दक्षिणी भाग में होकर भाग लगभग समतल है।

मिट्टियाँ

इस गांव के उत्तरी भाग में बाणगंगा नदी के सहारे सहारे – रेतीली मिट्टी फैली हुई है, जबकि गांव के मध्यवर्ती दक्षिणी भाग में काली मिट्टी पायी जाती है । भाग में दुमट तथासन् 1991 की जनगणना के अनुसार यहां की जनसंख्या 767 है। इस गाँव की मुख्य जाति बैरवा है, जो सम्पूर्ण जनसंख्या की 47.84 प्रतिशत है । बैरवा जाति अनुसूचित जाति संवर्ग से सम्बन्धित जाति है । मुख्य व्यवसाय गलीचा उद्योग है इसके अलावा दरी उद्योग भी इनका मुख्य व्यवसाय है। तालों रूपयों का कारोबार दरी उद्योग के रूप में हर वर्ष होता है। यहां से दरियों को जयपुर लाया जाता है तथा जयपुर से ये दरियाँ बाहर विदेशों में निर्यात की जाती है। इस गांव की दूसरी मुख्य जाति हरियाणा ब्राह्मण हैं इनका मुख्य व्यवसाय कृषि है



चित्र 2

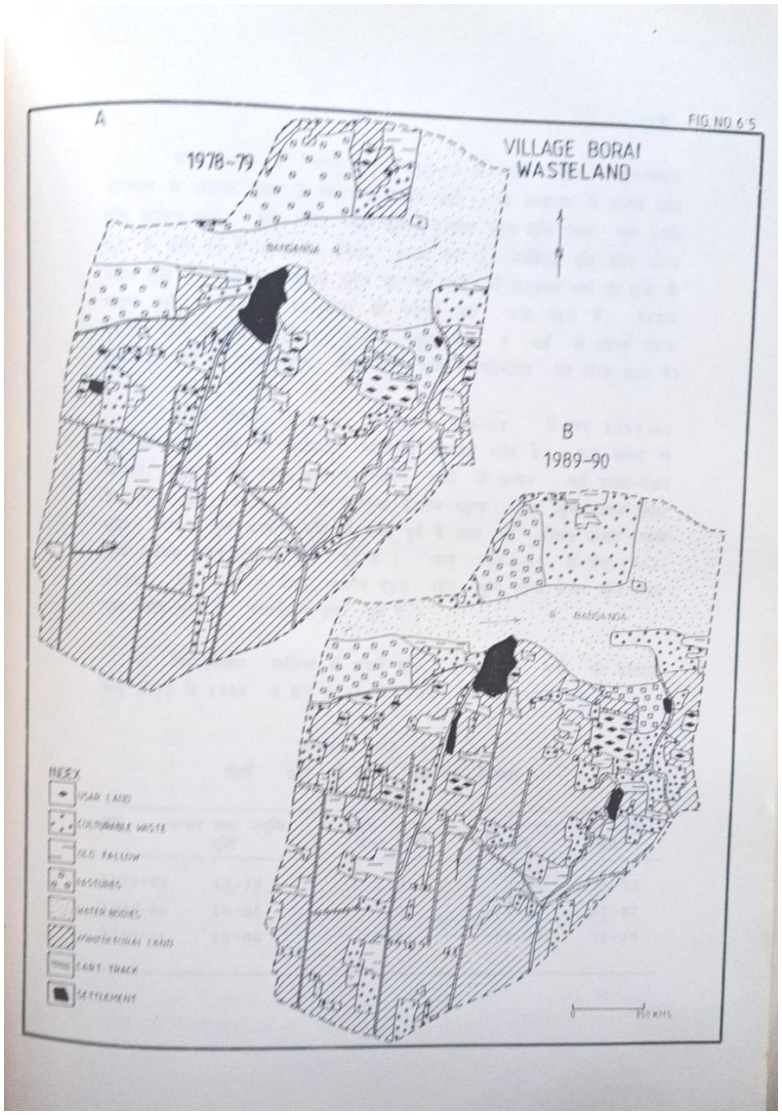
बोरई ग्राम में कुल पशुओं की संख्या 1100 है। इस ग्राम 33 डीजल पम्प सेट तथा 3 ट्रेक्टर हैं

परती भूमि का वितरण

बोरई ग्राम में सन् 1978–79 में 10.70 प्रतिशत ऊसर तथा कृषि अयोग्य भूमि थी । इस ग्राम में 2.09 प्रतिशत भूमि कृषि योग्य बेकार भूमि तथा इस ग्राम 8.54 प्रतिशत पुरातन पड़त है। सन् 1978–79 में में कुल परती भूमि 21.33 प्रतिशत थी। (मानचि कृषि योग्य बेकार भूमि के छोटे छोटे क्षेत्र सम्पूर्ण गांव में फैले हुए हैं, लेकिन अधिकांश कृषि योग्य बेकार भूमि गांव के मध्यवर्ती पूर्वी व उत्तरी भाग में है। पुरातन पड़त का वितरण गांव में छोटे–छोटे हिस्सों में सम्पूर्ण गांव में फैला हुआ है। ऊसर भूमि मुख्यतः गांव के मध्यवर्ती भाग में अधिक है ।

सन् 1989–90 में इस गांव में 19.29 प्रतिशत भूमि ऊसर तथा कृषि अयोग्य है और 14.68 प्रतिशत कृषि योग्य बेकार भूमि है। बेकार भूमि उत्तरी भाग में अधिक है । इसके अलावा कृषि योग्य इसका वितरण सम्पूर्ण गांव में फैला हुआ है। बोरई गांव में 12.49 प्रतिशत पुरातन पड़त भूमि है यह भूमि भी सम्पूर्ण गांव में असमान रूप से विपरित है । ऊसर भूमि मुख्यरूप से गांव के मध्यवर्ती भाग में पूर्व से पश्चिम में छोटे–छोटे क्षेत्रों में फैली हुई है। उस गांव में कुल परती भूमि 46.46 प्रतिशत है।

वर्तमान में इस ग्राम के मध्यवर्ती भाग में पुरातन एवम् उत्सर भूमि में वृद्धि हुई है। ग्राम के सभी हिस्सों पड़त भूमि में कृषि योग्य बेकार भूमि में भी वृद्धि हुई है। ऊसर भूमि में वृद्धि का मुख्य कारण यह है कि पहले इस क्षेत्र में शत प्रतिशत सिंचाई जमवारामगढ़ बांध से आने वाली नहर की शाखाओं से की जाती थी, लेकिन वर्षा के अभाव में सन् 1981 के पश्चात् से इस नहर से सिंचाई संभव नहीं हो सकी, इस कारण कुओं से सिंचाई की जाने लगी परन्तु कुओं का पानी साथ होने की वजह से ऊसर भूमि में वृद्धि हुई है।



चित्र 3

इस गांव के उत्तरी भाग में स्थित चरागाह भूमि सन् 1978–79से 1989–90 की अवधि के दौरान कम हुई है, जिसका प्रमुख कारण ग्राम के उत्तरी–पूर्वी भाग में बाण गंगा नदी पर दौसा तहसील के चन्दाना ग्राम के निकट चन्द्राना बांध बन जाना है इस बांध के निर्माण से चरागाह तथा इसके पूर्व में स्थित जमीन कृषि योग्य बंजर भूमि में परिवर्तित हो गई है। जिसका प्रमुख कारण बांध निर्माण के दौरान यहां से मिट्टी सोदकर बांध निर्माण के लिए ले जाता है इससे चरागाह के पश्चिमी एवम् पूर्वी भाग में कमी हुई है तथा यह सम्पूर्ण क्षेत्र जलाकांत क्षेत्र में परिवर्तित हुआ है।

बाणगंगा नदी के दक्षिण पूर्व में स्थित चरागाह भूमि भी कम हुई हैं प्रमुख कारण ग्राम की कोती जाति द्वारा अनाधिकृत रूप से कृषि वर्तमान में पानी की कमी के कारण काफी क्षेत्र पुरातन पड़त इसका किया जाना है के रूप में है

गांव के दक्षिणी पश्चिमी भाग में जहां पर सन 1978–79 की अवधि के दौरान तलाई थी, अब उसमें कृषि की जाने लगी है ।

सन् 1978–79 के दौरान ग्राम के पूर्वी भाग में नाले के आस–पास वाले क्षेत्र में कृषि की जाती थी, लेकिन सन् 1989–90 की अवधि के दौरान यह क्षेत्र कृषि योग्य बंजर भूमि में परिवर्तित हो गया है, जिसका प्रमुख कारण नाले के द्वारा आस–पास की जमीन का अवनालिकाओं में बदल जाना तथा नाले के क्षेत्र में वृद्धि होना है

ग्राम के दक्षिणी भाग में पुरातन पड़त भूमि में इस दौरान वृद्धि हुई है, जिसका कारण जमवा रामगढ़ बांध में पानी की कमी से सिंचित क्षेत्र कम हुआ है । यह सम्पूर्ण क्षेत्र नहरी क्षेत्र है। यहाँ पर पहले जमवा रामगढ़ बांध की नहरों से सिंचाई की जाती थी । यहाँ के कृषकों के अनुसार इस क्षेत्र में सन् 1967 तक लगातार सिंचाई हुई है, इसके पश्चात इसी बांध के पानी द्वारा सन् 1977 में सिंचाई की गई। सन् 1981 में भी बाँध दारा सिंचाई हुई, लेकिन बाद में सूखे की वजह से सिंचाई संभव नहीं हो सकी है। जयपुर की बढ़ती हुई आबादी को जमवा रामगढ़ बाँध द्वारा पेयजल आपूर्ति किए जाने के कारण अब सिंचाई के लिए पानी उपलब्ध नहीं हो पाता है।

इसके अलावा पुरातन पद्दत भूमि में वृदि का कारण भूमिगत जल का नीचे होना भी है। सिंचाई की दृष्टि से यहां का भूमिगत जल खराब है इस ग्राम के दक्षिणी भाग में स्थित कुओं के पानी का पी एच मान 8.0 है तथा कन्डक्टीविटी 6.3 है इस भाग के पानी में लवणीयता है। जिस पानी का पी. एच. मान 8.0 होता है वह सामान्य पानी, 8.0 से ज्यादा क्षारीय पानी, पी. एच. मान 7.0 वाला उदासीन पानी एवं 7.0 पी. एच. से कम मान वाला पानी अम्लीय होता है जिस पानी की कन्डक्टीविटी 1.0 है वह सामान्य पानी है 4.0 से कम होने पर लवणीय एवं 4.0 से ज्यादा कन्डक्टीविटी होने पर पानी कृषि के लिए बिल्कुल खराब है। सर्वेक्षित ग्राम के दक्षिणी भाग में कन्डक्टीविटी 6.3 है जो सिंचाई के लिए अनुपयुक्त है। ग्राम के उत्तरी भाग में बाणगंगा नदी के आस–पास वाले क्षेत्र में पानी का पीएच मान 8.2 है तथा कन्डक्टर्भवटी 1.41 है। इसका तात्पर्य यह हुआ कि पानी में क्षारीयता व लवणीयता दोनों हैं। जिस पानी को कन्डक्टीविटी 4.0 से कम होती है । उस पानी की विस्तृत जांच कृषि अनुसंधान अधिकारी, क्षारीय मिट्टी परीक्षण प्रयोगशाला, जोधपुर से करवाई जाती है।

परती भूमि छोड़ने के कारण

सर्वेक्षण के दौरान लोगों बताया कि सिंचाई की सुविधा नहीं होने एवम् भूमिगत जल के अधिक नीचे चले जाने से भूमि को परती के छोड़ दिया जाता है कुओं को गहरा करने हेतु सरकार ने किसी भी कृषक को ऋण नहीं दिया है। कुओं के विद्युतीकरण के अभाव में भी भूमि को परती छोड़ दिया जाता है । गांव के दक्षिण पश्चिम में बलुई मिट्टी होने पचम् ढूँढ नदी के प्रवाहित होने से अधिकांश भाग परती छोड़ दिया जाता है।

परती भूमि का सुधार

गत एक दशक में बहुत क्य व्यक्तियों ने परती भूमि को सुधारा है। ग्राम का कुल क्षेत्रफल 60 हेक्टयर है, जिसमें लगभग 50 प्रतिशत क्षेत्र ढूँढ नदी व इस नदी से अपरदित क्षेत्र के अन्तर्गत होने के कारण इस क्षेत्र में कोई सुधार नहीं हुआ है गांव के उत्तरी पश्चिमी एवम् उत्तरी– पूर्वी भाग में मात्र 5 हेक्टयर भूमि को सुधारा पड़त एवम् कृषि अयोग्य भूमि के अन्तर्गत थी । गया है, जो पहले पुरातन

सुधार की लागत

परती भूमि को सुधारने की सोसत प्रति हेक्टयर लागत लगभग 3100 रू. आयी है जिसमें 75 प्रतिशत खर्चा ट्रेक्टर द्वारा भूमि फिराई तथा पर पलटा समतल कराने हेतु और प्रतिशत सर्चा स्वयं के पवम् 25 अन्य श्रमिकों के रूप में सर्च हुए हैं

सुधार के लिए सुझाव

नदी का पाट अधिक चौड़ाई में नहीं फैले इसके लिए नदी के दोनों किनारों पर ऊँची मेड़ बनानी चाहिए तथा इसके दोनों किनारों पर सपन वृक्षारोपण किया जाना चाहिए, ताकि अपरदन की किया को रोका जा सके। गांव में कुओं को विद्युतीकृत किया जाना चाहिए तथा सरकार द्वारा किसानों को अपने कुओं को गहरा कराने हेतु ऋण दिया जाना चाहिए जिससे भूमिगत जल के अधिक मात्रा में उपयोग होने से सिंचित क्षेत्र में वृद्धि हो सकेगी । नदी में सन् 1981 की बाढ़ के दौरान अतिरिक्त रेत आ गई थी, सरकार को चाहिए कि इस रेल को हटाकर क्षेत्र को कृषि योग्य बनाया जाना चाहिए ।

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 91-93

भारत में मौद्रिक एवं वित्तीय क्षेत्रों में डिजिटल मुद्रा का चलन

डॉ. जगदीश प्रसाद मीना*

सार

आज भारत देश में ही नहीं अपितु सम्पूर्ण विश्व में प्रत्येक व्यक्ति चाहे, वह किसी भी उम्र या वर्ग का हो। वह डिजिटल पेशे से जुड़े हुए है। भारत के डिजिटिलाइजेशन का वर्तमान समय में काफी विस्तार हो चुका है जिसका भारत में रहने वाले लोग लाभ ले रहे है, शहर से लेकर गाँवों तक इन्टरनेट की पहुँच हो गई है। इन्टरनेट अब सभी वर्गों के लोगों की आधारभूत जरूरतों में शामिल हो चुका है। आर्थिक लेन–देन हो या जन्म–मृत्यु का रजिस्ट्रेशन सब कुछ ऑनलाईन हो रहा हैं। जिससे आम–आदमी को अपना अतिरिक्त समय बर्बाद नही करना पड़ रहा है तथा अन्य आर्थिक अनावश्यक व्ययों से भी बचत हो रही। सभी सरकारी कार्यालयों में कम्प्यूटर और इन्टरनेट का प्रयोग किया जा रहा है। दुनिया के पहले कम्प्यटूर का आविष्कार 1940 के दशक में सेना की समस्याओं के हल के लिए किया गया था। उस समय जिसका मूल्य 5 लाख रूपये था। भारत का पहला कम्प्यूटर रिफ्रैंक था। जिसका पूरा नाम टाटा इंस्टीट्यूट ऑफ फण्डामेन्टल रिर्सच ऑटोमेटिक कैलकुलेटर है। भारत ने 1956 मे खरीदा था, तब इसका मूल्य 10 लाख रूपये था। और इसका नाम एचईसी –2 एम था। साल 1956 से 1965 तक रिफ्रेंक ने काम किया। तथा 1975 में इन्टरनेशनल बिजनेस मशीन (आईबीएम) ने पहला पर्सनल कम्प्यूटर बनाया। सन् 1980 के दशक में देश की दो बडी टेलिकॉम कम्पनी एम टी एन एल और बी एस एन एल की शूरूआत हुई। वैश्वीकरण के दौर में 1991 में निजी क्षेत्र की कम्पनियों ने सरकार की सहायता से सॉफ्टवेयर विकसित करना पड़ा।

शब्दकोशः *डिजिटिलाइजेशन, एचईसी –2, इन्टरनेशनल बिजनेस मशीन, वैश्वीकरण, पर्सनल कम्प्यूटर।*

प्रस्तावना

इसमें डिजिटललाईजेशन को विकसित करने के लिए सरकार ने अथक प्रयास किये। बहुराष्ट्रीय कम्पनियों को देश में व्यापार करने की छूट प्रदान की गई। सन् 1997 से 1998 के बीच भारतीय सॉफ्टवेयर कम्पनियों ने निर्यात 1.76 बिलियन डॉलर का मुनाफा कमाया, जो 1990 से 1991 के बीच तुलनात्मक रूप से काफी कम था। इसके बाद में दूरसंचार का प्रयोग बढ़ने लगा जिसके फलस्वरूप अब भारत दुनियाभर में सबसे अधिक सॉफ्टवेयर निर्यात करने वाला देश बन गया है।

26 जनवरी 2009 को यूनिक आईडेंटिफिकेशन ऑथिरिटी ऑफ इण्डिया या यूआईडीए आई की शुरूआत की गई। इस अभियान की शुरूआत 2010 में हेउए इंफोसिस के को– फाउन्डर नंदन निलेकणी ने आधार रखा था और लोगो लान्च किया। इसके तहत् 12 डिजिट यूनिक आईडेटिंफिकेशन नम्बर देश के नागरिकों डिजिटलाइजेशन के क्षेत्र में महत्वपूर्ण भूमिका अदा की गई। आधार के माध्यम से आमजन डिजिटल

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सुविधा से देश के नागरिकों द्वारा सरकारी तथ–गैर सरकारी सेवाओं का लाभ प्राप्त कर रहा है। भारत में डिजिटल अभियान का विकास का आधार यह है कि भारत में अब आमजन डिजिटल शिक्षा डिजिटल करेंसी, डिजिटल विश्वविद्यालय, किसानों को डिजिटल शिक्षा, डिजिटल बैंक, डिजिटल डाकघर, ई–पासपोर्ट, इत्यादि से जुडी हुई विभिन्न सरकारी योजनाओं प्राप्त लाभ विद्यार्थियों को प्राप्त होना चाहिए। डिजिटल भारत में शहरी तथा ग्रामीण दोनों स्थानों पर रहने वाले लोगों द्वारा ऑन लाईन विभाग योजनाओं डेस्कटॉप पीसी लेपटॉप स्मार्टफोन और टेबलेट इत्यादि इलेक्ट्रॉनिक उपकरणों की सहायता से लाभ मिल रहा है।

मौद्रिक एवं वित्तिय क्षेत्रों मे डिजिटल

दुनिया के देशों में डिजिटल मुद्रा का चलन प्रारंभ हो चुका है तथा भुगतान के क्षेत्र में काम ली जाती है लेकिन भारत में केन्द्रीय बजट, 2022–23 में भारतीय रिजर्व बैंक द्वारा डिजिटल मुद्रा के रूप में डिजिटल तकनीक को समर्पित है। इसके अन्तर्गत सम्पूर्ण विश्व में डिजिटलीकरण का युग प्रारंभ हो गया है, जिसका सम्बन्ध उच्च स्तरीय तकनीक एवं आभासी युग से है। डिजिटलीकरण की तकनीक का उपयोग ने केवल वित, बैंकिग व मौद्रिक क्षेत्र में ही किया जा सकता है बल्कि आज इसकी आवश्यकता कृषि, देशी व्यापार एवं अन्तर्राष्ट्रीय व्यापार, सेवा क्षेत्र शिक्षा, स्वास्थ्य प्रशासन आदि सभी क्षेत्रों मे है। यदि दुनिया के देशों के साथ तकनीकी उन्नयन की भी आवश्यकता है तथा विज्ञान एवं प्रोद्योगिकी को ही प्राथमिकता बनानी होगी ताकि आम व्यक्ति के जीवनस्तर को रोजगारपरक एवं खुशहाल बनाया जा सके। प्रधानमंत्री नरेन्द्र मोदी डिजिटल के इण्डिया के सपने देखते है जबकि लगभग 3 दशक पूर्व तत्कालीन प्रधानमंत्री राजीव गॉधी कम्प्यूटर क्रांति की देन है कि भारत में 90 दशक से कम्प्यूटरीकरण का कार्य तेजी से फैला एवं बढ़ा है तथा काफी कार्य लेखांकन, कर, व्यापारिक व्यवहार, भुगतान आदि का कार्य कम्प्यूटर की मदद से किया जाता है। प्रस्तुत बजट में डिजिटल इण्डिया की छाप स्पष्ट दिखाई देती है। प्रधानमंत्री का मानना है कि यदि देश का दुनिया के विकसित राष्ट्रों की कतार में लाना है तथा अर्थव्यवस्था के आकार को 2.5 बिलियन डॉलर से 5 बिलियन डॉलर लाना है तो डिजिटलीकरण की तरफ तेजी से बढ़ना होगा। इसी दिशा में मौद्रिक विनिमय व्यवस्था का स्थान धातुमान आदि के रूप में हुई। जिसके अन्तर्गत स्वर्ण एवं अन्य मूल्यवान धातुओं के सिक्कों का चलन था जो कि वस्तु के बदले में लेन–देन के लिए काम के लिए जाते थे ताकि विनिमय व्यवस्था एवं व्यवहार को आसान बनाया जा सके। लेकिन यह व्यवस्था कागजी विनिमय व्यवस्था में वर्ष 1929 की महान मंदी के बाद बदली तथा आज विश्व के देशों में केन्द्रीय बैंक द्वारा जारी संचालित कागजी मुद्रा डॉलर, पोण्ड, यूरो, रूपये आदि के रूप में चलन में है तथा भुगतान का माध्यम बनी हुई है।

भारत डिजिटल लेस–कैश अर्थव्यवस्था के लिए एक परिवर्तन के दौर से गुजर रहा है। यह देखते हुए कि हमारी जनसंख्या का कुछ प्रतिशत हिस्सा ही कर का भुगतान करता है, इसलिए यदि बैंकिंग और कर प्रणाली अधिक से अधिक डिजिटल भुगतान के माध्यम से भुगतान प्राप्त करती है तो इसमें देश की अर्थव्यवस्था में बेहतरी आएगी। इसके अलावा सार्वजनिक जीवन और शासन में भ्रष्टाचार का प्रमुख कारण नगदी में लेनदेन होना भी है। इसलिए एक लेस–केश समाज की तरफ बढ़ते हुए इससे भ्रष्टाचार को दूर करने में मदद मिलेगी और नगदी के प्रयोग पर रोक लगेगी। उपभोक्ताओं को लेस केश के कई लाभ है। एक रूपए से लेकर किसी भी राशि के लिए अब बिना नगदी के डिजिटल भुगतान किया जा सकता है। डिजिटल लेनदन कभी भी किया जा सकता है। इसके अलावा सरकार ने देश में डिजिटल को बढावा देने के लिए कई उपायों की घोषणा की है जिसमें यह एक ही प्रकार की सर्विस के लिए नगद लेनदेन के मुकाबले सस्ता होगा। आरबीआई की रिर्पोट के अनुसार कोरोना काल में ही भुगतान के नए व सुविधाजनक डिजिटल विकल्पों की लोकप्रियता बढ़ी है। हाल के वर्षों में मूल्य व संख्या के लिहाज से भले ही डिजिटल भुगतन बढ़ा, लेकिन आर्थिक प्रणाली में जीडीपी के अनुपात में नगदी में भी तेजी हटाना आई है। डिजिटल अर्थव्यवस्था की कल्पना करना भारत जैसे देश में बहुत कठिन है परन्तु सरकार द्वारा इस क्षेत्र के विकास हेतु बहुत प्रयास किए गए है। लेकिन मीड़िया के अभाव में डिजिटल माध्यम को ज्यादा–ज्यादा प्रसारित करे। कैशलेस लेन–देन को बढ़ावा देने और भारत को कैशलेस

समाज में बदलने के लिए विभिन्न डिजिटल भुगतान विधियॉ उपलब्ध है। डिजिटल होना उन लोगों के लिए फायदेमंद है जो एक या अधिक उत्पादों व सेवाओं को खरीदने के लिए दैनिक लेनदेन करते है। डिजिटल भुगतान खरीदारों को अपने बैंको से सीधे भुगतान करने में सक्षम बनाता है, व्यापारियों को दूसरे देशों में ग्राहकों को बेचने के लिए और ग्राहकों को विदेशों में भुगतान करने मे सक्षम बनाता है। डिजिटल भुगतान विधियों का उपयोग करने के कई फायदे और नुकसान है।

निष्कर्ष

वर्तमान समय में जिस प्रकार तेजी से डिजिटिलाईशन का उपयोग किया जा रहा है, उसी अनुपात में साइबर अपराध भी बढ़ा है। साइबर अपराध से जुड़े लोग डिजिटलाइजेशन का दुरूपयोग कर आमजन से धोखे से राशि एक दूसरे के खाते में डलवा लेते है। आमजन को मिथ्या संदेश भेज कर भ्रमित कर राशि प्राप्त कर लेते है। कभी ।ज्ड मशीन से पासवर्ड चुराकर राशि ग्राहकों के खातों से निकाल लेते है, कभी मेल–आई डी तथा मोबाइल हैग करके अनावश्यक रूप से राशि दूसरे खाते में डलवा लेते है, तो कभी लिंक भेजकर खुलवा लेते है, जिससे राशि दूसरे खाते में पहुचाई जाती है। जो डिजिटलाइजेशन की सुरक्षा में भारी चूक है। भारत में विकसित होते डिजिटल बाजार को सरकारों द्वारा सुरक्षा प्रदान की जानी चाहिए। जिससे डिजिटल अभियान को और गति मिल सके तथा डिजिटलाइजेशन में आमजन का विश्वास बना रहे।

लेकिन अब डिजिटल मुद्रा का चलन प्रारंभ हो गया है जिसके अन्तर्गत कागजी मुद्रा का चलन बाहर हो जाएगा तथा भुगतान व्यवस्था अधिक तकनीकी प्रधान, पारदर्शी, समय एवं श्रम की बचत चोरी एवं लाने ले जाने की झंझटो से मुक्त हो जाएगी। भारत मं नोटबंदी इसी दिशा में एक ऐतिहासिक कदम माना जाता है। वित मंत्री ने घौषणा की है कि भारतीय रिजर्व बैंक द्वारा जारी डिजिटल मुद्रा का नोट के मूल्य क बराबर की व्यवस्था होगी तथा डिजटल मुद्रा को जब चाहे जब कागजी एवं विनिमय व्यवस्था का आधार बनेगी। नोटों के प्रकाशन एवं घिसने, लाने ले जाने की जोखिम से मुक्ति मिलेगी तथा विदेशी आयातित विशेष किस्म के कागज की आवश्यकता भी नही रहेगी। इससे प्रकाशन एवं निर्गमन की लागत की बचत होगी। विश्व में डिजिटल मुद्रा के दो उपयोग हो सकते है या तो भुगतान का आधार बन सकती है या सम्पत्ति का।

सन्दर्भ ग्रन्थ सूची

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 94-108

AGRICULTURE COST ACCOUNTING: COST OF WHEAT AND BAJRA IN HARYANA AND RAJASTHAN STATE YEAR –WISE, NATURE-WISE AND COMMODITY-WISE COST ANALYSIS

Dr. Mukesh Kumar*

ABSTRACT

*In commodity-wise analysis, we have analyses cost of producing two different crops, namely **wheat** and **bajra.** The cost behaviour has been analyses separately for **irrigated** and **non-irrigated** farms. The cost of producing wheat or bajra include three different elements, namely material, labour an overhead, an analyses for the same was also carried out. During the course of survey, we noticed certain variations from place to place i.e. selected District in Haryana and Rajasthan State; therefore, it was decided to make cost analysis separately for all selected District covered under this study.*

***KEYWORDS**: Irrigated and Non-Irrigated Farms, Sample Mean, Standard Deviation, Standard Error, Sampling Error, Upper Limit, Lower Limit.*

Introduction

The cost of Wheat (Rabi) (Irrigated Farm), Bajra (Kharif) (Irrigated Farm), Bajra (Kharif) (Non-Irrigated Farm) was carried out to understand the universe i.e. the selected District of Haryana state and selected District of Rajasthan State . Therefore, it was decided to arrive at the limits within which the universe results are expected to lie on the basis of sample statistics. The expected limits are computed at **99% level of confidence** using; **Normal Probability Distribution or "t" Probability Distribution.**

Objectives

Their major objectives are given below:

- To compile all relevant recommendations or package of practices for the district to be meaningfully utilized in training programs and the follow-up extension activities.
- To plan and conduct production-orientation and need-based short as well as long duration training courses both on the campus and in the villages for various target groups, with priority on the resource-poor sections.
- To organize Farm Science Clubs to inculcate in the younger generation a scientific temper and an interest in agricultural and allied sciences and for scientific farming through supervised individual and group projects.
- To develop and maintain the campus farm and demonstration units on scientific lines as facilities for providing work experience to the trainees, dissemination of the latest technical know-how and also as a means to achieve financial sustainability is due course of time.

Process and Analysis of Cost

The process of setting up limits was as follows:

Step 1: Calculation of Sample Mean.
Step 2: Calculation of Standard Deviation
Step 3: Calculation of Standard Error (s.e.)
Step 4: Calculation of Sampling Error.
Step 5: Calculation of Upper Limit=Sample Mean - Sample Error
Step 6: Calculation of Lower Limit= Sample Mean – Sampling Error

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Cost of Production (Year-wise – Commodity-wise) in Haryana (Irrigated Farm)

Sr. No.	Resp. No.	Wheat						Bajra					
		2014	2015	2016	2017	2018	Average	2014	2015	2016	2017	2018	Average
1	101	9.34	9.61	10.06	10.67	11.33	10.20	11.80	11.95	12.09	12.24	12.39	12.10
2	102	9.34	9.61	10.06	10.67	11.33	10.20	5.81	11.98	12.13	12.28	12.43	12.13
3	103	9.97	10.25	10.71	11.35	12.04	10.86	14.50	14.68	14.86	15.04	15.23	14.86
4	104	9.96	10.25	10.73	11.37	12.08	10.88	14.23	14.41	14.59	14.77	14.95	14.59
5	105	10.18	10.48	10.97	11.63	12.35	11.12	14.54	14.83	15.13	15.43	15.73	15.13
6	106	10.09	10.37	10.86	11.51	12.23	11.01	14.65	14.83	15.01	15.20	15.38	15.01
7	107	9.33	9.59	10.04	10.65	11.31	10.18	12.67	12.82	12.98	13.14	13.30	12.98
8	108	10.16	10.45	10.93	11.59	12.32	11.09	14.20	14.49	14.78	15.07	15.37	14.78
9	109	10.09	10.38	10.86	11.52	12.24	11.02	14.15	14.33	14.50	14.68	14.86	14.50
10	110	9.79	10.07	10.54	11.17	11.87	10.69	13.47	13.63	13.80	13.97	14.14	13.80
11	111	9.73	10.01	10.48	11.11	11.81	10.63	13.82	13.99	14.16	14.34	14.51	14.16
12	112	9.76	10.04	10.51	11.15	11.84	10.66	13.48	13.64	13.81	13.98	14.15	13.81
13	113	9.64	9.91	10.38	11.00	11.69	10.53	11.73	11.87	12.02	12.17	12.31	12.02
14	114	9.97	10.47	11.30	12.43	13.68	11.57	14.14	14.31	14.49	14.67	14.85	14.49
15	115	9.97	10.25	10.73	11.38	12.09	10.88	14.14	14.31	14.49	14.67	14.85	14.49
16	116	9.97	10.19	10.67	11.31	12.01	10.83	14.12	14.29	14.47	14.65	14.83	14.47
17	117	9.97	10.31	10.79	11.44	12.16	10.94	14.23	14.41	14.59	14.77	14.95	14.59
18	118	9.98	10.03	10.50	11.12	11.80	10.69	14.12	14.29	14.47	14.65	14.83	14.47
19	119	9.63	9.91	10.37	11.00	11.69	10.52	12.50	12.65	12.80	12.96	13.12	12.81
20	120	9.64	9.92	10.38	11.01	11.70	10.53	12.85	13.01	13.17	13.33	13.49	13.17
21	121	9.69	9.97	10.44	11.07	11.76	10.59	12.87	13.03	13.19	13.35	13.51	13.19
22	122	9.65	9.92	10.39	11.01	11.70	10.53	12.85	13.01	13.17	13.33	13.49	13.17
23	123	9.96	10.25	10.73	11.37	12.09	10.88	12.71	12.86	13.02	13.18	13.34	13.02
24	124	9.64	9.92	10.38	11.01	11.69	10.53	12.47	12.62	12.78	12.93	13.09	12.78
25	125	9.99	10.27	10.75	11.40	12.12	10.91	14.50	14.68	14.86	15.04	15.23	14.86
26	126	9.97	10.25	10.73	11.38	12.09	10.88	13.47	13.63	13.80	13.97	14.14	13.80
27	127	9.95	10.24	10.71	11.36	12.07	10.87	14.29	14.46	14.64	14.82	15.00	14.64
28	128	9.80	10.29	11.12	12.23	13.45	11.38	14.29	14.46	14.64	14.82	15.00	14.64
29	129	9.80	10.08	10.55	11.19	11.88	10.70	13.40	13.57	13.73	13.90	14.07	13.73
30	130	8.19	8.43	8.82	9.35	9.94	8.95	13.80	13.96	14.14	14.31	14.49	14.14
31	131	9.81	10.09	10.56	11.19	11.89	10.71	13.38	13.55	13.71	13.88	14.05	13.72
32	132	9.80	10.08	10.55	11.19	11.89	10.70	14.06	14.23	14.41	14.59	14.77	14.41
33	133	9.97	10.47	11.30	12.43	13.68	11.57	13.19	13.35	13.52	13.69	13.85	13.52
34	134	9.99	10.49	11.33	12.46	13.71	11.59	14.75	14.93	15.11	15.30	15.48	15.11
35	135	10.17	10.28	10.76	11.41	12.12	10.91	14.75	14.93	15.11	15.30	15.48	15.11
36	136	9.97	10.25	10.73	11.38	12.09	10.88	13.70	13.87	14.04	14.21	14.38	14.04
37	137	10.14	10.25	10.73	11.38	12.09	10.88	13.72	13.88	14.05	14.23	14.40	14.06
38	138	10.37	10.25	10.73	11.38	12.09	10.88	13.70	13.87	14.04	14.21	14.38	14.04
39	139	9.97	10.47	11.30	12.43	13.68	11.57	13.74	13.90	14.07	14.25	14.42	14.08
40	140	10.35	10.41	10.90	11.57	12.29	11.06	14.12	14.29	14.47	14.65	14.82	14.47
41	141	10.45	10.34	10.83	11.49	12.21	10.99	13.72	13.88	14.05	14.23	14.40	14.06
42	142	9.53	9.80	10.26	10.87	11.55	10.40	14.19	14.36	14.54	14.72	14.90	14.54
43	143	9.97	10.25	10.73	11.38	12.09	10.88	13.72	13.88	14.05	14.23	14.40	14.06
44	144	9.45	9.72	10.18	10.80	11.48	10.33	13.72	13.88	14.05	14.23	14.40	14.06
45	145	10.04	10.33	10.81	11.47	12.19	10.97	13.59	13.75	13.92	14.09	14.26	13.92
46	146	9.95	10.24	10.71	11.36	12.07	10.87	14.12	14.29	14.47	14.65	14.83	14.47
47	147	9.97	10.25	10.73	11.38	12.09	10.88	13.74	13.91	14.08	14.25	14.43	14.08
48	148	10.45	10.52	11.02	11.69	12.43	11.17	13.70	13.87	14.04	14.21	14.38	14.04
49	149	9.80	10.08	10.55	11.19	11.88	10.70	13.74	13.91	14.08	14.25	14.43	14.08
50	150	9.80	10.29	11.12	12.23	13.45	11.38	13.74	13.91	14.08	14.25	14.43	14.08

	Wheat						Bajra					
	2014	2015	2016	2017	2018	Average	2014	2015	2016	2017	2018	Average
Sum	493.10	506.58	532.32	567.13	605.33	540.57	676.89	691.44	700.20	709.08	717.92	700.28
Mean	9.8620	10.1316	10.6464	11.3426	12.106	10.8114	13.8288	13.8288	14.04	14.1816	14.3584	14.0056
Stand.Deviation	0.35369	0.34204	0.40728	0.526	0.6797	0.4325	0.75520	0.7552	0.7701	0.78599	0.8024	0.7692
S.D. Error of Mean	.05002	.0483	.05760	0.0744	0.0916	0.0611	0.1068	0.1068	0.1089	0.1116	0.1134	0.10879
Variances	0.125	0.117	0.166	0.277	0.462	0.187	0.570	0.570	0.593	0.618	0.644	0.592
Range	2.26	2.09	2.51	3.11	3.77	2.64	3.06	3.06	3.11	3.26	3.42	3.11

Cost of production (Year-wise – Commodity-wise) in Rajasthan (Irrigated Farm)

Sr. No.	Resp. No.	Wheat						Bajra					
		2014	2015	2016	2017	2018	Average	2014	2015	2016	2017	2018	Average
1	1	8.72	9.16	9.89	10.88	11.97	10.12	10.91	11.13	11.35	11.57	11.80	11.35
2	2	11.21	11.53	12.07	12.80	13.60	12.24	12.27	12.42	12.57	12.73	12.88	12.57
3	3	11.21	11.53	12.07	12.80	13.60	12.24	10.23	10.35	10.48	10.61	10.74	10.48
4	4	8.72	8.97	9.39	9.95	10.58	9.52	10.91	11.04	11.18	11.31	11.45	11.18
5	5	8.01	8.24	8.62	9.14	9.71	8.75	10.23	10.35	10.48	10.61	10.74	10.48
6	6	8.01	8.28	8.67	9.20	9.77	8.79	10.23	10.47	10.60	10.74	10.87	10.58
7	7	8.01	8.10	8.47	8.98	9.53	8.62	10.23	10.35	10.48	10.61	10.74	10.48
8	8	7.48	7.85	8.48	9.32	10.26	8.68	8.18	8.28	8.38	8.49	8.59	8.38
9	9	9.54	9.82	10.27	10.89	11.57	10.42	10.83	10.96	11.09	11.23	11.37	11.10
10	10	9.34	9.61	10.06	10.67	11.33	10.20	10.91	11.04	11.18	11.31	11.45	11.18
11	11	8.85	9.11	9.53	10.10	10.74	9.67	8.92	9.03	9.14	9.26	9.37	9.15
12	12	9.34	9.61	10.06	10.67	11.33	10.20	10.23	10.35	10.48	10.61	10.74	10.48
13	13	9.17	9.44	9.88	10.47	11.13	10.02	10.23	10.35	10.48	10.61	10.74	10.48
14	14	6.27	6.45	6.75	7.15	7.60	6.84	6.54	6.62	6.71	6.79	6.87	6.71
15	15	7.54	7.76	8.12	8.61	9.14	8.23	7.88	7.98	8.07	8.17	8.27	8.08
16	16	11.21	11.53	12.07	12.80	13.60	12.24	9.82	9.94	10.06	10.18	10.31	10.06
17	17	8.12	8.52	9.21	10.13	11.14	9.42	11.15	11.38	11.61	11.84	12.07	11.61
18	18	8.57	8.82	9.23	9.79	10.40	9.36	10.23	10.35	10.48	10.61	10.74	10.48
19	19	9.97	10.47	11.30	12.43	13.68	11.57	10.91	11.04	11.18	11.31	11.45	11.18
20	20	9.34	9.66	10.12	10.73	11.40	10.25	10.75	10.88	11.01	11.14	11.28	11.01
21	21	7.91	8.14	8.52	9.03	9.60	8.64	11.15	11.36	11.50	11.64	11.78	11.49
22	22	9.28	9.54	9.99	10.59	11.25	10.13	10.23	10.60	10.73	10.87	11.00	10.68
23	23	8.01	8.24	8.62	9.14	9.71	8.75	8.18	8.43	8.53	8.64	8.75	8.51
24	24	8.24	8.48	8.88	9.41	10.00	9.00	10.23	10.60	10.73	10.87	11.00	10.68
25	25	8.15	8.56	9.25	10.17	11.19	9.47	8.18	8.58	8.69	8.80	8.91	8.63
26	26	8.70	8.95	9.36	9.93	10.55	9.50	9.83	10.18	10.31	10.44	10.57	10.27
27	27	9.53	9.80	10.26	10.88	11.56	10.41	11.71	11.86	12.00	12.15	12.30	12.00
28	28	11.21	11.53	12.07	12.80	13.60	12.24	10.91	11.11	11.24	11.38	11.52	11.23
29	29	8.60	8.84	9.26	9.81	10.43	9.39	10.23	10.41	10.54	10.67	10.80	10.53
30	30	8.97	9.23	9.66	10.24	10.88	9.79	14.32	14.40	14.58	14.76	14.94	14.60
31	31	9.34	9.61	10.06	10.67	11.33	10.20	10.23	10.35	10.48	10.61	10.74	10.48
32	32	8.01	8.24	8.62	9.14	9.71	8.75	8.18	8.28	8.38	8.49	8.59	8.38
33	33	8.01	8.19	8.57	9.09	9.65	8.70	9.82	9.94	10.06	10.18	10.31	10.06
34	34	7.33	7.67	8.03	8.52	9.05	8.12	7.87	8.06	8.16	8.26	8.36	8.14
35	35	7.65	7.86	8.23	8.73	9.27	8.35	8.18	8.43	8.53	8.64	8.75	8.51
36	36	9.34	9.61	10.06	10.67	11.33	10.20	10.23	10.35	10.48	10.61	10.74	10.48
37	37	9.42	9.69	10.14	10.75	11.42	10.28	10.23	10.35	10.48	10.61	10.74	10.48
38	38	8.63	8.87	9.29	9.85	10.46	9.42	8.92	9.03	9.14	9.26	9.37	9.15
39	39	9.34	9.61	10.06	10.67	11.33	10.20	10.91	11.04	11.18	11.31	11.45	11.18
40	40	8.80	9.05	9.47	10.04	10.67	9.61	9.09	9.20	9.31	9.43	9.54	9.31
41	41	9.61	9.89	10.35	10.97	11.66	10.49	9.20	9.31	9.43	9.55	9.66	9.43
42	42	9.44	9.71	10.16	10.77	11.45	10.30	11.38	11.52	11.66	11.80	11.95	11.66
43	44	9.46	9.73	10.19	10.80	11.47	10.33	10.23	10.35	10.48	10.61	10.74	10.48
44	45	9.76	10.04	10.51	11.14	11.84	10.66	9.09	9.20	9.31	9.43	9.54	9.31
45	46	11.21	11.53	12.07	12.80	13.60	12.24	11.69	11.83	11.97	12.12	12.27	11.98
46	47	9.61	9.89	10.35	10.97	11.66	10.49	13.63	13.80	13.97	14.14	14.31	13.97
47	48	10.19	10.48	10.97	11.64	12.36	11.13	12.52	12.67	12.82	12.98	13.14	12.83
48	49	9.85	10.13	10.60	11.24	11.94	10.75	10.76	10.89	11.03	11.16	11.30	11.03
49	50	9.62	9.90	10.36	10.99	11.67	10.51	10.53	10.66	10.79	10.92	11.06	10.79
50	43	6.64	6.97	7.53	8.28	9.11	7.71	11.15	11.38	11.61	11.84	12.07	11.61

	Wheat						Bajra					
	2014	2015	2016	2017	2018	Average	2014	2015	2016	2017	2018	Average
Sum	448.49	462.44	485.75	517.24	551.83	493.14	510.40	518.48	525.13	531.90	538.67	524.90
Average	8.9698	9.2488	9.7150	10.3448	11.0366	9.8628	10.2080	10.3696	10.50266	10.6380	10.7734	10.4980
Std.Devi.	1.13503	1.15613	1.19808	1.26614	1.35242	1.21236	1.44941	1.44727	1.46844	1.4890	1.51179	1.4723
S.D.E.	0.16052	0.1635	0.1694	0.1790	0.19126	0.17145	0.20498	0.20467	0.20767	0.21059	0.21380	0.20822
Variance	1.288	1.337	1.435	1.603	1.829	1.470	2.101	2.095	2.156	2.217	2.286	2.168
Ranges	4.94	5.08	5.32	5.65	6.08	5.4	7.78	7.78	7.87	7.97	8.07	7.89

Cost of Production (Year-wise – Commodities-wise) (in Rs.) Non-Irrigated Farm (Haryana & Rajasthan State)

Haryana							Rajasthan						
Resp.	BAJRA						Resp.	Bajra					
No.	2014	2015	2016	2017	2018	Average	No.	2014	2015	2016	2017	2018	Average
151	12.62	12.12	14.04	15.40	14.41	13.72	51	9.35	8.98	13.26	11.41	13.75	11.35
152	13.30	12.64	15.09	14.60	13.65	13.86	52	9.94	9.45	11.28	10.91	14.80	11.28
153	13.18	12.02	15.79	15.28	16.58	14.57	53	9.95	9.07	11.92	11.53	12.51	11.00
154	15.38	14.02	14.80	14.38	14.02	14.52	54	11.81	10.77	15.92	13.69	14.28	13.29
155	15.29	14.90	13.02	15.55	14.29	14.61	55	12.47	12.15	10.61	15.21	14.15	12.92
156	15.69	14.50	14.67	15.77	15.15	15.16	56	13.36	12.34	12.48	15.21	14.56	13.59
157	12.17	12.34	13.26	15.85	15.47	13.82	57	9.98	10.12	13.60	12.99	14.10	12.16
158	12.42	11.66	13.26	14.97	15.47	13.56	58	11.69	10.97	12.48	15.21	15.87	13.24
159	13.47	12.54	12.29	12.71	15.23	13.25	59	10.52	11.11	11.94	12.84	13.93	12.06
160	12.34	12.75	11.99	12.19	13.85	12.62	60	9.70	9.31	13.76	11.84	14.27	11.78
161	12.75	12.67	13.54	14.22	15.00	13.63	61	15.58	15.19	15.16	15.21	15.47	15.32
162	9.95	11.07	12.22	13.70	14.86	12.36	62	16.62	15.43	14.59	13.68	14.67	15.00
163	14.38	13.80	13.23	14.54	15.43	14.27	63	12.47	11.97	11.47	12.61	13.38	12.38
164	10.52	12.28	14.75	14.97	15.23	13.55	64	11.22	12.34	10.98	12.22	12.80	11.91
165	11.50	12.82	13.93	15.15	14.61	13.60	65	9.03	9.12	10.02	11.28	12.23	10.34
166	12.17	11.87	10.11	10.74	10.18	11.01	66	15.78	15.38	13.10	13.92	13.19	14.27
167	14.28	14.88	13.26	15.69	14.33	14.49	67	13.07	13.61	12.13	14.35	13.11	13.25
168	12.18	12.40	12.32	13.13	14.25	12.86	68	11.22	10.77	13.26	13.69	13.75	12.54
169	14.83	14.57	12.67	15.34	14.45	14.37	69	14.04	13.80	12.00	14.53	13.69	13.61
200	13.26	13.93	14.97	16.10	15.09	14.67	70	12.61	13.62	12.86	13.83	13.63	13.31
170	13.48	14.16	15.22	15.50	15.21	14.71	71	11.08	11.30	9.40	9.85	10.01	10.33
171	11.23	11.86	12.74	13.70	14.76	12.86	72	13.12	12.54	12.42	10.70	11.08	11.97
172	12.11	11.84	11.76	14.66	15.18	13.11	73	11.22	10.97	10.90	13.58	14.07	12.15
173	13.60	15.27	18.52	13.83	14.14	15.07	74	10.44	11.78	13.26	13.20	13.72	12.48
174	10.77	11.79	14.26	14.72	15.24	13.35	75	11.33	11.28	11.47	11.64	11.51	11.45
175	12.86	12.78	13.90	15.69	15.13	14.07	76	11.31	11.06	11.38	11.43	11.56	11.35
176	13.41	13.48	15.30	16.54	14.86	14.72	77	11.76	9.58	10.81	12.23	12.87	11.45
177	11.03	12.56	13.41	14.31	15.21	13.30	78	13.97	13.89	13.44	12.77	13.54	13.52
178	13.42	15.17	15.53	14.99	15.88	15.00	79	9.84	11.12	11.39	13.42	14.05	11.97
179	13.60	14.45	14.38	13.17	13.64	13.85	80	12.86	13.67	13.59	12.45	12.89	13.09
180	11.47	12.92	13.88	15.13	15.77	13.83	81	12.41	14.17	13.18	13.73	13.78	13.45
181	11.47	12.92	11.70	10.66	15.18	12.39	82	9.35	10.53	9.54	8.69	12.38	10.10
182	14.86	14.64	15.13	15.67	14.50	14.96	83	10.60	10.45	10.80	12.75	14.24	11.77
183	13.51	13.05	13.62	14.64	15.79	14.12	84	12.54	12.26	11.12	11.71	12.84	12.10
184	14.14	13.40	14.40	15.07	14.34	14.27	85	14.41	13.65	14.67	15.35	14.61	14.54
185	12.91	15.38	15.96	15.08	15.43	14.95	86	10.65	12.69	14.69	14.67	13.59	13.26
186	12.53	12.91	13.55	14.57	15.73	13.86	87	15.15	12.12	12.00	12.84	13.26	13.07
187	13.10	13.72	14.27	14.87	15.42	14.27	88	9.54	9.64	10.61	11.88	13.17	10.97
188	13.22	13.09	13.78	14.52	15.75	14.07	89	11.16	10.37	12.44	13.74	15.47	12.63
189	10.45	10.80	11.61	12.75	14.43	12.01	90	10.05	10.99	12.26	13.44	14.52	12.25
190	10.34	10.40	12.36	13.15	13.97	12.04	91	13.33	13.30	13.47	13.70	13.59	13.48
191	13.60	14.26	15.53	15.55	15.79	14.95	92	9.62	11.08	11.91	11.74	13.29	11.53
192	10.01	10.93	11.18	12.63	13.78	11.71	93	10.04	10.96	11.22	12.67	13.82	11.74
193	10.20	11.33	12.51	13.83	15.00	12.57	94	9.12	8.75	12.93	11.12	13.41	11.07
194	11.47	12.58	15.28	15.75	15.19	14.05	95	12.23	12.11	11.85	13.74	14.14	12.81
195	11.58	13.45	14.75	15.86	13.82	13.89	96	10.04	11.45	13.26	13.34	13.60	12.34
196	13.07	14.75	15.33	15.46	15.61	14.84	97	11.76	13.27	13.79	13.91	14.04	13.35
197	10.70	11.86	12.82	13.86	15.75	13.00	98	13.36	13.82	13.31	14.21	13.54	13.65
198	13.24	13.36	14.74	14.74	15.29	14.27	99	10.65	10.75	11.86	13.00	14.05	12.06
199	14.80	15.32	15.00	14.94	15.75	15.16	100	11.51	11.92	11.67	11.62	13.93	12.13

	Haryana							Rajasthan					
	2014	2015	2016	2017	2018	Average		2014	2015	2016	2017	2018	Average
Sum	633.86	654.21	691.63	726.12	743.09	689.75		584.86	586.97	617.46	645.28	678.71	622.66
Mean	12.6772	13.0842	13.8326	14.5224	14.8618	13.7950		11.6972	11.7394	12.3492	12.98056	13.574	12.4532
Std.Devi.	1.4895	1.29293	1.5041	1.26833	0.9637	0.98240		1.8595	1.72559	1.4158	1.4507	1.0721	1.1542
S.D. Error	0.2106	0.18285	0.21271	0.1793	0.13630	0.13893		0.26298	0.24404	0.2002	0.2051	0.1516	0.16326
Variance	2.219	1.672	2.262	1.609	0.929	0.965		3.458	2.978	2.005	2.105	1.149	1.333
Range	5.74	4.98	8.41	5.88	6.40	4.15		7.59	6.68	6.52	6.66	5.86	5.22

It was also decided to obtain the price from " Krishi Upaj Mandi Haryana & Rajasthan State" at which a farmers were able to sale his produce to the wholes seller were obtained to draw indications about the state of affairs of the agricultural activities carried out by the farmers. The sale price for wheat and bajra for the years under study were as follows:

Sale price (Per Kg. in Rs.) in Haryana State

Crop	2014	2015	2016	2017	2018
1. Wheat	7.00	6.80	8.80	10.80	11.30
2. Bajra	5.29	6.05	6.67	6.89	7.10

Source: Planning Department & Department of Economic and Statistical Analysis,

Sale price (Per Kg. in Rs.) in Rajasthan State

Crop	2014	2015	2016	2017	2018
1. Wheat	7.25	7.60	9.60	10.30	11.00
2. Bajra	5.05	6.00	6.47	6.80	6.80

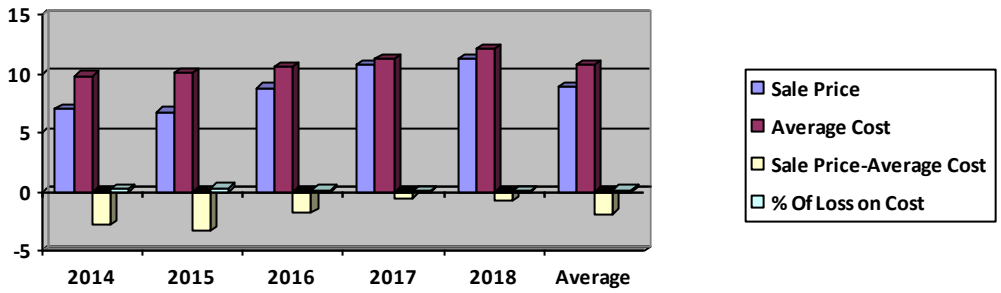
Source: Planning Department & Department of Economic and Statistical Analysis,

The aforesaid tables were used to analysis the state of an agriculturalist in carrying out this activity during the period under study has been done commodity-wise and nature-wise. The picture emerges as follows:

- Wheat (Irrigated Farms)
- Bajra (Irrigated Farms)
- Bajra (Non-Irrigated Farms)

Wheat (Irrigated Farms) (Per Kg. in Rs.) selected District of Haryana State

Items	2014	2015	2016	2017	2018	Average
Sale Price	7.00	6.80	8.80	10.80	11.30	8.94
Average Cost	9.86	10.13	10.65	11.34	12.11	10.82
Sale Price-Average Cost	-2.86	-3.33	-1.85	-0.54	-0.81	-1.88
% Of Loss on Cost	29.00%	32.87%	17.37%	4.76%	6.69%	17.38%



The aforesaid table communicates clearly that the cost of production of wheat in irrigated farms is much higher than the sale price for all the **five years** under study.

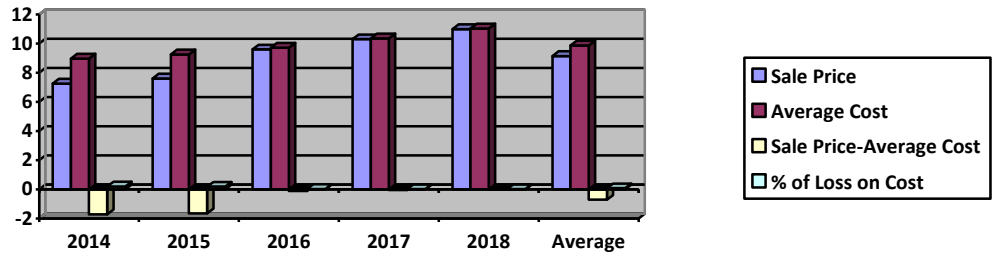
In 2014, the farmer was losing on an average **29.00%** on his capital on account of wheat production. In the following years the loss continued. In 2015, the loss of capital was **32.87%,** in 2016 capital loss was **17.37%**, in 2017 capital loss **4.76%** whereas in the year 2018 is was **6.69%.** The same has been depicted graphically.

On an average picture for the years under study has shown that the average loss of capital on account of producing wheat is **17.38%.** This fact is an alarming one. If a farmer loss **17.38%** of his capital every year then after **6 years** he will lose his complete capital and will enter into the debt trap.

When this fact was further investigated we got indication: One, the farmers are shifting their interest towards cash crops and number two, some of the farmers are meeting their loss of producing wheat by sowing other cash crops.

Wheat (Irrigated Farms) (Per Kg. in Rs.) selected District of Rajasthan State

Items	2014	2015	2016	2017	2018	Average
Sale Price	7.25	7.60	9.60	10.30	11.00	9.15
Average Cost	8.97	9.25	9.72	10.35	11.04	9.87
Sale Price-Average Cost	-1.72	-1.65	-0.12	-0.05	-0.04	-0.72
% of Loss on Cost	19.18%	17.84%	1.24%	0.50%	0.40%	7.30%



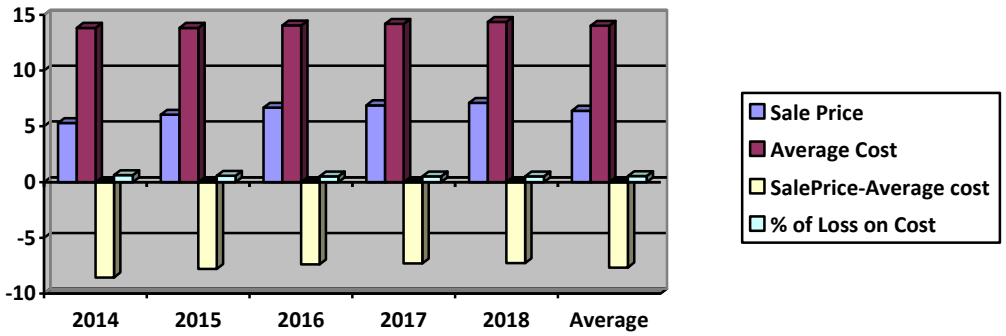
The aforesaid table communicates clearly that the cost of production of wheat in irrigated farms is much higher than the sale price for all the **five years** under study.

In 2014, the farmer was losing on an average **19.18%** on his capital on account of wheat production. In the following years the loss continued. In 2015, the loss of capital was **17.84%**, in 2016 capital loss was **1.24%,** in 2017 capital loss **0.50%** whereas in the year 2018 is was **0.40%**. The same has been depicted graphically.

On an average picture for the years under study has shown that the average loss of capital on account of producing wheat is 7.30%. This fact is an alarming one. If farmers loss 7.30% of his capital every year. When this fact was further investigated we got indication: One, the farmers are shifting their interest towards cash crops and number two, some of the farmers are meeting their loss of producing wheat by sowing other cash crops.

Bajra (Irrigated Farms) (Per Kg. in Rs.) selected District of Haryana State

Items	2014	2015	2016	2017	2018	Average
Sale Price	5.29	6.05	6.67	6.89	7.10	6.40
Average Cost	13.83	13.83	14.04	14.18	14.36	14.01
SalePrice-Average cost	-8.54	-7.78	-7.37	-7.29	-7.26	-7.65
% of Loss on Cost	61.75%	56.25%	51.18%	51.41%	50.56%	54.60%



The aforesaid table communicates clearly that the cost of production of bajra in irrigated farms is much higher than the sale price for all the **five years** under study.

In 2014, farmer was losing on an average **61.75%** of his capital on account of his production. This loss is decreasing every year. In 2015, the loss of capital was **56.25%,** in 2016 it was **51.18**%, and in 2017 it was **51.41**% whereas in the year 2018 it was **50.56**%. The same has been depicted graphically.

On an average picture for the years under study has shown that the average loss of capital on account of producing bajra is **54.60%**. This fact is an alarming one. If a farmer loss **54.60%** of his capital every year then after **two years** he will loss his complete capital and will enter into the debt trap.

When this fact was further investigated we got two indications: one, the farmers are shifting their interest towards cash crop and number two, some of the farmers are meeting their loss of producing bajra by sowing other cash crops. The natural outcome of the aforesaid finding will be the scarcity of food grain supply.

Bajra (Irrigated Farms) (Per Kg. in Rs.) selected District of Rajasthan State

Items	2014	2015	2016	2017	2018	Average
Sale Price	5.05	6.00	6.47	6.80	6.80	6.22
Average Cost	10.21	10.37	10.50	10.64	10.77	10.50
SalePrice-Average Cost	-5.16	-4.37	-4.03	-3.84	-3.97	-4.27
% of Loss on Cost	50.54%	42.14%	38.38%	36.09%	36.86	40.67%

The aforesaid table communicates clearly that the cost of production of bajra in irrigated farms is much higher than the sale price for all the five years under study.

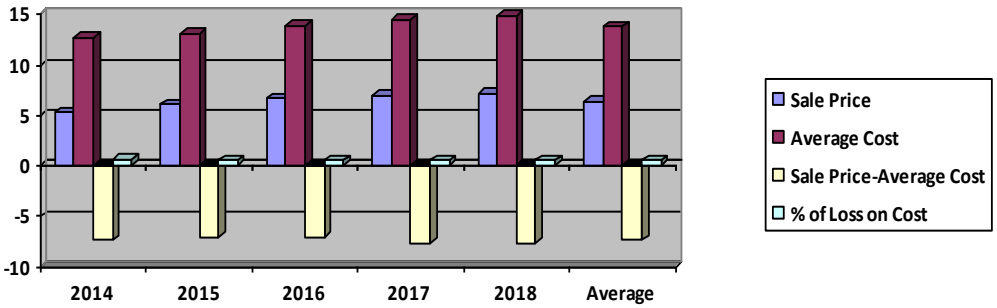
In 2014, farmer was losing on an average **50.54**%% of his capital on account of his production. This loss is decreasing every year. In 2015, the loss of capital was **42.14**%, in 2016 it was **38.38**%, in 2017 it was **36.09%** whereas in the year 2018 it was **36.86%.** The same has been depicted graphically.

On an average picture for the years under study has shown that the average loss of capital on account of producing bajra is **40.67%.** This fact is an alarming one. If a farmer loss **40.67%** of his capital every year then after Two & Half years he will loss his complete capital and will enter into the debt trap.

When this fact was further investigated we got two indications: one, the farmers are shifting their interest towards cash crop and number two, some of the farmers are meeting their loss of producing bajra by sowing other cash crops. The natural outcome of the aforesaid finding will be the scarcity of food grain supply.

Bajra (Non-Irrigated Farms) (Per Kg. in Rs.) selected District of Haryana State

Items	2014	2015	2016	2017	2018	Average
Sale Price	5.29	6.05	6.67	6.89	7.10	6.40
Average Cost	12.68	13.08	13.83	14.52	14.86	13.79
Sale Price-Average Cost	-7.39	-7.03	-7.16	-7.63	-7.76	-7.39
% of Loss on Cost	58.28%	53.75%	51.77%	52.55%	52.22%	53.59%



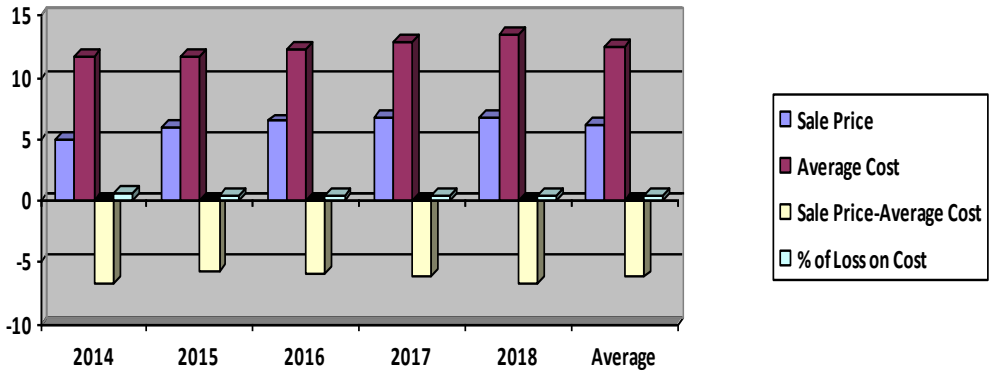
The aforesaid table shows the cost of production of bajra in non-irrigated farms is much higher than the sale price for all the Five years under study.

In 2014, farmer was losing on an average **58.28%** of his capital on account of bajra production. In 2015, the loss of capital was **53.75**% in 2016 it was **51.77%,** in 2017% it was **52.55%** whereas in the year 2018, it was **52.22**%. The same has been depicted graphically.

On an average picture for the years under study has shown that the averages loss of capital on account of producing bajra is **53.59%.** This fact is an alarming one. If a farmer loss of his capital every year then after Two years he will loss his complete capital and will enter into the debt trap.

Bajra (Non-Irrigated Farms) (Per Kg. in Rs.) selected District of Rajasthan State

Items	2014	2015	2016	2017	2018	Average
Sale Price	5.05	6.00	6.47	6.80	6.80	6.22
Average Cost	11.69	11.74	12.35	12.98	13.57	12.45
Sale Price-Average Cost	-6.64	-5.74	-5.88	-6.18	-6.77	-6.23
% of Loss on Cost	56.80%	48.89%	44.05%	47.61%	49.89%	50.04%



The aforesaid table shows the cost of production of bajra in non-irrigated farms is much higher than the sale price for all the **five years** under study.

In 2014, farmer was losing on an average **56.80%** of his capital on account of bajra production. In 2015, the loss of capital was **48.89%**, in 2016 it was **44.05%,** in 2017 it was **47.61%** whereas in the year 2018, it was **49.89%.** The same has been depicted graphically.

On an average picture for the years under study has shown that the averages loss of capital on account of producing bajra is **50.04%.** This fact is an alarming one.

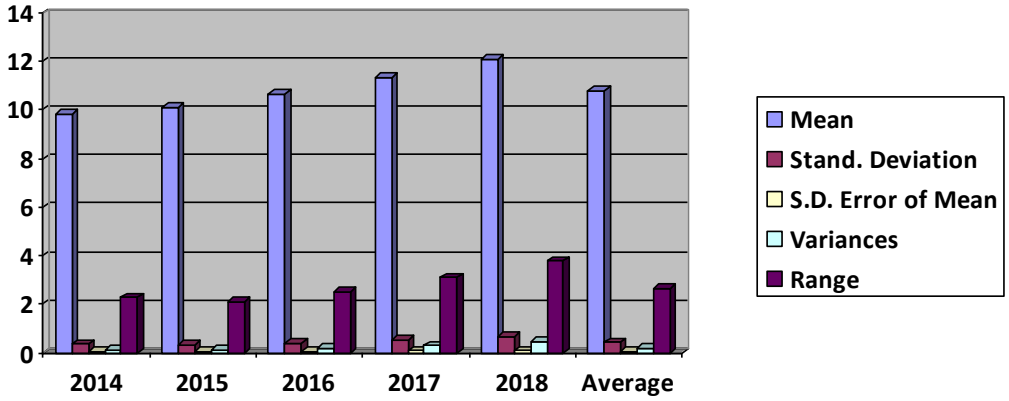
The aforesaid analysis has used sample statistics but to arrive at conclusions with confidence, we have fixed the parameter limits for the cases under study. The picture merges as follows:

- **Wheat (Irrigated Farms)**
- **Bajra (Irrigated Farms)**
- **Bajra (Non-Irrigated Farms)**

Wheat (Irrigated Farms) selected District in Haryana State

Average Cost and its Statistical Limits

Limits	2014	2015	2016	2017	2018	Average
Mean	9.86	10.13	10.65	11.34	12.11	10.81
Stand. Deviation	0.35	0.34	0.41	0.53	0.68	0.43
S.D. Error of Mean	.050	.048	.058	0.07	0.092	0.06
Variances	0.12	0.11	0.17	0.28	0.46	0.19
Range	2.26	2.09	2.51	3.11	3.77	2.64



The cost of producing wheat per kg. in 2014 was Rs. 9.86, next year 2015, 2016, 2017 and in 2018 it were Rs.10.13, 10.65, 11.34, 12.11, respectively.

A search for finding reasons of such a high increase in unit cost in a year has revealed that the prices of input elements for producing wheat are increasing regular, whereas the production remains constant.

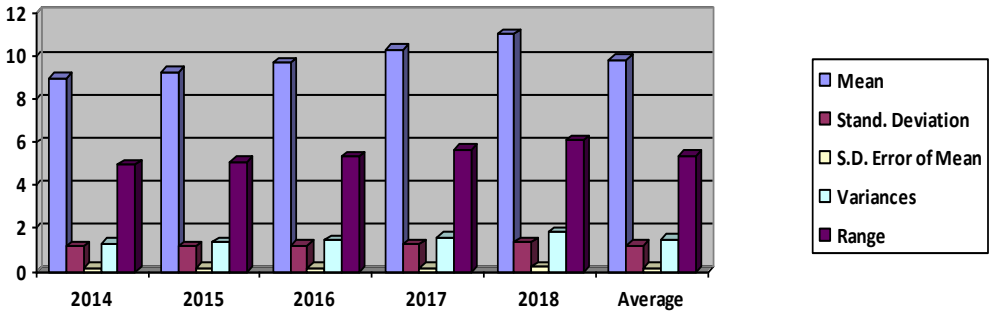
On an average picture of the unit cost reveals that a kg. of wheat is produced for Rs. 10.81. This average cost was obtained on the basis of sample data; the same were used to fix the parameter limits at 99% level of confidence. The results obtained communicate that the average cost of producing a kg. of wheat would range between Rs. 9.86 to Rs 10.81. The same has been depicted graphically.

In 99% cases the averages cost will never be less than Rs. 9.86 per kg. and as we know that the average price at which the production can be sold by the farmer is approximately Rs. 8.94 per kg. this implies that a wheat grower is bound to lose (9.86-8.94=0.92) 10% of his investment every year.

Wheat (Irrigated Farms) selected District in Rajasthan State

Average Cost and its Statistical Limits

Limits	2014	2015	2016	2017	2018	Average
Mean	8.97	9.25	9.72	10.34	11.04	9.86
Stand. Deviation	1.14	1.16	1.19	1.27	1.35	1.21
S.D. Error of Mean	0.16	0.16	0.17	0.18	0.19	0.17
Variances	1.29	1.34	1.44	1.60	1.83	1.47
Range	4.94	5.08	5.32	5.65	6.08	5.40



The cost of producing wheat per kg. in 2014 was Rs. 8.97, next year 2015, 2016, 2017 and in 2018 it were Rs.9.25, 9.72, 10.34, 11.04, respectively.

A search for finding reasons of such a high increase in unit cost in a year has revealed that the prices of input elements for producing wheat are increasing regular, whereas the production remains constant.

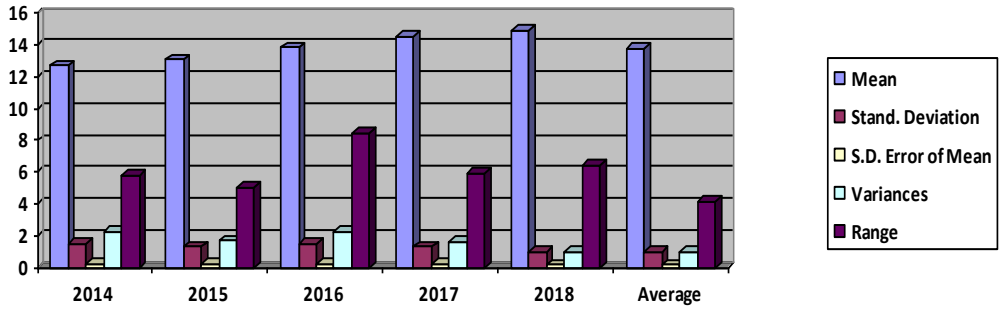
On an average picture of the unit cost reveals that a kg. of wheat is produced for Rs. 9.86. This average cost was obtained on the basis of sample data; the same were used to fix the parameter limits at 99% level of confidence. The results obtained communicate that the average cost of producing a kg. of wheat would range between Rs. 8.97 to Rs 11.04. The same has been depicted graphically.

In 99% cases the averages cost will never be less than Rs. 9.86 per kg. and as we know that the average price at which the production can be sold by the farmer is approximately Rs 9.15 per kg.

Bajra (Irrigated Farms) (Per Kg. in Rs.)

Average Cost and its Statistical Limits in selected District of Haryana State.

Limits	2014	2015	2016	2017	2018	Average
Mean	12.68	13.08	13.83	14.52	14.86	13.79
Stand. Deviation	1.49	1.29	1.50	1.27	0.96	0.98
S.D. Error of Mean	0.21	0.183	0.21	0.18	0.14	0.14
Variances	2.22	1.67	2.26	1.61	0.93	0.96
Range	5.74	4.98	8.41	5.88	6.40	4.15



The cost of production per kg. Bajra in 2014 was Rs. 12.68, next year in 2015 was 13.08, in 2016 it was 13.83, in 2017 it was 14.52 whereas in the year 2018 the cost increased was Rs. 14.86.

A search for finding reasons of such a high increase in unit cost in a year has revealed that the prices of input elements for producing bajra are increasing regularly whereas the production remains constant.

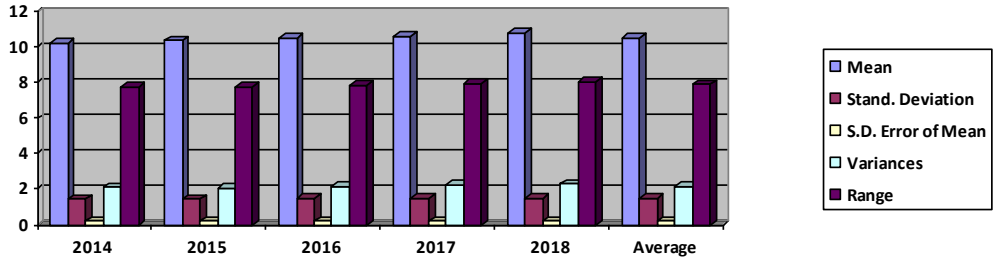
On an average picture of the unit cost reveals that a kg. of bajra is produced for Rs. 13.79. This average cost was obtained on the basis of sample data; the same were used in fix the parameter limits at 99% level of confidence. The results obtained communicate that the average cost of producing a kg. of bajra would range between Rs. 12.68 to Rs. 14.86. The same has been depicted graphically.

In 99% cases the average cost will never be less than Rs. 13.79 per kg. and as we know that the average price at which the production can be sold by the farmer is approximately Rs. 6.40 Kg., this implies that a Bajra grower is bound to lose 46% of his investment.

Bajra (Irrigated Farms) (Per Kg. in Rs.)

Average Cost and its Statistical Limits in selected District of Rajasthan State.

Limits	2014	2015	2016	2017	2018	Average
Mean	10.21	10.37	10.50	10.64	10.77	10.49
Stand. Deviation	1.45	1.45	1.47	1.49	1.51	1.47
S.D. Error of Mean	0.20	0.20	0.21	0.21	0.21	0.21
Variances	2.10	2.09	2.16	2.22	2.29	2.17
Range	7.78	7.78	7.87	7.97	8.07	7.89



The cost of production per kg. bajra in 2014 was Rs. 10.21, next year in 2015, 2016,2017 and 2018 it was 10.37, 10.50, 10.64 and 10.77.

A search for finding reasons of such a high increase in unit cost in a year has revealed that the prices of input elements for producing bajra are increasing regularly whereas the production remains constant.

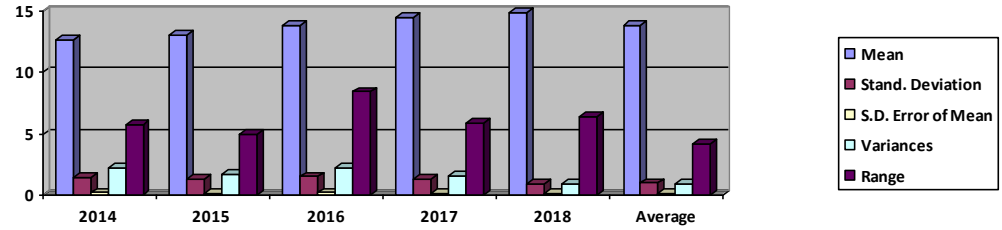
On an average picture of the unit cost reveals that a kg. of bajra is produced for Rs. 10.49. This average cost was obtained on the basis of sample data; the same were used in fix the parameter limits at 99% level of confidence. The results obtained communicate that the average cost of producing a kg. of bajra would range between Rs. 10.21 to Rs.10.77. The same has been depicted graphically.

In 99% cases the average cost will never be less than Rs. 10.49 per kg. and as we know that the average price at which the production can be sold by the farmer is approximately Rs. 6.22 Kg., this implies that a wheat grower is bound to lose 59.29% of his investment.

Bajra (Non-Irrigated Farms) (Per Kg. in Rs.)

Average Cost and its Statistical Limits in selected District of Haryana State

Limits	2014	2015	2016	2017	2018	Average
Mean	12.68	13.08	13.83	14.52	14.86	13.79
Stand. Deviation	1.48	1.293	1.50	1.26	0.96	0.98
S.D. Error of Mean	0.21	0.18	0.21	0.18	0.14	0.14
Variances	2.22	1.67	2.26	1.61	0.93	0.96
Range	5.74	4.98	8.41	5.88	6.40	4.15



The cost of producing bajra per kg. was approximately same in 2014 was 12.68 and 2015, 2016, 2017 and 2018 it was 13.08, 13.83, 14.52 and 14.86. It is showing a high increase in cost per kg.

A search for finding reasons of such a high increase in unit cost in a year has revealed that the tractor hire increased by 40% due to hike in diesel price and prices of input element for producing bajra are increasing regularly whereas the production remain constant.

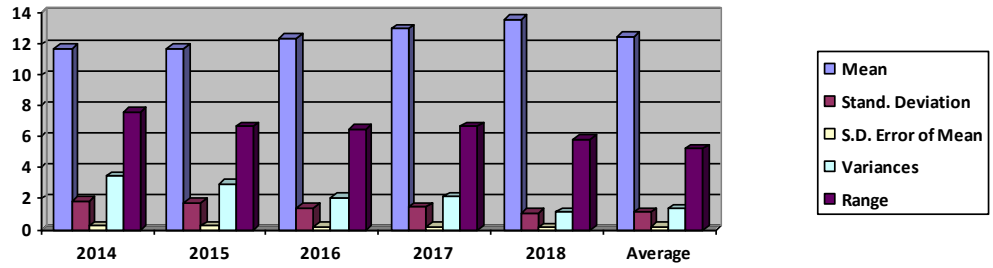
On an average picture of the unit cost reveal that a kg. of bajra is produced for Rs. 13.79. This average cost was obtained on the basis of sample data; the same were used to fix the parameter limits at 99% level of confidence. The results obtained communicate that the average cost of production a kg. of bajra would range between Rs. 12.68 to Rs. 14.86. The same has been depicted graphically.

In 99% cases the average cost will never be less than Rs. 13.79 per kg. and as we know that the average price at which the production can be sold by the farmer is approximately Rs. 6.40 per kg., this implies that a bajra grower is bound to lose 46.41% on his investment.

Bajra (Non-Irrigated Farms) (Per Kg. in Rs.)

Average Cost and its Statistical Limits in selected District of Rajasthan State

Limits	2014	2015	2016	2017	2018	Average
Mean	11.69	11.74	12.35	12.98	13.57	12.45
Stand. Deviation	1.86	1.73	1.42	1.45	1.07	1.15
S.D. Error of Mean	0.26	0.24	0.20	0.21	0.15	0.16
Variances	3.46	2.98	2.05	2.11	1.15	1.33
Range	7.59	6.68	6.52	6.66	5.86	5.22



The cost of producing bajra per kg. was approximately in 2014 it was Rs. 11.69 and in 2015,2016, 2017 and 2018 it was 11.74, 12.35, 12.98 and 13.57 . It is showing a high increase in cost per kg.

A search for finding reasons of such a high increase in unit cost in a year has revealed that the tractor hire increased by 40% due to hike in diesel price and prices of input element for producing bajra are increasing regularly whereas the production remain constant.

On an average picture of the unit cost reveal that a kg. of bajra is produced for Rs. 12.45. This average cost was obtained on the basis of sample data; the same were used to fix the parameter limits at 99% level of confidence. The results obtained communicate that the average cost of production a kg. of bajra would range between Rs. 11.69 to Rs. 13.57. The same has been depicted graphically.

In 99% cases the average cost will never be less than Rs. 12.45 per kg. and as we know that the average price at which the production can be sold by the farmer is approximately Rs. 6.22 per kg., this implies that a bajra grower is bound to lose 49.95% on his investment.

Area-Wise Cost Analysis

During the course of survey we noticed certain variations from place to place i.e. from selected District of **Haryana** and selected District of **Rajasthan** State therefore, it was decided to make cost analysis separately for the entire selected District covered under this study as follows:

- **Wheat (Irrigated Farm)**
- **Bajra (Irrigated Farm)**
- **Bajra (Non-Irrigated Farm)**
- **Wheat (Irrigated Farm):** The process for the test of significance to check the effect of area on cost of producing one kg. Wheat was computed using " **Chi-square (X 2)** test in the following steps:

Hypotheses

Null Hypotheses: Observed Value- Expected Value=0

Level of Confidence (L.O.C.)

- 99.00%
- 95.00%

Test Criterion

Chi-square (X2) distribution

Table (Critical) Value

At 99.00% L.O.C. for 4 degree of freedom= x2 .01=13.30

At 95.00% L.O.C. for 4 degree of freedom =x2 .05=9.49

The process of find out calculated value of x2 was as follows.

(**In selected District of Haryana State)**

District	Observed (O)	Expected (E)	(O-E) 2	(O-E) 2/E
Sirsa	10.73	10.81	0.08	0.01
Hissar	10.78	10.81	0.03	0.00
Fatehabad	10.62	10.81	0.19	0.02
Bhiwani	11.08	10.81	0.27	0.02
Mahendra Garh	10.86	10.81	0.05	0.00
Sum	**54.07**			**0.06**

The calculated value of x2 (0.06) is much less than the table value of the x2 (13.30 at 99% level of confidence for 4 degree of freedom) and (9.45 at 95% level of confidence for 4 degree of freedom). Hence, the difference between observed and expected values is considered to be insignificant.

Since, the difference has been considered insignificant, we accept our null hypotheses that the area as factor does not influence the cost of producing one kg. of wheat. Since the null hypotheses accepted, we conclude that the cost of producing one kg. of wheat in selected District of Haryana State do not different significantly. The location of the farm does not influence the cost of production.

(In selected District of Rajasthan State)

District	Observed (O)	Expected (E)	(O-E) 2	(O-E)2/E
Jhunjhunu	9.96	9.86	0.10	0.01
Alwar	9.78	9.86	0.08	0.01
Churu	9.73	9.86	0.13	0.01
Sikar	9.38	9.86	0.48	0.05
Dausa	10.46	9.86	0.60	0.06
Sum	**49.31**			**0.14**

The calculated value of x2 (0.14) is much less than the table value of the x2 (13.30 at 99% level of confidence for 4 degree of freedom) and (9.45 at 95% level of confidence for 4 degree of freedom). Hence, the differences between observed and expected values are considered to be insignificant.

Since, the difference has been considered insignificant, we accept our null hypotheses that the area as factor does not influence the cost of producing one kg. of wheat. Since the null hypotheses accepted, we conclude that the cost of producing one kg. of wheat in selected District of Rajasthan State do not different significantly. The location of the farm does not influence the cost of production.

- **Bajra (Irrigated Farm):** The process for the test of significance to check the effect of area on cost of producing one kg. bajra was computed using " **Chi-square (X 2)** test in the following steps:

Hypotheses

Null Hypotheses: Observed Value- Expected Value=0

- **Level of Confidence (L.O.C.)**
  - 99.00%
  - 95.00%
- **Test Criterion**

Chi-square (X2) distribution

Table (Critical) Value

At 99.00% L.O.C. for 4 degree of freedom= x2 .01=13.30

At 95.00% L.O.C. for 4 degree of freedom =x2 .05=9.49

The process of find out calculated value of x2 was as follows.

(**In selected District of Haryana State)**

District	Observed (O)	Expected (E)	(O-E)2	(O-E)2/E
Sirsa	13.90	13.99	0.09	0.01
Hissar	13.85	13.99	0.14	0.01
Fatehabad	13.80	13.99	0.19	0.01
Bhiwani	14.26	13.99	0.27	0.02
Mahendra Garh	14.14	13.99	0.15	0.01
Sum	**69.95**			**0.06**

The calculated value of x2 (0.06) is much less than the table value of the x2 (13.30 at 99% level of confidence for 4 degree of freedom) and (9.49 at 95% level of confidence for 4 degree of freedom). Hence, the differences between observed and expected values are considered to be insignificant.

Since, the difference has been considered insignificant, we accept our null hypotheses that the area as factor does not influence the cost of producing one kg. of bajra. Since the null hypotheses accepted, we conclude that the cost of producing one kg. of bajra in selected District of Haryana State do not different significantly. The location of the farm does not influence the cost of production.

(**In selected District of Rajasthan State)**

District	Observed (O)	Expected (E)	(O-E)2	(O-E)2/E
Jhunjhunu	10.78	10.49	0.29	0.03
Alwar	9.92	10.49	0.57	0.05
Churu	10.86	10.49	0.37	0.04
Sikar	9.62	10.49	0.87	0.08
Dausa	11.31	10.49	0.82	0.08
Sum	**52.49**			**0.28**

The calculated value of x2 (0.28) is much less than the table value of the x2 (13.30 at 99% level of confidence for 4 degree of freedom) and (9.49 at 95% level of confidence for 4 degree of freedom). Hence, the differences between observed and expected values are considered to be insignificant.

Since, the difference has been considered insignificant, we accept our null hypotheses that the area as factor does not influence the cost of producing one kg. of bajra. Since the null hypotheses accepted, we conclude that the cost of producing one kg. of bajra in selected District of Rajasthan do not different significantly. The location of the farm does not influence the cost of production.

- **Bajra (Non-Irrigated Farm):** The process for the test of significance to check the effect of area on cost of producing one kg. bajra was computed using " **Chi-square (X 2)** test in the following steps:

Hypotheses

Null Hypotheses: Observed Value- Expected Value=0

- **Level of Confidence (L.O.C.)**
  - 99.00%
  - 95.00%

Test Criterion

Chi-square (X2) distribution

Table (Critical) Value

At 99.00% L.O.C. for 4 degree of freedom= x2 .01=13.30

At 95.00% L.O.C. for 4 degree of freedom =x2 .05=9.49

We rejected our null hypotheses that there are as a factor does not influence the cost of production. Since the null hypotheses is rejected, we conclude that the cost of producing one kg. of bajra is influenced by area in selected District of Haryana & Rajasthan. This means that the location of firm influences cost of producing one kg. of bajra. The location of farm does not figure as a factor to influence the cost of production in case of irrigated farming whereas the location becomes an important factor to influence the cost of production in non-irrigated farms. This finding supports the very well know fact that the rains vary from place to place. Therefore, the place is supposed to influence the cost only in rain based farming.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 109-113

PLANNING FOR HEALTH WITH REFERENCE TO FUTURE NEEDS

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ABSTRACT

The foregoing analysis depicts the high morbid conditions of the region in which the water-borne diseases have their sway to the extremities. The region suffers mostly from diarrhoeal and dysentric infections in all seasons of the year with greater incidences in summer months and rainy season. Malaria still continues to be an epidemic disease (9455/million) whose periodic outbreaks not only cause high morbidity but also take a heavy toll of life. Helminthic diseases, mostly among children and the younger age-groups are most rampant.

***KEYWORDS**: Helminthic Disease, Dysentric Infections, Epidemic Disease, High Morbidity.*

Introduction

The tribal population which forms a large bulk of the resident population is invincingly poor and dependent upon the forest produce and meagre agricultural produce. The Government of Rajasthan has made tremendous efforts to provide safe water supply, mostly by sinking hand pumps, yet it appears to be insufficient to arrest the march of water-borne diseases which have greater scourge in this region. It is therefore essential to plan for health of the resident population for future especially in view of the growing population of this area.

The total population of the region in 1981 was 70, 11, 326 which is likely to increase to 89, 63, 200 in the year 1991 and to 1,11,82,300 in the year 2001. On account of higher sex-ratio in almost all the districts of the region, the fertility rates are likely to remain higher and the population growth-rate is not likely to fall substantially.

The predominantly tribal districts like Banswara (984) Dungarpur (1045) and Udaipur (977) have much higher sex-ratio than the Rajasthan State (919). The literacy-rates are also appallingly low in all the six districts which fore tells that neither the family planning measures to reduce the population growth rate are likely to be effective nor the health education is likely to impart the desired goals of better health to the society. The lowest literacy rates of the State are found in the tribal districts of Banswara (16.85%) Dungarpur (18.52%), Bhilwara (19.79%). Sirohi (20.07%) Chittorgarh (21.94%) and Udaipur (22.01%) which are far less than the States average (24.38%). In the context of this demographic backdrop the planning for health has to be envisaged to achieve the goal of health for all by 2000 A.D.

To alleviate the health problems of the tribal people of the region it is essential that infrastructural facilities are provided which can reduce the infant mortality. disease incidences and their epidemic outbreaks and the standard of living of the general mas is raised to be above the poverty line. The following measures are therefore to be adopted.

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- Provision of potable, safe drinking water is made in all towns and villages.
- Towns and villages are to be connected by roads to have easy accessibility.
- Agricultural produce is increased so that the people get suffi- cient nourishment and do not fall an easy victim to scourge of diseases.
- Literacy rate is increased both in male and female population and health education is imparted to all preferably in younge rage-groups.
- Alternative and supplementary means of income are to be provided so that the people do not depend upon the agricultural produce and forest products alone. Such modes of income can be the development of fisheries, animal husbandry sericulture and social forestry.
- The health-care centres which are equipped with indoor beds. diagnositic facilities and trained medicos are established in major towns and large villages. Referral hospitals, dispen- saries and primary health centres are opened at nodal growth centres chiefly the villages, Ayurved, Unani and homeopathic medical centres can also be opened in smaller villages.

Progress during the Plans

In view of a larger percentage a larger percentage of tribal population in the southern hilly regions of Rajasthan, the State Government started the Tribal Sub Plan (TSP) in 1981 which covered the entire districts of Banswara and Dungarpur, 7 blocks of Udaipur district (Kotra, Jhadol. Sarada Dhariyawad. Salumbar Kherwara and Girwa). 2 blocks of Chittorgarh district (Partapgarh and Arnod) and one block of Sirohi (Abu Road). The Tribal Sub Plan, thus covered 4.183 million population (1981 census) of the State which is about 12-20% of the total population of Rajasthan. It constitutes 5.77% of the total area of the State having about 4409 villages. Thus the TSP covers only 43.74% of the total tribal population of the State. The main aims of the Tribal Sub Plan have been to create exclusive agencies to undertake tribal development work with a focus on individual families, to build infrastructure in these areas for better economic growth, to impart education and techni- cal and technical training to tribal people for better standards of living to alleviate poverty through special family oriented programmes to provide supplementary nutrition to vulnerable groups of children and lactating mothers and to improve the quality of life for the tribals by provision of potable water medical facilities education, employment transport and means of communications.

During the VI Five Year Plan (1980-85), a total of 13 new primary health centres, 8 subsidiary health centres and 212 subcentres were started in the TSP region. In addition to it 2 ‘A’ class Ayurved hospitals and 79 ‘B’ class Ayurved dispensaries were opened. The total number of villages covered by safe rural water supply schemes was 2456. To improve the means of transport about 265 km. of metalled roads were constructed in the rural areas. This was a laudable achievement in a short span of 5 years. Improvements in the systems of modern medicine had cost about Rs. Rs. 19.668 million. But it was felt that the targets were achieved only quantitatively and there was much scope to improve the health-care measures measures in qualitative terms.

In the VII Five Year Plan (1985-90) a total provision of Rs. 100.6 million million was made for medical health and family planning pro- grammes. The amount is meant for the construction of buildings of primary health centres the family planning programme incentives, provision of drugs and medicines, training of para-medical staff for rural health health centres and for the control of various endemic diseases like tuberculosis, venereal diseases, blindness. malaria and guinea- worm disease. To make make available the facilities of modern medicine even in the remote areas, the Government has set up 3 mobile dispen- saries in this area. These mobile units are well equipped with medicos and trained auxilliary medical staff to meet with the needs of the people. These mobile vans run of definite routes once a week so that the rural people can take advantage of them on fixed dates at pre- arranged schedules.

The necessity of providing safe and hygienic drinking water to the resident population was also realised but the problem was found to be more acute than in other areas of the State. Out of 4,378 populated villages in the TSP area. 3,578 villages were found to be problemetic in regard to the supply of safe drinking water. The problems were mostly of pollution as the old dug-wells, open step-wells were highly infested with various germs chiefly of guinea-worm and dysentry. The open water-bodies like rivers, ponds and lakes were also grossly polluted. The underground aquifers are not rich with potable water because of the hard granitic and gneissic rocks in the area. So the only alternative is to sink hand

pumps in the shallow aquifers which can provide water to small communities only and they they soon become dry after using the water for for an hour or more. The Public Health and Engineering Department of the State, which is the main agency to install hand pumps and tube wells and to provide piped water-supply. felt that cent per cent habitations can not be provided with the basic facility of safe drinking water on account of the dispersed and scatte- rred habitations perched on hill slops. However, in the VII Plan, a total outlay of Rs. 46.3 million was earmarked for the coverage of 150 more villages of the TSP area for the provision of safe drinking water supply.

The UNICEF has also assisted this region by providing Rs. 125 million for the eradication of guinea-worm disease and the project was launched in 1985 mainly in Banswara and Dungarpur districts which are highly infested. Under this scheme, all the the step-wells of the area were closed for for public use. Health education was imparted to the rural people through posters, documentary films and television programmes. The Panch, Sarpanch and the Heads of the tribal communities were also trained at block level so that they can explain to their communities about the causes of the guinea-worm disease and the methods to eradicate it. The disease is now said to be under control although a total eradication may only be possible in the next five-year plan.

Education is an important aspect of promoting health. health. By the end of the VI Five-Year Plan the region had a total of 2,665 primary schools, 650 upper primary schools and 245 secondary and higher secondary schools. The region also had 4 colleges, 22 Ashram schools. 600 adult education centres and 400 non-formal education centres. If was found that about 92% of the tribal children were attending the primary schools (6-11 age-group) and about 69% were attending the upper primary schools (11-14 age group). However, the girls percentage in both the types of schools was far less being 30.5% and 10.2% respectively. The State Government has therefore earmarked a sum of Rs. 209.9 million for the primary education in this aroa for the VII Five Year Plan. This plan envisages the further expansion of 306 primary schools, besides distribution of free books, stationary and grant of scholarships to the tribal children. Special facilities for residential accommodation of girls in hostels for promoting female education has also been envisaged. The achievements of these targets are yet to be assessed at the end of the VII Plan, Plan. However, some guidelines can be proposed for future which can be implemented in the next plan.

Future Needs

In order to improve the health situation in the region in future years, three aspects viz. health-care centres, provision of safe drink- ing water and education are of paramount importance and they have been mainly considered here. The number of medical centres in 1981 was 488 for a population of 70,11.326 meaning thereby that for each medical centre, there was a dependency of 14,367 persons. In 1988, the number of medical centres increased to 1643 for a population of 83,35,000 which reduced the dependency per medical centre to 5073 persons only. Initially, this may appear to be a progress but it is not so. Out of 1643 medical centres in 1988, about 1209 were sub- centres (73%) which do not have the trained staff of doctors and nurses. The medical centres which are of use to the public are 35 hospitals, 181 primary health centres. 157 dispensaries and 7 maternity centres, all of which combined together form an insignificant proportion of the total health centres. Thus the actual demographic load on each functional medical centre is 34,000 which is extremely high.

Therefore, it it is essential that hospitals hospitals in rural areas are opened. The existing dispensaries should be upgraded into hospitals and they should be equipped with all the laboratory and pathological tests. It is also noteworthy that maternity and child welfare centres should be opened more in the the rural areas. These are the centres at which not only maternity cases are admitted but they are also the main centres of pre-natal and post-natal care of the children and infants.

They can also serve as the centres of family planning in a more effective way.

The region has the highest incidences of infant mortalities in an chiefly due to the reason that the maternity and child welfare centres do not exist in the rural areas. In the initial phase such centres can opened at the following places all of which have a population of more than 20,000 people. Provision of maternity centres at these places will greatly reduce the work-load factor upon existing hospitals and primary health centres. It will also ensure proper medical care to maternity cases and infants who, at present, suffer from several nutritional deficiency diseases and are left uncared even for minor ailments like dysentery, diarrhoea and infantile hepatitis. Observations in this regard indicate that women and children from far-off places reach the hospitals and primary health centres to avail better opportunities of diagnosis and treatment at the main hospitals of the urban centres.

In 1991 and in 2001 when the population of the region would be around 8.965 million and 11.182 million respectively, the demand for health-care centres would be more. In order to have one medical centre for a population of 10,000 persons, the requirement of such centres will be around 8,965 and 11,182 in these years. To fulfil this dire need the State will have to increase the number of centres enormously and for that purpose the financial cooperation from private entrepreneurs will have to be needed. All the villages having more than 1000 population should thus be provided with a small aid-post which has at least one qualified physician and two members of the auxilliary staff to look after the minor ailments of the resident population.

Malaria Eradication

The region is an endemic zone of malaria in Rajasthan due its hot, moist climate and large coverage of forest and grassland on the hills and riverine basins. To control the disease, it is essential that marshy lands and open water bodies are sprinkled with effective insecticides to kill the mosquito population. The problem should first be checked in cities and cities and towns where the mosquitoes breed in the dirty water open drains, cesspools of dirt and filth, overhead tanks of the houses that are used for toilets flushing, open dug-wells and also in the cool, dark corners of every household. Periodic spray of insecticides at these places of mosquito breeding will greatly reduce the danger of malaria.

The disease has also to be checked by administering prophylactic doses of quinine preparations to the potentially susceptible human population in the endemic zones. This task can be done by village level workers, inspectors of the malaria department, panch and sarpanch of the villages without incurring any expenditure. The people have also to to be educated for it and they should be explained the benefits of such preventive measures.

Water Supplies

Most of the water-borne diseases can be checked by improving the water-supplies. It is true that for such a large population, which is incessantly increasing, provision of safe water supplies is a difficult task. But efforts have to be made to supply the potable water from the ground-water resources which are relatively free from contaminations.

The region has some of the perennial rivers also. The water of these rivers can also be dammed and stored in artificial reservoirs which can supply safe drinking water after purification. Thus the waters of the river Berach and its tributaries which flow through the Kapasan, Bari Sadri, Nimbahera, Chittorgarh and Gangrar tehsils of Chittorgarh district can be suitably utilized for drinking purposes. Similarly, the waters of Banas and its tributaries flowing in the northern parts of Udaipur district, the Sabarmati in the south- western parts of Udaipur district and the Som and Erau rivers in the southern parts of Udaipur district can be suitably used.

The River Mahi and its tributaries - Anas, Haran and Som are the biggest sources of surface water in southern upland region. Here, the Ghatol, Bagidora and Kushalgarh tehsils of Banswara district have more than 87% of the population consisting of tribal people. Here, the Mahi-Bajaj Sagar project has been constructed to dam the waters of the river Mahi, at Borkhera village about 16 km east of the Banswara town (Fig. 8.1). The 74 metre high Mahi dam has formed an artificial reservoir of 143.4 km^2 with a gross water storage capacity of 2180 million cubic metres of water. The reservoir is envisaged to irrigate 881,235 hectare of agricultural land in Banswara district and Gujarat State and also to generate 140 MW of hydro-electricity.

The waters of Mahi and its reservoir can also be used to meet the drinking water needs in Bagidora and Banswara tehsils. The two canals viz., the right bank and left bank canals can be used to give water for drinking, all along their courses, to the villages and towns. The impact of Mahi-Bajaj Sagar Project on disease ecology and disease diffusion need to be studied in detail after about five years of its commissioning. Till then, careful observations have to be taken in the neighbouring area in regard to the increase in the incidences of prevalent diseases like malaria, hepatitis, diarrhoea and dysentry which can show higher incidence-rates. In order to achieve the desired benefits of the reservoir in respect to agricultural irrigation and drinking water supplies, careful monitoring of the disease incidence patterns and their remedial measures have to be done simultaneously.

It is not the intention here to provide a blue-print for the development of water resources in the region; rather the main theme is to highlight the impact of existing water resources in causing morbidity patterns. The point sources of water contaminations (p.78) and non-point sources of water contaminations (pp. 78-79) have to be beradicated and a proper management of water has to be done.

The State Department of Water Pollution Control has to ensure that these contaminations do not occur and the soil and water are saved from contaminations because of the increasing industrialization at some centres in this area. A large number of surface water storage tanks and lakes (pp. 83-85) which are now used for irrigation as well as drinking water are to be made free from biotic contaminants. The dependency on ponds and tanks for drinking water in rural areas which is still high has to be reduced and protected water supplies from subterranean aquifers has to be provided to lessen the disease morbidity in this area.

Development of Education

As noticed already, literacy-rates are very low in the region and there is a great great need to increase the education and literacy in this area. With the increase in population numbers in the next decade, the region would need a larger number of primary and secondary schools. The increase in educational institutions can be anticipated to be at the rate of 3 per cent per year if the present trends of enrolments are to be maintained. However, there is a great need to increase the number of such institutions if the literacy-rates are to be escalated and brought to the level of the State average and the National average.

Vocational education and health education are of paramount importance in the region. The tribals, who want to be wedded with their own vocations and systems of culture and who have so far defied to accept the modern education as acculturation, need a means of system of vocational education which can suit their needs. Infusion of modern techniques of pasture development, animal husbandry, fish culture, aquaculture, forestry schemes, natural silk-making, processing of forest produce, development of of vegetable and fruit gardening are some of the vocations which can be profitably introduced in the tribal society without destruction of their culture and environment.

The female education which is abysmally low in the region need to be boosted at every stage. Besides imparting them the traditional education, it has also to be ensured that they are educated in the management of proper health and hygiene. The simple methods of personal and social hygiene are to be taught and disseminated so that this section of the society who manages the house and the children does practice them. The adult non-formal education and education centres which are already existing in this area can be entrusted with this task.

It can thus be inferred that a planned development of the region can greatly reduce the morbidity patterns of diseases. The various water-borne diseases can be arrested and their incidence-rates lessened by tackling the health problems from multi-faceted directions. All the associated factors like the establishment of well-equipped health-centres and hospitals, eradication programmes of guinea-worm and malaria, improvement in the water-supplies and imparting of vocational and health education work simultaneously. They have to be developed in a phased way in accordance to the needs of the people and without destruction of the environment and the culture of the tribal people.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 114-118

GEOGRAPHICAL SETTING AND ITS ENVIRONS

Dr. Rajendra Kumar Meena*

ABSTRACT

Rajasthan is the largest state of India by covering an area of 3,42,239 km^2. The length of Rajasthan state is 826 Km. from north to south and 869 km. east to west. The land boundary of Rajasthan is about 5920 km. long. Which is 10.45% of the total geographical area of the country. Rajasthan being the largest state is followed by Maharastra, Madha Pradesh, Andhra Pradesh and Uttar Pradesh. The state is five times bigger than Sri Lanka. Three times than chekoslovakia, Seventeen times than Israel and more than double of England. It has 1070 km. International boundary towards Pakistan. It is rhomboid in shape and has been divided into 7 divisions and 32 districts from administrative point of view. Jaipur is the capital of Rajasthan. Jaisalmer district with a land area of 38,401 km^2 is the largest and the district of Dholpur with a land area of 2950 km^2 is the smallest of all the districts of Rajasthan.

***KEYWORDS**: Land Boundary, Geographical Area, International Boundary, Desert Cycle.*

Introduction

The Rajasthan state is located in the north western part of India between 23°3' to 30°12' north latitude and 69°30' to 78°17' east longitude with the tropic of cancer passing through the southern most tip of the state. It is surrounded by Punjab in north, Gujarat in South, Pakistan in west and Uttar Pradesh in east. It has Haryana and Delhi in north east and Madhya Pradesh in south east.

Physiography

Rajasthan has a very mature topography developed during the thousands of years of denudation and erosional processes. The present relief is ultimately the product of the past fluvial cycle of erosion and recent desert cycle of erosion. It is a land of lofty hills and shifting sand-dunes of scorching heat and freezing cold of fertile plain rugged ravines and dense forests. Aravalli is the oldest mountain ranges in the world extending form Delhi to the plains of Gujarat in a length of about 692 km. It divides Rajasthan into north west and south east parts. The state can be divided upto four main topographic regions.

- **Sandy Arid Region**

Western sandy plain includes the Marusthali and the adjoining Bangar to the west of the Aravallis. The western sandy plain is a wide expanse of wind blown sand, poorly watered and sterile. The eastern portion of this is known as desert which is dry and dessolate within thin patches of prickly grass and other desert plants. The region comprises Bikaner, Barmer, Churu, Jodhpur, Jaisalmer, Nagaur, Hanumangarh, Sriganganagar, Pali, Sirohi, Sikar and Jhunjhunu districts. The general aspect of this region is of an interminable sea of sand hills of different shapes and sizes varying from 6 m. to 60 m. in height and being sometimes three to five km. in length.

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- **Semi-Arid Plain or Bangar**

This region is drained by the Luni in its south-eastern portion. In this part the older rocks protrude above the surrounding sandy surface. Gullying has given rise to conglomerate landscape. The land is slightly undulating within venue of sand deposited by the south-western winds. Semi-arid transitional plain characterised by inland drainage and stream with salt lake such as Didwana, Kuchaman, Degana and great Sambhar Lake, Ghaggar plain covers the three-fourth area of the Ganganagar district. There is no stream except the GhaggarNali which flows through the ancient bed of the Ghaggar river which is now extinct and hence this region is known as 'Ghaggar plain'.

- **The Aravalli Hilly Region**

The Aravalli range running across the Rajasthan from south west to north east. The length of Aravalli is 692 km from Palanpur in Gujarat to Delhi. This range is the oldest folded mountain range in the world from most dominant geological structure in the formation of the north Indian terrain and drainage system. It intersect

Rajasthan into two major geographical unit on its two sides. The western part occupying about 2/3 of the state is almost arid and the eastern part is comparatively well drained and fertile. The loftiest and most clearly defined section of the Aravalli range is the Marwar and Merwara hills where it forms and unbroken range. Beyond Ajmer, its breaks up into discontinuous hills which stretch north east towards west of Sambhar Lake and reach up to Khetri from Ajmer to Beawar. The Aravalli is squeezed in a 50 km. wide range much indented by several wind gaps.

- **Eastern Plain**

The denudational chronology of the regional landscape from Pre-Cambrian to subrecent period peneplanation, warping, intrusion and deformation, have produced many relief features. The plain of Bharatpur appears to be extension of the upper Ganga plain and the Kota plain is virtually an extension of the Morena plain but the Banas plain though an alluvial tract is rather a peneplain. The middle Mahi plain is tangled wilderness of valleys known as Chappans, covering parts of Udaipur, Dungarpur, Banswara and Pratapgrah and draining to the Arabian Sea.

- **South-East Plateau (Hadoti Plateau)**

It is called 'Pathar' and 'Uparmal' comprises of the eastern and south-eastern part of the state and is known as Hadoti. This plateau lies in the eastern parts alongwith the Chambal river in south-east of Mewar plain and covers greater part of Bhilwara, Bundi, Kota, Baran and Jhalawar districts. It contains about 9.6 per cent of the area of whole of Rajasthan. The tablelands has very diverse topography consisting of more or less sandy uplands, broad depressions and land strectches of deep black soil. Most of the parts of this region are drained by Chambal river and its tributaries like Kali Sindh Parwan and Parwati.

Administrative Division

Rajasthan has been divided into 7 divisions and 32 districts from administrative point of view. The 7 offices of the commissioners in the state and the districts covered under them are as follows.

S.No.	Division	District
1.	Jaipur Division	Jaipur, Dausa, Alwar, Bharatpur, Dholpur, Sikar and Jhunjhunu districts
2.	Jodhpur Division	Jodhpur, Jalore, Pali, Barmer, Sirohi and Jaisalmer districts.
3.	Ajmer Division	Bhilwara, Tonk, Nagaur and Ajmer districts.
4.	Kota Division	Kota, Baran, Bundi, Jhalawar, Karauli and Sawaimadhpur districts.
5.	Udaipur Division	Udaipur, Rajsamand, Dungarpur, Banswar and Chittorgarh districts.
6.	Bikaner Division	Bikaner, Hanumangarh, Sriganganagar and Churu districts
7.	Bharatpur Division	Bharatpur, Dholpur, Sawaimadhopur and Karoli districts

Drainages System

The Great Indian watershed divided the drainage to the Arabian sea on one side and the Bay of Bengal on the other. The Ajmer valley itself drains westwards by the Sabarmati into the Luni river and the ridge east of Ajmer drains to the Banas and Chambal and from then by the Yamuna and Ganges to the Bay of Bengal. The Rajasthan plain situated in the west of Aravalli range is drained by smaller streams, and their tributaries upto the Arbian sea. Among these rivers- Luni, Sukri, Jawai, Jojri, Sakai, Ghuhia and Bandi. The Saraswati carrying the drainage of the Pushkar valley joins the Sabarmati a tributary of the Luni. The sabarmati alongwith its tributaries Sei, WakalHathmati etc. flows southwards to the Gulf of Cambay.

South of the Aravalli axis is drained by the Mahi through Som and its tributaries. Eastern side of the Great Indian watershed the Banas river alongwith its main tributaries like Khari, Moshi and Morel on the left bank and Berach, Bajasen and Golwa on the right flow towards to the east to join the Chambal river which ultimately joins the river Yamuna in Uttar Pradesh. There are many saline and fresh water lakes in the state. Saline water lakes are Sambhar, Deedwana, Pachpadra, Lunkaransar and sweet water lakes are Jaisamand, Rajsamand, Pichola, Fatehsagar, Udaisagar, Anasagar, Nakki lake, Pushkar, Siliserh, Kolayat, and Balsamand.

Climate

The climate is characterized with large variations in temperature, scanty rainfall and extreme dryness. The summer season is started from April to June and winter from November to March. The period from July to mid- september is dominated by the south-east winds and is called as monsoon period while mid- september to october is the transitional post monsoon period. The major factors affecting the climate of the region are latitudinal position, height above the mean sea level, distance from sea, types of soil, wind direction, the location of Aravalli ranges and vegetation cover.

The region has been divided into the following climate regions on the basis of distribution of rainfall and variation of temperature as well as their effects in the type of vegetation found in the different parts of the region.

- **Arid Region**

This region includes Jaisalmer, northern parts of Barmer, Phalodi tehsils of Jodhpur, western part of Bikaner and southern part of Hanumangarh and Sriganganagar districts. Here the arid hot desert climatic conditions are preveling. The average temperature during summer is recorded more than 34°C and during winter it ranges between 12°C to 16°C and mean annual rainfall recorded less than 100mm in extreme west part of region and rest of the area record less than 200mm rainfall.

- **Semi-Arid Region**

This region covers parts of Ganganagar, Hanumangarh, Churu and Nagaur Jodhpur and Barmer districts. It gets 200-400 mm of mean annual rainfall and its nature is erratic as well as torrential. Thus whenever rain occurs it brings floods. The average temperature during summer season ranges 32° to 36°C whereas during winter season it ranges 10° to 17°C.3.

- **Sub-Humid Region**

This region includes districts of Alwar, Jaipur. Dausa and Ajmer, eastern parts of Jhunjhunu, Sikar, Pali and Jalore districts and north western parts of Tonk, Bhilwara and Sirohi districts. It is sub-tropical humid region and gets scanty rainfall which is limited to a few months of the year. The region receives mean annual rainfall between 400-600 mm. The average temperature during summer season remains between 28°C and 34°C whereas it is recorded 12°C in northern parts and 18°C in southern parts of the region. The region is characterized with steppe type of vegetation.

- **Humid Region**

It includes the districts of Bharatpur, Dholpur, Sawaimadhopur, KarauliBundi, Kota, Barmer, Rajsamand and north-eastern parts of Udaipur. The region receives mean annual rainfall between 600 to 800 mm. Deciduous type of trees are found in this region.

- **Very Humid Region**

This region comprises south-east Kota, Baran, Jhalawar, Banswara, south-west Udaipur and adjacent areas of Mt. Abu. It receives mean annual rainfall between 800 mm to 1500 mm. Summers are hot whereas winters are cold and dry. Most of the rain occur in rainy season. The region is characterised with monsoonal savanna type of vegetation.

Natural Vegetation

Various types of forests cover about 32,309 km2 of area which constitute about 9.44 per cent of the total area of the state. In Rajasthan due to adverse climatic conditions of scarcity of surface water, uncertain and scanty rainfall, extreme temperatures and biotic factors like indiscriminate grazing, unregular cutting of trees and periodical clearance of land for cultivation the forest cover is very low. Rajasthan has a great variety of natural vegetation ranging from scanty vegetation in the western arid region to mixed deciduous and sub-tropical ever green forests in the east and south east of the Aravalli ranges. The main plant community found on the rocks and hills include Euphorbia (Thor), Salvadora (Jal)

Capparis (Kair) Grewin (Gangetti), MayteniusEmarginata (Malkangani) Anogeissus (Dhonkara), Acacia Milotica (Babul) Tecomella Undulata (Rohira) CratolariaMedicagenia (Gulati) Prosopis Cineraria (Khejri) etc. Dominant species are Cappris Decidua (Kair) Acacia Senegal (Kumta) Ziziphus (Ber). The aquatic vegetation is like Cyperus rotundus (Motha), polygonum barbatum (herb with flower), hydrilla ceratophyllum, aponagetonscripus and common alage like chara. In water logged area grasses like typha found. Sand dunes plant calligonumpolygonoides (Phog), indigoferaargentia (Neel) crotolariaburhia (sannia) citrulluscolocynthis (Tumba) catotrpisprocera (Akra) are mainly found. Common grasses are panicum turgidum (Murut grass), elusinecompressa, stalonferouscyperaceae.

Soils

The soil of the State have developed under the arid and humid climate over the bed rocks of complex nature predominantly under the process of laterization. Due to scarcity of rains, low vegetation cover on the surface and organic matter in the soil are liable to wind erosion, as moisture relative capacity is nil.

The soil of the Rajasthan is classified into eight groups.

- **Desert Soil**

These soils cover considerably large area in the districts of Nagaur, Jodhpur, Jalore, Barmer, Hanumangarh, Sriganganagar, Churu, Jhunjhunu and Sikar. It contains a high percentage of soluble salt and high pH value. Texture is sandy to sandy loam and varing percentage of calcium carbonate and generally is poor in organic matter. These soils are pale brown, single grained, deep and well drained.

Surface horizon is non calcareous and the zone of lime accumulation is ill formed. The soil have comparatively darker colour. Most of the desert soils has low nitrogen ranging between 0.02 to 0.07 percent. This deficiency is balanced to some extent by the presence of high available nitrogen in the form of nitrate. The phosphates together with nitrates have made these desert sands fertile for agricultural crops and plants where water supply is regular.

- **Dunes and Associated Soils**

In western Rajasthan sand dunes are frequent occurrence. The dunes are of varying heights from low shifting dunes to high and very high stabilized or partially stabilized dunes. These are accumulation of fresh sand blown by the wind. The interdunal soils are light yellowish brown in colour sandy to sandy loam, deep and well drained. Cultivation is practised in rainy season on the slopes of low to medium high dunes and usually rainfed bajra or kharif pulses are grown.

- **Brown Soil**

These soils are found in the part of Tonk, Bundi, Sawaimadhopur, Bhilwara, Udaipur and Chittorgarh districts. Major area of these soils are in the catchment area of Banas river. Texture of these soils varies from sandy loam to clay loam. The colour of soils ranges from greyish brown to yellowish brown. They are rich in calcium salts but have poor organic matter. Rabi crops are grown under irrigation.

- **Red Loams**

These soils are found in southern parts of Rajasthan in the districts of Dungarpur, Banswara and parts of Udaipur and Chittorgarh. These soils are characteristically reddish in colour sandy loam to loam in texture with granular or crumb structure and well drained. The soils are suitable for maize, chillies (Kharif crops) wheat, barley and rapeseed (rabi crops) cultivation.

- **Sierozems**

These soil are found in Dausa, Pali, Nagore, Jaipur, Ajmer districts. They are mostly yellowish brown, sandy loam to sandy clay loam in texture with weak structure and are permeable. The soils are suitable for cultivation but for low rainfall and high evaporation. Kharif crops are rainfed and rabi crops are grown through well irrigation.

Population

Rajasthan has a population of about 564.73 lakh spread over an area of 3,42,239 km2. The state covers 10.43 per cent of the country's total area whereas support 5.5 per cent of the total population. It ranks eighth in total population among the states of India in 2001. Out of the total population 432.67 lakh was rural and 132.05 lakh urban. The average density of population was 165 persons km^2.

In the east of Aravallis, the density of population ranges between 146 to 471 persons per km2. The density is heaviest in the district of Jaipur, Bharatpur, Dausa, Alwar, Dholpur and Jhunjhunu in the north east of the state. It is also heaviest in the Dungarpur and Banswara districts. In these districts it ranges between 294 to 471 persons per km2. The lowest density of less than 70 persons per km2 has been recorded in the district of Bikaner (61), Barmer (69) and Jaisalmer (13). Jaisalmer district has the lowest (13) density in the state. There are twenty two district which have higher density than the average density of population of the state as a whole. These districts are Jaipur (476), Dausa (384), Bharatpur (414), Alwar (257), Jhunjhunu (323), Dholpur (324), Sikar (296), Dungarpur (294), Banswara (298), Ajmer (257), Sawai Madhopur (248), Udaipur (197), Kota (288), Jhalawar (190), Bhilwara (192), Bundi (173), Chittorgarh (166), Rajsamand (256), Sri Ganganagar (224), Karauli (218), Sirohi (166) and Tonk (168).

Female Density

In Rajasthan according to census 2001 overall population density was 165 persons per km2 which was less than that of India 324 per km2. The total female population was 2.71 crore according to population census 2001. The overall density of female was 79 female per km2 in Rajasthan. The female density was heaviest in the districts of Jaipur(214), Dausa(211), Bharatpur(191), Alwar(168), Jhunjhunu(157) in the north-west of the state and also in the Dungarpur(149), Banswara(147) district. In these districts it ranges between 147 to 211 female per km2..

The lowest density of less than 90 female per km2 has been recorded in the district of Bundi(82), Chittorgarh(81), Tonk(81), Sirohi(80), Sriganganagar and Hanumangarh(80), Nagaur(76), Pali(73), Baran(70), Jalore(67), Jodhpur(60), Churu(56), Barmer(33) and Jaisalmer(6). The female population density was the result of several factors i.e. physical, social, agricultural and historical. In fact the whole of physical, economic and cultural environment affect it..

Conclusion

This state has arid and semi-arid climatic conditions. Western region is mostly a sand covered peneplain in which rocky outcrops appear through the sand. The whole of the region is not covered by sand dunes but the degree and the extent of sand dunes greatly influence the economic activity in this area. Economic activities is determined by the geographical factors. The various forms and patterns of settlement in state closely express the geographical character of the region. The state has the basic resources of dairy development. In the arid and semi-arid zone livestock rearing is the primary occupation and the principal source of livelihood for the people.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 119-122

ANALYSIS OF ROAD NETWORK WITH SPECIAL REFERENCE TO SHAHPURA TEHSIL, JAIPUR DISTRICT

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ABSTRACT

The analysis of transport networks is an important part of geographical analysis. Initially development of transport networks were not systematic. Post-War changes and developments in transport emphasises on the analytical study of networks; the construction of good road, railways and rapid growth in airways and telecommunications led to the development of network analysis. In any region road network is one of the most significant elements of the cultural landscape. In the area under study roads are the only means of transportation. The term 'network' have a loose connotation. Network is applied in different sphere of social relation and in in public utility services. It has been frequently used in the study of electronics and its allied fields. It is a set of transportation routes which may and frequently do join and cross at junction. Basically the transportation network may be defined as set of inter-connected routeways along which interaction take place. The network serve to link location together, e.g., from farm to market from factories to consumption centres, from one town to another.

***KEYWORDS**: Transport Networks, Post-War Changes, Rapid Growth, Cultural Landscape.*

Introduction

According to dictionary meaning of the term 'network' is a meshed fabric of intersecting lines. In geographer's term 'Transportation network is a set of geographic locations inter converted in a system by a number of routes" (Kansky, 1963, p. 1). Thus, the network includes nodes and linkage which are the systematically organised points and lines. According to Hurst (1974) network are structures designed to the nodes together via routes whether they be flow of people, money, goods, information or anything else.

The roads which compose the network are seldom laid down at random. Although the networks are highly complex spatial systems yet their features, characteristics and pattern have been analysed through a number of techniques. The Graph Theory provides the most convenient, consistant and accurate measures of the structural analysis of network. Graph Theory is a subject of topology. According to Bridge (1972) topology is a form of geometry, which is concerned with the position and relationship between points the straightness of lines or the size of area. In order to describe topological structure of a network it is necessary to idealise the network in form of a graph. "Graph are arrays of points, which are connected or not connected to one another by lines" (Haggett and Chorley, 1969). According to Graph Theory in order to analysis the spatial structure of network in an area the network is abstracted to its most basic elementary form, the graph. While abstracting the road network of the region under study, as graph following information's should be kept in mind.

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- No concern with the length and or orientation of lines and paints has been shown. Every link and node is considered as one unit irrespective of its length (edges) and size (node).
- The spatial sequence of the centres has been maintained but the sinuously of roads have been ignored.
- The administrative boundaries are generally ignored while abstracting of network into a graph.
- The graph is not drawn to the scale.
- The existing circuit connection between nodes are shown.
- The forks in road network where no settlement exists have been ignored.

Graph Theoretic Terms

The network represents a series of vertices representing nodes and a set of nodes (representing linkages) together with a relationship of incidence, that associates each edge with two vertices, edges, circuit, path, length of the paths, associate number and diameter.

- **Vertex (V)**

A vertex 'V' or also known as a node or a point or a junction or a terminal is an element of the graph 'G' such as the V.E.G. It is a point of intersection of 'n' edges. 64 nodes have been selected in the study area to evaluate the structure of road network.

- **Edge (e)**

They are also known as links or sides or segments or arcs. An edge is an element of the graph (G) such as E.G.V. It is a continuous link between a vertex vi and vj Edges (Linkages) are transportation lines along which interaction occurs between two places. In other words, edges are lines representing routes, which link nodes. In the region under study, 64 nodes connecting 45 edges have been selected. In order to count the number of edges and vertices for each revenue circle many edges and vertices have been counted twice. For instance, the edge connecting Shahpura and Manoharpur has been counted for both the revenue circle, though a node does not actually exist at the end of revenue circle boundary on such edges but to explain to explain the connection a node have been assumed in both the revenue circle i.e. the inter revenue circle edge was considered as two edges because it connects two vertices in different revenue circles. Thus revenue circle wise total number of edges and vertices comes to 94 and 64 respectively. The number of vertices and edge in different tehsil are given in table as under.

Table 1: Number of Nodes and Linkages

S. No.	Revenue Circle	Number of vertices			Number of edges		
		Actual	Assumed	Total	Actual	Assumed	Total
1.	Amarsar	22	4	26	14	15	29
2.	Manoharpur	23	8	31	15	23	38
3.	Shahpura	19	8	27	12	15	27
	Total	64	20	84	41	53	94
Tehsil as a whole	64	10	74	45	39	84	

- **Circuit**

A circuit is a finite closed path in which the initial vertex V_1 of the edge sequence coincides with the terminal vertex Vx. A circuit without any circuit within it is called a 'Fundamental circuit'. In the area under study, there are 3 fundamental circuits. For example Manoharpur, Bishangarh- Nawalpura and back to Manoharpur, Bishangarh to Nathawala-Shahpura to Bihangarh, Amarsar- Nathawala-Bishangarh to Shyosinghpura and back to Amarsar.

- **Path**

A path is a finite finite set of edges where each edge, θ, being connected with θi-1 edge by one of its vertices and to e1+1 edge by the other vertex. In other words, a path is a collection of routes (edges) linking a series of node e.g., Shahpura to Kareeri is the collection of routes via Devipura-Amarsar-Hanutpura-Jodhpura in collection of 5 edges.

- **Length of the Path**

The number of routes in a path is called the length of the path. Under the Graph Theory the Length of the path is not stated in terms of kilometres or miles but in terms of number of edges or routes in the path. For instance, the length of the path betweenManoharpur to Devipura via Shahpura is 4 but via Bishangarh it is 8.

- **Distance of the Path**

It is the length of the shortest path joining two nodes. For example between Manoharpur to PeeplodNarain via Bishangarh, Chaterpura and Dhelawash.

- **Associate Number**

It provides an understanding of the maximum number of edges from a given vertex to each of the other vertices. Number of edges indicates topological distance. Topological distance between two vertices, is the number of edges, which are number of the shortest path between the given vertices (here shortest path is taken to mean the smallest number of edges of a given path). Therefore, the associate number, expressing the maximum distance between network vertices may be interpreted as a measure of the network topological extent (like the network's diameter).

- **Diameter (s)**

The highest associates number (Ki) is the diameter of the network. It is expressed a α = Max. dij. In the region under study the diameter is 5, observed between Devan to Devipura (Shahpura Revenue Circle).

- **Subgraph**

Subgraph are places of larger graph in which the pairs of points of vertices in the system which cannot join in a path. In the area under study there is no subgraph.

Connectivity of Network

When the network is reduced as a graph it shows several lines connecting different nodes. The degree of connection between all the nodes in a system is called the the 'connectivity of the network' (Taaffe, 1973, p. 101). "The "The connectivity of a network may be defined as the degree of completeness of the links between nodes" (Robinson, 1978, p. 74). "The degree to to which direct movements are possible as apposed to indirect movements as the connectivity of the network. The networks which are most connected are those in which the directness of routes joining up pairs of places is maximised" (Cox, 1972, p. 146).

This connectivity of the network is a result of the arrangement of nodes and edges. Haggett and Chorley (1969, p. 10) in their topological classification have identified four four types of connectivity of network in Planner Graph.

- **Path Connectivity**

It is a single line connectivity the simplest component of geographical network. In the study region this type of connectivity may be noticed in its earlier phase (1970) of sequence of road network development.

- **Tree Connectivity**

In this pattern every node is linked to the network by one edge only. There exist no circuit. This pattern is visible in 1972. In this pattern this minimum connectivity (e min.) are expressed as V-1, where V is number of vertices. e min. = V-1.

- **Circuit Connectivity**

Circuit or closed closed loops exist in the network with more than one route between a pair of node. In this case number of edges is equal to or greater than the number of the nodes i.e., e.v. As circuit exist in this type of connectivity, these are alternative path between the nodes which can be determined by the number of linkages added to the e min. i.e. actual edge e min.

or e – e min.

or e – (v-1)

or e – (V+1)

In this there may be maximum connectivity which can be obtained by a e max. = 3 (v-2) : and the maximum number of circuit would be:

e max. - e min.

or 3(v-2) - (v-1)

or 3v 6-v+1

or 2v 5

The circuit connectivity in the study region can be observed in the network development from 1981.

- **Cell or Barrier Connectivity**

In this type connectivity the flow is either blocked or resisted. It consists of closed loops which may be isolated. For instance, island boundaries or loops surroundings sets of administrative areas forming mutual boundaries.

In the region under study since the path and cell connectivity are not conspicuous, as such only branching and circuit connectivity have been measured and analysed.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 123-128

भूमि उपयोगः समस्याएं एवं सम्भावनाएं

डॉ. कैलाश चन्द्र खण्डेलवाल*

सार

भूमि सभी प्राकृतिक संसाधनों में एक आधारभूत संसाधन है। बिना भूमि के किसी भी अन्य प्राकृतिक संसाधनों की परिकल्पना तक नहीं की जा सकती है। पिछले कुछ वर्षो पूर्व जनसंख्या की वृद्धि के साथ भूमि का अधिकतम उपयोग किया जाने लगा है, जिससे भूमि की उर्वरा शक्ति की कमी होने लगी। इसी समस्या को ध्यान में रखकर विभिन्न सरकारी एवं गैर सरकारी संगठन विभिन्न क्षेत्रों में भूमि सर्वेक्षण करने के लिए आगे आये, जिससे कि वर्तमान भूमि उपयोग स्वरूप को देखकर भूमि संसाधन को भावी विकास हेतु नियोजित किया जा सके। भारत सरकार ने छठी पंचवर्षीय योजना में व्यवस्थित भूमि उपयोग हेतु विशेष प्रावधान रखा और कहा कि "हमें हमारे प्राकृतिक संसाधनों मिट्टी, पानी, वनस्पति एवं जन्तु आदि का ध्यान पूर्वक संरक्षण करना चाहिए, जिसके ऊपर हमारा आर्थिक विकास आधारित है, इनके अवैज्ञानिक शोषण से मिट्टी कटाव एवं बाढ़ आदि की विकरालता उत्पन्न होती है।"

शब्दकोशः *प्राकृतिक संसाधन, उर्वरा शक्ति, भूमि सर्वेक्षण, भूमि संसाधन, अवैज्ञानिक शोषण।*

प्रस्तावना

कृषि नियोजन में भूमि उपयोग प्रतिरूप अपना महत्व रखता है । प्राचीन समय से ही किसान भूमि का उपयोग करता आ रहा है और एक लम्बे अरसे में किसानों ने भूल एवं सुधार के नियम के आधार पर यह सीख लिया है कि उसको अपनी भूमि पर कौनसी फसल कव उगानी चाहिए, जिससे अधिकतम लाभ प्राप्त हो। इस प्रकार किसी भी क्षेत्र का वर्तमान फसल प्रतिरूप वहां की भूमि की उत्पादकता की ओर गत करता है, क्योंकि किसान उसी फसल को अपने खेत में प्रथम स्थान देता है जो यहां के भूमि एवं भौगोलिक वातावरण के लिए सर्वश्रेष्ठ है। इस आधार पर वर्तमान भूमि उपयोग के माध्यम से उन क्षेत्रों का सहज अनुमान लगाया जा सकता है, जो कृषि के लिए उपयुक्त एवं अनुपयुक्त है । इसके द्वारा अनुपयुक्त भूमि व कृषि क्षेत्रों के भावी विकास के लिए कोई योजना निर्धारित की जा सकती है, जबकि पूर्ण विकसित क्षेत्रों के लिए वर्तमान स्तर को कायम रखा जा सकता है। भूमि उपयोग द्वारा मृदा अपरदन एवं उसकी शक्ति की कमी का अनुमान लगाया जा सकता है।

भूमि उपयोग प्रतिरूप का ग्रामवार विश्लेषण

भूमि उपयोग प्रतिरूप के वितरण के लिए तहसील के सन् 1978–80 से सन् 1987–89 के आंकड़ों का विश्लेषण निम्न शीर्षकों में किया गया हैः–

- भूमि जो कृषि के अतिरिक्त अन्य काम में ली गई ।
- ऊसर तथा अकृषि योग्य भूमि ।
- स्थाई चारागाह तथा अन्य गोचर भूमि ।
- कृषि योग्य परती भूमि
- पड़त भूमि ।
- वास्तविक बोया गया क्षेत्र ।

* सह–आचार्य भूगोल, बी.एन.डी. राजकीय कला महाविद्यालय, चिमनपुरा, शाहपुरा, जयपुर, राजस्थान।

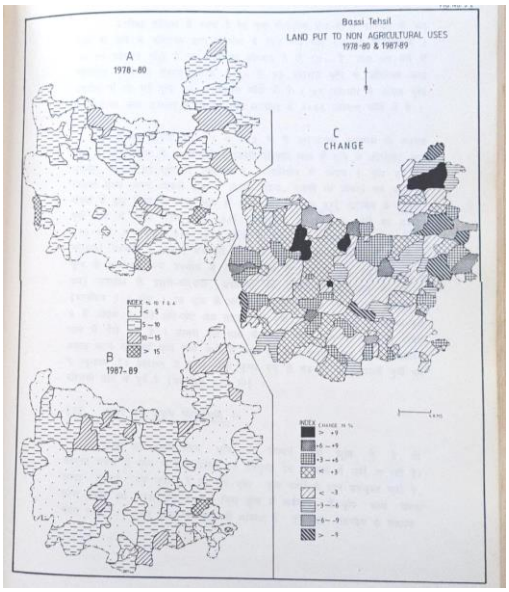
वन

वन प्रकृति की एक मूल्यवान देन है । वनस्पति, जो मानव के हस्तक्षेप के बिना ही पृथ्वी पर प्रसारित है, प्राकृतिक वनस्पति कहलाती है। प्राकृतिक संसाधनों में वनों का महत्वपूर्ण स्थान है। अब से तीन शताब्दी पूर्व पृथ्वी का 60 प्रतिशत भाग प्राकृतिक वनों से ढका था । मानव ने इसका अत्यधिक शोषण किया तथा अब धरातल के केवल 30 प्रतिशत भाग में ही प्राकृतिक वन विद्यमान है, जिसका मानव तेजी से शोषण कर रहा है इस तीव्र शोषण के कारण यह संभावना व्यक्त की गई है कि एक समय ऐसा आयेगा कि वन सम्पदा समाप्त हो जायेगी। इस दृष्टि को ध्यान में रखकर वर्तमान समय में विश्व के प्रत्येक राष्ट्र की सरकार अपने–अपने देशों में वनों का विकास कर रही है तथ (3:07 चउ, 08/01/2023) डवींद ठींललः 50

नियंत्रण पाने के प्रयास किये जा रहे हैं। वन भूमि की उर्वरकता में वृाद करते हैं वृक्षों की पत्तियाँ सद्गत कर मिट्टी में जीवांश वृद्धि कर उन्हें अधिक उपजाऊ बनाती हैं। इन्हीं विशेषताओं के कारण वन किसी भी देश के लिए प्राकृतिक सम्पदा कहे जाते हैं वनों का उचित संरक्षण एवं विकास प्रत्येक देश की राष्ट्रीय नीति का विशेष उद्देश्य है।

भूमि जो कृषि के अतिरिक्त अन्य काम में ली गई हो

कृषि के अतिरिक्त अन्य काम में ली गई भूमि के अन्तर्गत आबादी क्षेत्र, सड़कें नहरें, कुप, जलाशय व कारखाने इत्यादि को शामिल किया जाता है भारत में कुल भौगोलिक क्षेत्र का 5.84 प्रतिशत क्षेत्र इस प्रकार की भूमि के अन्तर्गत है, जबकि राजस्थान में इसका प्रतिशत 4.68 है। जयपुर जिले में इस भूमि का प्रतिशत 5.95 है एवं बस्सी तहसील में यह भूमि 6.45 प्रतिशत है। सन् 1987–89 (त्रिवर्षीय औसत) के दौरान बस्सी तहसील के दक्षिणी पूर्वी भाग में स्थित ग्वालनी 24.80 प्रतिशत व चक देवरी 19.04 गाँव में सर्वाधिक 15 प्रतिशत से अधिक क्षेत्र है, जिसका प्रमुख कारण आबादी क्षेत्र में वृद्धि होना, सड़क एवं कुओं के क्षेत्र में विस्तार होना है अधिक क्षेत्र 10 से 15 प्रतिशत तहसील के उत्तरी एवं दक्षिणी पूर्वी भाग के छोटे–छोटे क्षेत्रों में फैला हुआ है। कृषि के अतिरिक्त अन्य काम में ली गई भूमि का मध्यम क्षेत्र 5 से 10 प्रतिशत तहसील के उत्तरी और दक्षिणी पूर्वी भाग में तथा न्यूनतम क्षेत्र (15 प्रतिशत से कम) तहसील के उत्तरी–पश्चिमी सीमावर्ती भाग में, दक्षिणी–पश्चिमी भाग में, मध्यवर्ती एवं पूर्वी भाग में है मानचित्र।



चित्र 1

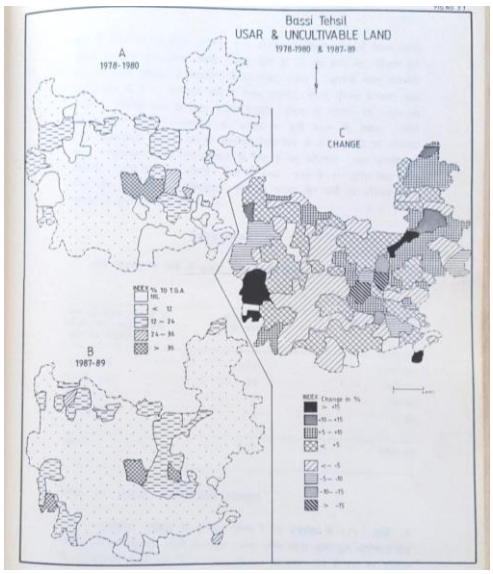
उपर्युक्त मानचित्र के अध्ययन से अवगत होता है कि तहसील के उत्तरी–पूर्वी व उत्तरी–पश्चिमी भाग में कृषि के अतिरिक्त अन्य उपयोग में ली गई भूमि में सर्वाधिक (9 प्रतिशत से अधिक) वृदि हुई है, जिसका मुख्य कारण आबादी क्षेत्र में विस्तार होना, सड़कों का विकास एवं कुओं की संख्या में वृद्धि होना है। इस भूमि में अधिक वृद्धि (6 से 9 प्रतिशत) तहसील के उत्तरी पूर्वी भाग में स्थित भटेरी (+6.69 प्रतिशत) श्यामपुरा (+8 14 प्रतिशत) नई का महादेव (+6.9 प्रतिशत) व रजवास (+7.21 प्रतिशत) गाँवों में हुई है। मध्यम वृद्धि 3 से 6 प्रतिशत तहसील के उत्तरी मध्यवर्ती एवं पूर्वी भाग के छोटे–छोटे क्षेत्रों में हुई है कृषि के अतिरिक्त अन्य उपयोग में ली गई भूमि में न्यूनतम वृद्धि 83 प्रतिशत से कम तहसील के उत्तरी–पश्चिमी मध्यवर्ती एवं दक्षिणी–पश्चिमी भाग में हुई है। इस भूमि के अधिक व सर्वाधिक कमी 6 से 9 प्रतिशत व 9 से अधिक 8 वाले छोटे–छोटे क्षेत्र तहसील के पूर्वी उत्तरी–पश्चिमी व दक्षिणी–पूर्वी भाग में फैले हुए हैं। उत्तरी पूर्वी भाग में स्थित पाटन बांध में पानी की आवक क्षमता घटने से इसमें कृषि किये जाने से कमी हुई है। मध्यम 3 से 6 प्रतिशत 8 व न्यूनतम 3 प्रतिशत से कम कमी मुख्य रूप से तहसील के मध्यवर्ती पूर्वी एवं पश्चिमी भाग में हुई है।

ऊसर तथा अकृषि योग्य भूमि

ऊसर तथा अकृषि योग्य भूमि से तात्पर्य उस भूमि से है, जो वर्तमान समय में कृषि के लिए उचित एवं उपयुक्त ढंग से काम में नहीं आ रही है। इसका तात्पर्य यह नहीं है कि यह भूमि कृषि कार्यो के लिए उपयुक्त नहीं है, बल्कि इसका अर्थ उस भूमि से है जिस भूमि में वर्तमान में कृषि कार्य करना संभव नहीं है इस प्रकार की भूमि को भविष्य में उपयुक्त तकनीक के माध्यम से कृषि योग्य बनाया जा सकता है। किसी क्षेत्र विशेष में अकृषि योग्य भूमि के प्रतिशत का अनुपात उस क्षेत्र विशेष के तकनीकी विकास, जनसंख्या दबाव, सांस्कृतिक विकास व वनस्पति के तद्जनित से होता है

भारत के कुल 325 मिलियन हेक्टर क्षेत्र में से 150 मिलियन हेक्टर अपरदन, 7 मिलियन हेक्टर जल प्लावन, 20 मिलियन बाड द्वारा एवम् 10 मिलियन अकृषि योग्य भूमि है इस प्रकार 197 मिलियन हेक्टर भूमि वर्तमान परिस्थितियों में कृषि के लिए अयोग्य है, जिससे विशेष कार्यक्रमों द्वारा कृषि योग्य बनाया जा सकता है।

ऊसर तथा अकृषि योग्य भूमि का अधिक क्षेत्र (24 से 36 प्रतिशत) तहसील के मात्र दो गांवों हरड़ी (25.91 प्रतिशत) व असैपुरा (25.43 प्रतिशत) में है, जो क्रमशः तहसील के उत्तरी पश्चिमी व दक्षिणी पूर्वी भाग –



चित्र 2

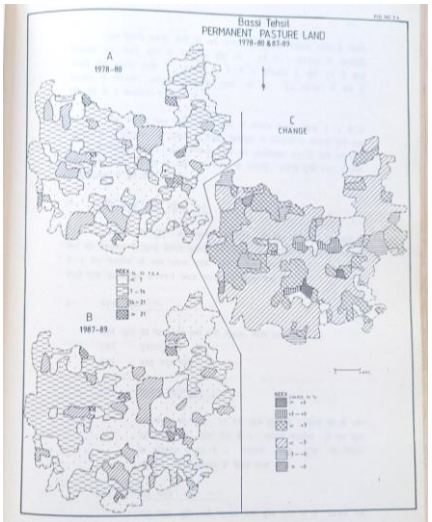
भाग में स्थित है (मानचित्र) उत्तरी पश्चिमी भाग में स्थित पहाड़ी श्रृंखला के कारण यहां अधिक अकृषि योग्य भूमि है इस भूमि का मध्यम क्षेत्र 12 से 24 प्रतिशत तडसील के मध्यवर्ती दक्षिण पश्चिमी एवम् सीमावर्ती उत्तरी भाग में है मध्यवर्ती भाग में स्थित लालगढ़, पहाड़ी श्रृंखला के कारण तथा उत्तरी – पश्चिमी भाग में स्थित बेनाड़ा पहाड़ी श्रृंखला के कारण इस भूमि का क्षेत्र मध्यम है । तहसील के उत्तरी पूर्वी भाग में स्थित बोरई (17. 65 प्रतिशत) गांव में जल के अत्यधिक खारा होने से ऊसर भूमि की अधिकता है । न्यूनतम क्षेत्र (12 प्रतिशत से कम) का अधिकांश भाग तहसील के पश्चिमी उत्तरी पूर्वी व दक्षिणी भाग में फैला हुआ।

मानचित्र के अध्ययन से ज्ञात होता है कि ऊसर तथा अकृषि योग्य भूमि में सर्वाधिक वृद्धि (15 प्रतिशत से अधिक) तहसील के दक्षिण पश्चिमी भाग में स्थित बसेड़ी (+21.34 प्रतिशत) है, सिन्दौली (+21.97 प्रतिशत) बाला की नांगल (+16.75 प्रतिशत) गांवों में हुई है, जिसका प्रमुख कारण इस क्षेत्र में ट्रेट नदी द्वारा अवनालिका अपरदन होना है । तहसील के उत्तरी पूर्वी भाग में स्थित निमोरा (+19.06 प्रतिशत) गांव में बांसखो नई का नाथ पहाड़ी श्रृंखला के कारण अपरदन से के विकास होने से सर्वाधिक वृद्धि हुई है अधिक वृद्धि (10 से 15 प्रतिशत) तहसील के उत्तरी पूर्वी एवम् उत्तरी पश्चिमी भाग में हुई है। इसकी वृद्धि हरचन्दपुरा उर्फ बालावाला (+10.34 प्रतिशत), बोरई (+12.30 प्रतिशत) व गोठड़ा (+10.73 प्रतिशत) गांवों में अधिक हुई है । मध्यम वृद्धि (5 से 10 प्रतिशत) तहसील के दक्षिणी पश्चिमी उत्तरी पूर्वी – व उत्तरी पश्चिमी भाग में हुई है । न्यूनतम वृद्धि (5 प्रतिशत से कम) के छोटे–छोटे क्षेत्र तहसील के पश्चिमी, दक्षिणी व मध्यवर्ती भाग में फैले हैं।

स्थाई चरागाह तथा अन्य गोचर भूमि

इस प्रकार की भूमि लगभग सम्पूर्ण तहसील के गांवों में फैली है । बस्सी तहसील (7.71 प्रतिशत) एवम् जयपुर जिले (7.76 प्रतिशत) में इस भूमि का प्रतिशत लगभग समान है । राजस्थान में यह भूमि 5.30 प्रतिशत तथा भारत में 4 प्रतिशत है। सन् 1987–89 के दौरान त्रिवर्षीय औसत स्थाई गोचर भूमि की सर्वाधिकता (21 प्रतिशत से अधिक) तरत के उत्तरी दक्षिणी व दक्षिणी – पूर्वी भाग के छोटे–छोटे क्षेत्रों में है। (मानचित्र) इस भूमि की अधिकता (14 से 21 प्रतिशत) तहसील के उत्तरी, दक्षिणी व पूर्वी भाग में है। मध्यम (7 से 14 प्रतिशत) स्थाई चरागाह तथा अन्य गोचर भूमि तहसील के पूर्वी एवम् दक्षिणी भाग के छोटे–छोटे क्षेत्रों में है न्यूनतम (7 प्रतिशत से कम) स्थाई चरागाह तथा अन्य गोचर भूमि तहसील के पूर्वी, मध्यवर्ती एवम् दक्षिणी भाग में फैली हुई है।

मानचित्र से अवगत होता है कि स्थाई चरागाह तथा अन्य गोचर भूमि में अधिक (6 प्रतिशत से अधिक) वृदि तहसील के दक्षिणी भाग में हुई है।



चित्र 3

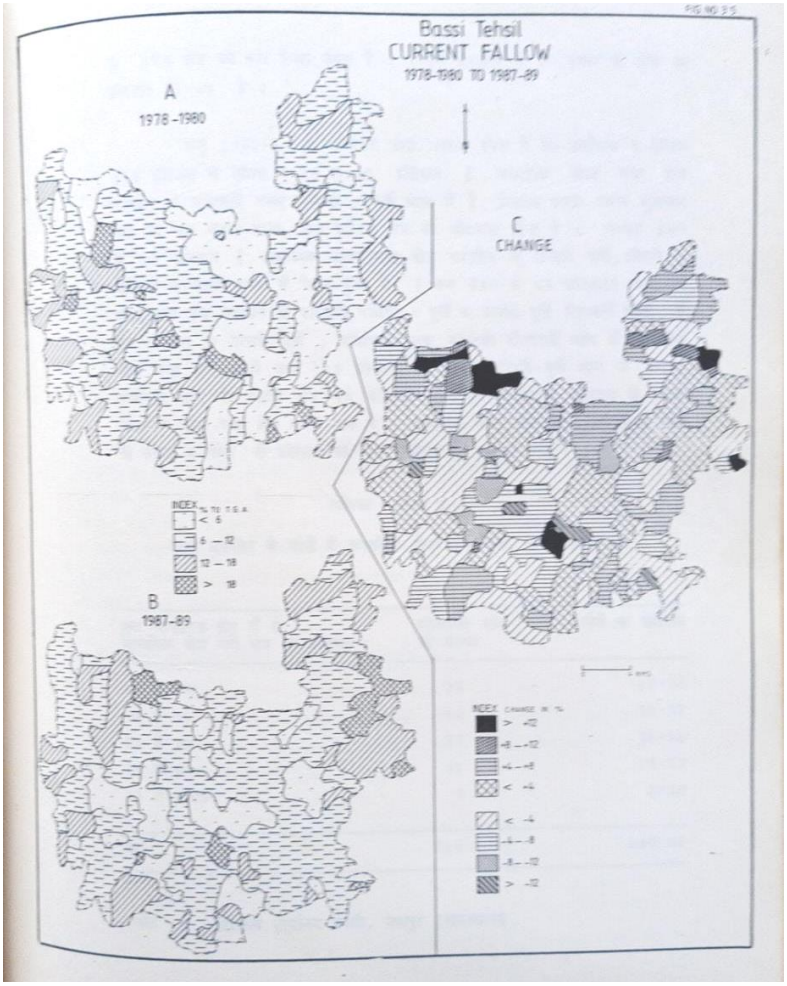
स्थाई चरागाह तथा अन्य गोचर भूमि में मध्यम एवम् अधिक (3 से 6 प्रतिशत व 6 प्रतिशत से अधिक) कमी तहसील के पश्चिमी व दक्षिणी पूर्वी भाग में हुई है जिसका प्रमुख कारण चरागाह भूमि पर अनाधिकृत रूप से कृषि करना है। न्यून कमी (3 प्रतिशत से कम) तहसील के दक्षिणी उत्तरी पूर्वी एवम् उत्तरी– पश्चिमी भाग में हुई है।

कृषि योग्य परती भूमि

इस प्रकार की भूमि के अन्तर्गत उस भूमि को रखा जाता है, जो कृषि के लिए तो उपयुक्त है किन्तु किन्ही कारणों से कृषि के उपयोग में नहीं ली जा रही है । इस तहसील में कृषि योग्य परती भूमि 4.63 प्रतिशत है परती भूमि का विस्तृत अध्ययन अगले अध्याय में किया गया है ।

वास्तविक बोया गया क्षेत्र

वास्तविक बोये गये क्षेत्र से तात्पर्य एक कृषि वर्ष में वास्तव में बोये गए क्षेत्र से है वास्तविक बोये गए क्षेत्र की गणना करने के लिए कुल फसली क्षेत्र में से दुपज क्षेत्र को घटा दिया जाता है सम्पूर्ण तहसील में इस प्रकार की भूमि का प्रतिशत 61.49 है ।



चित्र 4

सन् 1987–89 के मानचित्र द्वारा अवगत होता है कि सर्वाधिक व अधिक (85 प्रतिशत से अधिक व 70 से 85 प्रतिशत) वास्तविक बोया गया क्षेत्र तहसील के मध्यवर्ती एवम् दक्षिणी पूर्वी भाग में है, जिसका प्रमुख कारण भूमिगत जल का कम गहरा होना, कुल सिंचित क्षेत्र की अधिकता होना है । मध्यम (55 से 70 प्रतिशत) वास्तविक बोया गया क्षेत्र तहसील के उत्तरी पूर्वी, दक्षिणी पश्चिमी व उत्तरी भाग में फैला हुआ है । कम (40 से 55 प्रतिशत) वास्तविक बोया गया क्षेत्र तहसील के पश्चिमी, दक्षिणी पूर्वी व उत्तरी पूर्वी सीमावर्ती भागों में – है। तहसील के उत्तरी पूर्वी मध्यवर्ती एवम् पश्चिमी सीमावर्ती भाग में वास्तविक बोया गया क्षेत्र सबसे कम (40 प्रतिशत से कम) है, उत्तरी–पूर्वी भाग में ऊसर, मध्यवर्ती भाग से पहाड़ी क्षेत्र एवं पश्चिमी भाग में अवनालिका अपरदन के कारण वास्तविक बोया गया क्षेत्र सबसे कम है।

फसलीय भूमि तहसील के लगभग सम्पूर्ण भाग में छोटे–छोटे खण्डों के रूप में विस्तृत है। अधिकांश कृषि तहसील के दक्षिणी पश्चिमी भाग में की जाती है, जहां पर फसलीय भूमि का विस्तार अधिक है तथा यही तहसील का अधिक उपजाऊ क्षेत्र है । दक्षिणी एवं दक्षिणी पश्चिमी भाग में से 12 लगभग 50 प्रतिशत कृषि की जाती है । यहां पर जलस्तर तहसील के अन्य भागों की अपेक्षा अधिक ऊँचा है। औसतन रूप से यहां 10 से 12 मीटर की गहराई पर कुओं में पानी उपलब्ध है मुख्यरूप से यह क्षेत्र बस्सी रोजवाड़ी ऐसोसियेशन प्रकार की मिट्टियों से निर्मित है जो गहरी और मध्यमन गठन वाती पीती भूरी से गहरी पीले रंग की है । तहसील के उत्तरी–पूर्वी भाग में स्थित भूमि एवं पूर्वी भाग में स्थित पाटन बांध के आस–पास वाले क्षेत्र में उत्सर भूमि की समस्या है अतः यहां पर कम फसलीय क्षेत्र दिखाई देता है यहां रबी की मुख्य फसलों में गेहूं, जो तथा सरसों है । इसके अतिरिक्त खरीफ की फसलों में बाजरा, मक्का एवं मूंग, मोठ आदि मुख्य हैं जो पूर्णतया वर्षा पर आधारित हैं। वर्षा के अभाव में उत्पादन कम होता है। तहसील के दक्षिणी–पश्चिमी भाग में पहाड़ियों के होने, पश्चिमी भाग में रतनगंगा एवं ट नदी के होने एवं मध्यवर्ती भाग में पहाड़ी श्रृंखला होने से फसलीय भूमि अपेक्षाकृत तहसील के अन्य भागों से कम है।

बनीय क्षेत्र फसतीय भूमि एवं पानी के प्रमुख स्त्रोतों के अला सम्पूर्ण भूमिको चरागाह भूमि के अन्तर्गत रखा गया है। एवं झाड़ियों सहित भूमि दोनों को शामिल किया है। दिया गया है। इसमें गाड़ियों रहित भूमि जिसे परती भूमि का नाम इस प्रकार की भूमि छितरे हुए रूप में सम्पूर्ण तहसील में फैली हुई है से भूमि तहसील के उत्तरी–पूर्वी भाग में, मुख्य रूप यह भूमि तहसील भाग मध्यवर्ती भाग में एवं पश्चिमी भाग में विस्तृत रूप से फैली हुई है इसमें मुख्य रूप से ढूँढ नदी, रतनगंगा नदी, सेती नदी, जटवाडा नदी का भाग, उत्तरी–पूर्वी भाग में स्थित ऊसर भूमि एवं पहाड़ी श्रृंखला सम्मिलित हैं प्रतिरूप के अलावा तहसील इस प्रकार भूमि उपयोग की पहाड़ी भूमि, खड्ड कटाव, ऊसर तथा क्षारीय भूमि की समस्या, चरागाह भूमि आदि का अध्ययन परती भूमि के अध्ययन के महत्वपूर्ण पहलू हैं जिनका विस्तृत अध्ययन आगे किया गया है।

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 129-134

GREEN HR PRACTICES AND ITS IMPACT ON EMPLOYEES RETENTION

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ABSTRACT

GHRM (Green Human Resource Management) has a lot of relevance in today's corporate environment, and its importance is expanding day by day with the awareness of GHRM inside businesses and all over the world. The understanding of environmental management and sustainable development is quickly expanding as countries participate in a greener movement to strive towards a sustainable working environment. Green HRM refers to the combination of environmental management with human resource management. This research attempted to emphasize the necessity of green HR practices in commercial organizations in order to generate sustainability. Using the current literature study, this paper focuses on Green HR practices as a strategic endeavor in which human resources are engaged in managing the environment inside the corporation to promote sustainable business practices. The study is also being performed to determine the association between green HR practices and staff retention in businesses.

***KEYWORDS**: Green HR Practices, Employee Retention, Sustainability, GHRM.*

Introduction

Green Human Resource Techniques (Green HR Practices) are highly significant in today's business environment for enhancing the earning potential of firms by utilizing ecological practices. Because of today's high turnover rate, understanding employee retention has become increasingly important. Many businesses are currently using a greener approach in their operations. This has a favorable impact on the workers' perceptions of the organization for which they work. They believe that, in addition to their functional contributions on the work, they have a bigger obligation to protect the environment.

Green HR practice is a new idea for being a green organization. It is critical for our environment and the earth as a whole. It will foster long-term development. Green HR practices must be implemented by both management and staff. The application of Green HR practices would guarantee appropriate usage of the company's resources as well as the natural resources of the country as a whole. This will aid in the preservation of a safe working environment for both current and future generations. The HR manager is primarily responsible for implementing Green HR practices and policies in the firm. HR management is a critical management function that deals with an organization's most essential resource, its human resources.

The globe is chasing sustainability because it is a significant problem for businesses. Green HR practices are critical in developing a company's sustainable culture. Organizations are increasingly recognizing the importance of sustainability in improving their competitiveness, reputation, and capacity to recruit and retain talent.

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Though Green HR practices are still in its infancy in India, the study emphasises the relevance of Green HR practices in establishing organizational sustainability and having a direct influence on worker retention.

Green HRM is a combination of policies, procedures, and systems that promote green behaviour inside a company's internal environment and try to create a resource-efficient, environmentally conscious, and socially responsible workplace.

Objectives of the Study

- To evaluate the GHRM practices for Employee Retention
- To avail benefits of GHRM towards Employee Retention
- To identify the problems faced by the companies while practicing GHRM for Employee Retention.
- To know the importance of GHRM for Employee Retention in today's corporate world.

Literature Review

A very few studies has been done so far regarding Green HR Practices in India. Some literature review that has been carried out for the purpose of this study:

Saba Jafri (2012) stated that Green HR practices encourage employees to act in an ecologically responsible manner. The research revealed discrepancies in the perceived advantages of implementing Green HR Practices. Many impacts, such as improved staff morale, reinforced public image, greater employee loyalty, higher brand awareness, competitive advantage, improved worker productivity, and increased employee retention, vary substantially depending on the size of the firm.

A.Anton Arulrajah, Prof. H.H.D.N.P. Opatha, and Dr. N.N.J. Nawaratne (2015) asserted that by comprehending and enhancing the breadth and depth of green HR practices, organizations may sustainably increase and improve their environmental performance. Green HR practices are useful instruments for greening the operations of a firm. Through the application of green HR practices, the green performance, green behaviours, green mentality, and green competences of human resources may be developed and transformed.

According to Aykan and Ebru (2017), strategic tools within the scope of GHRM include improved environmental performance of executives to the lowest level workers in an integrated manner, improved positive communication between the organization and the employees, reduced carbon footprint through monitoring and developing technological innovations and developments, efficient resource utilization, reduced costs, and enhanced efficiency and productivity.

Gharibeh, Muna (2019) indicated that the use of GHRM practices has a positive relationship with an organization's competitive advantage, with the strongest correlation being with the green selection and recruiting practice and the lowest correlation being with the green training and development practice. Nonetheless, this conclusion is consistent with the findings of (Marshal et al., 2014; Masri & Jaroon, 2017). However, the study discovered that educational institutions do not offer green training and development programmes since they prioritise cost-cutting. And because educational organizations are the most important sector in any nation, Jordanian educational organizations are encouraged to boost their budgets for training and development programmes in order to improve the application of GHRM principles.

Research Methodology

To fulfill the aforementioned aims, the study employed a systematic literature evaluation of several research publications to collect data. The entire study is based on secondary data.

Green HR Practices

Some green HR Practices that would lead to increase in performance of the employees which will eventually lead to work satisfaction and help in retaining them.

- **Green Recruitment and Selection:** A green recruiting process is one that is beneficial to the environment. It refers to a paperless recruitment procedure or one that has the least environmental effect. Applications are accepted online, and so on. This refers to employing individuals who have the same behavior, skill, talent, knowledge, and understanding of the organization's environmental management system. Organizations use telephone or video

interviews to save time and reduce the environmental effect of travel (Saini and Shukla 2016). Green recruitment is a system that emphasizes the importance of the environment and makes it a fundamental component of the business.

- **Green Training and Development:** Green training and development is a method through which a firm focuses on the development of its workers' skills, knowledge, and attitudes, with a particular emphasis on new understanding and awareness of environment management-related information, skills, and attitudes. Employees are trained on the job, and they are trained in specific areas such as employee engagement and the efficient and effective use of the company's resources, raw materials, and machinery with zero or little waste. Employees are now being educated on paper waste disposal and recycling procedures. Green training and development is a method of informing employees about the significance of environmental management. It is a means of developing new skills and training employees in new working skills/methods that save/conserve energy, minimize waste, and extend environmental consciousness throughout the business, as well as providing a chance for employees to address environmental problems.
- **Green Compensation:** Employees must be motivated in order to strive for a greener working environment and a greener business. In the form of performance rewards, rewards and pay have been a significant HRM procedure for employees. HR practices are then implemented so that the workers' goals and interests are aligned with those of the firm. Employees require a sense of influence and motivation in order to achieve the organization's green goals, which may be pushed via incentives and incentive systems. Employees will work tirelessly and enthusiastically to fulfil the organization's objectives.
- **Green Performance Management:** Green performance management is a way for fostering sustainable development and environmentally responsible behavior that focuses on the environmental policy of a business. It is a way for enhancing employees' professional skills and contributing to the more efficient attainment of organizational objectives. This may also be accomplished by creating corporate-wide environmental performance standards and a green information system, which enables a business to collect the necessary environmental performance data. All of these objectives may be met through performance review. There may be a method for evaluating the job performance of employees based on green-related criteria, and a comprehensive performance assessment may provide valuable feedback to employees while simultaneously supporting the organization in attaining continuous improvement in environmental outcomes. Green performance management is crucial to the long-term effectiveness of green management work because it aligns employee performance with the firm's needed environmental performance (Jabbour and Santos, 2008).
- **Green Reward Management:** Sustainability of an organization's environmental performance depends heavily on its green reward management systems. Green reward management has made significant contributions to encouraging managers and non-managerial employees to engage in corporate environmental management programmes. It may be implemented in two ways: financially and non-financially. Certain companies compensate their employees economically (e.g., through incentives, bonuses, or cash) for their outstanding environmental performance. Other companies do not compensate their employees economically (awards/special recognitions/honors/prizes) for their excellent environmental performance.
- **Green Employee Relations:** Human resource management is committed to fostering positive employer-employee relationships. As a result, the working environment and work culture inside the organization improve significantly. It assists workers in working in a healthy work culture/environment, and a positive employee relationship is an intangible asset in achieving corporate goals. Employees must participate in green initiatives and policies and become active in green management in order to realise their goals, capabilities, passion, and drive towards green management practices. Employees will be more conscious of environmental management as a result, and he will operate in a cost-effective manner with a sustainable method of using resources, minimizing waste, and lowering pollution in the workplace and throughout the business. It also prioritizes individual and organizational health and safety, as well as an eco-friendly workforce and working environment. It will aid in the development of a more favourable relationship between management and employees, as well as inspire employees to adapt to and contribute to the organization's green efforts and policies.

- **Green Health and Safety:** In addition to normal health and safety protocols, companies are increasingly concerned with the health and safety of their personnel. The major objective of green health and safety is to provide all employees with a green workplace. In the present period, it is also referred to as Green Building, and businesses all over the world are adopting it as an alternative to the conventional workplace or office space. These constructions are resource-efficient, energy-efficient, environmentally conscientious, and utilise renewable energy. These companies are implementing a variety of environmental strategies to avoid employee stress and occupational disorders caused by hazardous working conditions. These places of employment are fully safe and provide healthy working conditions. Additionally, it helps to the company's reputation as an employer of choice and corporate citizen.

Top 10 Indian Companies practicing GHRM

- Wipro Technologies
- Suzlon Energy
- ITC Limited
- HCL Technologies
- Tata Consultancy Services
- Oil and Natural Gas Company (ONGC)
- Idea Cellular
- IndusInd Bank
- Tamil Nadu Newsprint and Papers Limited (TNPL)
- Tata Metaliks Limited

Suggestion schemes and problem-solving circles, staff independence to form and experiment with green ideas, integrating employee involvement and participation into maintenance(cleaning), employee help-line for guidance in green matters, tailoring green employee involvement schemes to industry/company standards, increasing line/supervisory support behaviours in environmental management, union-management negotiating to reach green workplace agreements, training of union representatives in respect of environmental management aspects, encouraging employees to use green forms of transport, set-up of low carbon chiefs(including CEO and Board)to increase action in environmental management, and introducing green whistle-blowing and help-lines.

Benefits of Green HR Practices

- It has a significant effect in staff retention and turnover.
- It improves the company's reputation in the marketplace and, as a result, increases sales and brand loyalty.
- To secure human and business organization existence.
- GHRM is a method for attaining the internal and external working environment's overall quality and enhancing the work culture.
- In GHRM, the firm employs sustainable energy sources, which can minimize the organization's total costs.
- Increases productivity and longevity.
- Increases market financial position.
- Improves staff morale and motivation to work.
- It is a win-win situation for both businesses and employees since it contributes to a market advantage. Green organizations have lower employee turnover rates than non-sustainable firms.
- Green HRM techniques, such as online advertising and recruiting that use less paper and produce fewer carbon emissions in the office area, as well as training through electronic sources to avoid paper waste, can prevent environmental damage or loss.

- Green HRM techniques, such as online advertising and recruiting that use less paper, generating less carbon emissions in the office area, and training via electronic sources to decrease paper waste, can prevent environmental damage or loss.
- Adopting appropriate green management/HRM practices can lower the likelihood of involvement by the federal/local government and other law enforcement agencies.
- Green HRM techniques foster new inventive ideas and practices, which allows quality growth and process improvement.

Suggestions

Some Green HR Practices that the organization may embrace:

- Offering free bicycles to employees as an alternative to driving to work.
- Coordinating carpooling services.
- Purchasing computers from businesses that use recycled components.
- Purchasing from local merchants.
- Businesses are incentivized to implement green practices.
- By commencing work early in the morning, businesses may conserve energy.
- Carrying out an internal energy assessment.
- Fostering environmentally conscious attitudes among employees.
- Cutting down on paper work by doing it online.
- Recycling the company's garbage.
- Teleconference can help you save time and energy.
- Water supply monitoring in order to preserve water.
- Using renewable energy sources.

HRM Functions	Green Practices
Job Analysis	• Include an environmental factor as a duty in the job description. • Include an environmental component as a duty in the job description. • Make eco-competency a distinct qualification in job descriptions. • Include an environmental factor as a duty in the job description.
Recruitment	• Include environmental concerns in recruitment messages. • To communicate the employer's commitment to environmental protection through recruitment efforts.
Selection	• To choose candidates with appropriate environmental awareness to fill employment openings. • To identify applicants who have been environmentally conscious as customers in their own lives..
Induction	• To familiarise new workers with the organization's greening activities. • To establish induction programmes demonstrating the green citizenship behaviour of present employees.
Training	• Provide each employee with the appropriate knowledge and abilities on greening (the four green roles) through a greening-specific training programme. • Conduct training needs analysis to determine workers' green training requirements.
Performance Evaluation	• Evaluate the performance of employees based on green-related factors. • Include a distinct section on environmental progress in the performance feedback interview.
Rewards Management	• To provide monetary incentives for environmentally friendly employee performance. • To give non-monetary incentives, like as praise and recognition, to staff for their greening efforts.
Discipline Management	• Create and distribute a greening-related code of conduct. • Create a progressive disciplinary system for staff who violate green behaviour norms.

Source: Opatha and Arulrajha (2014)

Conclusion

The organization will be more successful if its staff are more engaged in environmentally conscious practices (Hanna, 2000). Green HR is the utilization of every employee touch point to promote sustainable practices and raise employee receptivity and commitment to sustainability problems. It also engages in environmentally-friendly practices, such as job-sharing, car-sharing, teleconferencing, and vCards, which help businesses save money, become more efficient, and retain more personnel.

Using practices that are good for the environment could boost employee morale and performance, which would be good for both the company and the employees. Using green HRM is good for both the environment and a company's bottom line. Green HRM practices improve the health and happiness of employees in a company.

In conclusion, adopting green HR practices in the organization would increase the efficiency of the organization's operations, reduce the overall cost of the organization, and improve employee performance, which would ultimately lead to their job satisfaction, thereby assisting managers in retaining a talented workforce. Increased job satisfaction corresponds with greater employee retention.

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Inspira-Journal of Commerce, Economics & Computer Science (JCECS)
ISSN : 2395-7069, Impact Factor: 6.289, Volume 08, No. 04, October-December, 2022, pp. 135-138

OPERATIONAL EFFICIENCY ANALYSIS OF CEMENT INDUSTRY: CONSTRUCTING THE INDIAN ECONOMY

Dr. Renuka Sharma*

ABSTRACT

In today's business world productivity are one and all key words. It's a measure of the economic soundness of the means of production. The economic progress is achieved by increasing the assembly including increased productivity. This is often amply revealed in the establishment of the National Productivity Council in 1958 and also the declaration of 1966 and 1982 to be National three Productivity Years. In fact, a country is alleged to be economically and industrially backward/forward depending upon the extent of productivity of labour, capital and whatever other factors of productions one could imagine. Analysis of Productivity incorporates one of the central positions in making the study of various problems and policies of wage. An increase which occurred in wages as a result of increase in productivity will also result in overall profits and that too not just for economic purpose but not for workers. However the wages and earnings cannot be linked directly with the productivity of labour without making a linking of it to capital productivity. If profit margin declines, rate of return on capital falls, provision for reserves goes down, the speed of profit is lowered and ultimately investment is slackened. During this reverse process, the speed of growth of industries begins to fall. Therefore, the study of operational productivity in cement industry is critical to possess a stronger understanding of the phenomenon further as for delineating the world of remedial action.

***KEYWORDS**: Productions, Productivity, Civilization, Economical, Industrial, Resolution, Performance, Capital.*

Introduction

Cement, the wonder material for binding stones and bricks together, has contributed to the event of contemporary civilization in an exceedingly number of the way that it's referred to as the builder of contemporary civilization. It ranks next to steel as a construction material. Though cement industry is one amongst the oldest industries, it's no viable substitute till date and it'll still be in demand in the future still as in far future. It means the industry will have an assured market with no major threat of obsolescence. Cement is one amongst the core industries defined under the economic Policy Resolutions adopted in the early stage of designing in India. The cement industry has played a pivotal role in reviving up the Indian economy by maintaining a powerful rate of growth during the post-independence period. Its growth implications essentially must be seen in the larger context of economic system instead of a regional or sub-regional context. Cement industry's performance is crucial to the economy to the extent of the expansion of infrastructure. Further, the demand for cement has been increasing from different segments like government, housing and company because of various factors and forces.

The Element of Productivity

In today's business world productivity are one and all key words. It's a measure of the economic soundness of the means of production. The economic progress is achieved by increasing the assembly including increased productivity. This is often amply revealed in the establishment of the

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National Productivity Council in 1958 and also the declaration of 1966 and 1982 to be National three Productivity Years. In fact, a country is alleged to be economically and industrially backward/forward depending upon the extent of productivity of labour, capital and whatever other factors of productions one could imagine. Analysis of Productivity incorporates one of the central positions in making the study of various problems and policies of wage. An increase which occurred in wages as a result of increase in productivity will also result in overall profits and that too not just for economic purpose but not for workers. However, the wages and earnings cannot be linked directly with the productivity of labour without making a linking of it to capital productivity. If profit margin declines, rate of return on capital falls, provision for reserves goes down, the speed of profit is lowered and ultimately investment is slackened. During this reverse process, the speed of growth of industries begins to fall. Therefore, the study of productivity in cement industry is critical to possess a stronger understanding of the phenomenon further as for delineating the world of remedial action.

Operational Efficiency

In its simplest form, organizational efficiency refers to the method during which a corporation's resources are organized. In maximum efficient organization, resources are arranged in such a way that no other method will produce profitable retailers. Therefore, operationalizing this idea requires defining organizational resources, and all possible alternative arrangements for these resources. Wanting such perfection, the researchers measure "efficiency" and label their findings as different types of efficiency. These may be Quality, performance, effectiveness, goal achievement or success. Efficiency is usually measured by the ratio of output (profit, return) and input (effort, cost). Ideally, all inputs and outputs are included, to which researchers apply this measure of efficiency, assuming that the organization has input, production processes and outputs, the unit of measurement in which these mills are used, Organization is a part of the organization that constitutes the whole process, often involving the whole organization. Management can be a word that can be near us since the beginning of human effort. It seems that we are managing our lives, people and the way we work almost about eternity. To prepare a basis for those meanings that can be treated towards management, one or more definitions will appear. In developing these definitions, we should take care of achieving a definition which provide "completeness" about the meaning of management and provide a more specific reference within which that term management can reside.

Managerial efficiency is not an aspect of personality, it is nothing that the manager has to work it in this way is not something else in the same way or the return of the specialty of the leadership is now returned, which suggested that the simple leader has special properties that are not less effective leaders. Efficiency is seen most well because the manager generates managing anywhere by managing it. What does a manager do it is not a lot, but what does he achieve. As an extreme example, a manager's real value for your company can sometimes be measured with the amount of the time when he could not dead in his office without notice without anybody. The more time it will be, it is more likely that it takes long-term policy decisions rather than short-term administrative decisions. The major decisions in a company are future and can enter the market, new products, new plant locations or major person appointments. The person who has them should not be included in it, as with the short term issues. If he does, he has not selected the output measures of his job or there is no skill or opportunity to make such situations where only policy issues reach it. Once a manager decided that he wants to be effective, then it should focus on the beginning of how it can contribute more effectively than it can. They will work which they are doing, but those who leave the undo is very big. Some Manager gave these baskets to define the character of their potential contribution and see its limit. A manager can see his contribution to manage a running anxiety and keep it equally, while the second can look as large components of solving the subordinate development and artistic problem, the second can mainly see your situation mainly as one of the pins to add pin to the other parts of the firm, and thus can take a broader approach about his responsibility. Experts rarely have experts in contributor, they often see themselves as a knowledge bank "I do not pay for what I do, but I have paid for what I know. This approach is specially from the firm, professor from scholars, and canceled from the society from the managerial to the university and does the efficiency can be achieved rarely by achieving a purpose, even though it is very widely written, even as the benefit is as soon as it is also written on the danger of losing customers or abandoning human resources. Any manager who sees the ordinary black and white words in any manager who makes their efficiency criteria in simple or white words, but not in the end. Efficiency is multi-functional.

Productivity and Performance

There is a lot of confusion when it comes to the definition and the difference between employee productivity and performance. Although two words are also used by human resources professionals and senior managers, there are subtle-differences between these two concepts. Let's find the definition of employee's performance and productivity and how it matters and companies can measure how to support and promote productivity in employees and organizations overall. People often forget about employee performance that it is a mixture of tangible and intangible factors. We sometimes use it to describe an employee's ability to complete their job to a certain standard based on their goals or objective. However, performance includes much more. An employee's performance also includes their communication, time to restore, desire to cooperate and their general attitude at work. When considering employee performance, as well as efficiency, you need to consider how they treat their colleagues. Are they helpful and motivate or are they hostile and irritable? The tangible and intangible factors of the workers are matter because both can make important effects on the overall performance and culture of your organization. As senior managers and human resources officials, you determine expectations and standards in relation to employee performance. These expectations shape employee's experience, can affect the performance, and of course impact on employee productivity, traditionally; productivity was a measure of output with time. This word was generated in the nineteenth century and focused on agricultural output. Productivity was used to describe what type of soil, plot of land, or plant varieties produced the greatest area. This information was tracked over time to determine when and what time of year to plant.

In business, we usually use 'productivity' to refer to the amount of work completed, the quality of that work, and the organizational objective it is worth. Importantly, productivity relates to the number of hours worked or the money invested. In this, however, productivity is almost always quantitative. Ideally, companies are looking for highest possible result (productivity) for the minimum amount of input. Many factors affect productivity. A large amount of misconceptions about it, these misconceptions can be detrimental to employee well-being, resulting in low levels of productivity and efficiency for your organization.

Here are some confusing (but common) beliefs about productivity.

- Working more hours is equal to the growing levels of productivity- this misconception is not only wrong, but it is recipe for employee burnout. After working by 55 hours a week by a staff, research has shown that productivity has dramatically declined. In fact, an employee who works 70 hours, does not produce more than 15 extra hours. This is the reason that many companies are using traditional 40 hours of work to reduce the week. Your employees are not robots. They cannot work all over the day and expect to be effective continuously.
- Downtime means that the time is wasted: to give an employee to work and be productive, they should have time to be healthy. They should downtime. They need to go away from their desks, stretch their legs, or interact to chat with their colleagues to engage in chat. Even five minutes social breaks can also be enough to make an employee mentally freshly.
- Multitasking means more being done: Science has shown that we are not good in multitasking as much as we think we are. The data shows that the human cannot do many things together. Instead, they work on their attention work, they can quickly do it, but it takes some seconds to adapt it. It adds, which is wasted time.

Conclusion

The recent initiations for stepping up investments in building roads, developing ports and fitting hydropower generating plants may perhaps provide the much necessary respite to beleaguered industry; thereby increase in the capacities and production in the years to come back. Construction of cement roads is cheaper in future and also results in savings in fuel consumption because of good road conditions and would boost cement consumption. the common tax burden on cement and average freight incurred for transporting cement should be restructured in such a way that how to grown up infrastructure industry to realize the goal. A lift to housing can result in spurring of demand for cement industry and linkage sector which might again cause an automatic push to revenue generation, employment creation, additional savings mobilization, capital formation and value. Fixing captive infrastructure facilities in cement plants will provide low affordably, the industry being run with maximum returns. The industry needs only to strive to realize even higher levels of productivity and

cost-efficiency, while keeping pace with the newest in technology. It is concluded that demand for cement is probably going to grow steadily and also the way forward for cement industry is certainly better. India's position as the world's second largest cement producer is probably going to stay unchallenged in the years ahead. Although China is prior India by leaps and bounds, the Indian cement industry will still grow at a handsome rate as compared to the developed economies.

Suggestions and Recommendations

Price increases in critical energy inputs like coal, power, lignite etc are some reasons for higher cost of production. Steps could also be taken to supply subsidized coal, power etc for the expansion of the industry. Tax rates in India are comparatively higher and this has led to fall in Profit after Tax. Tax concessions to the current industry may help the society to supply better housing facilities. Technological obsolescence is additionally a controversy in this industry. This industry is in need of change in the production process. There's a necessity for conversion from wet process to dry process. If the industry doesn't earn reasonable profit, institutional finance also becomes difficult. Hence steps are also taken to boost the advanced technologies for efficient and cheap cost. The cement industry is the capital - intensive in nature. On account of its record of declining profitability it's unable to boost the specified finance from the capital market. Hence special steps could also be taken by the governments to produce finance to the present industry at concessional rate of interest. There's excess production in the southern and western regions while there's excess demand from northern and eastern regions. These factors result in heavy transport cost. Hence suitable railway transport facilities and wagon availability is also provided for better transportation. Transportation is one in all the foremost problems in this industry. Non availability of railway wagons results in considerable delay in bringing in the raw materials and in dispatching the cement to numerous potential markets. Producers may acquire required wagons for quick and better transport of cement to numerous places.

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INSPIRA™

Reg. No. SH-481 R- 9-V P-76/2014

ISSN: 2395-7069

2395-7069

Printed in India by **Prof. (Dr.) S. S. Modi** at Shilpi Computer and Printers Jaipur, Rajasthan and published by him on behalf of the INSPIRA, Jaipur, Rajasthan

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