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CONTRIBUTION OF TOP MANAGEMENT LEADERSHIP AND COMMITMENT TO INNOVATION TOWARD EFFECTIVE CRISIS MANAGEMENT AT SAFARICOM PLC KENYA

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ABSTRACT

There are many similarities between organizational innovations and crisis management. A crisis can take many different shapes. If not properly managed, a crisis can lock an organization out of business. The objective of the study was to determine and establish the contribution of product innovations toward effective crisis management at Safaricom PLC Kenya. The study was supported by the Dynamic Capability Theory and the Resource Based View Theory. A total of 90 employees of Safaricom Kenya drawn from various departments formed the study's target population. The study sample was 30 employees computed as 30% of the target population. The data collection instrument for this study was a structured questionnaire. The program, Statistical Package for Social Sciences (SPSS) version 25 was used to code the data and then analyze it. Both descriptive statistics (frequency, means, and percentages) and inferential statistics were used to examine the data (regression analysis). Graphs and tables were used to present the findings. The study established that effective crisis management was not significantly predicted by top management leadership and commitment. The study established product innovation was a significant predictor of effective crisis management. Safaricom's product innovation strategy focuses on improving product performance during a crisis. The study concluded that product innovation strategy though well focused was not adequate during a crisis. The study thus, recommended that the top management team at Safaricom PLC should consider carrying out research and development (R & D) so that appropriate product innovation strategies that focus on the improvement of product performance and product quality during a crisis are developed. The findings of this study can be utilized by the management at Safaricom Kenya Limited in guiding the formulation of supportive policies and procedures that enhance the contribution of product innovation to effective management.

KEYWORDS: *Safaricom PLC Kenya, Product innovation, Organizational Innovations, Effective Crisis Management*

INTRODUCTION

The global work environment has become increasingly complex and unstable as a result of rapid development. An organizational crisis is a high-impact, low-probability that presents a risk to the organization's survival. Uncertainty regarding the causes, impacts and available solutions characterizes it and a conviction that decisions need to be taken immediately. A crisis might occur as a consequence of an industry-wide economic downturn or recession, or it can occur as a result of both internal and external factors (Głodziński & Marciniak, 2016). Crises make it easier for businesses to use new product ideas created quickly by others, but they also make it more difficult, and these innovations come in handy as crisis management enablers (Bessant et al., 2015).

Organizational innovation is one of the most significant and challenging issues that business organizations must deal with. This is because studies have demonstrated that innovation significantly affects an organization's performance and survival (Alharbi, Jamil, Mahmood and Shaharoun, 2019). This enhances flexibility and inventiveness, which encourages the development of technical advances (Monson, 2017). Innovative organizational practices are essential components of crisis response plans. The telecommunication sector has not been left behind, as the sector continues to experience innovations year after year, in this ever-dynamic world.

Internet of Things (IoT) devices and sensors in practically every area of the technological economy are affected by them. Other trends in the telecommunications sector for 2022 include connectivity technologies, 5G network and technology; cloud computing, artificial intelligence, cybersecurity, high-resolution content, and communication models (Husami, 2022). The COVID-19 epidemic



and rising worldwide connectivity give telecom firms several chances to expand their subscriber bases and introduce cutting-edge products and services (Altman, 2022).

In the Philippines, Trabaho (2022) pointed out that, amidst COVID-19, companies that can swiftly create new products and services are better positioned to adjust to shifting market conditions. According to the analysis, 83% of non-R&D-intensive firms were adversely affected by the 2020 pandemic, compared to 60% of R&D-intensive enterprises that were questioned in 2019.

By the end of 2019, the population of Sub-Saharan Africa was 45% women. There were 477 million subscribers to mobile services. Over the next five years, the mobile market in the area will hit numerous significant milestones, including half a billion mobile customers in 2022. By 2024, there will be 1 billion mobile connections, and by 2025, there will be 50% of subscribers (GSM Association, 2020).

The growth of mobile technology has led to a combined total of 70.98 million customers throughout Uganda, Kenya, and Tanzania, or nearly 58% of their combined population. The Three countries have a total of 15 million, 29.2 million, and 26.8 million, subscribers, correspondingly. With 74% of the population using mobile services, Kenya has the highest penetration rate; Tanzania came next with 62 percent, and Uganda with 42.4 percent (International Finance Corporation, 2015).

Over the past three decades, the telecommunications sector has been growing invisibly around the globe (Neirotti *et al.*, 2016). The number of persons entering the telecom business has increased throughout this period as well. Many people have decided to access fixed phone lines, the internet, and cell phones. In this way, several nations are resolving to promote finance-related growth. Today's fastest-growing economies, China and India provide several essential standard components. One of the world's major telecom markets is China, and according to expert estimates, more than 1.25 million new mobile subscribers join each week (Pyramid, 2018).

With an average fan base of around 149.2 million people in Africa, Nigeria is arguably the finest medium for transmitting innovations on earth (Nigerian Communication Commission [NCC], 2017). The base of supporters is always growing, and a piece of it has consistently provided significant advantages for undertakings. Nigeria's Gross Domestic Product (GDP) is mostly supported by telecommunication, which accounts for 9.1% of the country's GDP (Nwakanma *et al.*, 2018).

Three mobile phone providers, Safaricom Limited and Airtel Kenya Limited, and Telkom Kenya Limited control the majority of the country's telecom market. The services provided are mainly basic voice and text messages -SMS, and to a lesser extent, data, facsimile, voicemail, and electronic mail. Through organizational innovations, Safaricom has grown into the present-day gigantic status in the East African region (CCK, 2021). Data and broadband subscriber numbers during the second quarter of the fiscal year 2021–2022, which concluded in December 2021, were revealed to be 46.35 million and 29.15 million, respectively. The overall number of 3G and 4G subscribers during the review period, as determined by Kenya's ICT regulator Communications Authority, was stated as 28.36 million (Abuya, 2022).

Table 1. 1: Market Share Summary for Mobile and fixed broadband coverage

Data Service Provider	Subscriptions	Market share (%)
Dimension Data	11.1K	1.4
JTL	157K	19.7
Liquid	14K	1.8
Mawingu	11.4K	1.4
Poa!	71K	9.0
Safaricom	293K	36.8
Telkom Kenya	4.4K	0.6
Truth Wireless	600	0.1
Wananchi Group	229K	28.7
Others	4.4K	0.6

Source: CCK (2022)

With several service categories licensed separately as infrastructure or facility public telecommunications service providers and none facility service providers, the sector has a market structure that is characterized by technology and services. Other authorized operators include VoIP-using IBGOs like Jamii Telecom Ltd., wireless LLOs like Popote Wireless Ltd., Flashcom Ltd., and Access Wireless Ltd., and PDNOs like Kenya Data Network (Communications Commission of Kenya (CCK), 2021).

Safaricom Limited was founded in April 1997 as a subsidiary of KPTC to provide mobile phone services. On 26th May 2000 Vodafone Plc Group of UK acquired 40% shares with TKL retaining 60% to form a JV company (Safaricom Limited, 2021). Vodafone transferred 5% shares to an off-shore firm, Mobitelea Ventures Ltd, registered in Guernsey Island, through Vodafone Kenya Ltd (The East Africa, 20-26 November 2006; Daily Nation, 9 March 2007; 10 August 2007). The company's mission is to "be Kenya's



mobile communication leader" by enhancing the lives of its users and promoting more mobile connectivity among people, organizations, and communities. Customer satisfaction, staff contentment, individual and collective accomplishments, and corporate social responsibility are the core principles of the company (Safaricom Company Limited, 2022).

Safaricom's aggressive marketing strategies and provision of its products in areas where no other competitors operate (Abuya, 2022). Organizational crisis presents both danger and an opportunity at same time. At Safaricom the business model is to be aware of the danger and recognize the opportunity. Systems of activities, capabilities, and resources that enable businesses to provide the value offer to consumers and gain a competitive edge are known as value creation and delivery processes, value capture, which demonstrates how firms generate revenues and profits from delivering its value propositions, are all components of a business model (Baldassarre, Calabretta, Bocken, & Jaskiewicz, 2017).

Due to the intense rivalry in Kenya's telecommunications sector, Safaricom has been wise to focus on organizational innovation as a means of standing out from competitors by offering distinctive services and products that address new consumer needs (Kanyingi, 2018). Investment is also channeled towards making innovation useful for crisis management. Safaricom is eager to broaden its creative problem-solving methodology in order to better serve the demands of its clients and the general public (Safaricom Company Limited, 2022).

In the 2019 fiscal year, Safaricom Ltd reorganized our Strategy and Innovation Division and created the new position of Chief Business Development Officer. These five teams—Strategy, Innovation, Market Research and Consumer Insights, Big Data and Analytics, and Regional Growth make up what is currently known as the Business Development Division. These are considered useful contributors towards crisis management. It is important to find out whether the introduced organizational innovations contribute towards effective crisis management at Safaricom (Safaricom Company Limited, 2022).

Statement of the Problem

Ideally, organizations need to cushion themselves to be able to survive during crisis and in the post crisis era. Additionally, as a way of ensuring that these businesses continue to be relevant in the market, they need to create and implement new strategic plans focused on creating, carrying out, and offering process improvements. Research studies show that organizations that appropriately utilize sound organizational innovations are able to withstand crisis related business setbacks (Scott & McMurray (2022). The telecommunication sector is one of the sectors that thrive much on innovations owing to its global competitiveness and the ever-dynamic market environment. One of the major companies in the sector in Kenya is the Safaricom Company. The company needs to retain a competitive advantage in the telecommunication arena and continue catering to the needs of its customers even in times of crisis. Mushrooming new technologies, novel customer products, and customer demands require innovation to become their core strategic objective.

Research studies in the telecommunication sector in Kenya appear to have ignored to focus on organizational innovations as crisis management strategies. The focus has been on the link between organizational innovations and organizational performance and organizational growth. For instance, a study by Letangule and Letting (2012) discovered that these firms improved organizational performance as a result of their use of innovative techniques. A study by Njoroge *et al*, (2016) found that innovations positively influenced the organizational performance of telecommunication companies in Kenya. According to Ngugi and Mutai's (2014) study on factors impacting the growth of mobile telephony in Kenya at Safaricom Limited, innovation contributes to the growth of mobile telephony. This, therefore, implies that there was limited research on the contribution of product innovations on crisis management.

Objective

To establish the contribution of product innovations toward effective crisis management at Safaricom PLC Kenya innovation strategies

Research Questions

What is the contribution of product innovations towards effective crisis management at Safaricom PLC Kenya innovation strategies?

Theoretical framework

This study is supported by the Dynamic Capability Theory by David Teece, Gary Pisano, and Amy Shuen" in 1997, The Schumpeter Theory of Innovation by Joseph Schumpeter in 1994 and the Resource Based View Theory by Birger Wernerfelt (1984), and Jay Barney in 1991.

Empirical Literature

The study's empirical review is presented in this section.



Crisis Management

Effective crisis management, according to Marker (2020), happens when a company uses competent preparation and a proactive response to completely prevent a crisis, reduce its intensity and duration, or transform it into an opportunity. A crisis is described as an unanticipated occurrence or circumstance that immediately jeopardizes priorities or restricts the ability of the business to operate or flourish.

The business world of today is dynamic and somewhat predictable. Additionally, Customers' demands for project execution flexibility in terms of time, cost, quality, and scope are increasing as a result of the intense rivalry among project-based businesses. Due to the aforementioned factors, many entities strike a balance between sustainability and unsustainability. The organization should continuously use the crisis management idea to prevent degradation. One of the most often used tools supporting business operations, risk management, appears inadequate in the aforementioned circumstances.

Jugo (2013) explained that crisis communication strategies that are both proactive and reactive have their uses, and both need extensive planning. No company should ever wait until a problem spirals out of hand before formulating a strategy. Organizations fail there, managers are fired, and businesses crumble. In light of this, we will discuss the nature of crisis communication, the distinctions between proactive and reactive crisis communication strategies, and their function in reputation management.

Some businesses are at risk of extinction during times of crisis (O'Reilly III & Tushman, 2011). Crises endanger business organizations' initiatives and stunt their progress since they have a detrimental effect on every aspect of the external business environment (Dhochak & Sharma, 2015). For example, in times of crisis, organizations have very few funding opportunities owing to poor capital market efficiency, lack of information, and economic component deficiencies (Cowling *et al.*, 2012; Mason & Harrison, 2015). Governments should encourage NGOs to offer SMEs various forms of support, such as consultations, training, advice, and direction, as well as emotional support, to help them deal with the challenges brought on by crises.

Organizational Innovation

Adapting the core to meet changing customer needs is a more urgent action to take during a crisis. Other necessary actions include recognizing and swiftly addressing new opportunity areas brought about by the changing environment, reassessing the portfolio of innovation initiatives to make sure resources are allocated appropriately, and laying the foundation for post-crisis growth to maintain competitiveness throughout the recovery period (Am, Furstenthal, Jorge & Roth, 2020). Changes in the organization structure, adjustments to the workforce, creation of new markets and acquisitions of a new raw material source, changes to the enterprise's market position, adjustments to the economic, social, and environmental policies, and changes to the control system are all examples of innovations that can be used to get the company out of a crisis.

Businesses in underdeveloped nations (like Vietnam) have less access to information and have less protection for their property rights (Welter and Smallbone, 2011). As a result, it is challenging for them to innovate like their peers in industrialized nations (Nguyen *et al.*, 2016). In such an organizationally volatile and resource-constrained context, it is easier to understand why Vietnamese enterprises utilize organizational innovation more frequently than any other type of innovation (Nguyen *et al.*, 2013). They gain expertise via repetition, which enables them to perform better the more they use it. The results of this study show that businesses in Vietnam should give innovation in workplace organization and business practices greater consideration since these two factors have a strong beneficial impact on performance. Organizational innovation performance in one area is unaffected by organizational innovativeness in other areas, therefore businesses can carry out each of the organizational innovation components separately or concurrently.

According to Niemien (2020), organizational innovation culture is crucial for crisis management. An organization that really encourages and promotes innovation may be said to have an innovation culture if there are persistent, visible patterns of behavior that allow individuals to actively drive innovation throughout the company. According to a metanalysis research by Nieminen (2020), a staggering 64% of the studies indicated a major barrier to innovation as the issue with the least amount of cultural support. Only 6% of executives reported being happy with their performance in terms of innovation, and this was ascribed to a lack of effort and support.

Organizational innovation, according to Zaied and Affes (2016), improves work quality, information interchange, learning capacity, and the utilization of new technologies and knowledge to increase a company's success. Organizational innovation should therefore possibly enhance corporate performance. The results of this study show that businesses in Vietnam should give innovation in workplace organization and business practices greater consideration since these two factors have a strong beneficial impact on performance. Organizational innovation performance in one area is unaffected by organizational innovativeness in other areas, therefore businesses can carry out each of the organizational innovation components separately or concurrently. In reality, according to OECD (2005), organizational innovation may boost employee happiness and productivity at work and/or lower administrative and transaction costs, both of which can boost profitability even in times of crisis.



According to Am, Furstenthal, Jorge, and Roth (2020), a number of Norwegian businesses were persistent in their organizational innovation between 1999 and 2004, and this persistence increased the (positive) effects of organizational innovation on their performance. A major financial and human toll is incurred during crises, particularly the one we are currently experiencing. Assets and human capital are left stranded, and there is enormous social and economic disruption. The introduction of new business models is a result of disruption, which is a forerunner to many of these processes. For instance, the sharing economy emerged from the emergence of marketplaces for underutilized assets as a result of the financial crisis of 2009 thanks to technology, which caught incumbents off guard as people sought for much-needed additional revenue streams. The 2002 SARS epidemic that wracked Asia and forced its residents to take refuge in their homes served as the catalyst for the expansion and broad acceptance of e-commerce in that region, making China the hub of social commerce innovation.

Gódziski and Marciniak (2016) conducted research on crisis management in project-based enterprises and its characteristics and looked into the range and significance of organizational innovations. The study found that the key components of crisis response techniques are organizational innovations. By implementing organizational innovations, the entity will experience short-term gains as they work to increase the company's adaptability, flexibility, and control over ongoing initiatives.

Product Innovation

The term "new product" has been defined and its boundaries explained in many ways in the literature. According to Sheng, Hartmann and Chen (2015), Multinational Corporation's product innovation refers to their capability to introduce and develop new products that will fulfill needs across multiple country markets. Crawford describes a new product as "one that the company requires new marketing for, conveys the major changes, but avoids any alterations that would call for straightforward promotions" (Kim, Park & Sawng, 2016). For "new products," there are several categorization categories. Four groups may be created from these new products. These are significant product upgrades, new additions, and repositioned products.

A high degree of perceived crisis may lead to higher new product performance, according to Samra, Zhang, Lynn, and Reily's (2019) investigation of how organizations handle crises in new product development (NPD) in the United States. Survey research is used to gather information from 119 NPD teams in high-tech companies so as to conduct hypothesis testing. The study established that the development of new products or services were an effective way of managing crises. The results show that the relationship between new product performance and perceived crises is somewhat mediated by formal communication.

Xiao et al. (2016) looked at whether sharing knowledge always leads to better team decision-making. The study looked at the concealed profile condition for developing new products. According to the study, businesses that are going through a crisis frequently have the opportunity to take a bigger risk on a brand-new product that would guarantee their survival. A new product may be effectively introduced along with competent NPD process management, providing a remedy for this dilemma. To address such a dangerous issue, the NPD team might create a new product.

Wenzel, Stanske, and Lieberman (2020) studied strategic responses to the crisis. The study established that it is challenging to mobilize new product innovations early in a social crisis since private enterprises must first focus on protecting existing operations in the short term, this typically includes cost-cutting measures like layoffs. The study findings suggested that product innovations contributed positively to crisis management.

According to Ndesaulwa and Kikula (2017), there are two reasons why product innovation improves an organization's productivity and outcomes. The first issue is that new technological innovations and product advancements won't be viewed as cost-effective measures but rather as a significant improvement to the company's performance. Furthermore, in order to show how well this company is using its capital, these spending needs are tied to the expenses of production. Additionally, a higher ratio shows that management is very open to adopting and being creative with developing technology, whereas a lower proportion shows the opposite, indicating an antiquated, non-innovative attitude to corporate development.

Velegol (2020) claims that the majority of chemical industry research and development (R&D) facilities are closed or are only accessible to limited personnel. Many of the conventional innovation tactics used by R&D executives and organizational managers are no longer applicable, despite their desire to innovate during this period. You and they are not alone in this; virtually all businesses in the chemical process industries (CPI) are now dealing with similar issues and are concerned about the future. Engineers and researchers are balancing conflicting demands while spending less time in labs or on-site facilities as they strive to stay useful to their organizations.

RESEARCH FINDINGS AND DISCUSSIONS

A total of 29 out of the targeted 30 employees completed the surveys correctly and returned them. A 98% response rate was shown by this. Self-administered questionnaires were employed, and a 98% response rate was reported. Additionally, respondents were informed that the data they provided would be kept confidential. This was adequate for the researcher to provide trustworthy



conclusions and suggestions. For surveys conducted on paper, a 75% response rate is recommended (Nulty, 2008). In light of this, the research's reached response rate was adequate. Additionally, Bell and Costa (2006) claimed that when the response rate rises, the non-response error reduces. The response rate, in this case, was good as a consequence.

The results show that the male respondents made up 55% of the respondents, while females made up the remaining 45%. The results imply that staff had worked there for a period long enough to be able to provide the data sought by the study. The use of responses from staff having varied service tenures helped the researcher eliminate the possibility of bias based on length of service. The results show that 34.5% of the respondents held degrees or above in their academic backgrounds. Another 27.6% of respondents held a master's degree, while 27.6%, 27.6%, and 2.60 % of respondents had academic credentials at the diploma and certificate levels, respectively. Most of the participants were in the age bracket of 25 to 35 years. The results suggest that the researcher was able to collect data from respondents with varying levels of qualification, thus eliminating research partiality based on demographics.

Descriptive Statistics Results for the contribution of Product Innovation towards Crisis Management

The respondents were prompted to rate how much they agreed or disagreed with several statements on the benefits of product innovation for crisis management at Safaricom Kenya. Their responses were guided by a Likert scale of 1 – 5 was used, that is, (1) = Strongly Disagreeing; (2) = Disagreeing; (3) = Neutral; (4) = Agreeing; (5) = Strongly Agreeing. The results were as provided in Table 1.

Table 1's findings demonstrate that the claim that the organization's product innovation strategy focuses on enhancing product performance during crisis recorded a mean score of 3.44. The reported mean score when rounded off is 3.0, thus, equivalent to the 'neutral' response strength. This shows that according to most of the employees, the organization's product innovation strategy focuses on improving product performance during crises. The findings are in agreement with Reynolds, Ho, and Zach (2020) who established a product innovation strategy that focuses on improving product performance, which is useful for crisis management.

The findings revealed that the statement asserting that the organization's product innovation strategy focuses on enhancing product quality recorded a mean score of 3.759. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom's product innovation strategy focuses on enhancing product quality. The results concur with those of Ndesaulwa and Kikula (2017)'s investigation where it was established that a product innovation strategy that focuses on enhancing product quality contributed favorably toward effective crisis management.

The results show that the statement asserting that the organization has been keen on the introduction of new products during crisis recorded a mean score of 3.9655. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom has been keen on the introduction of new products during a crisis. The results are consistent with a research by Samra, Zhang, Lynn, and Reily (2019) who established that the development of new products or services was an effective way of managing crisis.

The findings revealed that the statement asserting that the organization's product innovation strategy focuses on improving existing products during crisis recorded a mean score of 3.966. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom's product innovation strategy focuses on improving existing products during a crisis. The findings are in agreement with those in a study by Reynolds, Ho, and Zach (2020) who established that a product innovation strategy that focuses on improving existing products during a crisis was effective.

Table 1: Descriptive Statistics Results for the contribution of Product Innovation towards Crisis Management

	N	Min	Max	Mean	Std. Deviation
Our product innovation strategy focuses on improving product performance during the crisis	29	1.00	5.00	3.4483	.90972
Our product innovation strategy focuses on enhancing product quality	29	1.00	5.00	3.7586	.91242
The organization has been keen on introducing new products during the crisis	29	3.00	5.00	3.9655	.73108
Our product innovation strategy focuses on improving existing products during the crisis	29	2.00	5.00	3.8276	.80485
Valid N (listwise)	29				

Source: Survey data (2022)

Descriptive Statistics Results for Effective Crisis Management

The participants were asked to mark the assertions about effective crisis management at Safaricom Kenya they agreed with. Their responses were guided by a Likert scale of 1 – 5 was used, that is, (1) = Strongly Disagreeing; (2) = Disagreeing; (3) = Neutral; (4) = Agreeing; (5) = Strongly Agreeing. The results were as provided in Table 2.



The findings show that the statement suggesting that the organization benefits from skillful planning during crisis recorded a mean score of 3.7586. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom company benefits from skillful planning during a crisis. The findings agree with a study by Marker (2020) who found that skillful planning during a crisis was a strong indicator of effective crisis management. The findings in Table 2 show that the statement suggesting that the company's organization can provide a proactive response during crisis recorded a mean score of 3.5862. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom Company can provide a proactive response during a crisis.

The results show that the statement suggesting that the company can uphold a customer-first mentality during crisis recorded a mean score of 3.7586. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom Company can uphold a customer-first mentality during a crisis.

The results in Table 2 show that the statement suggesting that organization supports a response coordination system in place that effectively tackles shortcomings after a crisis recorded a mean score of 3.897. The reported mean score when rounded off is 4.0, thus, equivalent to the 'agree' response strength. This shows that according to most of the employees, Safaricom Company supports a response coordination system in place that effectively tackles shortcomings after a crisis. The results concur with those of a Struckman and Yammarino investigation (2003) who found that a response coordination system in place that effectively tackles shortcomings after a crisis was an indicator of effective crisis management.

Table 2: Descriptive Statistics Results for Effective Crisis Management

	N	Min	Max	Mean	Std. Deviation
Our organization benefits from skillful planning during a crisis	29	2.00	5.00	3.7586	.78627
Our organization can provide a proactive response during a crisis	29	2.00	5.00	3.5862	.73277
Our organization can uphold a customer-first mentality during a crisis	29	1.00	5.00	3.7586	.83045
Our organization supports a response coordination system in place that effectively tackles shortcomings after a crisis	29	2.00	5.00	3.8966	.90019
Valid N (listwise)	29				

Source: Survey data (2022)

Correlations

Correlations between Organizational Innovations and Effective Crisis Management at Safaricom PLC, Kenya

Table 3 presents the correlation results between organizational innovations and effective crisis management at Safaricom PLC, Kenya. The findings show that product innovation and effective crisis management have a positive Pearson correlation as follows: ($r = 0.563$, $p = 0.001$). This demonstrates that there was a link between successful crisis management and product innovation. This association is statistically significant due to the p-value (0.005) being smaller than the test significance limit ($p < 0.05$). The results suggest that a unit increase in product innovation attracts a unit increase of 0.563 towards effective crisis management. It, therefore, means that product innovation contributed favourably towards effective crisis management.

Table 3: Correlations between Organizational Innovations and Effective Crisis Management at Safaricom PLC, Kenya

		Effective Crisis Management
Product Innovation	Pearson Correlation	.563
	Sig. (2-tailed)	.001
	N	29
Effective Crisis Management	Pearson Correlation	1
	Sig. (2-tailed)	
	N	29

*. Correlation is significant at the 0.05 level (2-tailed).

**Regression Analysis**

This section displays the results of the multiple regression analysis that was performed to establish the relationship between the independent and dependent variables. The variables that were investigated include the relationship between top management leadership and commitment, product innovation, process innovations and market innovations (Independent variables), and effective crisis management (dependent variable).

Model Summary

How much of the variance in the dependent variable can be explained by the independent variables is shown by the R Square value in the Model Summary table. At Safaricom PLC, the independent factors presented in Table 4 below explained 50.9 percent (R Square) of the variation in the contribution to successful crisis management. This implies that top management leadership and commitment, product innovation, process innovations, and market innovations collectively contribute toward effective crisis management at Safaricom PLC. Effective crisis management and all of the independent variables entered to have a multiple correlation coefficient 761 (R-value). As the number of variables rises, the Adjusted R Square corrects for a bias. The standard error of the estimate serves as a gauge for forecast precision. There is a need to carry out further research to identify other organizational stress management strategies that will account for the remaining 49.1% (that is, 100% – 50.9%) at Safaricom PLC.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.761 ^a	.579	.509	.35065

a. Predictors: (Constant), Market Innovations, Product Innovation, Top Management Leadership, and Commitment, Process Innovations

Analysis of Variances (ANOVA)

When Sig. (p-value) is $p < 0.05$, the predictors (the independent variables) in the research are significant. Table 4.11's data demonstrate that the p-value was 0.000. The relationship between the independent variables (market innovations, product innovations, top management leadership and commitment, and process innovations) and successful crisis management at Safaricom PLC is significant, as determined by the p values being less than 0.05 (test significance level). Our predictions are much more accurate than would be anticipated by chance because $p < 0.05$. The following is a summary of the regression line that organizational innovations predicted: We may infer that the regression is statistically significant since $F(4, 24) = 8.259$; $p = 0.000$. These results suggest the combined contribution of organizational innovations toward effective crisis management is statistically significant.

Table 5: Analysis of Variances (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4.062	4	1.015	8.259	.000 ^b
Residual	2.951	24	.123		
Total	7.013	28			

a. Dependent Variable: Effective Crisis Management

b. Predictors: (Constant), Market Innovations, Product Innovation, Top Management Leadership and Commitment, Process Innovations

Beta Coefficients for Organizational Innovations

The Beta Coefficients concerning regression outputs are presented in Table 5. The estimated equation was as shown below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Effective Crisis Management = 1.796 Constant + 0.069 Top Management Leadership and Commitment + 0.668 Product Innovation - 0.624 Process Innovations + 0.633 Market Innovations + 0.504 Standard error.

The results show that all the predictors except top management leadership and commitment had p values less than 0.05, and thus were significant predictors. The p values were as follows: Top Management Leadership and Commitment (0.717), Product Innovation (0.001), Process Innovations (0.005), and Market Innovations (0.002). Since the constant value in the model is significant and



standardized coefficients beta scores rather than unstandardized B-coefficients are utilized, and all independent variables have identical (Likert) scales.

The multiple regression results show that top management leadership and commitment had a beta coefficient of ($\beta_1 = 0.069$; $p = 0.717$). This also means that an increase in top management leadership and commitment by one unit would increase effective crisis management by 0.069 units. Moreover, with a p-value greater than 0.05 test significance level, it means that top management leadership and commitment was not significant predictor of effective crisis management. The findings agree with

The multiple regression results show that product innovation had a beta coefficient of ($\beta_2 = 0.668$; $p = 0.001$). This means that a decrease in product innovation by one unit would result in a decrease in effective crisis management by 0.668 units. This implies that product innovation was a significant predictor of effective crisis management.

The multiple regression results show that process innovations had a beta coefficient of ($\beta_3 = -0.624$; $p = 0.005$). This means that an increase in Market Innovations by one unit would result in a decrease in effective crisis management by 0.624 units. This implies that process innovations were not significant predictors of effective crisis management.

The multiple regression results show that market innovations had a beta coefficient of ($\beta_4 = 0.633$; $p = 0.002$). This means that a decrease in product innovation by one unit would result in a decrease in effective crisis management by 0.633 units. This implies that market innovations were significant predictors of effective crisis management.

Table 4. 1: Beta Coefficients for Organizational Innovations

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.796	.504		3.56	.002
Top Management Leadership and Commitment	.038	.104	.069	.367	.717
Product Innovation	.514	.143	.668	3.59	.001
Process Innovations	-.515	.167	-.624	-3.09	.005
Market Innovations	.482	.136	.633	3.555	.002

a. Dependent Variable: Effective Crisis Management

CONCLUSIONS

The study concludes that product innovation was a significant predictor of effective crisis management. This is supported by the fact that the organization's product innovation strategy focuses on improving product performance during a crisis. Safaricom's product innovation strategy focuses on enhancing product quality. The study concluded that product innovation strategy though well focused was not adequate during a crisis.

RECOMMENDATIONS

The top management team at Safaricom PLC should consider carrying out research and development (R & D) so that appropriate product innovation strategies that focus on the improvement of product performance and product quality during a crisis are developed.

The management of Safaricom PLC should consider organizing update training for its employees engaged in process innovations to boost effective crisis management.

There is a need for the management to roll out a stringent policy. The company should consider engaging experts who can guide product offerings (services) alterations to better meet the demands of its customers. The company needs to improve its process to be able to offer higher-quality services as the latest automated service delivery solutions (such as computers and mobile phones).

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MODERN IN LITERATURE LESSONS LESSON METHODS

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It is known that fiction affects human feelings, educates him morally, and shapes his spiritual maturity.

Therefore, literature is a type of art that affects the formation of moral values and moral image of a person. The uniqueness of literature as a school subject is that the object of its study is artistic works that are examples of speech art. The main goal of teaching literature at school is to form a mature person who has healthy beliefs, understands universal human values, is morally sound, and can be morally responsible for his actions.

The task of teaching literature in general education schools is to instill in students a love for fiction, to make them able to read and analyze literary works, to express their thoughts correctly and freely, orally and in writing, is to educate. The goals and objectives of school literary education determine the content of literary science. To study the high artistic works of national, fraternal and world peoples and written literature, to form the skills of understanding and analyzing the works read, to master some theoretical information, to improve students' oral and written speech. constitutes the content of literature lessons in secondary schools ¹. It is necessary to emphasize that it is possible to understand the essence of a specific work of art through comprehensive analysis. It is expedient to organize teaching methods in general education schools as follows.

Lesson Types: Learning new knowledge; Formation of new knowledge and skills; Generalizing, repeating; formation of knowledge and skills; practical application of acquired knowledge and skills; mixed class.

Modern Teaching Methods

- Work with the book; Problem lesson; Conversation; Debate is a lesson in debate; Work on the test; Creative work; Travel lesson; Conference lesson; Story; Stage view lesson; Lesson of practical exercises; Brainstorming; Internet and computer lessons; Yertak lesson; Imaginary lesson; Lesson of various games;

Non-Traditional Lesson: Round discussion, Seminar lesson (reinforcement of topics); Communication lesson (conversation); Meeting lesson; Knowledge test lesson; Intelligence lesson; Competitive lesson; Debate lesson; Auction lesson; Survey lesson; Collection and classification lesson; Creativity lesson;

In this article, it is determined that the 5th grade ² will be passed on the basis of the current literature textbook " Masterpieces of wisdom. We present recommendations for studying the topic "Proverbs" through a non-traditional teaching method.

SUBJECT: *Masterpieces of wisdom. Proverbs*

The purpose of the lesson:

- Educational goal: to inform students about the proverb, to create knowledge, skills and competences;
- Educational goal: to inculcate the ideas of hard work, love of country and honesty expressed in proverbs, to condemn vices such as evil and lying, and to instill respect for national values

- Developmental goal: To develop students' knowledge of proverbs, educational and scientific aspects of the subject;

Teaching materials: slides, tests, picture posters, collection of proverbs, test questions, additional literature and handouts

Method: Discussion lesson

Style: Giving new knowledge

Type: Mixed

Lesson Plan

- Continue the proverb game;

¹Uzbek folk proverbs. Collection. From the introduction. Tashkent: "Teacher", 2003. 3 p.

²5th grade Literature textbook, part I. Ahmedov S., Kasimov B., Kochkarov R., Rizayev Sh. Tashkent: "Sharq" NMAK. 2020.



- Conversation about the proverb;
- Place articles based on topics;
- Bouquet of tests;

In the first part of the lesson, the teacher will use the "Continue the proverb" method to monitor the students' knowledge of proverbs in the lesson and to test the students' expressive reading and knowledge in the process of creating a psychological atmosphere in the lesson:

- *A friend is talking*,
- *If wealth comes from work*,
- *If your motherland survives*,
- *Service to the people*-
- *A rabbit from many*

In the second part of the lesson, a conversation about the proverb is held, and the teacher informs the students about the topic. Information is displayed on a slide basis.

Teacher: People's purmano, purhikmat expressions, cultural figures, scientists, state figures' instructive sayings are proverbs, works that express the wise thoughts of the people based on life experiences in a concise form. "Proverbs" is an Arabic word meaning "Word".

B. Sarimsakov is a folklorist scientist who conducted research on proverbs. Volume III of Uzbek folk proverbs was published in 1988-1989. In 2001, Uzbek folk proverbs were published ³.

The main features of proverbs:

1. It is in poetic and prose form;
2. In a proverb, a clear idea, a complete conclusion is expressed;
3. There is judgment in the thought of the proverb;
4. Proverbs reflect the history of the people's traditions and their entire existence;
5. Proverbs are used both literally and figuratively;
6. Proverbs have internal rhyme

In the course of the lesson, the article on the concept of "Folk oral creativity" given in the textbook is read by the students, and new information is given by the teacher.

The third stage: it is necessary to classify the proverbs given in the textbook into groups according to the students' topic.

Example:

Patriotism

1. A nightingale loves a garden, a man loves his country.
2. Your country is peaceful - you are peaceful.
3. If your motherland survives, your color will not be straw.
4. Service to the people is the highest duty.
5. Your motherland is your golden cradle.
6. Be a poor man in your own country until you are a king in his own country.

Hard work

1. Work is pleasure under work.
2. Wealth comes from work, marriage brings beauty.
3. The sugar and honey of what you have earned is sweet
4. If you work, you will enjoy.
5. Man is broken by man's work.

Peace

1. The one that fell on the wind is the one that fell on the ground.
2. War is disaster, peace is pleasure.
3. Peace conquers war.
4. With peace, the wind blows, and with the rain - eat.
5. Try the guy's baton on the field.

Friendship

1. A friend speaks bitterly, an enemy laughs
2. A friend is known in secret.

³Literature 5th grade teacher's book. T.; "Sharq", NMAK. 2007. Page 7.



3. If you are a friend, correct your friend's fault.
4. Even if you have a thousand friends, there are few, and even if you have one enemy, there are many.
5. My head without friends, my soup without salt.

Etiquette - morals

1. A well-behaved child is welcome
2. Learn politeness from rudeness
3. Kindness is more valuable than gold
4. The child is dear, his manners are dearer than him ⁴.

In this way, students divide proverbs into meaningful groups. The test bouquet method determines how well the student has mastered a new topic. Tests are distributed to each group or student.

- A) How many proverbs are given in "Zarbulmasal" by Gulkhani?
- B) 400
- C) More than 300.
- D) More than 100.
- E) proverbs are not given.
- F) Proverb comes from which language and means word?
- G) Greek
- H) English
- I) Uzbek
- J) Arabic

Continue the story .

Agree to everything, to No.....

- A) be satisfied
- B) tolerate
- S) be patient
- D) give thanks

End of the lesson: Students' work is checked and evaluated. It ends with a question-and-answer session on the topic. All students must actively participate in the lesson.

: write proverbs in alphabetical order and memorize 10 proverbs and explain their meaning.

The students' attitude towards learning the masterpieces of the rich literary heritage of our nation is formed through the examples of lessons given above. All types of activities related to studying and continuing our national traditions, restoring our values, are connected with the study of folk proverbs in the process of teaching literature.

- Students' independent study of folk proverbs; understand the ideas presented in them;
- Personal attitudes and views towards masterpieces of folk thought;
- Interest in learning folk proverbs;
- Development of oral and written speech;
- Lesson methods for studying folk proverbs deepen students' thoughts about the creativity and rich spiritual heritage of our people;
- Formation of skills of independent, creative use of folk proverbs;
- Making a sound faith decision;
- It is the basis for cultivating a sense of love for the country, loyalty to the country, becoming a morally pure, spiritually perfect person.

Thus, proverbs, which are examples of folk art, played a decisive role in the emergence, formation and development of written literature. Studying them serves to make the student's speech fluent and to develop logical thinking.

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⁴See: Shomaksudov Sh., Shorahmedov Sh. A storehouse of meanings. (collection of proverbs). Tashkent: "Fan", 2001. pp. 12-26.



THE ISSUES OF PROVIDING MEDICAL SERVICES TO THE POPULATION IN THE VILLAGES OF ANDIZHAN REGION

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ABSTRACT

The article covers the issues of providing medical services to the population in the villages of Andizhan region, protecting the health of the population, and providing them with quick and high-quality medical care. Also, the work carried out by doctors and nurses was studied, and the activity of outpatient clinics was analyzed.

KEY WORDS: Village population, medical service, outpatient clinic, "Family doctor", "Village doctor".

INTRODUCTION

Protection of public health is one of the most important social tasks of society. Man is the main criterion of all things and values. It is this aspect of the problem that is important in the system of social relations. In the early stages of independence, providing medical assistance to citizens, strengthening sanitary-prophylactic services, increasing quality and efficiency, especially protecting the lives of pregnant women and children were among the priority tasks.

RESEARCH METHODS

In the years of independence, the path of extensive development of the health care system was abandoned, and the path of continuous intensive improvement was adopted. The number of underpowered and inefficient patient beds has been reduced. The number of seats per population was reduced from 10 to 6.1. This, in turn, made it possible to improve the treatment conditions of patients. Ten years ago, per patient in hospitals 2.5-3 square meters of space was appropriate, but in 2000 this figure was 8-10 m². In turn, the main part of the funds allocated to medicine (50 percent) was spent on the prevention of diseases and treatment of patients in ambulatory polyclinic conditions. The structure of maternity hospitals has been completely restructured - departments for health care before childbirth, a delivery room and departments for restoring the health of mother and child after childbirth have been established.

RESULTS AND DISCUSSIONS

1994 of the Cabinet of Ministers of the Republic of Uzbekistan In 1994, on the implementation of the Decision No. 132 of March 11 "On the privatization and expropriation of pharmacy institutions of the Ministry of Health of the Republic of Uzbekistan" 195 pharmacy institutions were taken out of state ownership [5.12].

In November 1998, on the basis of the Medical Sector Reform Program, a 350-bed Emergency Medical Research Center of the Republic of Uzbekistan, a regional branch of the Andizhan Regional Clinical Hospital was established in the city of Andizhan. Andizhan city ambulance station and regional sanitary-aviation station were transferred to this branch. Emergency medical centers were equipped with modern diagnostic and treatment equipment and apparatus manufactured in foreign countries. On the initiative of the governor of the region, the only magnetic resonance computed tomography was launched in the Andizhan State Medical Institute clinic in the valley. 17 branches with 390 beds were established under central hospitals of 3 cities and 14 districts in order to create a system of emergency medical care in regional districts [4.68]. By this time, the population of the region had 6 thousand 271 doctors, of which 8.4 percent were of the highest category, 29.3 percent of the first category and 8.2 percent of the second category, 21 thousand 445 medical workers, of which 2.3 percent were of the highest category, 23.5% of first-class, 4.1% of second-class medical workers provided services [4.77]. In 2000, 1 thousand 59 doctors and 2 thousand 639 secondary medical workers improved their qualifications. Chief doctors of regional and district central hospitals and epidemiology centers passed the attestation commission according to their positions.



The issues of training and improving the professional skills of secondary medical workers in the region have been the focus of the local authorities. As a result, Andizhan and Asaka medical schools were transformed into medical colleges. Andizhan State Medical Institute has opened a training course for high-class nurses. In 1995, the central dental polyclinic was commissioned in Andizhan, a polyclinic for 410 patients in Khanabad, a 50-bed children's hospital, preventive buildings in Marhamat district [5.7]. By the end of 1993, 67% of anemic women were given vitamin supplements in Andizhan region [4.207]. The death rate among the population decreased by 12 percent [5.17]. In 1995, residents of Andizhan region were served by 98 hospitals, 250 ambulatory clinics, polyclinic institutions, and 539 FAPs. 410 thousand 950 patients were treated in them. At the same time, the average stay of patients in hospitals was 14.7 days. The total incidence among the population of the region decreased from 637 to 505 [5.4].

The comprehensive struggle aimed at maintaining the health of the population and raising a healthy generation has given its initial results. The indicators obtained for the Izboskan district of the province are a clear proof of this [6.131]. Experiences of advanced countries have begun to be used in training and certification of doctors. A training program for doctors was introduced using the tried and tested methods of medical service. Fifteen doctors and a little less than sixty mid-skilled workers per thousand population is a proof that bold steps are being taken in this field in the country. The instructions of the head of state aimed at strengthening the medical service in the village itself fulfilled the long-suffering dreams of our people.

In turn, the regional administration took necessary measures to meet the population's need for medicines in the domestic market. However, life has clearly shown that it is impossible to solve this problem without developing the national pharmaceutical industry and starting the production of medicines at the expense of local raw materials with reliable foreign partners.

Currently, the head of state is doing a lot of work to reform the industry. Sh. Mirziyoev, in his speech at the inauguration ceremony of the President of the Republic of Uzbekistan at the joint session of the Chambers of the Oliy Majlis, touched on the tasks of bringing the work to a new level in this regard, "In order to protect human health, which is an invaluable asset for us, a complex of measures will be implemented to improve the health sector, first of all, to fundamentally improve the activities of its primary units, rural medical centers, to further develop specialized special centers that provide emergency medical aid and high-tech services. increase should be in the center of attention of the government [1.16]", he emphasized. In 2018, 7 billion 429 million soums from the local budget were spent on construction and reconstruction works in the health care system institutions of Andizhan region. In order to improve the quality of emergency medical care, in 2018, 4,682 state units were added, and 36 institutions were provided with soft furniture, computer equipment, and medical equipment. 2.3 times more than in 2017, 50 billion 150 million soums were allocated for the expenditure of medicines [7.1].

Resolution of the President of June 20, 2017 No. PD-3071 "On measures to further develop the provision of specialized medical care to the population of the Republic of Uzbekistan in 2017-2021" and "On the program for the comprehensive development of high-tech specialized medical services provided to the population in 2017-2021" The decree was manifested in the work carried out in Andizhan regional multidisciplinary medical center. 55% of the patients in the center were low-income population, disabled people of the first and second groups, unemployed and retired citizens. In the medical center, research was conducted on treatment based on high-tech, modern methods. Endoprosthesis operations of large joints were carried out with the participation of specialists from clinics of the republic. Methods of osteosynthesis of long bone fractures based on modern technologies were implemented in Balikchi, Izboskan, Shahrikhan and Oltinkol districts. European and Chinese experiences were used in the operations. On the basis of a loan from the German State Bank, a wide introduction of modern diagnostic and treatment methods was envisaged [7.1].

Based on the lessons of the pandemic, telemedicine was launched between the republic's specialized medical centers and their local branches, and the possibilities for diagnosis and treatment were further expanded. In order to raise the quality of medical service in villages and neighborhoods to a new level, instead of a general practitioner, "Medical brigades" consisting of a family doctor and 5 secondary medical workers were established, and the "Family doctor" point and family polyclinics were launched. Within the framework of the "Village Doctor" program, more than a thousand doctors treating people's ailments in remote areas were given 30 million soums of aid money, and they were provided with service homes [2.1].

CONCLUSION

As part of activities aimed at increasing the status of middle-level medical workers, they are given the opportunity to independently engage in "nursing work". The graduates of technical schools named after Ibn Sina (total of 47) are intended to be professionals in several fields of medicine. So, for the purpose of treatment of oncohematology and endocrine diseases, special departments were established in regional hospitals. 35 inter-district centers for acute blood-vascular diseases were established. Many people's lives have been saved by providing quick and competent medical care to the residents of these centers in cases of heart attacks and strokes. Also, medical tourism is developing in valley regions as well as in the republic today. More than 30 private hospitals and sanatoriums located in remote villages of the district operate in Marhamat district of Andizhan region alone. Citizens visiting them from different parts of the country and neighboring countries not only restore their health, but also prevent them from contracting various life-threatening diseases. The main thing is that the first elements of medical tourism are being formed through this.



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ENTREPRENEURSHIP EDUCATION AND GRADUATE EMPLOYABILITY IN KOGI STATE, NIGER

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ABSTRACT

The 21st century presents new problems for humanity, including globalization, the rapid rate of invention, and the rapid dissemination of technology. Along with other variables, these are altering not only how economies and businesses operate but also the nature of the labor market. Education is the most effective means available to society to challenge the future. It is widely assumed that the increasing percentage of graduate unemployment is due to a lack of required skills and competencies required by employers. To operate effectively and proficiently in the workplace, graduates must acquire the necessary capacities, knowledge, and skills. And because these skill set is lacking in most graduates; the issue of employability is brought to the table. This paper thus is to bring to light the required skill sets needed by employers of labor and how the graduates are faring as to the supply of these required skills at the sampled workstation. This paper concludes that the graduates need to do better for themselves after graduating to acquire the needed skills sought-after by these employers and also recommends a shift or readjustment of the curriculum to accommodate the required skills needed to flourish in the work place.

KEYWORDS: *Entrepreneurship, Education, Employability, Graduates, Skills, Kogi State*

INTRODUCTION

In all communities, education has been the driving force behind social, economic, and political change, it contributes to ideals that promote individual excellence, social cohesion, and national growth, acting as an integrative force in society. Throughout history, revolutions, social movements, and discoveries and innovations have been the catalysts for advancement. The 21st century presents new problems for humanity, including globalization, the quick rate of invention, the rapid dissemination of technology, and its rapid use in daily life. Along with other variables, these are altering not only how economies and businesses operate but also the nature of the labor market. The knowledge and skills needed for current and future employment are evolving, and as a result, all levels of education must adapt to the new demands (1). Given the dynamic economic environment characterized by profound and rapid change, higher education institutions can no longer provide their graduates with all of the knowledge and skills required to perform in their professional lives. Knowledge and skills needed for effective functioning in a complex global world may be changing. In the information age, industries will have dynamic needs. According to Tony Dolphin [2], these drivers for change will continue “to cause dislocations and disruptions in the labor market”, so that there will continue to be “fundamental shifts in the types of jobs that will be available and skills demanded by employers”. Individuals with “entrepreneurial, scientific, creative, and emotional skills” will be required for the new jobs that will be created in the future [1,2]. Education is the most effective means available to society to challenge the future [3].



What is an Entrepreneur?

An entrepreneur can be a person who has a home business idea and sets up their first online store on the side, or a freelancer just starting. (4). In contrast to the normal individual, entrepreneurs see opportunities and solutions whereas others simply see inconveniences and issues. Entrepreneurs are the engines that propel any economy. When entrepreneurs are educated, they are likely to contribute better to the expansion and advancement of the economy. It is through inculcating sound and practical entrepreneurship education that poverty will be mitigated and subsequently eradicated in our country. (5)

What is Entrepreneurship?

The act of founding an enterprise or business while embracing all the risks to achieve financial gain is referred to as entrepreneurship. Via entrepreneurship, individuals may take control of their careers and steer them in the way they desire. It involves making a life that works for you. infinite bosses, there isn't any time constraints. Because there's no one preventing you. Entrepreneurs always can begin the process of transforming the world for everyone, including themselves. According to real entrepreneurs, Founder and CEO of NeuroFlow, Christopher Molaro says, "Entrepreneurship means being the one who is willing to take a leap and work hard enough to sacrifice everything else around them, all in the name of solving problems because no one else is capable or possesses the desire." Entrepreneurs see better ways to accomplish tasks and look further than the limitations of existing tools and regulations. Perhaps more crucially, they are compelled to take the possible situations because of their passion and urgency to attain their goal.

Entrepreneurship has recently become a hot subject matter in our policy conversation. This real discussion emerged as a result of the fact that a large percentage of Nigerians, notably school leavers, are struggling to find paid employment, possibly requiring the acquisition or training of this pool of human capital as entrepreneurs. To research, Nigeria is the most populated black nation in Africa and 8th in the world with a population strength of over 200 million people, Nigeria has a nominal Growth Domestic Product (GDP) of \$448.10 billion. Despite these statistics, youth unemployment remains a thing of concern to the country today. According to Garba (6), the government of Nigeria is particularly worried about the increasing youth 4 unemployment rate and generally, the bad economic condition in the country. According to Oshewolo (7), this was alarming as more than 45% of the Nigerian population lives below the poverty line, while 67% of the poor are extremely poor. "The reality on the ground which helps to give a better explanation to poverty in Nigeria is that which is seen every day on the streets of both urban and rural areas" (8). To reduce this ugly trend, the Government of Nigeria introduced N-Power together with the Social Investment Programme (SIP) in 2016. Though the Federal Government of Nigeria 1986 established the small-scale industries and Youth Employment Schemes (YES) under the National Directorate of Employment (NDE), and subsequently, You WIN and others aimed at providing skills and micro-credits to beneficiaries to start businesses of their choice, as many more Nigerians are churned out from institutions of higher learning without basic readiness for self-reliance.

Entrepreneurship Education

Entrepreneurship education refers to a specified knowledge that inculcates in learners the traits of risk-taking, innovation, arbitrage, and coordination of factors of production for the unique purpose of creating new products or services for new and old users in society (9,10,11). Entrepreneurship is conceptualized as formal or informal structured learning that inculcates in students/trainees the ability to identify, screen, and seize available opportunities in the environment in addition to skill acquisition (12). Defining it as "a process of providing individuals with the ability to recognize commercial opportunities and the insight, self-esteem, knowledge, and skills to act on them" (12). Entrepreneurship education is a study of the source of opportunities and the process of discovery (13, 14). To Gartner (15) entrepreneurship is about entrepreneurial individuals creating innovative organizations that grow and create value, either for profit or not. But entrepreneurship does not have to include the creation of new organizations, it can also occur in existing organizations (16).

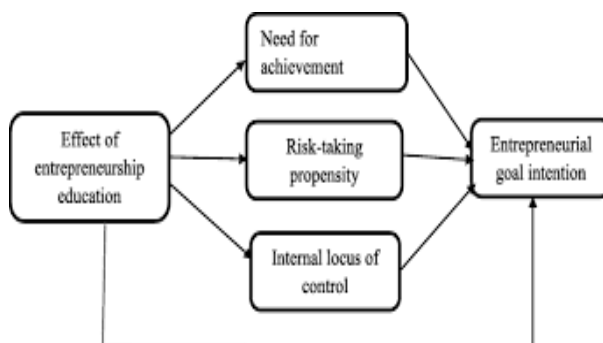


FIG1: ENTREPRENEURIAL EDUCATION.



Entrepreneurship learning

Learning is at the heart of education, as stated by Ramsden (17): “The aim of teaching is simple, it is to make student learning possible”. Various perspectives and theories on the concept of education have been proposed, which are relevant for entrepreneurship education. “The entrepreneur is forced to alter behavior through experiential learning”. (18). Learning can be defined as a cognitive process of attaining and organizing knowledge, making meaning from experience, and generating new solutions from existing knowledge. The learning process is intended to assist participants in better positioning themselves for entrepreneurship and becoming more enterprising. It is thus intended to cultivate individuals' entrepreneurial spirit, to make them more entrepreneurial, first in terms of mindset, then in terms of actions.

Entrepreneurship training programs aimed at helping students become enterprising individual can also influence their entrepreneurial behavior and orientation. Entrepreneurial behavior can be described as the processes, practices, and decision-making activities that lead to entrepreneurship (19).

Entrepreneurs' goal is not to learn how to run a business or become managers, but to learn how to deal with difficulties as they arise, sometimes succeeding, sometimes failing. The entrepreneur's learning thus entails discovering an increasingly quick and appropriate, feasible solution to the wide range of issues he or she encounters. Teaching “about” entrepreneurship entails a content-heavy and theoretical approach aimed at providing a broad overview of the phenomenon. In higher education institutions, this is the most common approach. Teaching “for” entrepreneurship refers to a career-oriented approach aimed at providing aspiring entrepreneurs with the necessary knowledge and skills. Through teaching, students undergo a present invention that provides a learning process.

Educational entrepreneurship aims to impart skills, attitudes, aspirations, and competencies mostly among the youths and supply funds to enable them to practice entrepreneurship or create self-employment as well as help generate employment for others (20,21). Therefore, the need for entrepreneurship education is important in our today's educational sectors to make students and youths self-employable after graduation.

Kogi State has been a state with fewer industries and with its proximity to over ten (10) states of the federation make it vulnerable to both homegrown and transmitted unemployment crisis. Therefore, it is imperative for her to deliberately embark on the mission of converting these seeming weaknesses and thread them into the advantage of both attaining self-reliance and securing a crime-free environment.

CONCEPT OF EMPLOYABILITY

In recent years, the concept of employability has remained a focal point for the government, employers, job seekers, and educators. Employability pertains to a person's ability to obtain and keep a job. Individually, Employability is determined by the knowledge, skills, and competencies they possess, how they introduce those assets to potential employers, and the context in which they seek employment. Employability can also be defined as the state of being prepared and fully prepared for a job in which one possesses the necessary skills. Brewer (22) also defined employability in terms of skills, knowledge, and competencies that enhance workers' ability to secure and retain a job and also make progress on the job. Employability skills are defined as graduates' ability to possess and demonstrate the knowledge, characteristics, and attitudes required to obtain and structure a result that allows them to be productive and fulfilled not only in their professions but also in life.

OBJECTIVE OF THE STUDY

- To assess the importance of entrepreneurial skills development on self-employment of youth in Kogi State.
- To examine the extent to which entrepreneurship education has imparted the required skills and attitudes for youth employment and employability in Kogi State.
- To identify the constraints to the practice of entrepreneurship skills in Kogi State.
- To suggest the need for repackaging entrepreneurship education in Kogi State tertiary education sector for optimal effect among the youths.

LITERATURE REVIEW

The significance of an entrepreneur's decision-making skill for self-employment cannot be over-emphasized. According to (22), risk-taking and high-level creativity and innovation are crucial for entrepreneurial success. According to (23), technical skills and business management skills are so much important in entrepreneurial engagement. Entrepreneurship is about identifying and converting opportunities. (24) posited that it is about seeking investment opportunities and establishing a profit-oriented enterprise. (25), expressed the need to identify and exploit 6 entrepreneurial opportunities for self-employment. It is thus important that entrepreneurial skills be acquired to enhance the easy identification and conversion of opportunities in the business environment of



Kogi State. The skills acquired are likely to facilitate the distinctive way of handling the entrepreneurial issue, instill self-confidence, and increase self-esteem and self-employment. According to (26) The youth's empowerment mainly focuses on creating and supporting the enabling conditions under which youths can act on their behalf and their terms instead of at the direction of others. According to UNESCO (2008), entrepreneurship education consists of a variety of experiences that provide students with the ability and vision to access and transform various opportunities. It goes beyond just starting a business. It aims to improve students' ability to predict and react appropriately to societal changes. These enabling conditions according to these scholars include economics and social base, political will, adequate resource allocation and supportive legal and administrative frameworks, a stable environment of equality, peace, democracy, access to knowledge, information, and skills, and a positive value system. In general, education has been shown to have a positive impact on entrepreneurship.

RESEARCH QUESTION

1. To what extent do employers in the sampled workplace expect graduates to be entrepreneurial?
2. To what extent do graduates in the sampled workplace demonstrate entrepreneurial skills acquired through Entrepreneurship Education?

RESEARCH HYPOTHESES

There is no significant difference between entrepreneurial skills required by employers and entrepreneurship skills displayed by graduates.

SURVEY DESIGN

The ex-post facto research design was adopted for the study. This is because the design allows the researcher to conduct the study without interfering with the variables, as the variables were already in existence before this research was carried out, and the scientist does not have direct control over the variables. The population of the study comprised 100 employers of labor in both the public and private establishments in the Kogi State of Nigeria. A total of 100 respondents were used for the study. This study employed the random sampling technique, selecting from various Local Government Areas of the state. The instrument for data collection was a four-point Likert scale questionnaire titled Entrepreneurship Education and Graduate Employability Questionnaire (EEGEQ). The instrument is comprised of two sections, Section A which contains items to get data from the graduates, and Section B, which contains items to get data on employers of labor. Data collected were analyzed using descriptive statistics of mean, frequency distribution, percentage, and standard deviation used to analyze the research questions while a t-test was used to test the hypothesis at a 0.05 level of significance.

Research Question 1: To what extent do employers in the sampled workplace expect graduates to be entrepreneurial?

Table 1: Graduate Entrepreneurial Skill demanded by Employers of labor.

		Statistics					
		INNOVATIVE	ABILITY TO TAKE RISK	CREATIVITY	PROFESSION ALISM	KNOWLEDGE	ABILITY TO COORDINATE SELF AND OTHERS
N	Valid	100	100	100	100	100	100
	Missing	0	0	0	0	0	0
Mean		.62	.51	.62	.65	.56	.57
Std. Deviation		.488	.502	.488	.479	.499	.498
Minimum		0	0	0	0	0	0
Maximum		1	1	1	1	1	1



		VARIABLES			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ABILITY TO COORDINATE SELF AND OTHERS	1	16.7	16.7	16.7
	ABILITY TO TAKE RISKY	1	16.7	16.7	33.3
	CREATIVTY	1	16.7	16.7	50.0
	INNOVATIVE	1	16.7	16.7	66.7
	KNOWLEDGE	1	16.7	16.7	83.3
	PROFESSIONALISM	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Table 1 reveals that entrepreneurship skill is required by employers of labor at a weighted average of 2.89 (71.9%). This implies that the level to which employers required entrepreneurship skills is high. The skill of an innovative mindset, professionalism, and general knowledge of the establishment ranked higher in the required skill set by employers of labor. This implies that graduates with an innovative mindset, a sense of professionalism, and Knowledge are more likely to secure employment faster.

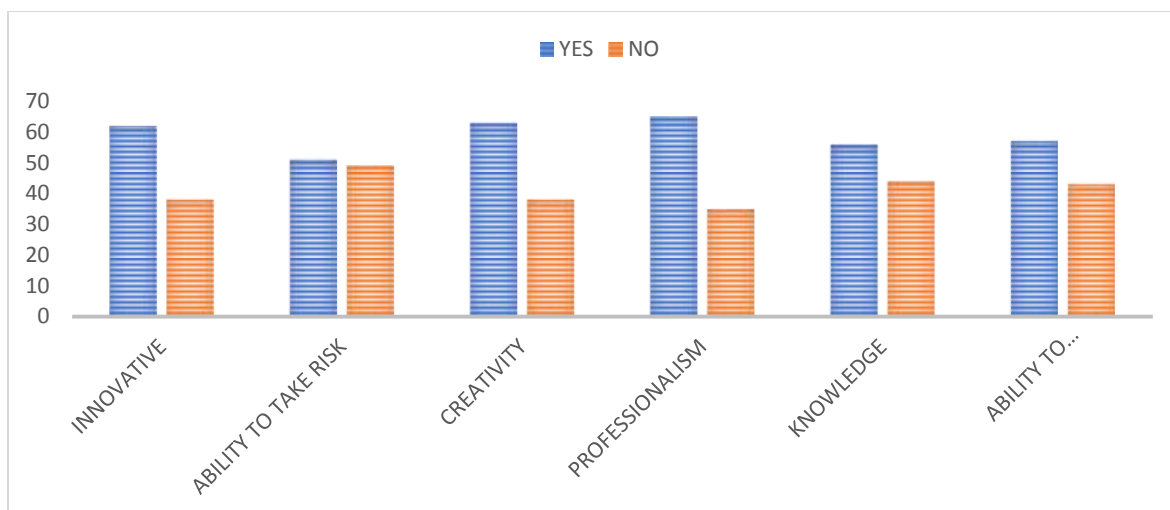


FIG 1: Bar chart showing a relationship between required and not required entrepreneurial skills by employers of labor

TABLE 2: To what extent do graduates in the sampled workplace demonstrate entrepreneurial skills acquired through Entrepreneurship Education?

N	VARIABLES	NOT DISPLAYED	DISPLAYED	AVERAGELY DISPLAYED	HIGHLY DISPLAYED	MEAN	STD
1	INNOVATIVE	6	36	46	12	25	19.07878
2	ABILITY TO COORDINATE SELF AND OTHERS	8	50	14	23	23.75	18.55398
3	CREATIVTY	9	13	60	18	25	23.62202
4	ABILITY TO TAKE RISKY	11	47	36	6	25	19.68079
5	KNOWLEDGE	6	34	53	7	25	22.7303
6	PROFESSIONALISM	4	63	12	21	25	26.26785
	WEIGHTED AVERAGE	2.12(53.89)					

This shows that graduates displayed the required entrepreneurial skills in the labor market. The weighted average of the table is 2.22(52.85%). This implies that the level to which graduates display entrepreneurship skills is a little on the low to average side.



Ho1: There is no significant difference between entrepreneurial skills required by employers and entrepreneurship skills displayed by graduates.

TABLE 3: T-test analysis showing differences between entrepreneurship skills required by employers and displayed by graduates.

VARIABLE	N	MEAN	STAV	T	df	SIG.	REMARKS
Entrepreneurship Skills Required	100	25	1.9	5.317655	128.6225	0.0025	Significant
Displayed	100	23.75	2.6				

This table shows that there is a significant difference between entrepreneurship skills required and entrepreneurship skills displayed by graduates, as shown in the table ($t = 5.31$; $df = 128$; $p < 0.05$). As a result, Ho1 is rejected. This signifies a difference in the entrepreneurial skills required, as to that displayed by employed graduates.

DISCUSSION OF RESULT

These results gathered from this study shows clearly the required skills needed in these days' economy and labor market. With changing times comes a need to upgrade, in other to survive. The research question 1, which demanded to know the extent to which employers of labor expect or require a show of the needed entrepreneurial skills, it was proven that an innovative mindset, knowledge of the establishment, and the ability to be professional at the workplace ranked higher than 50%, in the order, 66.7%, 83.3%, and 100% respectively, with ability to be creative ranking the highest after these three, with 50% level of requirement.

The relationship between required and not required skills by employers of labor shows that practically all the skills imaginable were needed higher than those not required, while the sampled skills are ranked above 50% for required, those that did not require them were all lower than 45%.

Research question 2, asked to know to what extent graduates in a sampled workplace demonstrate entrepreneurial skills acquired through entrepreneurial education, from the results gathered in this study, the weighted average of 2.22 (52.85%) is equated to a low-average output or show of skills by the employed graduates.

Finally, the hypothesis proposed was rejected, as there is a significant difference between entrepreneurial skills required by employers and those showcased by graduates.

The researchers' findings revealed that there were significant gaps in the availability of entrepreneurship skills by many graduates of entrepreneurship and that graduates' entrepreneurship skills were discovered to be severely lacking.

CONCLUSION

This research study investigated Entrepreneurship Education and Graduate Employability in Kogi State. It is a fact that graduates in Nigeria find it hard to get employed, after their higher education, and many employers of labor have thought that it is because they are not employable due to graduates not having the required entrepreneurial skills needed by them. Entrepreneurship skills are critical in addressing the issue of graduate employment and unemployability among higher education graduates. This result shows a difference in the demand for Entrepreneurial skill sets required by employers and the supply by the graduates of entrepreneurship. In Kogi state, Nigeria, the case is not so different, as seen from the results computed during the course of this research.

Students must take personal responsibility for maximizing their opportunities to develop diverse skills while still in university. Most graduates take pride in their certificates that cannot get them gainfully employed. The main purpose of Entrepreneurship Education is to build in students and youths, the fighting will and power to make something of themselves after graduating, being able to employ themselves and those in the long run. But how equipped are they to face the labor market? How ready are they to display skills needed to survive, build their businesses, and help them grow?

Does the curriculum of higher institutions and entrepreneurship education schools encompass the required skills needed to build the students? Because entrepreneurship education is a component of both adaptable and functional curricula, the curriculum contents should be interrelated and overlap.

Graduates should know and cultivate qualities sought after by their potential employers. The most required and sought-after skills as shown in the study include but are not limited to Professionalism, having an innovative mindset, creativity, and general knowledge of the workforce.

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STUDY OF USAGE OF MOBILE LEARNING AMONG THE PRE-SERVICE TEACHERS OF RANGAREDDY DISTRICT

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ABSTRACT

Mobile learning allows educational institutions to expand their educational services beyond the boundaries of their classrooms right into the reading rooms of their learners. The present investigation is taken up with aim to assess the usage of mobile learning by pre-service teachers in Ranga Reddy district and to assess the usage of mobile learning by pre-service teachers with respect to their gender, management and methodology. This investigation is employed by descriptive survey method on sample size of 200 drawn through purposive method of sampling. A researcher developed tool was employed to gather data to study. This tool consists of 15 statements, where respondents are instructed to opt with one or all options method of responding. Data analysis is done by using simple descriptive statistics and analyzed in two sections whereas Section-A deals with analysis of data (overall) and Section-B deals with analysis of data with respect to their gender, management and methodology. The major findings include, most of the pre-service teachers are using chrome app (90%) on their mobile tools and for academic purpose they are using what's app (87%), for presentation MS Power point (88.5%) for taking pictures (70%) for making videos (60%) doing assignments (56%) and also using for personal use (70.5%). They are using their university website occasionally to check the result (66%) and for exam syllabus (60.5%).

KEYWORDS: Mobile Devices, Mobile Learning, Digital Learning, and Pre-service teacher

INTRODUCTION

"Technology can become the "wings" that will allow the educational world to fly farther and faster than ever before—if we will allow it."

Mobile Learning, often shortened as M-learning, is the concept of gaining education on various available contexts by the usage of social media interactions and online content from using portable electronic media. The advantage with this technology is that it doubles up as a convenient form of distance education and also a time managing tool, as students have the option to avail the education at a time of the day as per their liking. When we say M-learning technologies, it is generally a blanket term which also includes other hand-held devices like

- MP3 Players
- Mobile Phones
- Smartphones
- Tablets and
- Phablets (a tablet which can also operate as a calling device)

The feature that M-learning focuses the most is on providing the learners a flexibility of time and place. The content must be made available for access according to the ease and convenience of the learner. To achieve this, many mobile tools have been created to engage and assist learners in finding new learning materials and sources. M-learning is the most convenient form of online educational platform today, simply because content can be accessed from any place on demand.

APPROACHES OF MOBILE LEARNING

Mobile learning has different approaches. They are:

- Class room
- Class management
- Distance learning
- Podcasting
- Learning work



- Lifelong Learning
- Self –Learning

TYPES OF MOBILE LEARNING

- Apps based learning
- Augmented reality based learning
- Experienced based learning
- Content delivery based learning
- Game based learning
- Social learning

REVIEW OF RELATED LITERATURE

In some other researches it is found that the pre-service teachers were confident that the use of mobile devices will create significant climate change in the area of teaching (Aobrefuna, C. & Offorma, G.C. 2014). The pre-service teacher educators were reflected positively on the effectiveness of mobile learning applications in teaching area (Osuji 2017). 87% of the variance in pre-service teachers' intention to adopt mobile learning practices and their roles in pre-service teacher training are important to develop effective contents (OzlemBaydas & Rabia vilmaz.M 2016). Particularly video lessons are more effective in the field of learning using mobile learning (Hemabala J. & Suresh, E.S.M. 2013).

METHODOLOGY

In the present investigation “**Descriptive Survey Method**” is adopted to investigate into intended area of Research.

OBJECTIVES

1. To evaluate the usage of mobile learning by pre-service teachers in Ranga Reddy district.

RESEARCH QUESTIONS

1. How are the pre-service teachers using their mobile device for everyday studying purpose?
2. How are the pre-service teachers using mobile devices during lesson preparation?
3. How often pre-service teachers are using their mobile devices in a day?
4. How often pre-service teachers visiting their university website?

VARIABLES

Dependent variable	Independent variable
Mobile learning	Pre-Service Teachers

SAMPLE

A sample of 200 pre-primary school teachers were taken as sample by using Purposive sampling technique.

TOOL

The present study tool is a kind of questionnaire consist of 15 statements and respondents are asked to opt one or all options that are applicable to the participants.

STATISTICAL TECHNIQUES USED

Descriptive and inferential statistics are used.

DATA ANALYSIS & FINDINGS

1. USAGE OF MOBILE LEARNING AMONG PRE-SERVICE TEACHERS (OVERALL)

Objective-1: To assess the usage of Mobile learning among pre-service teachers of Ranga Reddy district.

1. USAGE OF MOBILE DEVICE FOR EVERYDAY STUDY PURPOSE

Research Question-1: How are the pre-service teachers using their mobile device for everyday studying purpose?

**Table.1****“Showing frequencies and percentages on usage of mobile devices by pre-service teachers for every day studying purpose”**

Responses	During lessons	Between lessons	For independent studying	For peer discussion	On projects only	I don't use my mobile device for studying purposes
Frequency	48	27	128	39	77	6
Percentage	24%	13.5%	64%	19.5%	38.5%	3%

Interpretation

From the above table 1, It is observed that 24% of pre-service teachers are using their mobiles during lessons every day whereas 13.5% are using in between lessons, 64% are using it for independent study, 19.5 % are using for their peer discussions and 38.5 % pre-services teachers are using for their projects whereas only 3 % of them are not using mobile devices for studying purpose. Therefore, most of the pre-service teachers are using their mobile device for independent studying followed in projects and in between lessons.

2. USAGE OF MOBILE DEVICES DURING LESSONS**Research question2:** How are the pre-service teachers are using mobile devices during lesson preparation?**Table.2****“Showing frequencies and percentages on usage of mobile device by pre-service teachers during lessons”**

Responses	I don't use my mobile device in lesson	Only for school/learning purpose	Mostly for school/learning purposes	Only for non-school/learning purposes	Mostly for non-school/learning purposes	An even mixture of learning and personal use
Frequency	11	25	64	9	12	141
Percentage	5.5 %	12.5%	32%	4.5%	6%	70.5%

Interpretation

From the above table 2, It is inferred that 5.5% if the pre-service teachers are not using their mobile device in lessons. Whereas 12.5% of them are using only for school purpose 32% of them are using mostly for learning purpose 4.5% of them are using for non-school purposes 6 % of them are using for non-school purpose/learning purposes and 70.5% of them are using for even mixture of learning and personal .Therefore, 70.5% of the pre-service teachers are using their mobile device for an even mixture of learning and personal use.

3. USAGE OF MOBILE OF AN AVERAGE ON A GIVEN DAY**Research question 3:** How often pre-service teachers are using their mobile devices in a day?**Table. 3****“Showing frequencies and percentages on usage of mobile device often on average by pre-service teachers on a given day”**

Response	0-1 hr.	1-2 r.	2-3 hr.	3-4 hr.	5 & above hrs.
Frequency	27	44	56	46	27
Percentage	13.5%	22%	28%	23%	13.5%

Interpretation: From the above table 3, It is observed that 13.5 % of pre -service teachers are using their mobile device often on average for 0-1 hour on any given day where as 22% of them are using it for 1-2 hours, 28% are using it for 2-3 hours, 23% of them are using for 3-4 hours, 13.5% are using mobile device for 5 and above hours in any given day. Therefore, Most of the pre-service teachers are using their mobile device for 2-3hrs in a given day followed by 1-2hrs and 3-4hrs.

4. VISITING OF UNIVERSITY WEBSITE OFTEN BY PRE-SERVICE TEACHERS**Research question 4:** How often pre-service teachers visiting their university website?

**Table.4****“Showing frequencies and percentages on visiting the university website often by pre-service teachers on their mobile device”**

Response	Every day	Every week	A Few times a week	Occasionally	Never seen
(Frequency)	9	13	36	127	15
Percentage	4.5%	6.5%	18%	63.5%	7.5%

Interpretation

From the above table 4, It is noticed that 4.5% of pre-services teachers are often visiting their university website everyday where as 6.5% of them are visiting it every week, 18 % of them are visiting few times a week 63.5% of them are visiting it occasionally and 7.5% of pre-service teachers never seen their university website in their mobile devices. Therefore, most of the pre-service teachers are visiting their university website occasionally followed by few times a week.

5. USAGE OF FEATURES OF UNIVERSITY WEBSITE ON MOBILE DEVICE**Research question:** For what purpose pre-service teachers are using university website on their mobile device?**Table.5****“Showing frequencies and percentages on the usage of features on university website over mobile devices by pre-service teachers”**

Response	I Don't use	Results	Academic calendar	Exam syllabus	Events/occasions
Frequency	8	132	56	121	19
Percentage	4%	66%	28%	60.5%	9.5%

Interpretation:

From the above table 5, It is observed that 4% of pre-service teachers are not using any feature on university website over their mobile device where as 66% of them are using it for checking the results, 28% of them are using it for academic calendar, 60.5% of them are using it for checking the exam syllabus and 9.5% of the are using their mobile device on university website for events/occasion. Therefore, most of the pre-service teachers are using the results feature in their university website followed by exams syllabus and academic calendar.

6. USAGE OF MOBILE APPLICATION FOR ACADEMIC PURPOSE**Research question:** Which mobile application are they using on their mobile device for academic purpose?**Item 6:** Which mobile browser/application do you use on your mobile device for your academics?**Table .6****“Showing frequencies and percentages on the usage of mobile applications on their mobile devices for academics by pre-service teachers”**

Response	Don't know /default browser	Chrome	Safari	UC browser	Firefox
frequency	6	180	8	31	16
Percentage	3%	90%	4%	15.5%	8%

Interpretation

From the above table 6, It is inferred that 3% of the pre-service teachers are not using any default application on their mobile device for academics where as 90% of them are using chrome, 4% of them are using safari app 15.5% of them are using UC browser and 8% of them are using Firefox application in their mobile device for academics. Therefore ,most of the pre-service teachers are using chrome application in their mobile device for academics .

7. USAGE OF MOBILE DEVICE TO FIND AND ENROLL TO COURSE AREAS**Research question7 :** Do pre-service teachers are able in finding and enrolling to course areas without difficulty on their mobile device ?

**Table.7**

“Showing frequencies and percentages on finding and enrolling to course areas without difficulty on their mobile device by pre-service teachers”.

Responses	Strongly agree	Slightly agree	Unsure/don't know	Slightly disagree	Strongly disagree
frequency	39	109	22	18	12
Percentage	19.5%	54.5%	11%	9%	6%

Interpretation

From the above table 7, It is noticed that 19.5 % of pre-service teachers are agreed strongly in finding and enrolling to course areas without any difficulty on their mobile device where as 54.5 % of them agreed slightly, 11 % of them are unsure, 9 % of them are disagreed slightly and 6 % of them are strongly disagreed in finding and enrolling course areas without any difficulty on mobile device. Therefore, most of the pre-service teachers agreed slightly in finding and enrolling to course areas in their mobile devices.

8. USAGE OF DISCUSSION BOARDS WITH OUT ANY DIFFICULTY

Research question 8: How far pre-service teachers utilizing discussion boards on their mobile devices without any difficulty?

Table.8

“Showing frequencies and percentages on utilizing of discussion boards on their mobile device by pre-service teachers without any difficulty”

Response	Strongly agree	Slightly agree	Unsure/don't know	Slightly disagree	Strongly disagree
(frequency)	27	88	55	21	9
Percentage	13.5%	44%	27.5%	10.5%	4.5%

Interpretation:

Form the above table 8, it is observed that 13.5% of the pre-service teachers are agreed strongly in utilizing discussion boards without difficulty on their mobile device where as 44% of them are agreed slightly, 27.5% of them are unsure, 10.5% of them are disagreed slightly and 4.5% of them are disagreed strongly in utilization of discussions boards on their mobile device. Therefore, most of the pre-service teachers agreed slightly in utilizing discussion boards on their mobile device.

9. SEARCHING AND FINDING INFORMATION IN PARTICULAR WEBSITE

Research question 9: Does pre-service teachers are able in finding and searching information in particular website on their mobile device?

Item 9: I am able to search for and find information in particular website/source on my mobile device.

Table .9

“Showing frequencies and percentages on searching and finding information in particular website by pre-service teachers on their mobile device”

Response	Strongly agree	Slightly agree	Unsure/don't know	Slightly disagree	Strongly disagree
Frequency	119	51	17	10	3
Percentage	59.5%	25.5%	8.5%	2%	1.5%

Interpretations:

From the above table 9, It is inferred that 59.5% of pre-service teachers are agreed strongly in searching and finding information in website on their mobile device where as 25.5% of them are agreed slightly, 8.5% of them are unsure, 2% of them are disagreed slightly and 1.5% of them are agreed strongly in searching and finding information in particular website. Therefore, most of the pre-service teachers agreed strongly in searching and finding the information on their mobile device.

**10. USAGE OF MOBILE DEVICE FOR LEARNING PURPOSE**

Research question 10: What are the other mobile tools using by pre-service teachers on their mobile device for learning purpose?

Table .10

“Showing frequencies and percentages on usage of other tools by pre-service teachers for learning purpose”

Response	One-drive	Word	Excel	Power point	Google drive	What's app	Outlook
Frequency	13	62	53	101	136	126	11
Percentage	6.5%	31%	26.5%	50.5%	68%	63%	5.5%

Interpretation

From the above table 10, it is observed that 6.5% of the pre service teachers are using one drive on their mobile devices for learning purpose whereas 31% are using word, 26.5% are using excel, 50.5% of them are using powerpoint, 68% are using googledrive, 63% of them are using what's app and 5.5% are using outlook for learning purpose on their mobile device. Therefore, most of the pre-service teachers are using google drive for learning purpose followed by what's app and Power point.

CONCLUSION

Education system particularly from past decade period is massively influenced by technology. It is simply not confined to only some part of education but also almost all spheres of domain education including admission, administration, regulation, curriculum designing, technology led instructions, assessments, feedback, reporting etc. Earlier the concept of educational technology was only filled up with computers but from past 3-4 years a revolutionary upgradation is sought in mobile technology in terms of 2G to 3G to 4G applications and unlimited data access given by the network service companies like Jio and other network companies. This innovation made easy that usage of mobile phones with internet accessibility. The present study is witnessing that most of the pre-service teachers are using their mobile devices for their academic purposes which makes their learning easy, viable and flexible. They are using different featured application in order to come across their academic accomplishments or expectations.

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GIS TECHNOLOGY IN THE ASSESSMENT OF EROSION AND ACCUMULATION PROCESSES IN THE RIVER BED

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ABSTRACT

Article deals with the use of modern GIS (geographic information system) in the study of the deformation processes in the river. The most difficult problem in obtaining information on erosion and accumulative process is rapid assessment of the process. In the researches analyzed the possibility of using GIS technologies in the assessment of deformation processes in the foothills of the river, which have a highly variable nature. This information helps to draw conclusions about changes and events in nature. Study included collection, analysis and delivery of data to users with using GIS. The deformation processes in the river bed were evaluated and analyzed using Landsat satellite data. The researches described how to achieve a quick assessment of their processes.

INTRODUCTION

Deformation changes are occurring the management of water resources, rivers and streams. It is important to identify these changes in a timely manner so that they can be prevented [1,2,3]. Because the size and extent of changes are unstable, they require speed and accuracy, scientifically sound conclusions, and the development of useful measures. Targeted research is important around the world, with the aim of developing a variety of risk-based measures to remotely control land, creating a systematic, electronic, rapid and accurate network of ground water information [4,5,6,7]. Establishment of a global system of land and water management through GIS systems, organizing global surveillance and analysis based on Earth satellites, thus reducing redundant resources, improving results accuracy, creating different models, databases, rural and water resources. Introduction to agriculture is important [8,9]. One of the important issues is the improvement of computational methods and technologies for river flow assessment and river deformation prediction. Today, these issues are being studied, such as accurate and reliable assessment of the situation, and economic efficiency. This requires the use of modern technologies as the development of these works [10,11]. Today, GIS has the ability to analyze data from a remote location without problems, and has increased its use in various fields. Remote sensing technologies are a set of devices, techniques, and programs that help gather information about nature and the Earth. These data are collected on Earth by recording on active and passive sensors mounted on the Earth's satellite or pilot [12,13,14]. Active sensors emit light from them and capture them by means of absorption and return to the earth and various objects. Examples are radar sensors. Passive sensors are based on the absorption and return of sunlight to various objects and surface. Variation in the absorption capability of the objects allows for more detailed study of plant, water and other objects in the remote sensing by spectra. Satellite imagery can also explore areas that are difficult to navigate and explore. Since irrigation systems are relatively small, so far only linear maps have been generated using GPS (Global Position System) devices. Losses and their operational status have been studied locally. The launch of satellites with high-resolution sensors over the last 10 years has also enabled remote sensing in the water industry using their images [15,16]. This article presents the results of studies on river flow assessment using GIS technologies, determination of flow and river hydraulic and hydrological parameters.

METHODS AND MATERIALS

The Landsat archive-high-resolution satellite systems were used to assess the deformation processes in the river. The ability to easily analyze the remote sensing data in GIS has increased its use in various fields. These images also explore areas that are difficult to navigate and explore. However, initially they were of low resolution and were not available in the water sector. Therefore, to date, there has been little research on the use of water in the water. Mostly, many studies have focused on land use and land classification by analyzing mid- and high-resolution images. ArcGIS plays an important role in this system. Specific information includes properties of an object (statistics, maps, geometry, etc.). The prospect of using this program in science is rapidly evolving as it has the advantage of incorporating it into all data [17,18].



One of the key factors in the evaluation of river processes is the change in river parameters over time. These studies used the ArcGIS application ArcMap. Originally, Landsat 8 satellite images were downloaded free of charge from GloVis US official website. The maps are made by date for each downloaded image. GPS and GPS data were used to verify the accuracy of the mapped maps. Initially, the geodetic survey was conducted to study the existing parameters of the Sox River. Nine invariants were selected for each kilometer along the length of the stream. At that point, 7 immutable points were selected in each station, and at these points measurements were performed using GPS [19]. For each student, the leveling works were completed and mapped (Table 1).

Table 1. Geodesic measurements

№	Right		Centre		Left	
PC 12	659	657	656,8	565,38	656,48	657,7
PC 22	648,75	647	645,63	646,68	647,25	647,7
PC 32	638,23	637,09	636,11	636,18	634,78	634,58
PC 42	623,8	622,8	622,72	623,8	623,48	623,65
PC 52	613,97	612,02	612,47	612,32	613,12	612,12
PC 62	602,15	600,65	600,8	599,8	599,55	599,2
PC 72	590,9	588,45	588,6	588,95	586,7	586,6
PC 82	579	575,3	575,8	576	575,9	574,75
PC 92	567	564.3	564.85	565.3	564.7	566.6

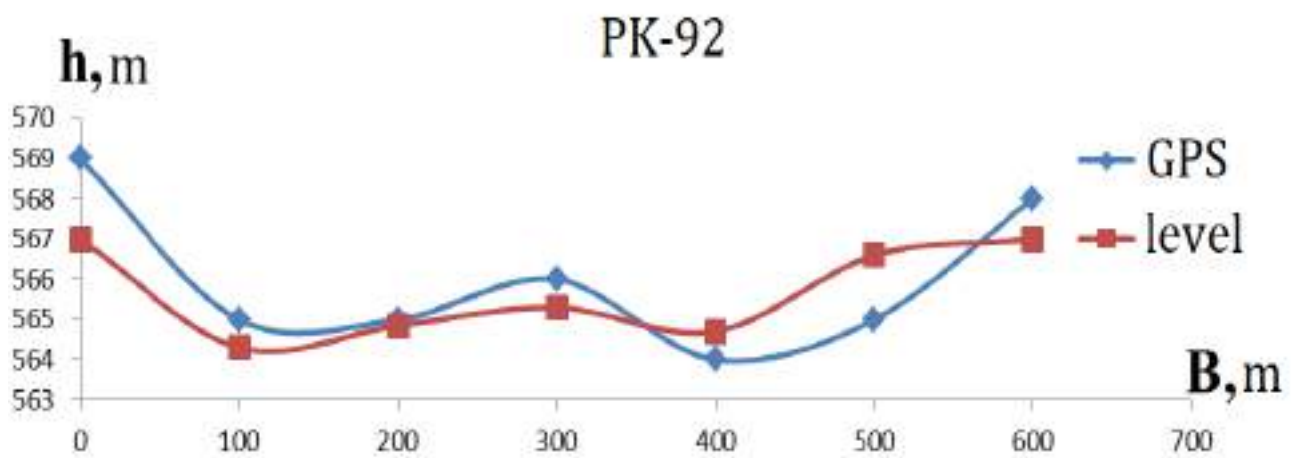
Subsequently, measurements were made with each GPS device and mapped to the table (Table 2). There was a difference between level and GPS-based results. The maximum value of these differences was 2 meters.

Table 2. GPS data

№	Right		Centre		Left	
PC 12	659	658	656	658	655	656
PC 22	645	643	641	643	643	645
PC 32	634	633	635	632	632	632
PC 42	624	620	621	623	620	621
PC 52	611	610	611	612	612	611
PC 62	600	600	600	601	599	599
PC 72	593	591	588	590	587	588
PC 82	580	577	577	578	575	578
PC 92	569	565	565	566	564	565

RESULTS AND DISCUSSION

On the basis of the values measured in our analysis phase, the cross-sectional surface for each stave was drawn (Figure 1). The difference between level and GPS is 1.5-2 meters.

**Fig. 1. Cross-section of the Sox River PK-92**



The map based on this data has been verified. At the same time, the width and width of the stream were measured and compared using the ArcMap application of ArcGIS (Figure 2). The results of the field experiments and satellite imagery were the same.

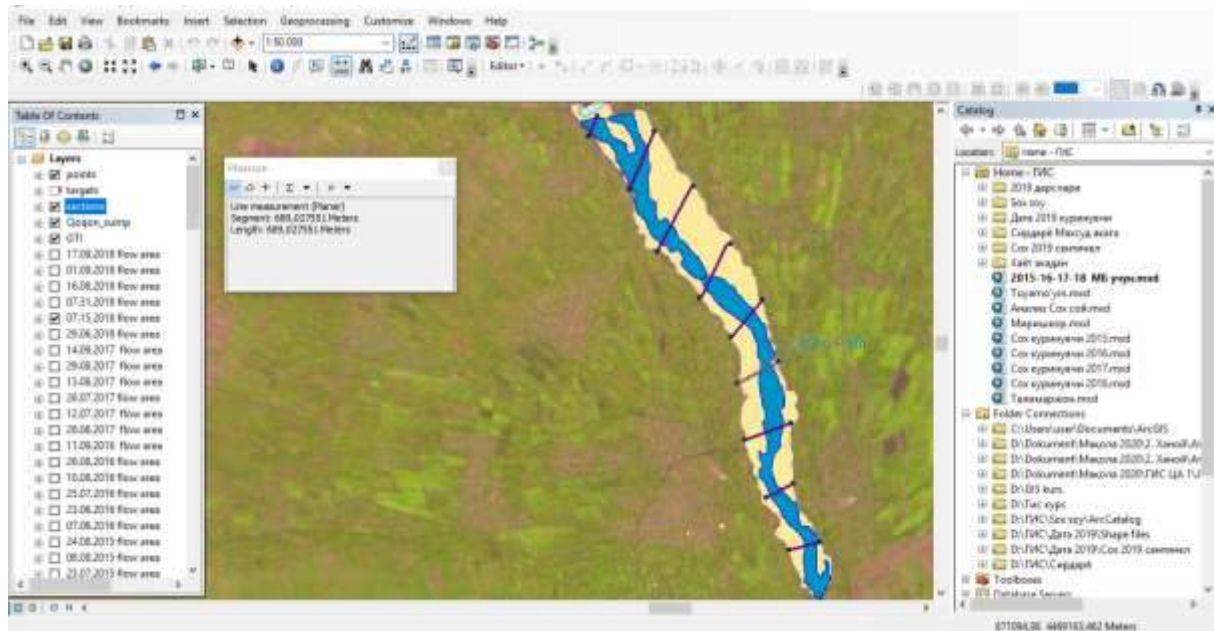


Fig. 2. Measurement of leith and with of Sox in ArcMap

The last 4 years of Landsat 8 satellite image data have been downloaded for free from the GloVis USGS official website. Based on these data, water flow maps for the past 4 years have been made. Based on the maps, the flow area and the width of the pickets were determined (Table 3). Based on the average width of the Sox stream in the identified pickets, the average depth of each picket was determined from the linkage equation of river width and average depth. Determination of the morphometric connections of the river was analyzed based on the most commonly used computational methods to evaluate the processes in the river [20,21]:

$$H=0.05B^{0.74} \quad (1)$$

Table 3. River morphometric connections

Picket	Discharge m ³ /s	Water surface area ha	Average width m	Actual width m	Slope	Average depth m	Cross-section surface m ²	Average speed m/s
12	95	127.1	149.5	93	0.011	1.43	133.09	0.71
22	95	127.1	149.5	138	0.011	1.92	264.46	0.36
32	95	127.1	149.5	75	0.011	1.22	91.53	1.04
42	95	127.1	149.5	127	0.011	1.80	228.87	0.42
52	95	127.1	149.5	106	0.011	1.58	167.11	0.57
62	95	127.1	149.5	182	0.011	2.35	428.05	0.22
72	95	127.1	149.5	120	0.011	1.73	207.37	0.46
82	95	127.1	149.5	115	0.011	1.67	192.57	0.49
92	95	127.1	149.5	115	0.011	1.67	192.57	0.49

CONCLUSION

Based on the data in the table we can see that the flow rates in the sampled sediments vary with cross-sectional surface, average depth and average velocities. In relatively large areas with average depth, average velocity is small. This indicates that the average flow rate is greater and more likely to be washed off at high velocities, whereas fuzzy particle sinking is observed due to the smaller velocity in the medium with a high flow rate. Based on the above processes, it is possible to evaluate the deformation processes in the river. The studies analyzed the last four years of river flow data.

In our research, we extracted and evaluated river formation based on a five-year observation of sedimentation processes using Landsat images. According to the analysis, the use of GIS in the remote sensing of the deformation processes in the basin



allows the rapid detection of emerging processes. This allowed saving time and resources, creating a reliable and quality database. It shows the ability to map maps using Landsat images for many years and create a database based on these maps and predict the future based on hydraulic laws.

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THE APPLICATION OF CONCEPTS RELATED TO THE ART OF SINGING IN BABUR'S WORK

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ANNOTATION

The art of Uzbek singing has been highly respected since ancient times. Information about this, along with historical, artistic and cultural sources, was also reflected in classical literary works. This article talks about the types of singing art and the use of related concepts in the work "Baburnoma" by Zahiriddin Muhammad Babur.

KEY WORDS: *singing, navo, history, song, understanding, creativity.*

ANNOTATSIYA

O'zbek qo'shiqchilik san'ati qadimdan yuksak ehtirom bilan baholangan. Bu haqdagi ma'lumotlar tarixiy, san'at va madaniyatga doir manbalar bilan birgalikda mumtoz adabiy asarlarda ham o'z aksini topgan. Mazkur maqolada Zahiriddin Muhammad Boburning "Boburnoma" asarida qo'shiqchilik san'ati turlari va ularga oid tushunchalarning qo'llanilishi xususida so'z boradi.

KALIT SO'ZLAR: *qo'shiqchilik, navo, tarix, nag'ma, tushuncha, ijod.*

АННОТАЦИЯ

Искусство узбекского пения с древних времен пользуется большим уважением. Сведения об этом, наряду с историческими, художественными и культурологическими источниками, нашли отражение и в классических литературных произведениях. В данной статье говорится о видах певческого искусства и применении связанных с ними понятий в произведении "Бабурнома" Захириддина Мухаммада Бабура.

КЛЮЧЕВЫЕ СЛОВА: *пение, навo, история, песня, понимание, творчество.*

We know that during the period of Temur and Timurids, literature, culture and art reached the peak of development. Musical creativity and performance developed rapidly. According to the information provided by Khofurbekov, "According to the owner's opinion, musical instruments that are common among the common people legally became a symbol that defines the social and military status of governors and army chiefs." Therefore, Amir Temur was considered a person who looked at art with a special look, even though he was a king who fought in bloody wars. Of course, we can see such a beautiful natural worldview in Zahiruddin Muhammad Babur. Babur paid great attention and respect to the people of art. Wherever Babur went, he carried an ensemble of artists called "**dasta**" with him. Dasta was at the service of Babur's closest friends, comrades and mahrams in private conversations. Musicians, singers and dancers are organized based on the dasta, and Babur also called this group "**ahli nagma**". Cultural scientist M. Kadirov "Babur was well aware of the three components of music: musicianship, composition, and music science, he highly valued musicians and singers, and depending on the circumstances and mood, he organized gurungs and parties with the participation of musicians and singers" [1, p. 49].

As Babur's work "Boburnoma" is a narrative and a historical work according to the style and purpose, it gives brief, not specific, information about art and art people. Babur did not mention the term song in his work "Boburnoma", according to K. Sodikov in his "Annotated Dictionary of the Names of Turkish Texts of the Early and Middle Ages", "Babur mentioned the term song in his work "Mukhtasar" defines as: *qo'shuq ko'ngil oladigan vazn*:



Qilgil ey arami jan necha tartay intizar,
Qildi hajring natavan qildi shavqing beqarar

Bu vazn turk arasida qo'shuqqa mavzumdur. Urg'ushtak bitarda bu vazn taqsim qilurlar".

In the work "Boburnoma", he mentioned several terms related to the art of singing, and we can find almost all of these terms in Arabic and Persian languages. Let's first determine which of these terms Babur used in his work "Boburnoma", and then analyze them with examples: sound, pattern, musical, singer, nagma, nagamot, ahang, goyanda, used terms such as mutrib and surud.

Savt (a.) voice, sound, tune, melody. This term is mentioned in the work "Boburnoma". Navoi also used this term in the meaning of melody in his work "Sab'ai Sayyor". We can say that Babur used this term in the sense of music: "*Binoiy Hirida qolur. Ul kishi musiqiy mashq qilur, yozgacha oncha bo'lurkim, ishlar bog'lar. Yoz mirzo Hiri kelganda savt va naqsh o'tkarur*" [2, 242-b]. (Binay stays in Herat. He practices music that day. He works so hard until the summer that he even invents melodies. In the summer, when Sultan Husayn Mirza comes to Herat, he plays the tunes and patterns he created for him) [3,143-p]. At this point, we should mention one thing, we can say that Babur created a new term for singing in this work. Because if you pay attention, the writer used the term naqsh together with the term sayt in the work, and wherever Babur used the term saut from the beginning to the end of the work "Baburnoma", he certainly used the term naqsh before it. When we look at the explanatory dictionary of the Uzbek language, saut — Arabic is used in the sense of sound, sound, pattern – picture, decoration, carved image, flower, and in the figurative sense of beauty, decoration. used in [4, 216,-67-b]. In our opinion, Babur used the term naqsh in a figurative sense and wanted to convey the meaning of giving voice and beautiful performance.

Musical (a.) musical, melodious, i.e., in the explanatory dictionary: a type of art that reflects human emotional experiences, thoughts, imagination through the consistency or set of musical sounds (tones, melodies) [4,203-b]. In "Boburnoma" it is stated as follows: "*Alisherbek taajjub qilib tahsin qilur. Musiqiyda tavr ishlar bog'labdur, ul jumladin bit naqshi bor, nuhrang'a masum. Bu to'qqiz rangning tuganishi va naqshning maylosi rostadur*" [3,242-p]. (Alisherbek is surprised and compliments. He has created good works in constructive music. In particular, he has a pattern called "Nuhrang". The end of the nine colors and the pattern is in the tone "Rost") "Boburnoma" under the direction of A. Qayumov, 2008 In the edition of "Teacher" publishing house, the exact meaning of the term "pattern" is not given, but it is translated as it is.

Xonanda (f.) – singer, hafiz, that is, a person who sings "*Tashqaridan Xoja Pir bakovul va ulug' og'alar va nekim bo'lg'on sozanda va xonanda kelib, Sulton Mahmud mirzoning Xonzodabegimdin bo'lg'on ulug' qizini Haydar mirzog'akim Poyanda Sultonbegimdin bo'lub edi*" [2,94-p]. (From outside, Khwaja Pir Bakovul, great masters and existing musicians and khafiz came from Sultan Mahmud Mirza's Khanzoda Begim).

Nag'ma (a.) – it is used in the sense of melody, song, singers' rhythm. "*Majlisda nag'ma ahlidin Hofiz Hoji edi Jamoliddin Mahmud noyi edi*" [2,253-p] As we mentioned above, Babur called the group of singers ahli nagma, and in it all representatives of art (singer, musician, dancer) were organized and served the officials.

Nag'amot (a.) – it can also be said that the plural suffix is added to the term nagma. We can see the term Nagamot mainly in the works of Alisher Navoi and Babur: "*Shayxiddin yana bir nima rivoyat qildilar: nag'amotqa andoq mustahzor ekandurkim, har nag'makim, eshitsa, der ekandurkim, falonning falon pardasi munga ohangdur, vale xili ish bog'lamaydur*" [2,245-p]. (Shaykhiddin narrated another thing: he was so skilled in the perception of melody that he used to say that such and such a curtain is the melody for it. But he does not create many melodies. They only say that one or two patterns are his.)

Go'yanda (f.) – In the dictionary of Navoi's works, it means a storyteller, a song-singer, a person who tells a story, and in the explanatory dictionary of the Uzbek language, it means a woman who sings a song in a condolence ceremony, a person who tells a story. applied. Basically, the composition of Goyanda consisted of Sarayanda (singer) and Navozanda (instrumentalist) and they were formed only by men. "*Sozandalar soz choldilar va go'yandalar nima ayttilar*" [2,416-p]



All the terms mentioned above are mentioned in "Boburnoma", and Babur also used several terms related to singing in his collection of selected works:

Mutrib (*a.*) – showing the meanings of singer, musician, musician, Navoi uses the same meanings in his works. Babur used it in the following ghazal in the sense of a musician and a musician:

Yoz bo'ldiyu bo'ldi yana jannat kibi yozi
Xush ul kishikim, aysh ila o'tgay qishu yozi
Dutora uni ayshu farog'atni berur yod
Mutribg'a quloq tutki, ne der nag'mada sozi

If we pay attention to the meaning of this ghazal, it corresponds to the concept of a musician, a musician more than the meaning of a singer: listen to the musician, sing to the tune of what he says.

Surud (*f.*) – song.

Necha davron g'ussasi bo'lg'ay mening jonimg'a xos
Koshki o'lsam dog'i bu g'ussadin bo'lsam xalos
Ohu vovaylo – surudim dardu g'am – hamsuhbatim
Boda – ashkim qoni, kim ko'rdi muningdek bazmi xos?

Babur introduces several singers and musicians in his work "Boburnoma": Ruhdam, Bobojon, Kanbuzi, Kasim Ali, Yusuf Ali Taryoqi, Tengriquli, Abulqasim, Ramazan, and these people were called gypsies. had members.

In summary,

- During the period of Timur and Timurids, musicians and singers were treated with attention, respect and special recognition;
- Concepts related to the art of singing used in "Boburnoma" (savi, khanda, nagma, nagamot, naqsh, goyanda, musiik) are considered to be basic words;
- The concepts of the art of singing used by Babur were words borrowed from the Arabic and Persian languages. Babur did not repeat the various alternatives of these concepts in his works. For example, there are concepts such as song, alkhan, olang, and surud that can be synonymous with the term goyanda mentioned in "Boburnoma", but we can find only the term surud in the ghazal of Babur's Selected Works.
- The information in "Boburnoma" indicates that several types of singing art developed in the 15th century.

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MANAGEMENT OF PATIENTS WITH GASTRIC AND DUODENAL ULCERATIVE BLEEDING

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Running Title: HAEMOSTASIS FOR GASTRIC AND STOMACH ULCER BLEEDING

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ABSTRACT

Object: To evaluate the effectiveness of endoscopic haemostasis for peptic ulcer bleeding.

Materials and methods: This study included 60 patients with bleeding from stomach and duodenal ulcers who underwent inpatient treatment at the emergency surgery department of the second clinic of the Tashkent Medical Academy between 2018 and 2020. There were 27 men (60.0%) and 18 women (40.0%), for a ratio of 1.5:1. The age of the patients ranged from 18 to 73 years. Only patients with bleeding evaluated as Forrest IA (FIA), FIB, or FIIA were included in the study. Bleeding was estimated as FIA in 10 (22.2%) patients, FIB in 8 (17.8%), and FIIA in 27 (60.0%). The haemoglobin level ranged from 28 to 100 g/l. In some cases, methods other than clipping were used for endohaemostasis, but because of their ineffectiveness, they were not included in the work. In all cases, to achieve haemostasis, Hemoclips varying in size from 5 to 12 mm (Olympus) were installed.

Results: The analysis revealed that the efficacy of endoscopic clipping can reach up to 93.2% and that it is the method of choice for profuse gastroduodenal peptic ulcer bleeding, especially in patients with a high risk for anaesthesia and surgery. Thus, this method could be an alternative to open surgical interventions.

KEY WORDS: endoscopic haemostasis; retrograde endoscopic haemostasis; injection; haemoclipping; argon plasma coagulation; profuse gastroduodenal peptic ulcer bleeding.



TOPIC

The diagnosis and treatment of patients with acute erosive-ulcerative gastroduodenal bleeding remain great challenges in emergent surgery. The aetiological factors of acute erosion and ulcers complicated by bleeding are injuries, burns and surgical interventions [1, 2, 4]. Cases of erosion and ulcers of the upper gastrointestinal tract after minor operations in patients who previously did not suffer from gastrointestinal tract diseases have been described. The mortality rate in this category of patients, especially in cases of severe concomitant pathologies, can reach up to 60%; with bleeding recurrence, this rate is more than 80% [1, 2, 11].

In most published works, acute bleeding ulcers are often treated as peptic ulcers using the same therapeutic strategies. The clinical course of acute ulcers differs from that of peptic ulcers. Of all the known diagnostic methods, endoscopic examination not only allows accurate diagnosis but also enables haemostasis to be achieved, the effectiveness of which exceeds 90% [1, 3, 14, 16].

The main reasons for the unsatisfactory results of endoscopic haemostasis are the presence of intense arterial bleeding from ulcers in atypical locations, which leads to difficulties in visualizing the source of bleeding, as well as the presence of bleeding disorders, among others.

MATERIAL AND METHODS

We analysed 60 clinical cases of acute erosive-ulcerative bleeding treated at the emergency surgery department of the multi-disciplinary clinic of the Tashkent Medical Academy between 2018 and 2020. The age of patients ranged from 18 to 83 years. Over 50.0% of these patients were over 55 years of age. In 48 (80.0%) patients, the cause of bleeding was acute ulcers and erosion of the stomach (antrum and prepyloric region, 31 cases; body of the stomach, 6; cardiac section, 3; bottom of the stomach, 2; back wall of the body and large curvature of the stomach, 6 cases), and 12 (20.0%) patients had an acute duodenal ulcer. It should be noted that stomach ulcers at the last listed location are not common, but there are technical difficulties in visualizing these zones of the stomach to localize blood clots during bleeding from the upper gastrointestinal tract. The intensity of bleeding in all patients was distributed as follows: Forrest IA (FIA), 9 (15.0%); FIB, 21 (35.0%); and FIIA, 30 (50.0%).

An analysis of the main causes of acute ulcers revealed that the pathology developed due to uncontrolled non-steroidal and steroidal anti-inflammatory drug administration in 32 (53.5%) patients; volume surgeries, car accidents and burns in 20 (33.5%) patients, and the complicated course of an underlying disease or its decompensation over a long period of hospitalization leading to gastrointestinal haemorrhage (GH) in 8 (13.0%) patients. Moreover, in most cases, preventive antiulcer therapy was not carried out.

Most often, acute ulcers were observed in the hospital, appearing against the background of the decompensation of acute or chronic disease, often associated with multiple organ failure syndrome. Most ulcers in this group of patients occurred with a combination of diseases affecting the cardiovascular and respiratory systems and diabetes mellitus. When analysing the nature of the concomitant pathology, a significant dependence of the appearance of GH from acute ulcers on the number of systemic organ lesions was found. In 50 (84.5%) patients with a concomitant pathology, a combination of two or more diseases was observed, the most frequent of which were coronary heart disease, chronic non-specific lung disease and cerebrovascular disease. In addition, in this group, there were 7 patients with decompensated cirrhosis and liver failure and 3 patients with chronic renal failure.

Thus, the risk factors for the development of complications from acute ulcers in this group include the following: 1. advanced age; 2. limited nutrition, leading to an imbalance in the acid-base balance in the stomach; 3. uncontrolled intake of steroid and non-steroidal anti-inflammatory drugs; 4. second- to third-degree organ dysfunction on severity assessment using the APACHE system; and 5. prolonged bed rest.

Therefore, when these adverse factors are detected in patients, measures to prevent erosive and ulcerative lesions of the gastrointestinal tract should be applied. Acute ulcers associated with taking medications are observed in 45–68% of elderly patients, and this aetiology recently accounted for one-third of gastroduodenal bleeding cases. According to our data, this is the most frequent cause of complications of acute ulcers in inpatients. For the most part,



these ulcers appear after the use of cyclooxygenase inhibitors. Among our patients, 30 (50.0%) were over 55 years old and took more than 3 drugs per day, usually disaggregants (analogues of acetylsalicylic acid), anticoagulants (warfarin), NSAIDs (diclofenac, Voltaren, ibuprofen) and steroid preparations. Of these, 11 (18.1%) patients had systemic disease and diabetes mellitus and regularly received steroids (prednisone, beclomethasone) and hypoglycaemic drugs in combination with anti-inflammatory drugs and antiplatelet agents.

Acute ulcers in the early postoperative period develop in 2.5–24% of patients [1, 5, 8, 10, 12, 13]. Under our supervision, there were 20 (33.5%) patients with acute ulcers in the postoperative period. All acute ulcers in this patient group manifested from 4 to 9 days after surgery and were observed in the complicated course of disease during the postoperative period along with progressive organ dysfunction.

According to the conclusion of the Russian Association of Surgical Infection Specialists, 2 variants of acute ulcers in the early postoperative period are distinguished: type I - superficial diffuse erosion with a low risk of bleeding; type II - deep localized ulcers with a high risk of haemorrhagic complications, the frequency of which in ICU patients reaches 14%, with an associated mortality rate of 64% [2, 3]. There are various difficulties in diagnosing acute ulcers and erosion of the stomach, including the lack of clinically significant symptoms of bleeding in 60% of patients, the hidden nature of the disease, and the ability to achieve the diagnosis only with the appearance of haemodynamic disorders.

The standard in the diagnosis of erosive and ulcerative lesions of the upper gastrointestinal tract is endoscopy. Usually, for small acute ulcers 5–10 mm in diameter, the shape of the ulcer is round, the edges are smooth, the bottom is not deep, and a haemorrhagic plaque is often present. Multiplicity is characteristic of acute ulcers, and a combination of localization in the stomach and the duodenum is often observed.

During an endoscopic examination, in addition to examining the gastroduodenal zone, a primary assessment of the intensity and nature of the bleeding is of particular importance. To achieve haemostasis, we used thermal (monopolar, bipolar electrocoagulation, hydrocoagulation, argon plasma coagulation), injection and mechanical (vessel clipping) methods for haemostasis. The choice of the method for haemostasis depended on the intensity of ulcerative bleeding. In 21 cases (35.0%), the edges of the ulcer were chipped, electrocoagulation was performed in 7 (11.7%) cases, argon plasma coagulation was performed in 12 (20.0%) cases, and clipping was performed in 9 (15.0%) cases. In 11 (18.3%) cases, combined methods of endoscopic haemostasis were used (Table 1).

Table 1.**Applied methods for endoscopic haemostasis**

Endoscopic haemostatic method	Haemostatic agent	Number
Injection method	Ethanol (33%), ethoxysclerol (1%)	21 (35.0%)
Electrocoagulation	Bipolar electric current	7 (11.7%)
Argon plasma coagulation (APC)	Argon	12 (20.0%)
Clipping	Olympus Haemoclips, size 7-9 mm	9 (15.0%)
Combined methods	Injection + electrocoagulation, Injection + clipping	11 (18.3%)

It should be noted that in 54 (90.0%) cases, endoscopic haemostasis was performed for the first time with the patient positioned on their right side, with bleeding ulcers of the posterior wall of the upper third of the body and large curvature of the stomach.

Clinical example No. 1. Patient T., 59 years old (IC No. 8951). The patient presented (11/10/2018) to our clinic with signs of profuse bleeding from the gastrointestinal tract. Anamnesis revealed that the patient suffered from IHD, PICS, type 2 diabetes mellitus, and liver cirrhosis. The patient regularly took antiplatelet agents and anti-inflammatory drugs.

EGDS revealed no features in the oesophagus, blood clots of approximately 300 ml in the lumen of the stomach, and no pathology in the duodenum or the antrum or body of the stomach. Further retrograde examination



revealed an acute ulcer in the upper third of the stomach body on the side of the greater curvature; however, it was not possible to visualize the size of the ulcer or the nature of the bleeding due to the presence of blood clots over this area. To visualize the latter, the patient's position on the right side was changed. After that, all blood clots moved to the lesser curvature. It was further revealed that there was an acute ulcer in the area of the greater curvature of the stomach, 10x12 mm in size, with signs of active bleeding. Retrograde endoscopic chipping of the edges of the ulcer was performed with a 33% ethanol solution, stopping the bleeding. The patient reached a satisfactory condition and was discharged on the 4th day.

After performing endoscopic haemostasis for acute ulcers with active bleeding, it is necessary to identify patients with a high and low risk of recurrence according to the Forrest classification. Regarding patients with a high risk of bleeding recurrence from acute ulcers on endoscopy, we included patients with active bleeding from one or more acute ulcers at the time of primary endoscopy (FIA, FIB) and without bleeding (FIIA).

According to the results of primary gastroscopy in patients at a high risk of recurrent bleeding, a dynamic study is necessary to implement endoscopic prophylaxis for repeated haemorrhage. The term for performing repeated EGDFS depended on the reliability of the method performed for primary haemostasis, with an average of 0.5–3 days from the moment of primary endoscopy. During dynamic EGDFS, the quality of haemostasis and the risk of recurrent bleeding were re-evaluated, and prevention was carried out in the case of ongoing risk. After successful endoscopic haemostasis, further methods of prevention and treatment included intensive antiulcer therapy, normalization of the motor evacuation function of the stomach, and symptomatic treatment.



Picture 1. Retrograde haemostasis.

RESULTS AND DISCUSSION

After endoscopic treatment, final haemostasis was achieved in 54 (90.0%) cases. Recurrent bleeding was noted in 5 (10.0%) cases. After repeated endoscopic intervention in 2 cases, the bleeding was finally stopped. Due to inefficacy of the endoscopic method for haemostasis in an extremely serious condition, 2 patients were taken for surgery amid ongoing bleeding. In the postoperative period, 1 patient died due to multiple organ failure. Another patient died in the early postoperative period due to suture failure, peritonitis and DIC.

According to V.A. Kubyshkin [4], in most cases of bleeding from acute ulcers, the use of endoscopic methods for haemostasis in combination with modern antisecretory therapy can prevent recurrence and achieve adequate haemostasis without surgery. In general, the effectiveness of endoscopic haemostasis can reach 90–95%. In our observations, recurrent bleeding was not observed in the low-risk group. In 7 (4.2%) patients at high risk, recurrent bleeding was noted. After repeated endoscopic intervention in 3 cases, final haemostasis was achieved.



According to P.D. Fomin [8], using the injection method with a 33% ethanol solution, primary haemostasis was achieved in 90% of patients, final haemostasis was achieved in 85% of patients, and the rate of bleeding recurrence was 15%. However, often, this method can lead to tissue destruction and massive necrosis of the organ wall with its subsequent perforation, which is a disadvantage of this method.

In his research, Cook D.J. [11] claims that the use of coagulation methods for haemostasis allows primary haemostasis to be achieved in up to 91-94.0% of cases, allows final haemostasis to be achieved in 85.0-88.0% of patients, reduces the rate of emergent surgery to 10.5%, and reduces the mortality rate to 3.0-4.5%, with recurrent haemorrhage occurring in 8.0-9.5% of patients. In 21 cases, we used coagulation methods (diathermocoagulation, 7; argon plasma coagulation, 12; combined method, 2). Recurrent haemorrhage was noted in 2 (9.5%) cases, which required surgical treatment.

In 1980, for the first time in Japan, Dr Hachisu, together with the company Olympus, created a clipper and clips for endoscopic haemostasis. In his opinion, with the help of endoscopic clipping for ulcerative bleeding, haemostasis can be achieved in 85-100% of cases, reducing the frequency of recurrence from 20% to 2% [13].

K.F. Binmoeller [10], in Germany, applied the endoclip technique in 88 patients with active ulcerative bleeding from the upper gastrointestinal tract and obtained excellent results. Recurrence was observed in 5 (5.6%) patients, only one of whom required surgery. There were no cases of mortality.

Many authors claim [8, 10, 13] that using rotary clips in patients with active ulcerative bleeding can achieve final haemostasis in 95% of cases, with a decrease in the recurrence rate to 5.0%. Moreover, the inefficiency of the method may be associated with technical difficulties in visualization and identification of the bleeding source. We used endoscopic clipping in 12 patients; in 3 of these patients, endoclippping was combined with other methods. Bleeding recurrence was noted in 2 (16.6%) patients; in one of them, it was possible to stop the bleeding endoscopically; in the other, surgical treatment was required.

A randomized study published in the journal *Gastrointestinal endoscopy* reported that the rate of primary final haemostasis achieved by endoclippping increased from 92 to 96% and that the rate of bleeding recurrence decreased by almost half (from 15 to 8.5%). However, a change in the method of endoscopic haemostasis did not affect the rate of mortality or open surgical intervention [13].

Such a considerable difference in indicators of persistent haemostasis or recurrent bleeding is mainly due to the bleeding originating from a “difficult” location and the occurrence of profuse arterial bleeding. Despite the advantage of modern endoscopic methods for haemostasis, further research is needed to develop more effective methods.

CONCLUSIONS

1. Endoscopic methods for haemostasis are effective for controlling bleeding (especially FIA, FIB, and FIIA bleeding) from acute ulcers and erosive lesions of the upper gastrointestinal tract, with a rate of final haemostasis of up to 93.3%.
2. The use of combined methods and retrograde haemostasis with the patient on their right side made it possible to stop bleeding in 90% of cases.
3. In the case of endoscopic method failure, it is necessary to resort to open surgery.

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SYNTAXIC CONSTRUCTIONS IN PAREMIA OF THE KARAKALPAK LANGUAGE WITH THE CONCEPT "WORK"

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СИНТАКСИЧЕСКИЕ КОНСТРУКЦИИ В ПАРЕМИЯХ КАРАКАЛПАКСКОГО ЯЗЫКА С КОНЦЕПТОМ «ТРУД»

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ANNOTATION

The article lists some features of syntactic constructions in the paremias of the Karakalpak language, which are determined by the pragmatic purpose of this type of paremias as a folklore genre. The material for the analysis was proverbs and sayings from lexicographic works of the studied language, the syntactic structure of which is a simple and complex sentence.

KEY WORDS: paremia, proverb, saying, concept, work, syntactic constructions, simple and complex sentences, function words.

Аннотация. В статье перечислены некоторые особенности синтаксических конструкций в паремиях каракалпакского языка, которые определяются прагматическим назначением этого вида паремий как фольклорного жанра. Материалом для анализа послужили пословицы и поговорки из лексикографических работ исследуемого языка, синтаксическая структура которых представляет собой простое и сложное предложение.

Аннотация. Мақолада қарақалпақ тили паремиясидаги синтактик конструкцияларнинг айрим хусусиятлари келтирилган бўлиб, улар паремиянинг бу тури фольклор жанри сифатида прагматик мақсад билан белгиланади. Таҳлил учун материал ўрганилаётган тилнинг лексикографик асарларидан олинган мақол ва матал бўлиб, уларнинг синтактик тузилиши содда ва мураккаб жумла ҳисобланади.

Ключевые слова: паремия, пословица, поговорка, концепт, труд, синтаксические конструкции, простые и сложные предложения, служебные слова.

Таянч сўзлар: паремия, мақол, матал, тушунча, меҳнат, синтактик тузилмалар, содда ва мураккаб гаплар, вазифа сўзлар.

Пословицы и поговорки – сгусток народной мудрости, ярко выраженный концентрат народного таланта. «Пословица – это сливки слова», – гласит каракалпакская мудрость. Пожалуй, ни один вид художественного творчества не говорит так «ярко за себя, как пословицы и поговорки» [1:83].



Каракалпакские пословицы и поговорки отличаются своеобразием от пословиц и поговорок других народов. Испокон веков, передаваясь от поколения к поколению, из уст

В уста, пословицы и поговорки каракалпакского народа дают интересные сведения о традициях, жизненных обрядах и культуре далекого прошлого.

Каракалпакские народные пословицы и поговорки выражают глубокую народную мысль. Каждая из них отличается высокоидейностью, гуманизмом, тесной связью с жизнью. Заложённая в природе пословиц и поговорок многозначность свидетельствует о том, что они могут употребляться универсально для утверждения той или иной высказываемой мысли. С точки зрения широкого массового употребления, глубокого проникновения в плоть и кровь народа пословицы и поговорки занимают особое место во всей духовной и практической жизни людей [2:3]. В каждой пословице и поговорке заложено много оттенков значений труда: *Адам мийнетпен танықлы болады* (Человек работой славен); *Адам мийнети менен сулыұ* (Человек трудом красен); *Мийнет пенен рәхәт, екеуі де барабар* (Работа и радость всегда рядом); *Адамның қолы гул, маңлайдың тери – нур* (Руки человека – цветы, пот со лба – луч); *Алтын отта белли, адам мийнетте белли* (Проба для золота – пламя, для человека – работа).

Глубиной и остротой мысли пословицы и поговорки синтезируют вековые сокровища народных традиций. Языковые, стилистические богатства паремий основаны на сложной системе словесно-художественной культуры выразительно-изобразительных средств живой разговорной речи, устного народного творчества и общенародного языка. Эмоциональная и смысловая сила пословичных изречений определяется и их языковыми, в частности структурными средствами.

Исследование конструкций, составляющих грамматическую базу пословиц и поговорок, позволяет определить уникальные черты пословичной картины мира.

Грамматически паремии являются предложениями, в которых главные члены имеют единую синтаксическую позицию и синтаксическую функцию. Паремические предложения очень емки, кратки, содержательны. Обладая образностью и выразительностью, пословицы очень логичны и глубоко значимы, что обеспечивается четкостью композиции и краткостью собственно формы, которые соответствуют грамматической структуре.

Будучи предложениями, паремии обладают смысловой и интонационной завершенностью, синтаксической членимостью, категориями предикативности и модальности, то есть всеми конструктивными признаками предложения. Все пословичные изречения каракалпакского языка делятся на два синтаксических типа: на простые и сложные предложения.

В каракалпакском языке распространены пословицы, которые представляют собой двусоставные предложения со структурной схемой **Sn + Sn** (имя существительное в именительном падеже + имя существительное в именительном падеже): *Арпа-бийдай ас екен, алтын-гүмис тас екен* (Серебро и золото – камень, а ячмень и пшеница – еда); *Ериншеклик басқа бәле* (Лень – несчастье на голову); *Жалқау өз үйіне өзі қонақ* (Лентяй сам у себя гость); *Жақсы мийнет – жарым ырыс* (Хороший труд – половина блага); *Мийнетсиз өмір – қара көмір* (Жизнь без труда – чёрная копоть); *Халқыңа хызмет – өзіңе үлкен құрмет* (Служить народу – себе уважение).

В роли главных и второстепенных членов предложения в ряде случаев выступают **причастия**, например: *Ағаш екпеген саясында жатпас* (Не сажавший дерево, не будет отдыхать в тени); *Даңқын жаяр мийнет еткен, алғыс алар сыннан өткен* (Трудившийся – получит славу, прошедший испытания – получит благодарность); *Еңбектен қашқан дүмpekке жолығар суұ шығара алмай шалығар* (Бежавший от труда повстречает бугор и утомится, вынося воду); *Ешек минген еңбегін минеди* (Оседлавший осла, «оседлает» и труд); *Ісегеннің аузы асқа толады, жалқаудың жұмысы дау болады, айтатугыны заң болады, көрмеген адамға таң болады* (Работающий всегда сытый, для лентяя работа – тяжба); **деепричастия**: *Балықшы теңізде жүріп, күнінің өткенін билмес* (Находясь в море, рыбак не замечает, как день прошёл); *Жатып ишер жалқау болады, қос жақпас мылқау болады* (Лежебока – лентяй, а лентяй всегда немой); *Жылай-жылай жап қазсаң, күле-*

күле суұ ишесең (Плача копаешь арык, смеясь будешь пить воду); *Қашып кетсең де шашып кет* (Убегая, рассыпь); *Мийнет етсең ерінбей, тояды қарның тиленбей* (Будешь работать не ленись, отведаешь вкусного); **количественно-именные сочетания слов**: *Бір жыл тут еккен киси, жүз жыл гәуһар тереди* (Посадивший за год тутовник, сто лет будет собирать жемчуг); *Дигирман гезегинен қалған, бір күн аш қалады* (Кто



пропустил очередь в мельнице, тот останется на один день голодным); *Ериншектің екі досты бар: бири уйқы, бири қулық* (У лентяя два товарища: один – сон, другой

– *исі артық* (Рано встающая женщина на одно дело больше успевает, рано встающему джигиту – счастья больше); *Мийнет – билсең екінші анаң, жел тийгізбес болар панаң* (Труд- вторая мать, не будешь обижать, она будет твоей опорой).

Каракалпакские паремии характеризуются частотностью употребления сложноподчиненных предложений:

1) сложноподчиненные предложения, части которых соединены между собой при помощи союзных слов **ким, кимде-ким**, например: *Ким ислемесе, сол тислемейди* (Кто не работает, тот не ест); *Кимде-ким халық алдында ұмытса хызметін, ондайларға хеш ким етпес хурметін* (Кто забыл свою обязанность перед обществом, тот не достоин уважения); *Кимнің тарысы писсе, соның тауығы* (Было бы пшено, а куры найдутся).

2) СПП с временным значением: *Жан қыйнамай жұмыс ітпес, талап қылмай мұратқа жетпес* (Пока не помучаешься, не достигнешь цели);

3) СПП с условным значением: *Жалқауға ис бұйырсаң, өзіңе ақыл үйретеді* (Поручишь дело лентяю, он тебя учить будет); *Мийнети қатты болса, мийұасы татлы болады* (Трудовая дорожка тяжка, трудовая лепешка – сладка).

Для каракалпакских паремий характерным является использование **бессоюзных сложных предложений**: *Ағаш мийұасы менен танылады, адам мийнети менен танылады* (Дерево ценно плодами, человек – трудом);

Адамның қолы – гүл, маңлайдың тері – нур (Руки человека – цветы, пот – луч); *Алтын отта белли, адам мийнетте белли* (Проба для золота – пламя, для человека – работа); *Ис көп – көмір аз, уста көп – темир аз* (Работы много – угля мало, мастеров много – железа мало); *Мийнет пенен жер көгерер, илим менен ер көгерер* (Земля процветает трудом, молодец возвышается знанием); в том числе и **многокомпонентных бессоюзных сложных предложений**: *Ислегеннің аузы асқа толады, жалқаудың жұмысы дау болады, айтатұғыны заң болады, көрмеген адамға таң болады* (Работающий всегда сытый, для лентяя работа – тяжба); *Ғайраты бар кисинің, ләззеті бар исинің; ғайраты жоқ кисинің, ләззеті жоқ исинің* (Кто усердный, тот получает блаженство; кто не старается, тот не получает блага).

В каракалпакских паремиях широко используются **обобщенно-личные предложения**, ставящие своей целью сформировать наставления. В таких предложениях конечная сказуемость обычно выражена повелительными формами глагола, в чем находит отражение направленность сентенции, заключенной в пословице. Например: *Азат басың болсын десең, қолдан келсе жұмыс ислең* (Хочешь быть свободным, трудись); *Билмесең сөйлем, мийнетсіз хәзлік излем* (Не знаешь – не говори, без труда не ищи удовольствия); *Бүгінгі ишти ертеңге қойма* (Сегодняшнюю работу не откладывай на завтра); *Исим оңсын десең әдисін тап* (Хочешь, чтоб работа пошла на лад, найди способ); *Ишти билип исле, ақылды қосып исле* (Работу выполняй зная и с умом).

Крайне редко в каракалпакских паремиях встречаются обобщенно-личные предложения, употребляющиеся с вопросительной интонацией. Например: *Көп түйелі кисі қырға шығады, бір түйелі кисі несін шығады?* (Имеющий много верблюдов достигает высот, чего достигает имеющий одного верблюда?). *Бір пайда-пайда, екі пайда қайда?* (Одна польза – польза, а где две пользы?).

Служебные части речи – слова, не обладающие реальной семантикой, т.е. не имеющие значения конкретных или абстрактных лексических понятий,

а выражающие только грамматическую форму, которая указывает на различного рода оттенки, относящиеся как к отдельному слову в предложении, так и к целому предложению, а также на синтаксические отношения слов в

Послелог (изолированные формы знаменательных частей речи) в пословицах и поговорках выражают:

- отношения совместности, участия и помощи в совершении действия (**менен (бенен), пенен**): *Ағаш мийұасы менен танылады, адам мийнети менен танылады* (Дерево ценно плодами, человек – трудом); *Адам мийнети менен сулыұ* (Человек трудом славен); *Мийнет пенен танылған ердің, мәңгілікке өшпейді*



тарийхтан аты (Трудовое имя молодца никогда не исчезнет из истории); *Мийнет пенен жер көгерер, илим менен ер көгерер* (Земля процветает трудом, молодец возвышается знанием).

- отношения причины и цели (**ушын** - «для»): *Жалқауға ырысқал ушын уйқы берер, жаманға ақыл ушын кулки берер* (Лентяю для средства к существованию даётся сон, а плохому для ума даётся смех).

Союзы – служебные слова, употребляемые для выражения связи слов, словосочетаний и предложений между собой. В каракалпакских пословицах и поговорках встречаются синтаксические конструкции с использованием соединительных союзов:

- **да/де** в значении союза *и*, имеющего условное добавочное значение: *Ағашы аласа болсада, мийұасы тамаша* (Хоть дерево и низкое, плоды прекрасны); *Жатқан постын астынан суу да өтпейди* (Под лежащий камень и вода не течёт); *Талабында бардың соңы да бар* (У усердного и конец хороший); *Жер де берсең береди* (Дашь земле и она тебе даст); *Мийнетин ким көрсе, рәхәтин де сол көреді* (Кто потрудился, тот и наслаждался).

- **хәм** в значении союза *и*, выражающим соединительные отношения:

Адамның келбеті хәм көркі – мийнет (Облик и красота человека в труде).

- **хәм** в значении «а также»: *Ер елден буұаз болса, жер хәм ерден буұаз болады* (Молодец плодоносит от земли, а также от народа).

- **менен (бенен) пенен** в значении «и», «вместе с»: *Мийнет пенен рәхәт, екеуі де барабар* (Труд и благо всегда рядом); *Жалқау менен дос болсаң, аштан өлерсең, сылтаудың астында қаларсаң* (Водиться с лентяем – остаться голодным); *Жалғыз жеген тас болар, көп пенен жеген ас болар* (Еда одного – камень, еда вместе со всеми – вкусная пища).

Рассмотренные синтаксические конструкции паремий позволяют наилучшим образом отразить основной закон жанра – закон экономии словесного материала. Экономия в словах и художественных средствах придает пословицам и поговоркам большую силу; можно сказать, что сама краткость ее воспринимается как эстетическое качество, как проявление ее значительных художественных достоинств. В этом отношении показательны синтаксические формы паремий, которые представляют собой одно предложение: поэтому значение лексико-семантических средств выражения мысли в ней особенно велика.

Обобщая жизненный и духовный опыт народа, пословицы и поговорки представляют огромный историко-познавательный интерес, имеют важное воспитательное значение и большую эстетическую ценность.

С точки зрения охвата всех сторон народной жизни, богатства тематики, многогранности сюжета, прекрасного построения художественных особенностей, поразительных мудрых мыслей каракалпакские пословицы и поговорки можно назвать жемчужинами художественного слова [2:11].

Таким образом, изучение каракалпакских пословиц и поговорок является одной из самых актуальных задач каракалпакской лингвистики, лингвокультурологии, лингвофольклористики.

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REGULAR $(1, 2)^*$ -GENERALIZED η -CLOSED SETS IN BITOPOLOGY

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ABSTRACT

In this paper, we introduce regular $(1, 2)^$ -generalized η -closed sets and obtain the relationships among some existing closed sets like $(1, 2)^*$ -semi-closed, $(1, 2)^*$ - α -closed and $(1, 2)^*$ - η -closed sets and their generalizations. Also we study some basic properties of $(1, 2)^*$ -rg η -open sets. Further, we introduce $(1, 2)^*$ -rg η -neighbourhood and discuss some properties of $(1, 2)^*$ -rg η -neighbourhood.*

KEYWORDS : $(1, 2)^*$ - η -open, $(1, 2)^*$ -g η -closed, $(1, 2)^*$ -rg η -closed sets; $(1, 2)^*$ -rg η -neighbourhood

1. INTRODUCTION

The study of bitopological spaces was first initiated by Kelly [4] in 1963. By using the topological notions, namely, semi-open, α -open and pre-open sets, many new bitopological sets are defined and studied by many topologists. In 2008, Ravi et al. [8] studied the notion of $(1, 2)^*$ -sets in bitopological spaces. In 2004, Ravi and Thivagar [7] studied the concept of stronger form of $(1, 2)^*$ -quotient mapping in bitopological spaces and introduced the concepts of $(1, 2)^*$ -semi-open and $(1, 2)^*$ - α -open sets in bitopological spaces. In 2010, K. Kayathri et al. [3] introduced and studied a new class of sets called regular $(1, 2)^*$ -g-closed sets and used it to obtain a new class of functions called $(1, 2)^*$ -rg-continuous, $(1, 2)^*$ -R-map, almost $(1, 2)^*$ -continuous and almost $(1, 2)^*$ -rg-closed functions in bitopological spaces. In 2015, D. Sreeja and P. Juane Sinthya [11] introduced $(1, 2)^*$ -rg α -closed sets. Some of its basic properties are studied. In 2022, H. Kumar [5] introduced the concept of $(1, 2)^*$ - η -open sets and $(1, 2)^*$ - η -neighbourhood and; studied their properties. Recently H. Kumar [6] introduced the concept of $(1, 2)^*$ -generalized η -closed sets and $(1, 2)^*$ -g η -neighbourhood and; investigated their properties.

2. PRELIMINARIES

Throughout the paper $(X, \mathfrak{T}_1, \mathfrak{T}_2)$, (Y, σ_1, σ_2) and (Z, \wp_1, \wp_2) (or simply X , Y and Z) denote bitopological spaces.

Definition 2.1. Let S be a subset of X . Then S is said to be **$\mathfrak{T}_{1,2}$ -open** [7] if $S = A \cup B$ where $A \in \mathfrak{T}_1$ and $B \in \mathfrak{T}_2$. The complement of a $\mathfrak{T}_{1,2}$ -open set is **$\mathfrak{T}_{1,2}$ -closed**.

Definition 2.2 [7]. Let S be a subset of X . Then

(i) the **$\mathfrak{T}_{1,2}$ -closure** of S , denoted by $\mathfrak{T}_{1,2}\text{-cl}(S)$, is defined as $\cap \{F : S \subset F \text{ and } F \text{ is } \mathfrak{T}_{1,2}\text{-closed}\}$; (ii) the **$\mathfrak{T}_{1,2}$ -interior** of S , denoted by $\mathfrak{T}_{1,2}\text{-int}(S)$, is defined as $\cup \{F : F \subset S \text{ and } F \text{ is } \mathfrak{T}_{1,2}\text{-open}\}$.

Note 2.3 [7]. Notice that $\mathfrak{T}_{1,2}$ -open sets need not necessarily form a topology.



Definition 2.4. A subset A of a bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is called

- (i) **regular $(1, 2)^*$ -open** [7] if $A = \mathfrak{T}_{1,2}\text{-int}(\mathfrak{T}_{1,2}\text{-cl}((A)))$.
- (ii) **$(1, 2)^*$ -semi-open** [7] if $A = \mathfrak{T}_{1,2}\text{-cl}(\mathfrak{T}_{1,2}\text{-int}(A))$,
- (iii) **$(1, 2)^*$ - α -open** [7] if $A \subset \mathfrak{T}_{1,2}\text{-int}(\mathfrak{T}_{1,2}\text{-cl}(\mathfrak{T}_{1,2}\text{-int}(A)))$.
- (iv) **$(1, 2)^*$ - η -open** [5] if $A \subset \mathfrak{T}_{1,2}\text{-int}(\mathfrak{T}_{1,2}\text{-cl}(\mathfrak{T}_{1,2}\text{-int}(A))) \cup \mathfrak{T}_{1,2}\text{-cl}(\mathfrak{T}_{1,2}\text{-int}(A))$.

The complement of a regular $(1, 2)^*$ -open (resp. $(1, 2)^*$ -semi-open, $(1, 2)^*$ - α -open, $(1, 2)^*$ - η -open) set is called **regular $(1, 2)^*$ -closed** (resp. **$(1, 2)^*$ -semi-closed, $(1, 2)^*$ - α -closed, $(1, 2)^*$ - η -closed**).

The **$(1, 2)^*$ -semi-closure** (resp. **$(1, 2)^*$ - α -closure, $(1, 2)^*$ - η -closure**) of a subset A of X is denoted by **$(1, 2)^*\text{-s-cl}(A)$** (resp. **$(1, 2)^*\text{-}\alpha\text{-cl}(A)$, $(1, 2)^*\text{-}\eta\text{-cl}(A)$**), defined as the intersection of all $(1, 2)^*$ -semi-closed. (resp. $(1, 2)^*\text{-}\alpha$ -closed, $(1, 2)^*\text{-}\eta$ -closed) sets containing A .

The family of all regular $(1, 2)^*$ -open (resp. regular $(1, 2)^*$ -closed, $(1, 2)^*$ -semi-open, $(1, 2)^*$ - α -open, $(1, 2)^*$ - η -open, $(1, 2)^*$ -semi-closed, $(1, 2)^*$ - α -closed, $(1, 2)^*$ - η -closed) sets in X is denoted by $(1, 2)^*\text{-RO}(X)$ (resp. $(1, 2)^*\text{-RC}(X)$, $(1, 2)^*\text{-SO}(X)$, $(1, 2)^*\text{-}\alpha\text{O}(X)$, $(1, 2)^*\text{-}\eta\text{O}(X)$, $(1, 2)^*\text{-SC}(X)$, $(1, 2)^*\text{-}\alpha\text{C}(X)$, $(1, 2)^*\text{-}\eta\text{C}(X)$).

Remark 2.5. It is evident that any $\mathfrak{T}_{1,2}$ -open set of X is an $(1, 2)^*$ - α -open and each $(1, 2)^*$ - α -open set of X is $(1, 2)^*$ -semi-open but the converses are not true.

Remark 2.6. We have the following implications for the properties of subsets [5]:

$$\text{regular } (1, 2)^*\text{-open} \Rightarrow \mathfrak{T}_{1,2}\text{-open} \Rightarrow (1, 2)^*\text{-}\alpha\text{-open} \Rightarrow (1, 2)^*\text{-semi-open} \Rightarrow (1, 2)^*\text{-}\eta\text{-open}$$

Where none of the implications is reversible.

3. $(1, 2)^*$ -GENERALIZED η -CLOSED SETS IN BITOPOLOGICAL SPACES

Definition 3.1. A subset A of a bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is called

- (i) $(1, 2)^*$ -generalized closed (briefly $(1, 2)^*$ -g-closed) [10] if $\mathfrak{T}_{1,2}\text{-cl}(A) \subset U$ whenever $A \subset U$ and U is $\mathfrak{T}_{1,2}$ -open in X .
- (ii) regular $(1, 2)^*$ -generalized closed (briefly $(1, 2)^*$ -rg-closed) [3] if $\mathfrak{T}_{1,2}\text{-cl}(A) \subset U$ whenever $A \subset U$ and $U \in (1, 2)^*\text{-RO}(X)$.
- (iii) $(1, 2)^*$ -weakly closed (briefly $(1, 2)^*$ -w-closed) [2] if $\mathfrak{T}_{1,2}\text{-cl}(A) \subset U$ whenever $A \subset U$ and U is $(1, 2)^*$ -semi-open in X .
- (iv) $(1, 2)^*$ - α -generalized closed (briefly $(1, 2)^*$ - α -g-closed) [10] if $(1, 2)^*\text{-}\alpha\text{-cl}(A) \subset U$ whenever $A \subset U$ and U is $\mathfrak{T}_{1,2}$ -open in X .
- (v) regular $(1, 2)^*$ -generalized α -closed (briefly $(1, 2)^*$ -rg α -closed) [11] if $(1, 2)^*\text{-}\alpha\text{-cl}(A) \subset U$ whenever $A \subset U$ and $U \in (1, 2)^*\text{-RO}(X)$.
- (vi) $(1, 2)^*$ -generalized semi-closed (briefly $(1, 2)^*$ -gs-closed) [10] if $(1, 2)^*\text{-s-cl}(A) \subset U$ whenever $A \subset U$ and U is $\mathfrak{T}_{1,2}$ -open in X .
- (vii) regular $(1, 2)^*$ -generalized semi-closed (briefly $(1, 2)^*$ -rgs-closed) [10] if $(1, 2)^*\text{-s-cl}(A) \subset U$ whenever $A \subset U$ and $U \in (1, 2)^*\text{-RO}(X)$.



(viii) $(1, 2)^*$ -generalized η -closed (briefly $(1, 2)^*$ -g η -closed) [6] if $(1, 2)^*$ - η -cl(A) \subset U whenever $A \subset U$ and U is $\mathfrak{T}_{1,2}$ -open in X.

(ix) regular $(1, 2)^*$ -generalized η -closed (briefly $(1, 2)^*$ -rg η -closed) if $(1, 2)^*$ - η -cl(A) \subset U whenever $A \subset U$ and $U \in (1, 2)^*$ -RO(X).

The complement of a $(1, 2)^*$ -g-closed (resp. $(1, 2)^*$ -rg-closed, $(1, 2)^*$ -w-closed, $(1, 2)^*$ - α -g-closed, $(1, 2)^*$ -rg α -closed, $(1, 2)^*$ -gs-closed, $(1, 2)^*$ -rgs-closed, $(1, 2)^*$ -g η -closed) set is called $(1, 2)^*$ -g-open (resp. $(1, 2)^*$ -rg-open, $(1, 2)^*$ -w-open, $(1, 2)^*$ -rg α -open, $(1, 2)^*$ - α -g-open, $(1, 2)^*$ -gs-open, $(1, 2)^*$ -rgs-open, $(1, 2)^*$ -g η -open).

We denote the set of all $(1, 2)^*$ -rg η -closed sets in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ by $(1, 2)^*$ -rg η -C(X).

Theorem 3.2. Every $\mathfrak{T}_{1,2}$ -closed set is rg η -closed.

Proof. Let A be any $\mathfrak{T}_{1,2}$ -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ and $A \subset U$, where $U \in (1, 2)^*$ -RO(X). So $(1, 2)^*$ -cl(A) = A. Since every $\mathfrak{T}_{1,2}$ -closed set is $(1, 2)^*$ - η -closed, so $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -cl(A) = A. Therefore, $(1, 2)^*$ - η -cl(A) \subset A \subset U. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.3. Every $(1, 2)^*$ -g-closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ -g-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ -cl(A) \subset U whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X), since every regular $(1, 2)^*$ -open set is $\mathfrak{T}_{1,2}$ -open. So $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -cl(A) \subset U. Therefore $(1, 2)^*$ - η -cl(A) \subset U. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.4. Every $(1, 2)^*$ -rg-closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ -g-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ -cl(A) \subset U whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X). So $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -cl(A) \subset U. Therefore $(1, 2)^*$ - η -cl(A) \subset U. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.5. Every $(1, 2)^*$ - α -closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ - α -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ and $A \subset U$, where $U \in (1, 2)^*$ -RO(X). Since every $(1, 2)^*$ - α -closed set is $(1, 2)^*$ - η -closed, so $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ - α -cl(A) = A. Therefore $(1, 2)^*$ - η -cl(A) \subset A \subset U. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.6. Every $(1, 2)^*$ - α -g-closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ - α -g-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ - α -cl(A) \subset U whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X), since every regular $(1, 2)^*$ -open set is $\mathfrak{T}_{1,2}$ -open. Given that A is $(1, 2)^*$ - α -g-closed set such that $(1, 2)^*$ - α -cl(A) \subset U. But we have $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ - α -cl(A) \subset U. Therefore $(1, 2)^*$ - η -cl(A) \subset U. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.7. Every $(1, 2)^*$ -rg α -closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ - α -g-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ - α -cl(A) \subset U whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X). Given that A is $(1, 2)^*$ - α -g-closed set such that $(1, 2)^*$ - α -cl(A) \subset U. But we have $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ - α -cl(A) \subset U. Therefore $(1, 2)^*$ - η -cl(A) \subset U. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.8. Every $(1, 2)^*$ -semi-closed set is $(1, 2)^*$ -rg η -closed.



Proof. Let A be any $(1, 2)^*$ -semi-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ and $A \subset U$, where $U \in (1, 2)^*$ -RO(X). Since every $(1, 2)^*$ -semi-closed set is $(1, 2)^*$ - η -closed, so $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -s-cl(A) = A . Therefore $(1, 2)^*$ - η -cl(A) \subset $A \subset U$. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.9. Every $(1, 2)^*$ -gs-closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ -gs-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ -s-cl(A) $\subset U$ whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X), since every regular $(1, 2)^*$ -open set is $\mathfrak{T}_{1,2}$ -open. Given that A is $(1, 2)^*$ -gs-closed set such that $(1, 2)^*$ -s-cl(A) $\subset U$. But we have $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -s-cl(A) $\subset U$. Therefore $(1, 2)^*$ - η -cl(A) $\subset U$. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.10. Every $(1, 2)^*$ -rgs-closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ -rgs-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ -s-cl(A) $\subset U$ whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X). Given that A is $(1, 2)^*$ -gs-closed set such that $(1, 2)^*$ -s-cl(A) $\subset U$. But we have $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -s-cl(A) $\subset U$. Therefore $(1, 2)^*$ - η -cl(A) $\subset U$. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.11. Every $(1, 2)^*$ - η -closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ - η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ and $A \subset U$, where $U \in (1, 2)^*$ -RO(X). Since A is $(1, 2)^*$ - η -closed. Therefore $(1, 2)^*$ - η -cl(A) = $A \subset U$. Hence A is $(1, 2)^*$ -rg η -closed set.

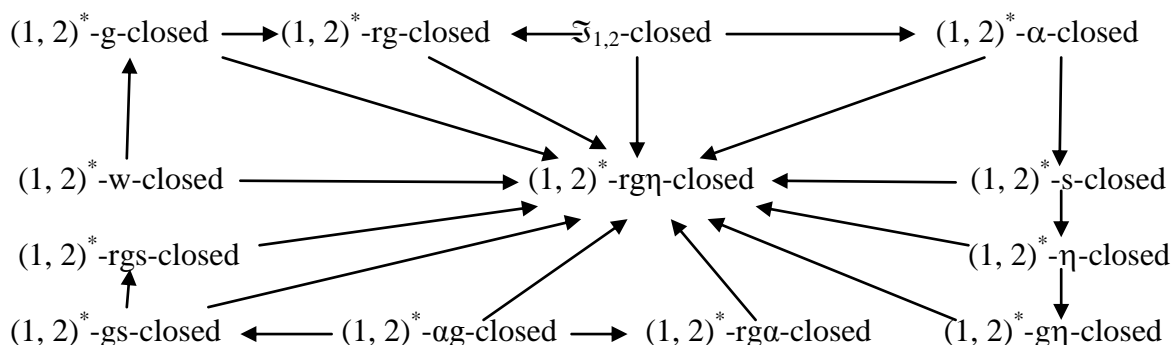
Theorem 3.12. Every $(1, 2)^*$ -g η -closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ -g η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ - η -cl(A) $\subset U$ whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X), since every regular $(1, 2)^*$ -open set is $\mathfrak{T}_{1,2}$ -open. Given that A is $(1, 2)^*$ -g η -closed set such that $(1, 2)^*$ - η -cl(A) $\subset U$. Therefore $(1, 2)^*$ - η -cl(A) $\subset U$. Hence A is $(1, 2)^*$ -rg η -closed set.

Theorem 3.13. Every $(1, 2)^*$ -w-closed set is $(1, 2)^*$ -rg η -closed.

Proof. Let A be any $(1, 2)^*$ -w-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ then $(1, 2)^*$ -cl(A) $\subset U$ whenever $A \subset U$, where $U \in (1, 2)^*$ -RO(X), since every regular $(1, 2)^*$ -open set is $(1, 2)^*$ -semi-open. So $(1, 2)^*$ - η -cl(A) \subset $(1, 2)^*$ -cl(A) $\subset U$. Therefore $(1, 2)^*$ - η -cl(A) $\subset U$. Hence A is $(1, 2)^*$ -rg η -closed set.

Remark 3.14. We have the following implications for the properties of subsets:





Where none of the implications is reversible as can be seen from the following examples:

Example 3.15. Let $X = \{a, b, c, d\}$ with $\mathfrak{T}_1 = \{\emptyset, X, \{a\}, \{b\}, \{a, b\}, \{b, c, d\}\}$ and $\mathfrak{T}_2 = \{\emptyset, X, \{c\}, \{a, c, d\}\}$. Then

- (i) $\mathfrak{T}_{1,2}$ -closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (ii) $(1, 2)^*$ -g-closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (iii) $(1, 2)^*$ -rg-closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (iv) $(1, 2)^*$ - α -closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (v) $(1, 2)^*$ -ag-closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (vi) $(1, 2)^*$ -rg α -closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (vii) $(1, 2)^*$ -semi-closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (viii) $(1, 2)^*$ -gs-closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (ix) $(1, 2)^*$ -rgs-closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (x) $(1, 2)^*$ - η -closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xi) $(1, 2)^*$ -g η -closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xii) $(1, 2)^*$ -rg η -closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xiii) $(1, 2)^*$ -w-closed sets : $\emptyset, X, \{a\}, \{b\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.

Example 3.16. Let $X = \{a, b, c\}$ with $\mathfrak{T}_1 = \{\emptyset, X, \{b\}\}$ and $\mathfrak{T}_2 = \{\emptyset, X, \{c\}\}$. Then

- (i) $\mathfrak{T}_{1,2}$ -closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}$.
- (ii) $(1, 2)^*$ -g-closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}$.
- (iii) $(1, 2)^*$ -rg-closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}, \{b, c\}$.
- (iv) $(1, 2)^*$ - α -closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}$.
- (v) $(1, 2)^*$ -ag-closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}$.
- (vi) $(1, 2)^*$ -rg α -closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}, \{b, c\}$.
- (vii) $(1, 2)^*$ -semi-closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}$.
- (viii) $(1, 2)^*$ -gs-closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}$.
- (ix) $(1, 2)^*$ -rgs-closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}$.
- (x) $(1, 2)^*$ - η -closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}$.
- (xi) $(1, 2)^*$ -g η -closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}$.
- (xii) $(1, 2)^*$ -rg η -closed sets : $\emptyset, X, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}$.
- (xiii) $(1, 2)^*$ -w-closed sets : $\emptyset, X, \{a\}, \{a, b\}, \{a, c\}$.

Example 3.17. Let $X = \{a, b, c, d\}$ with $\mathfrak{T}_1 = \{\emptyset, X, \{a\}\}$ and $\mathfrak{T}_2 = \{\emptyset, X, \{b\}, \{a, b, c\}\}$. Then

- (i) $\mathfrak{T}_{1,2}$ -closed sets : $\emptyset, X, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.



- (ii) $(1, 2)^*$ -g-closed sets : $\phi, X, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (iii) $(1, 2)^*$ -rg-closed sets : $\phi, X, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (iv) $(1, 2)^*$ - α -closed sets : $\phi, X, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (v) $(1, 2)^*$ -ag-closed sets : $\phi, X, \{c\}, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (vi) $(1, 2)^*$ -rg α -closed sets : $\phi, X, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (vii) $(1, 2)^*$ -semi-closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (viii) $(1, 2)^*$ -gs-closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (ix) $(1, 2)^*$ -rgs-closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (x) $(1, 2)^*$ - η -closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xi) $(1, 2)^*$ -g η -closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xii) $(1, 2)^*$ -rg η -closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xiii) $(1, 2)^*$ -w-closed sets : $\phi, X, \{d\}, \{a, d\}, \{b, d\}, \{c, d\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.

Example 3.18. Let $X = \{a, b, c, d\}$ with $\mathfrak{T}_1 = \{\phi, X, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}\}$ and $\mathfrak{T}_2 = \{\phi, X, \{a, b, d\}\}$. Then

- (i) $\mathfrak{T}_{1,2}$ -closed sets : $\phi, X, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (ii) $(1, 2)^*$ -g-closed sets : $\phi, X, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (iii) $(1, 2)^*$ -rg-closed sets : $\phi, X, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (iv) $(1, 2)^*$ - α -closed sets : $\phi, X, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (v) $(1, 2)^*$ -ag-closed sets : $\phi, X, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (vi) $(1, 2)^*$ -rg α -closed sets : $\phi, X, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (vii) $(1, 2)^*$ -semi-closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (viii) $(1, 2)^*$ -gs-closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (ix) $(1, 2)^*$ -rgs-closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (x) $(1, 2)^*$ - η -closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xi) $(1, 2)^*$ -g η -closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xii) $(1, 2)^*$ -rg η -closed sets : $\phi, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a, b, d\}, \{a, c, d\}, \{b, c, d\}$.
- (xiii) $(1, 2)^*$ -w-closed sets : $\phi, X, \{c\}, \{d\}, \{c, d\}, \{a, c, d\}, \{b, c, d\}$.

4. CHARACTERIZATIONS OF $(1, 2)^*$ -GENERALIZED η -CLOSED SETS

Theorem 4.1. The union of two $(1, 2)^*$ -rg η -closed subsets of $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is also $(1, 2)^*$ -rg η -closed subset of $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.



Proof. Assume that A and B are $(1, 2)^*$ - $\text{rg}\eta$ -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Let U be regular $(1, 2)^*$ -open set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ such that $A \cup B \subset U$, then $A \subset U$ and $B \subset U$. Since A and B are $(1, 2)^*$ - $\text{rg}\eta$ -closed such that $(1, 2)^*$ - $\eta\text{-cl}(A) \subset U$ and $(1, 2)^*$ - $\eta\text{-cl}(B) \subset U$. Hence $(1, 2)^*$ - $\eta\text{-cl}(A \cup B) = (1, 2)^*$ - $\eta\text{-cl}(A) \cup (1, 2)^*$ - $\eta\text{-cl}(B) \subset U$. That is $(1, 2)^*$ - $\eta\text{-cl}(A \cup B) \subset U$. Therefore $A \cup B$ is $(1, 2)^*$ - $\text{rg}\eta$ -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Theorem 4.2. The intersection of two $(1, 2)^*$ - $\text{rg}\eta$ -closed-sets in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is also a $(1, 2)^*$ - $\text{rg}\eta$ -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Proof. Easy to proof.

Theorem 4.3. If a subset A is $(1, 2)^*$ - $\text{rg}\eta$ -closed, then $(1, 2)^*$ - $\eta\text{-cl}(A) - A$ does not contain any non-empty regular $(1, 2)^*$ -closed set.

Proof. Suppose that A is $(1, 2)^*$ - $\text{rg}\eta$ -closed. Let F be a regular $(1, 2)^*$ -closed subset of $(1, 2)^*$ - $\eta\text{-cl}(A) - A$. Then $F \subset [(1, 2)^*$ - $\eta\text{-cl}(A) \cap (X - A)]$ and so $A \subset [X - F]$. But A is $(1, 2)^*$ - $\text{rg}\eta$ -closed. Therefore $(1, 2)^*$ - $\eta\text{-cl}(A) \subset [X - F]$. Consequently, $F \subset [X - (1, 2)^*$ - $\eta\text{-cl}(A)]$. We already have $F \subset (1, 2)^*$ - $\eta\text{-cl}(A)$. Hence $F \subset [(1, 2)^*$ - $\eta\text{-cl}(A) \cap X - (1, 2)^*$ - $\eta\text{-cl}(A)] = \phi$. Thus $F = \phi$. Therefore $(1, 2)^*$ - $\eta\text{-cl}(A) - A$ contains no non-empty regular $(1, 2)^*$ -closed set.

Example 4.4. The converse of Theorem 4.3 is not true.

Refer to **Example 3.18**. Let $A = \{a, b, c\}$. We have that $(1, 2)^*$ - $\eta\text{-cl}(A) - A = X - \{a, b, c\} = \{d\}$ does not contain any non-empty regular $(1, 2)^*$ -closed set. However, A is $(1, 2)^*$ - $\text{rg}\eta$ -closed in X .

Theorem 4.5. Let A be $(1, 2)^*$ - $\text{rg}\eta$ -closed set. Then A is regular $(1, 2)^*$ -closed if and only if $[(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) - A]$ is regular $(1, 2)^*$ -closed.

Proof. Let A be a $(1, 2)^*$ - $\text{rg}\eta$ -closed. If A is regular $(1, 2)^*$ -closed, then $[(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) - A] = \phi$. We know ϕ is always regular $(1, 2)^*$ -closed. Therefore $[(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) - A]$ is regular $(1, 2)^*$ -closed.

Conversely, suppose that $[(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) - A]$ is regular $(1, 2)^*$ -closed. Since A is $(1, 2)^*$ - $\text{rg}\eta$ -closed, $[(1, 2)^*$ - $\text{cl}(A) - A]$ contains the regular $(1, 2)^*$ -closed set $[(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) - A]$. By **Theorem 4.3**, $[(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) \setminus A] = \phi$. Hence $(1, 2)^*$ - $\text{cl}((1, 2)^*$ - $\text{int}(A)) = A$. Therefore A is regular $(1, 2)^*$ -closed.

Remark 4.6. The converse of **Theorem 4.4** is not true as per the following example.

Example 4.7. Let $X = \{a, b, c, d, e\}$ with $\mathfrak{T}_1 = \{\phi, X, \{a, b\}, \{a, b, c, d\}\}$ and $\mathfrak{T}_2 = \{\phi, X, \{c, d\}, \{a, b, c, d\}\}$. If we consider $A = \{a, c\}$, then $(1, 2)^*$ - $\eta\text{-cl}(A) - A = X - \{a, c\} = \{b, d, e\}$ does not contain any non-empty regular $(1, 2)^*$ -closed set. However A is $(1, 2)^*$ - $\text{rg}\eta$ -closed.

Theorem 4.8. For an element $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$, the set $(X, \mathfrak{T}_1, \mathfrak{T}_2) - \{x\}$ is $(1, 2)^*$ - $\text{rg}\eta$ -closed or regular $(1, 2)^*$ -open.

Proof. Suppose $(X, \mathfrak{T}_1, \mathfrak{T}_2) - \{x\}$ is not regular $(1, 2)^*$ -open set. Then $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is the only regular $(1, 2)^*$ -open set containing $(X, \mathfrak{T}_1, \mathfrak{T}_2) - \{x\}$. This implies $(1, 2)^*$ - $\eta\text{-cl}((X, \mathfrak{T}_1, \mathfrak{T}_2) - \{x\}) \subset (X, \mathfrak{T}_1, \mathfrak{T}_2)$. Hence $(X, \mathfrak{T}_1, \mathfrak{T}_2) - \{x\}$ is $(1, 2)^*$ - $\text{rg}\eta$ -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.



Theorem 4.9. Let A be a $(1, 2)^*$ -rg η -closed subset of X . If $A \subset B \subset (1, 2)^*\text{-}\eta\text{-cl}(A)$, then B is also $(1, 2)^*$ -rg η -closed in X .

Proof. Let $U \in (1, 2)^*\text{-rg}\eta\text{-O}(X)$ with $B \subset U$. Then $A \subset U$. Since A is $(1, 2)^*$ -rg η -closed, $(1, 2)^*\text{-}\eta\text{-cl}(A) \subset U$. Also, since $B \subset (1, 2)^*\text{-}\eta\text{-cl}(A)$, $(1, 2)^*\text{-}\eta\text{-cl}(B) \subset (1, 2)^*\text{-}\eta\text{-cl}(A) \subset U$. Hence B is also $(1, 2)^*$ -rg η -closed subset of X .

Remark 4.10. The converse of the **Theorem 4.9** need not be true in general. Consider the bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ where $X = \{a, b, c, d, e\}$ with topology $\mathfrak{T}_1 = \{\phi, \{a, b\}, \{a, b, c, d\}, X\}$, $\mathfrak{T}_2 = \{\phi, \{c, d\}, \{a, b, c, d\}, X\}$. Let $A = \{b\}$ and $B = \{b, c\}$. Then A and B are $(1, 2)^*$ -rg η -closed sets in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ but $A \subset B$ is not subset in $(1, 2)^*\text{-}\eta\text{-cl}(A) = \{a, b\}$.

Theorem 4.11. Let A be a $(1, 2)^*$ -rg η -closed in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Then A is $(1, 2)^*$ - η -closed if and only if $(1, 2)^*\text{-}\eta\text{-cl}(A) - A$ is a regular $(1, 2)^*$ -open.

Proof. Suppose A is a $(1, 2)^*$ - η -closed in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Then $(1, 2)^*\text{-}\eta\text{-cl}(A) = A$ and so $(1, 2)^*\text{-}\eta\text{-cl}(A) - A = \phi$, which is regular $(1, 2)^*$ -open in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Conversely, suppose $(1, 2)^*\text{-}\eta\text{-cl}(A) - A$ is a regular $(1, 2)^*$ -open set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Since A is $(1, 2)^*$ -rg η -closed, by **Theorem 4.3** $(1, 2)^*\text{-}\eta\text{-cl}(A) - A$ does not contain any nonempty regular $(1, 2)^*$ -open in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Then $(1, 2)^*\text{-}\eta\text{-cl}(A) - A = \phi$. Hence A is $(1, 2)^*$ - η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Theorem 4.12. If A is regular $(1, 2)^*$ -open and $(1, 2)^*$ -rg η -closed, then A is $(1, 2)^*$ -rg η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Proof. Let U be any regular $(1, 2)^*$ -open set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ such that $A \subset U$. Since A is regular $(1, 2)^*$ -open and $(1, 2)^*$ -rg η -closed, we have $(1, 2)^*\text{-}\eta\text{-cl}(A) \subset A$. Then $(1, 2)^*\text{-}\eta\text{-cl}(A) \subset A \subset U$. Hence A is $(1, 2)^*$ -rg η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Theorem 4.13. If a subset A of bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is both regular $(1, 2)^*$ -open and $(1, 2)^*$ -rg η -closed, then it is $(1, 2)^*$ - η -closed.

Proof. Suppose a subset A of bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is both regular $(1, 2)^*$ -open and $(1, 2)^*$ -rg η -closed. Now $A \subset A$. Then $(1, 2)^*\text{-}\eta\text{-cl}(A) \subset A$. Hence A is $(1, 2)^*$ - η -closed.

Corollary 4.14. Let A be regular $(1, 2)^*$ -open and $(1, 2)^*$ -rg η -closed subset in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Suppose that F is $(1, 2)^*$ - η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Then $A \cap F$ is an $(1, 2)^*$ -rg η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Proof. Let A be a regular $(1, 2)^*$ -open and $(1, 2)^*$ -rg η -closed subset in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ and F be closed. By **Theorem 4.13**, A is $(1, 2)^*$ - η -closed. So $A \cap F$ is a $(1, 2)^*$ - η -closed and hence $A \cap F$ is $(1, 2)^*$ -rg η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Theorem 4.15 [6]. If A is an open and S is $(1, 2)^*$ - η -open in bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$, then $A \cap S$ is $(1, 2)^*$ - η -open in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Theorem 4.16. If A is both open and $(1, 2)^*$ -g-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$, then it is $(1, 2)^*$ -rg η -closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.



Proof. Let A be an open and $(1, 2)^*$ -g-closed set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Let $A \subset U$ and let U be a regular $(1, 2)^*$ -open set in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. Now $A \subset A$. By hypothesis $(1, 2)^*$ - η -cl(A) $\subset A$. That is $(1, 2)^*$ - η -cl(A) $\subset U$. Thus A is $(1, 2)^*$ -rg η -closed in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

5. $(1, 2)^*$ -RG η -OPEN SETS AND $(1, 2)^*$ -RG η -NEIGHBORHOOD

In this section, we introduce $(1, 2)^*$ -rg η -open sets in bitopological spaces and study some basic properties of $(1, 2)^*$ -rg η -open sets. Also, we introduce $(1, 2)^*$ -rg η -neighborhood (shortly $(1, 2)^*$ -g η -nbhd in bitopological spaces by using the notion of $(1, 2)^*$ -rg η -open sets. We prove that every nbhd of x in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is $(1, 2)^*$ -rg η -nbhd of x but not conversely.

Definition 5.1. A subset A in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is called regular $(1, 2)^*$ -generalized η -open (briefly, $(1, 2)^*$ -rg η -open) in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ if A^c is $(1, 2)^*$ -rg η -closed in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. We denote the family of all $(1, 2)^*$ -rg η -open sets in X by $(1, 2)^*$ -rg η -O(X).

Theorem 5.2. A set A is $(1, 2)^*$ -rg η -open if and only if the following condition holds:

$$F \subset (1, 2)^*-\eta\text{-int}(A) \text{ whenever } F \text{ is regular } (1, 2)^*\text{-closed and } F \subset A.$$

Proof. Suppose the condition holds. Put $[X - A] = B$. Suppose that $B \subset U$ where $U \in (1, 2)^*$ -R-O(X). Now $X - A \subset U$ implies $F = [X - U] \subset A$ and F is regular $(1, 2)^*$ -closed, which implies $F \subset (1, 2)^*-\eta\text{-int}(A)$. Also $F \subset (1, 2)^*-\eta\text{-int}(A)$ implies $[X - (1, 2)^*-\eta\text{-int}(A)] \subset [X - F] = U$. This implies $[X - ((1, 2)^*-\eta\text{-int}(X - B))] \subset U$. Therefore $[X - ((1, 2)^*-\eta\text{-int}(X - B))] \subset U$ or equivalently $(1, 2)^*-\eta\text{-cl}(B) \subset U$. Thus B is $(1, 2)^*$ -rg η -closed. Hence A is $(1, 2)^*$ -rg η -open.

Conversely, suppose that A is $(1, 2)^*$ -rg η -open, $F \subset A$ and F is regular $(1, 2)^*$ -closed. Then $[X - F]$ is regular $(1, 2)^*$ -open. Then $(X - A) \subset (X - F)$. Hence $(1, 2)^*-\eta\text{-cl}(X - A) \subset (X - F)$ because $(X - A)$ is $(1, 2)^*$ -rg η -closed. Therefore $F \subset (X - (1, 2)^*-\eta\text{-cl}(X - A)) = (1, 2)^*-\eta\text{-int}(A)$.

Definition 5.3. Let $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ be a bitopological space and let $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$. A subset N of $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is said to be a $(1, 2)^*$ -rg η -nbhd of x iff there exists a $(1, 2)^*$ -rg η -open set G such that $x \in G \subset N$.

Definition 5.4. A subset N of a bitopological space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$, is called a $(1, 2)^*$ -rg η -nbhd of $A \subset (X, \mathfrak{T}_1, \mathfrak{T}_2)$ iff there exists a $(1, 2)^*$ -rg η -open set G such that $A \subset G \subset N$.

Theorem 5.5. Every nbhd N of $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$ is a $(1, 2)^*$ -rg η -nbhd of $(X, \mathfrak{T}_1, \mathfrak{T}_2)$.

Proof. Let N be a nbhd of point $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$. To prove that N is a $(1, 2)^*$ -rg η -nbhd of x . By definition of nbhd, there exists an open set G such that $x \in G \subset N$. As every open set is $(1, 2)^*$ -rg η -open set G such that $x \in G \subset N$. Hence N is $(1, 2)^*$ -rg η -nbhd of x .

Remark 5.6. In general, a $(1, 2)^*$ -rg η -nbhd N of $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$ need not be a nbhd of x in $(X, \mathfrak{T}_1, \mathfrak{T}_2)$, as seen from the following example.

Example 5.7. Let $X = \{a, b, c, d\}$ with topology $\mathfrak{T}_1 = \{\emptyset, \{a\}, \{b\}, \{a, b\}, \{a, b, c\}, X\}$ and $\mathfrak{T}_2 = \{\emptyset, \{a, b, d\}, X\}$ Then $(1, 2)^*$ -rg η -O(X) = $\{\emptyset, X, \{a\}, \{b\}, \{c\}, \{d\}, \{a, b\}, \{a, c\}, \{a, d\}, \{b, c\}, \{b, d\}, \{c, d\}, \{a, b, c\}, \{a,$



$b, d\}$, $\{a, c, d\}$, $\{b, c, d\}\}$. The set $\{b, c\}$ is $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of the point b , there exists an $(1, 2)^*$ - $\text{rg}\eta$ -open set $\{b\}$ is such that $b \in \{b\} \subset \{b, c\}$. However, the set $\{b, c\}$ is not a nbhd of the point b , since no open set G exists such that $b \in G \subset \{a, c\}$.

Theorem 5.8. If a subset N of a space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is $(1, 2)^*$ - $\text{rg}\eta$ -open, then N is a $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of each of its points.

Proof. Suppose N is $(1, 2)^*$ - $\text{rg}\eta$ -open. Let $x \in N$. We claim that N is $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of x . For N is a $(1, 2)^*$ - $\text{rg}\eta$ -open set such that $x \in N \subset N$. Since x is an arbitrary point of N , it follows that N is a $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of each of its points.

Definition 5.9. Let x be a point in a space $(X, \mathfrak{T}_1, \mathfrak{T}_2)$. The set of all $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of x is called the **$(1, 2)^*$ - $\text{rg}\eta$ -nbhd system** at x , and is denoted by $(1, 2)^*$ - $\text{rg}\eta$ - $N(x)$.

Theorem 5.10. Let $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ be a bitopological space and for each $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$. Let $(1, 2)^*$ - $\text{rg}\eta$ - $N(x)$ be the collection of all $(1, 2)^*$ - $\text{rg}\eta$ -nbhds of x . Then we have the following results.

- (i) $\forall x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$, $(1, 2)^*$ - $\text{rg}\eta$ - $N(x) \neq \phi$.
- (ii) $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x) \Rightarrow x \in N$.
- (iii) $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$, $M \supset N \Rightarrow M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$.
- (iv) $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$, $M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x) \Rightarrow N \cap M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$.
- (v) $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x) \Rightarrow$ there exists $M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$ such that $M \subset N$ and $M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(y)$ for every $y \in M$.

Proof. (i) Since $(X, \mathfrak{T}_1, \mathfrak{T}_2)$ is a $(1, 2)^*$ - $\text{rg}\eta$ -open set, it is a $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of every $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$. Hence there exists at least one $(1, 2)^*$ - $\text{rg}\eta$ -nbhd (namely - $(X, \mathfrak{T}_1, \mathfrak{T}_2)$) for each $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$. Hence $(1, 2)^*$ - $\text{rg}\eta$ - $N(x) = \phi$ for every $x \in (X, \mathfrak{T}_1, \mathfrak{T}_2)$.

(ii) If $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$, then N is a $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of x . So by definition of $(1, 2)^*$ - $\text{rg}\eta$ -nbhd, $x \in N$.

(iii) Let $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$ and $M \supset N$. Then there is a $(1, 2)^*$ - $\text{rg}\eta$ -open set G such that $x \in G \subset N$. Since $N \subset M$, $x \in G \subset M$ and so M is $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of x . Hence $M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$.

(iv) Let $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$ and $M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$. Then by definition of $(1, 2)^*$ - $\text{rg}\eta$ -nbhd. Hence $x \in G_1 \cap G_2 \subset N \cap M \Rightarrow (1)$. Since $G_1 \cap G_2$ is a $(1, 2)^*$ - $\text{rg}\eta$ -open set, (being the intersection of two $(1, 2)^*$ - $\text{rg}\eta$ -open sets), it follows from (1) that $N \cap M$ is a $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of x . Hence $N \cap M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$.

(v) If $N \in (1, 2)^*$ - $\text{rg}\eta$ - $N(x)$, then there exists a $(1, 2)^*$ - $\text{rg}\eta$ -open set M such that $x \in M \subset N$. Since M is a $(1, 2)^*$ - $\text{rg}\eta$ -open set, it is $(1, 2)^*$ - $\text{rg}\eta$ -nbhd of each of its points. Therefore $M \in (1, 2)^*$ - $\text{rg}\eta$ - $N(y)$ for every $y \in M$.

6. CONCLUSION

In this paper, we introduce regular $(1, 2)^*$ -generalized η -closed sets and obtain the relationships among some existing closed sets like $(1, 2)^*$ -semi-closed, $(1, 2)^*$ - α -closed and $(1, 2)^*$ - η -closed sets and their generalizations. Also we study some basic properties of $(1, 2)^*$ - $\text{rg}\eta$ -open sets. Further, we introduce $(1, 2)^*$ - $\text{rg}\eta$ -neighbourhood and discuss some properties of $(1, 2)^*$ - $\text{rg}\eta$ -neighbourhood. The regular $(1, 2)^*$ -generalized η -closed sets can be used to derive a new decomposition of unity, closed map and open map, homeomorphism,



closure and interior and new separation axioms. This idea can be extended to ordered topological and fuzzy topological spaces.

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INCREASING GRID EFFICIENCY BY INTERFACING PV & FUEL CELLS THROUGH AQUA MEDIUM

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ABSTRACT

1. The grid efficiency depends on the efficiencies of energy sources and transmission losses. Feeding of the grid takes place by different energy sources like Photovoltaic cells, Thermal & Hydraulic power plants. In conventional grid, during peak load PV modules supply energy to loads & during off peak loads energy is stored using batteries. For greater energy storage batteries like lithium-ion is inefficient, costlier & not compact in nature. The Idea is to replace the convention batteries with fuel cell. The fuel cell having 80% efficiency, compact & reliable. The fuel cell generates the electrical energy by taking hydrogen & oxygen (atmospheric air) as input. During off peak time the photovoltaic cell generates electrical energy from sunlight & convert it into hydrogen gas using electrolysis process. The generated hydrogen at daytime using electrolysis by utilizing solar energy, is stored in hydrogen cylinders & this hydrogen gas is supplied to fuel cells whenever energy deficiency occurs in grid during daytime or night time. The fuel cell consumes supplied hydrogen & atmospheric oxygen, generates Electrical energy & water as by-product. The water generated at fuel cell again supplied to electrolysis chamber at photovoltaic cell it is known as PVFC Aqua Cycle. So using this method there is no need of battery usage. In MATLAB, electrolysis simulation is done by the current signal from solar panel, current signal is used as the control signal for hydrogen fuel at fuel cell. The PVFC Aqua Cycle system reduces water consumption. We can also extract the hydrogen using Photo catalytic paint which takes solar energy & water moisture in air as input to produce hydrogen. The efficient method for generating hydrogen in environmental friendly is by using electrolysis which provides high molar rate of production. The main advantage of the energy storage system it can store large quantities of energy which is fictional normal conventional batteries. The maintenance cost of the system is also less, compact in nature.

2.1 HYDROGEN TANK

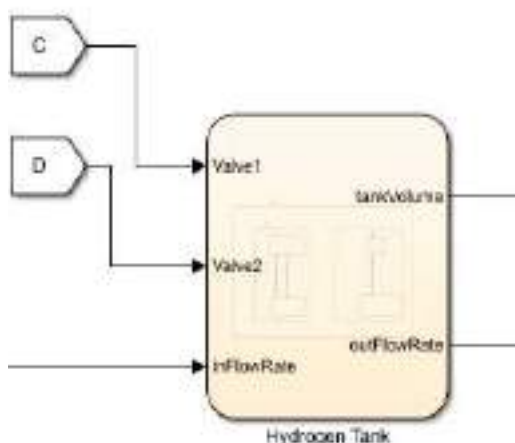


Fig2.1(a) Hydrogen tank.

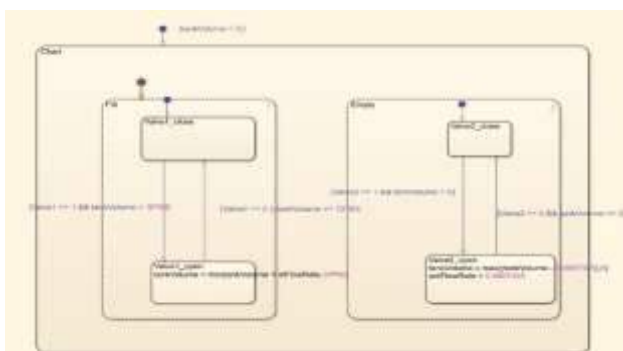


Fig2.1(b) Hydrogen tank LM

2.1.1 Function of the Hydrogen tank : The hydrogen tank is driven by the inflow & Outflow regulators & valve commands taken from energy regulatory switch. It will collect the hydrogen from the Electrolysis chamber through inflow regulator & stores the hydrogen in the scale of litres per minute. The stored hydrogen is supplied to the fuel cell. The storing of hydrogen starts at



off peak load valve one opens & hydrogen supplies if valve one is closed & valve two is open as shown in figure 2.1(a) The A tag represent the command input for valve one & similarly for valve 2.

2.1.2 Logical Implementation: The hydrogen tank takes three inputs & two outputs. The three inputs are Valve one, valve two on & off, Inflow rate is also as input. The outputs are the outflow rate & tank volume. Valve one operation if the input is one & tank volume is less than the 1000Lites then valve one will open. Valve two operation is that if valve two input equals one and tank volume will be greater than zero then the valve two will open. The Inflow rate will works as tank volume is equals to tank volume plus inflow rate. The outflow rate works as tank volume is equals to the tank volume minus outflow rate. The Inflow rate is input from the Electrolysis chamber whereas outflow rate is input to the fuel cell. The outflow rate is defined based on the requirement of the fuel call input. Which is provided constantly until the volume is less than the Outflow rate, the job is done by the outflow regulator. The Electrolysis chamber gives output of hydrogen in the form the moles but the hydrogen takes the input as litres, the job is done by the inflow regulator. The entire system is regulated & operated by the energy regulatory switch without manual operation such that the volume is initialized as zero.

Two parallel states fill & empty, the input for the fill State are Valve one on& off & inflow rate, the input for the empty state is valve two on & off & output for the empty state is outflow rate. The output for the chart state is the tank volume. The logic is derived at the transition between two states. Transition will automatically switches the State based on the logic written.

The valve one & valve two on & off tapping inputs are taken from the energy regulatory switch, Inflow rate is taken from the Electrolysis chamber, Outflow rate is given to the fuel as it's input which is regulated by the outflow regulator.

2.2 PVFC AQUA CYCLE SYSTEM

2.2.1 Function of PVFC Aqua cycle System : The function of the PVFC Aqua cycle system is to collect the water generated at the fuel cell & supplies it to the Electrolysis chamber. Electrolysis chamber requires water during its Electrolysis and water is produced as byproduct after reacting hydrogen with the atmospheric oxygen at fuel cell. So these water is again circulated to the Electrolysis chamber for reducing water consumption. It is driven by the Inflow regulator which deals GC deficiency factor, Valve one & Valve two operations for Inflow & outflow is done by the energy regulatory switch. The outflow regulator is connected between the Electrolysis chamber & the PVFC cycle system.

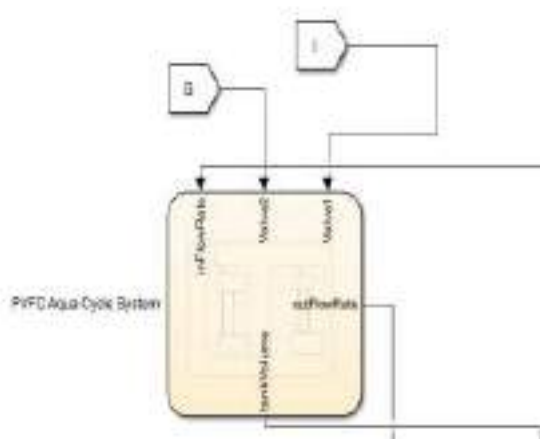


Fig2.2.1(a) PVFC Aqua Cycle System.

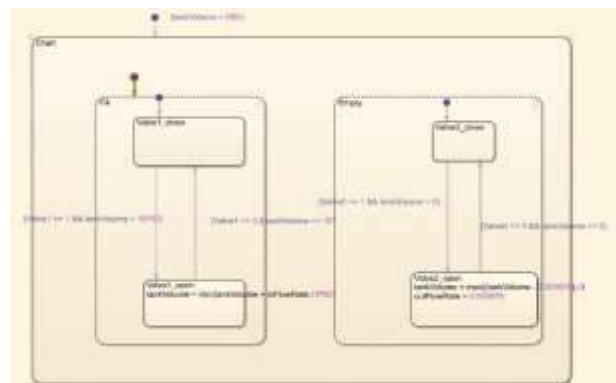


Fig 2.2.1(b) PVFC -LI

2.2.2 Logical Implementation : The valve one & Valve two on & off tapping from the energy regulatory switch controls the inflow & Outflow rates of PVFC Aqua Cycle System. The inputs for the PVFC Aqua cycle system is water input from the fuel cell & water outlet to the Electrolysis chamber. Valve one operation if the input is one & tank volume is less than the 500Lites then valve one will open. Valve two operation is that if valve two input equals one and tank volume will be greater than zero then the valve two will open. The Inflow rate will works as tank volume is equals to tank volume plus inflow rate. The outflow rate works as tank volume is equals to the tank volume minus outflow rate. Here the 500 Litres indicates the capacity of the tank. Increasing the tank capacity is also possible. It will take water input from the fuel cell & stores the water during the peak time by collecting the water from the fuel cell & sends to Electrolysis chamber during the peak time. The outflow rate is provided as constant until the volume of the tank is greater than the outflow rate this job is done by the outflow regulator. The GC constant is determined at Inflow regulator to fix the Generation consumption deficiency. Energy regulatory switch operates the entire peak & off peak conditions by giving tap command to the valves of the PVFC Aqua Cycle System.

Two parallel states fill & empty, the input for the fill State are Valve one on& off & inflow rate, the input for the empty state is valve two on & off & output for the empty state is outflow rate. The output for the chart state is the tank volume. The logic

is derived at the transition between two states. Transition will automatically switches the State based on the logic written. The above figure 2.1.1b shows the transistor implementation.

The valve one & valve two on & off tapping inputs are taken from the energy regulatory switch, Inflow rate is taken from the Fuel cell, Outflow rate is given to the Electrolysis chamber as it's input, which is regulated by the outflow regulator.

2.3 INFLOW REGULATOR- HYDROGEN TANK

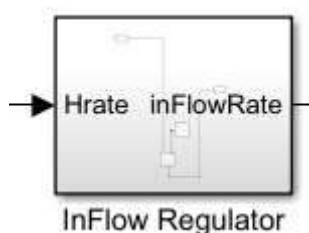


Fig2.3(a) Inflow Regulator.

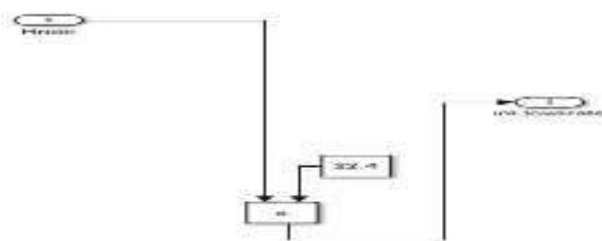


Fig2.3(b) Inflow Regulator LI

2.3.1 Description : The Inflow regulator of the hydrogen tank converts moles into the litres. The input of the Electrolysis chamber to hydrogen tank is in moles but the tank stores volume litres. The conversation constant is 22.4

2.4 OUTFLOW REGULATOR OF HYDROGEN TANK

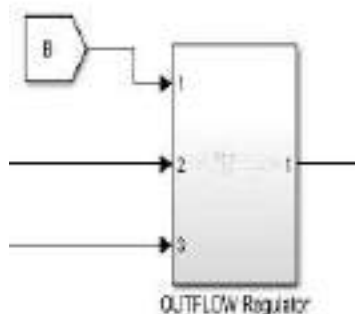


Fig2.4(a) Outflow Regulator

2.4.1 Description : The outflow regulator of hydrogen tank will provide constant fuel flow rate & time conversion between Electrolysis chamber & the fuel cell. The fuel cell stack consumption is in litres per minute but Electrolysis chamber production of hydrogen us moles let second it will convert the entire system scale to seconds by taking the input in litres per second & providing output as Litres per minute.

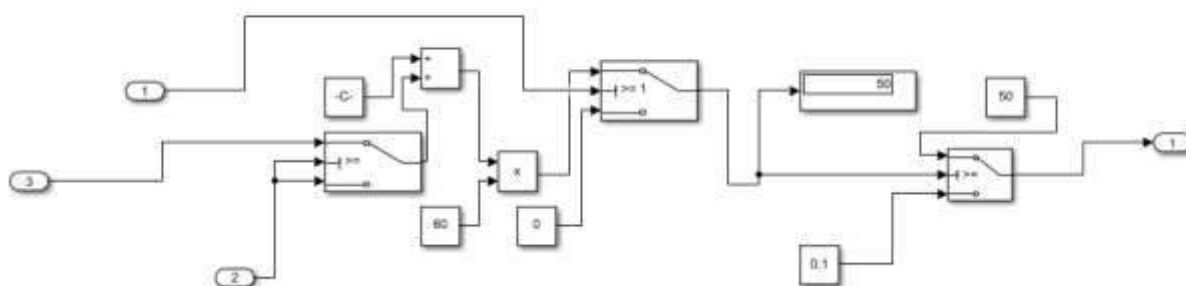


Fig2.4(b) Outflow Regulator LI

2.4.2 Implementation of constant outflow rate: The outflow rate from the hydrogen tank is 0.0007325. then it finds the required Generation & consumption deficiency constant which is given by $((\text{lpm}/60) - 0.0007325)$ the value equals 0.8326008. The constant is added to the outflow rate to get required output for the produced hydrogen. Then the tank volume is given to switch threshold value. It gives constant outflow rate until the tank volume is less than the outflow rate if tank volume is less than outflow rate than tank volume appears as output. But the outflow is continuous at off peak time means valve 2 is closed but it can be rectified by taking valve command separately for controlling the outflow rate.

2.4.3 Implementation of time conversion : The input from the Electrolysis chamber is in moles per second after Inflow regulator it converts liters per second but the consumption of the fuel cell is at litres per minute. The output of the outflow of the tank is in litres per second & it is converted it into the liters per minute by multiplying with 60 and then the output bus supplied to the fuel cell.

2.5 INFLOW REGULATOR- PVFC AQUA CYCLE SYSTEM :

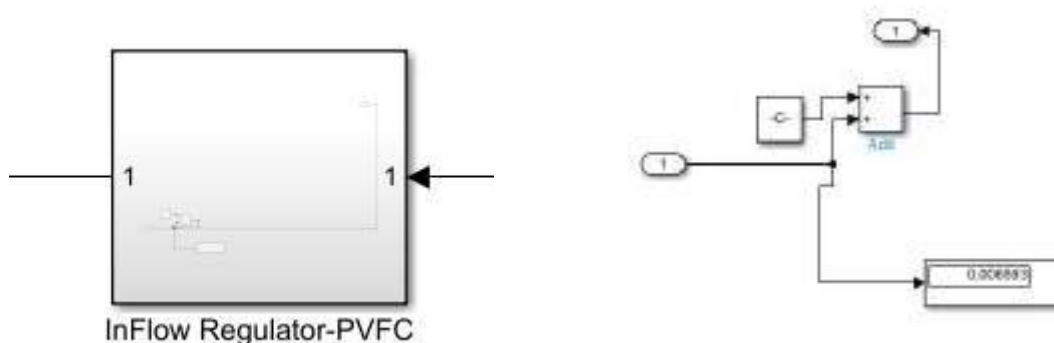


Fig2.5(a) Inflow Regulator PVFC

Fig2.5(b) Inflow Regulator PVFC-LI

2.5.1 Function of Inflow Regulator PVFC : The inflow Regulator of the PVFC Aqua cycle system takes input of water from the fuel cell then it calculates Generation consumption deficiency factor and add it to the inflow rate such that the water is added to the PVFC Aqua Cycle System through the inflow rate regulator. The GC constant is 0.0042

2.6 OUTFLOW REGULATOR- PVFC AQUA CYCLE SYSTEM

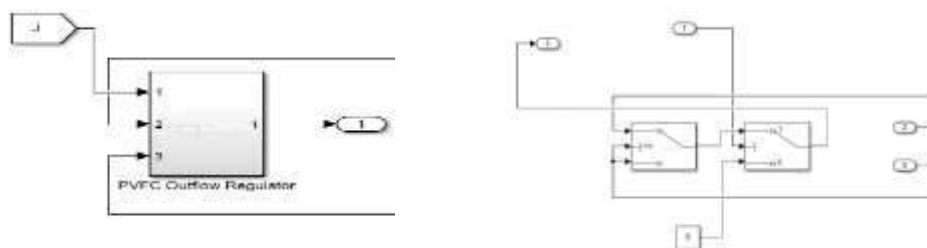


Fig2.6(a) Outflow Regulator -PVFC

2.6(b) Outflow Regulator-PVFC LI

2.6.1 Function of outflow regulator PVFC Aqua Cycle System : The outflow rate from the hydrogen tank is 0.003978 It is calculated how much water is required for the output of hydrogen and Simulated the water is using switch case if required water is getting or not the calculation is available at Chapter -3. The tank volume is given to switch threshold value. It gives constant outflow rate until the tank volume is less than the outflow rate if tank volume is less than outflow rate than tank volume appears as output. But the outflow is continuous at off peak time means valve 2 is closed but it can be rectified by taking valve command separately for controlling the outflow rate. It also takes command from the energy Regulatory Switch to control the flow.

2.7 ELECTROLYSIS CHAMBER

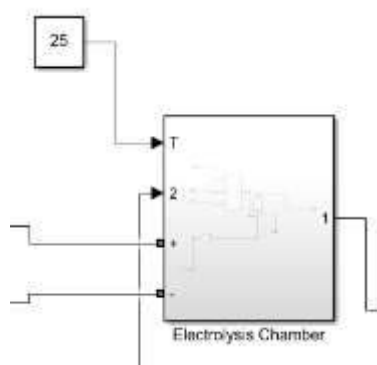


Fig2.7(a) Electrolysis Chamber.

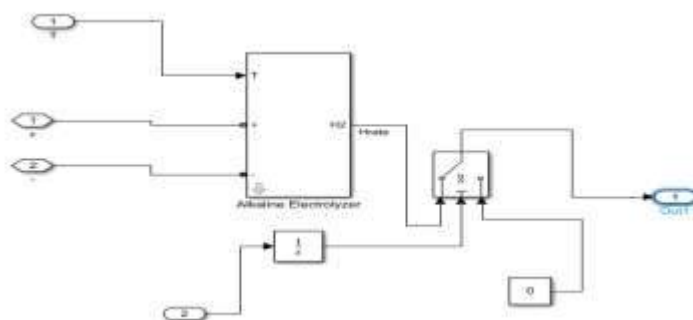


Fig2.7(b) Electrolysis chamber LI

2.7.1 Description of Modelling Electrolysis Chamber : Water can only be split into hydrogen and oxygen When a minimum electrical voltage is applied. Ideally the Cell voltage is equal to this minimum voltage, called Reversible voltage, but due to irreversibility, the cell Voltage is always higher. The extra voltage present in the cell is called Overvoltage and is composed of ohmic, activation and Diffusion overvoltages. Ohmic overvoltage is the Overvoltage due to overall resistance of all components of The electrical circuit, while the activation overvoltage is the Overvoltage related to extra energy required to start the Oxygen and hydrogen formation process in the electrodes Diffusion overvoltage only takes precedence at high Current densities when the reaction changes from Electronic transfer to matter transfer. An empirical model involving ohmic and activation Overvoltages the Model has six different parameters to characterize the Logarithmic response of an electrolyser cell voltage in Terms of current and temperature.

$$V = V_{rev} + \frac{r_1 + r_2 T}{A} I + s \log \left(\left(t_1 + \frac{t_2}{T} + \frac{t_3}{T^2} \right) \frac{I}{A} + 1 \right) \quad (1)$$

Where: T is the temperature of the cell, A is the area of the Electrodes, r1 and r2 are the ohmic overvoltage parameters, And t1, t2, t3, and s are the activation overvoltage Parameters. Is the reversible voltage of the cell and is Temperature and pressure dependant with a value of 1.229V at standard conditions (1 bar, 25 oC). For low Temperature ranges of up to 100 0C, voltage variation is Small and can be considered constant. Production rate of hydrogen can be related to the input Current using Faraday law. An empirical expression for the Hydrogen production efficiency is called Faraday Efficiency.

$$\dot{n}H_2 = \left(\frac{(I/A)^2}{f_1 + (I/A)^2} f_2 \right) \frac{I}{zF} \quad (2)$$

Where: f1 and f2 are parameters related to Faraday Efficiency, z is the number of electrons transferred in the Reaction (2 electrons for water electrolysis), F is Faraday Constant and is the molar flow rate per second F1 and f2 are usually considered constant for the overall Model. However, they vary with temperature. The Assumption of linear relation with temperature. Depends on the temperature range of operation. In this Research, a linear expression only applies for f1 whereas for F2 a limit value must be set to guarantee a range value Between 0 and 1 . Note that an extra point was added to f2 at 0 oC to Guarantee a limit value of 1.

$$f_1 = 2.5T + 50 \quad (3)$$

$$f_2 = 1 - 6.25 \times 10^{-6} T \quad (4)$$

A unit conversion is needed for the flow rate in Eq. (2) to obtain a rate in kilograms rather than moles. This Will facilitate comparisons in the result section. Using the Volume of an ideal gas at standard conditions , the Volumetric flow rate and the mass flow rate is given by Eq. (5).[1]

$$\dot{V} = \dot{n} v_{std} \rightarrow \dot{M} = \dot{V} c \quad (5)$$

where: $v_{std} = 0.0224136 \text{ m}^3/\text{mol}$ and $c = 0.08988 \text{ kg/m}^3$.

3.1 SOLAR CELL

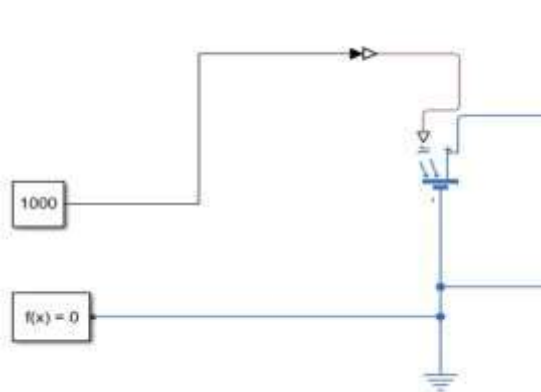


Fig 3.1(a) PV cell.

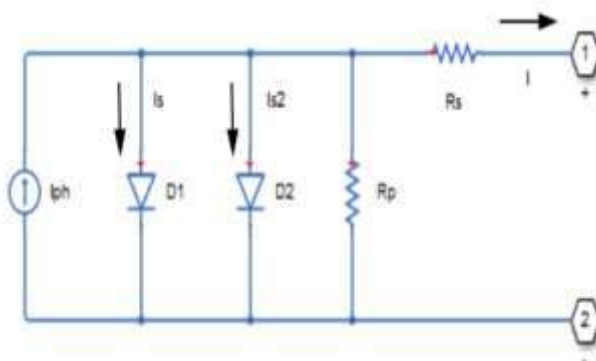


Fig 3.1(b) PV cell Equivalent circuit

3.1.1 Function of the Solar cell : The solar cell takes irradiance input as 1000 & Number of cells connected in series is 130 & the output voltage is 79.2 approximately 80. During peak time it is connected to load & during off peak time it is connected to Electrolysis chamber through the valve operation is controlled by energy regulatory switch. The solar cell is simscape but the entire model is Simulink it can be converted to Simulink by PS to Simulink converter.

3.2 Fuel cell

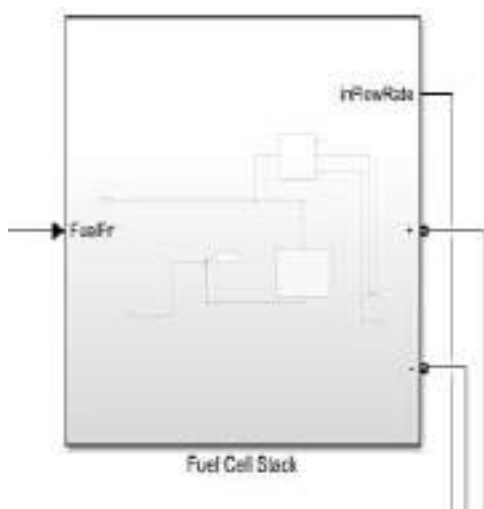


Fig3.2(a) Fuel cell

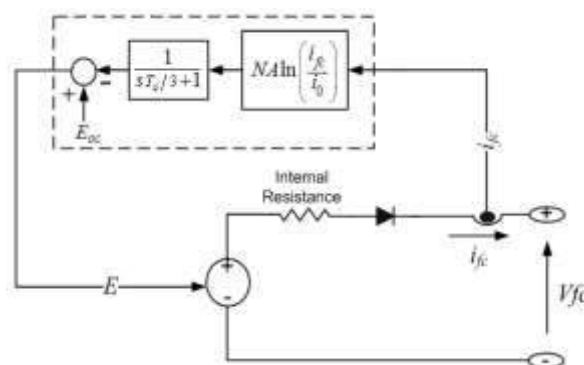


Fig3.2(b). Equivalent Circuit of Fuel cell

3.2.1 Fuel cell nominal parameters

Stack Power: Nominal = 5998.5 W, Maximal = 8325 W, Fuel Cell Resistance = 0.07833 ohms, Nerst voltage of one cell [En] = 1.1288 V, Nominal Utilization: Hydrogen (H₂)= 99.56 %, Oxidant (O₂)= 59.3 %, Nominal Consumption: Fuel 60.38 slpm, Air = 143.7 slpm, Exchange current [i₀] =0.29197 A &Exchange coefficient [alpha] = 0.60645

3.2.2 Manual water Simulation of the Fuel cell

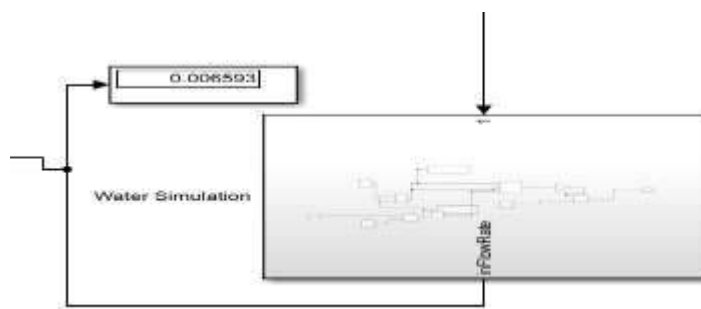


Fig 3.3.2(a) Manual water Simulation

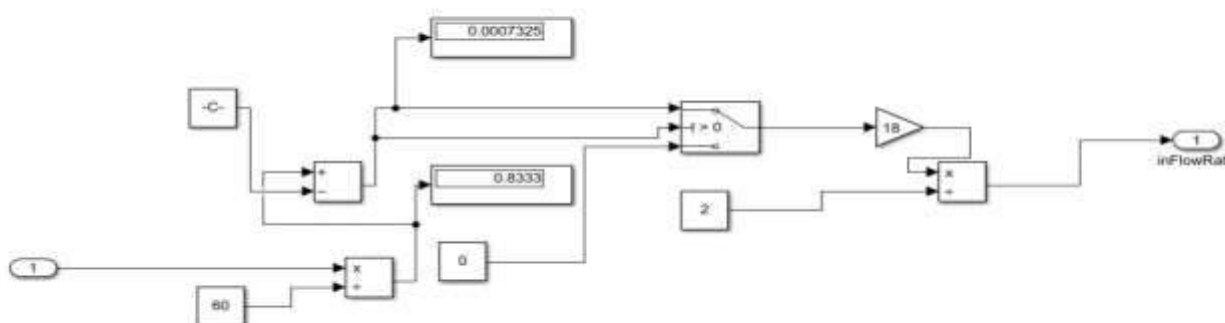


Fig3.2.2(b). Manual water Simulation LI

The generic Fuel cell stack didn't provide output of the water it only provides electrical energy by taking hydrogen gas as input in litres per minute. So the water is Simulated manually by taking same hydrogen input of the fuel cell.

3.2.2.1 Logical Implementation of water Simulation

Water Simulation Calculation for Fuel cell :

First it will take same fuel input of fuel cell convert it into litres per second from litres per minute the reverse process of outflow regulator and follow the below steps for calculating the water in litres per minute.

Molecular weight of water = 18grams

Every 18grams has 2 grams of hydrogen

1kg of water consists of $= (1000 \times 2) / 18 = 111.11$ grams of hydrogen

Let's consider H₂O as X liters

Water released at Fuel cell = $(x \times 18) / 2 = Y$ Litres.

3.2.3 Functions of the fuel cell : The function of the fuel cell is it will supply power to the load during the peak time & it will be off in off peak time. The fuel cell starts supplying the power to the whenever the fuel input(hydrogen) is given to the fuel cell the supply bus controlled by outflow regulator. The Outflow rate take the command from energy regulatory switch. The fuel will take inputs oxygen and hydrogen but we are only supplying hydrogen as input to the fuel cell because the oxygen will be taken directly from the atmospheric air so the necessity of providing oxygen to the fuel cell is not required.

3.3 Power Plant Simulation

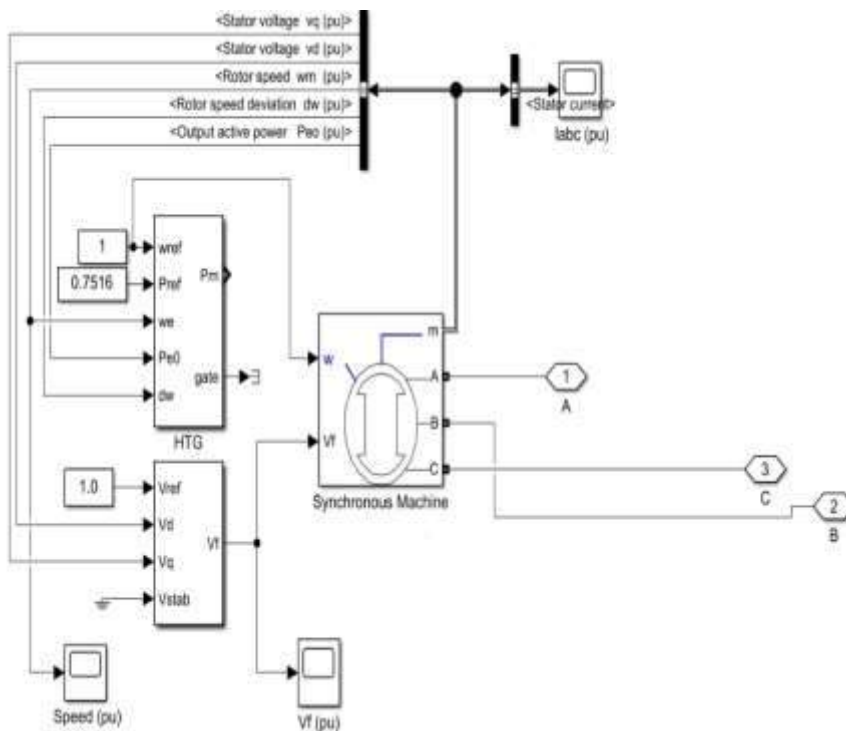


Fig 3.3(a) Power Plant Simulation LI.

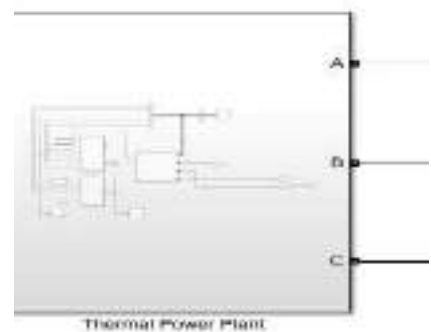


Fig3.3(b) Power Plant

3.3.1 Excitation System

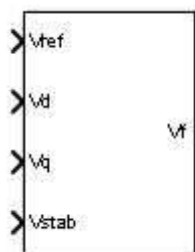


Fig : 3.3.2(a) Excitation System

3.3.2Function of the power plant : The function of the power plant it has to supply 15MW power constantly during peak & off peak time. The power plant is considered as the base plant. The system is three phase the Three phase transformer is connected to the Synchronous machine to give desired output voltage (415V).

4.1 TRANSFORMERS

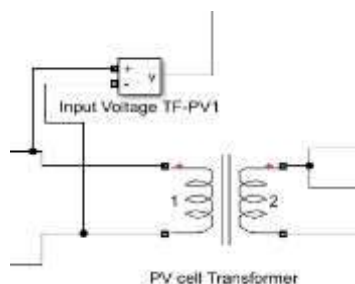


Fig 4.1(a) PV cell Transformer

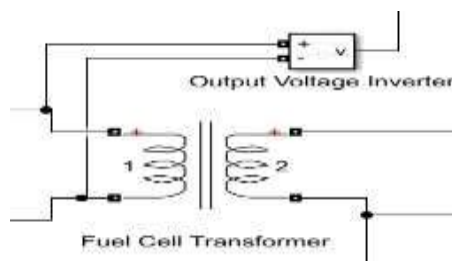


Fig 4.1(b) Fuel cell Transformer

4.1.1 Three phase transformer Block Description

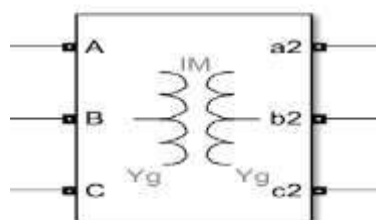


Fig 4.1.2(a) Three Phase Power plant transformer

4.1.2 Presence of single phase Transformer & it's function : The function of the single phase transformer is to step-up the voltage & it is present across the fuel cell & photovoltaic cell. The Inverter is placed after the photovoltaic cell and the fuel cell the inverter converts DC to AC and the output voltages of the inverter is step-up to 230v & supplied to the load. The two transformers having the rating of 5KW & 50HZ frequency and the values considered for ideal case.

4.1.3 Presence of Three phase Transformer & it's function : The function of the three phase transformer is to step-down the voltage coming from the alternator and it's is present in between three phase load & Alternator. The output voltage of the three phase transformer is 415V the capacity of the transformer is 20KW & frequency of the transformer is 50Hz. It is considered for the ideal condition.

4.2 Inverters :

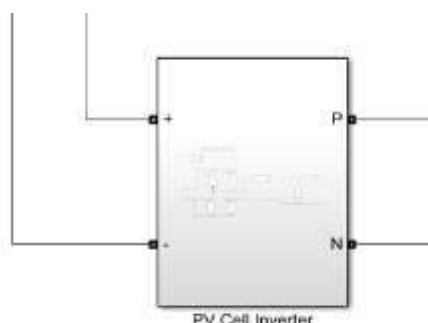


Fig 4.2(a) PV cell Inverter.

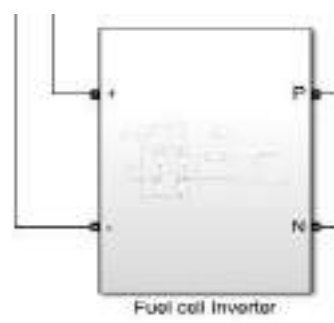
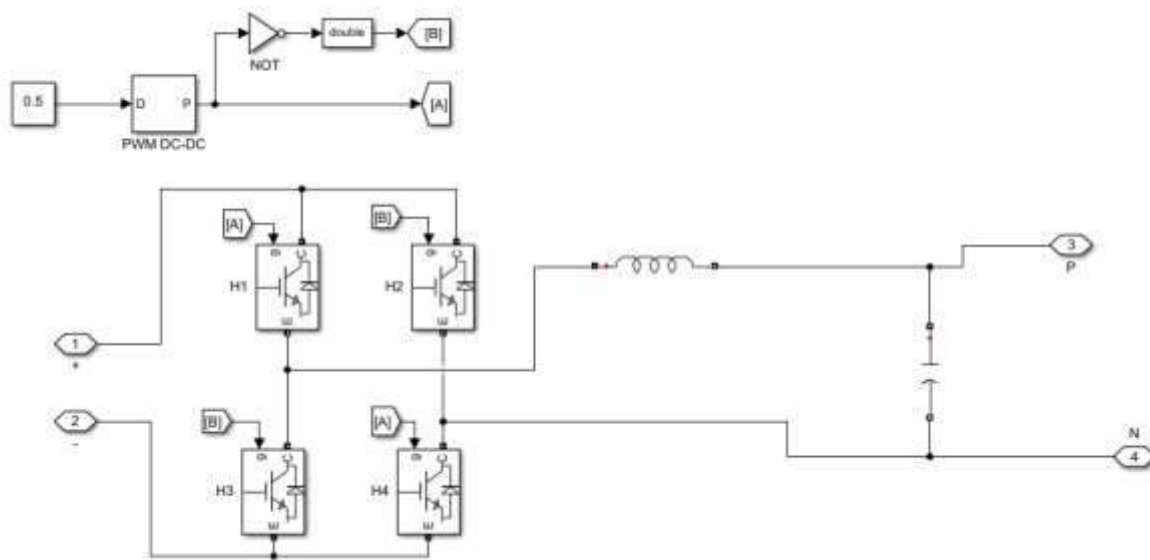


Fig 4.2(b) Fuel cell Inverter



4.2(c) Circuit diagram of Inverter

4.2.1 Function of Inverter : The function of the inverter is to convert DC of PV & Fuel cells Output to AC then it will be connected to the transformer to give the specified voltage to load(230V). The duty cycle is provided as 0.5 such that output frequency is 50HZ with respect to the below specified filter values.

4.2.2 Filter values of the Inverters :

Device	Inductor value	Capacitor value
PV Cell Inverter	21.0466e-4	6.36e-4
Fuel cell Inverter	20.0466e-4	22.36e-4

5.1 ENERGY REGULATORY SWITCH

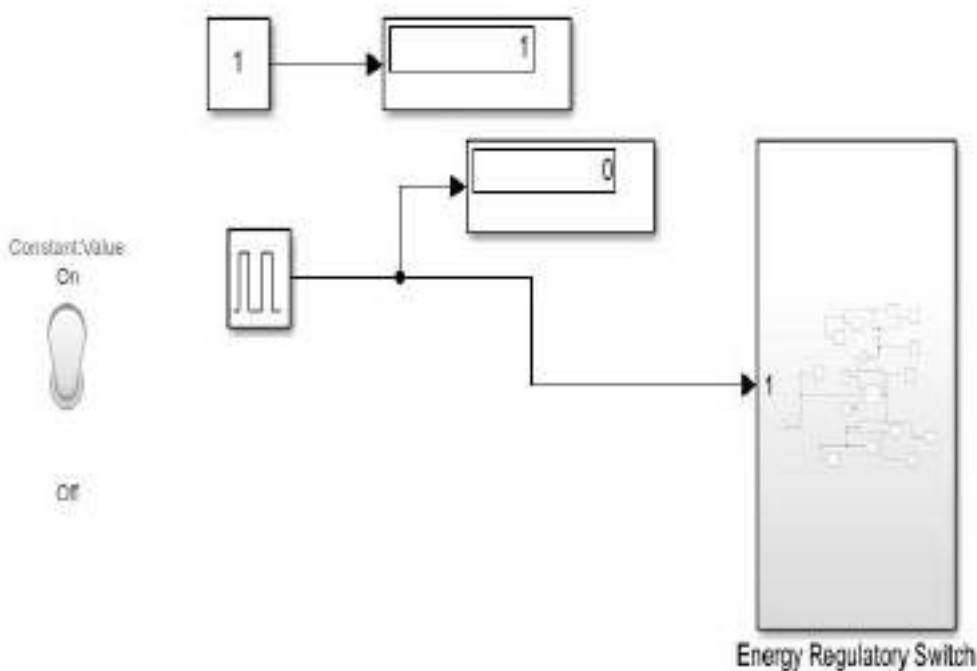


Fig5.1(a) Energy regulatory switch

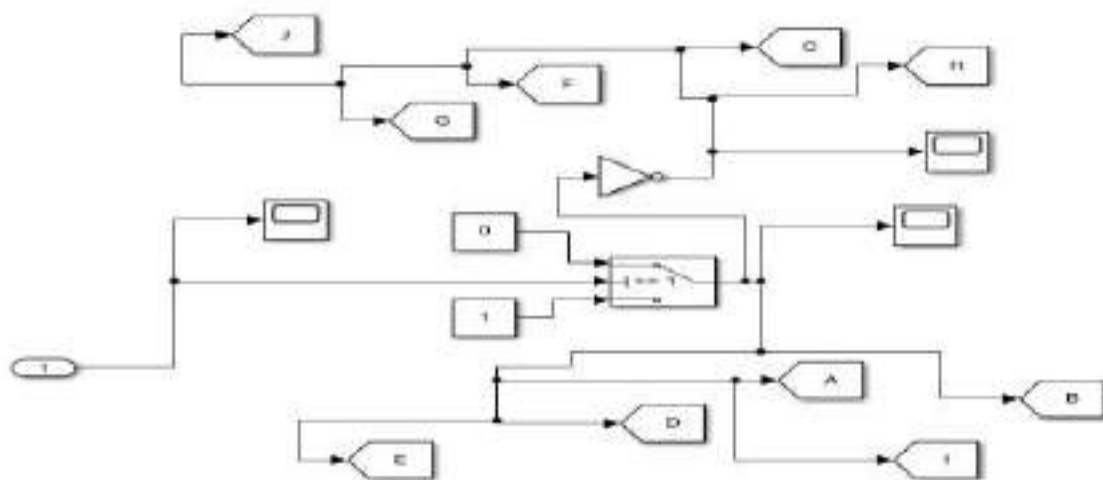


Fig5.1(b) Energy regulatory switch LI

5.1.1 Energy regulatory switch description : The energy regulatory is said to be heart of the system it controls the entire system by stimulating peak & off peak load condition. During off peak load it will give command to the solar cell valve operator to connect the solar cell to Electrolysis chamber, gives input to the hydrogen tank to open the valve and accept the inflowrate and also sends commands to the valve two of the hydrogen tank, Outflow Regulator to stop the outflow rate. It also sends the commands to the PVFC Aqua cycle system to open the valve two and send water to Electrolysis chamber. Here the hydrogen tank is initialized with 0 volume and PVFC Aqua Cycle System water tank is initialized with 250Litres of volume. During peak time the it will give command to the solar cell valve operator to connect the solar cell from the Electrolysis chamber to load, by closing valve one of hydrogen tank and opening valve two of the hydrogen tank & sending command to outflow regulator of hydrogen tank will hydrogen gas is supplied to fuel cell and fuel cell is also starts generating electricity which is already connected to the load. It also opens valve one of PVFC Aqua Cycle System and closes the valve two of the PVFC Aqua Cycle System such outflow rate of the water is stopped & Inflow rate is passed to the PVFC Aqua Cycle System then the water from the fuel cell is collected and stored. The Energy regulator switch is a subsystem such that all the tag variables of from us considered as Global.

5.2 Photovoltaic cell valve operation :

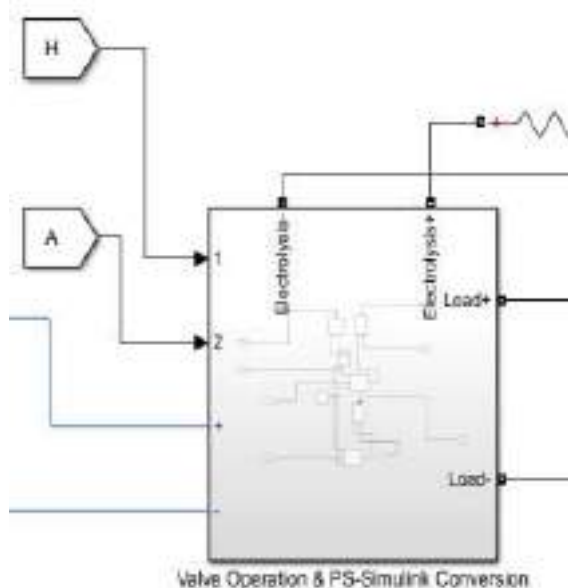


Fig 5.2(a) photovoltaic cell valve operation

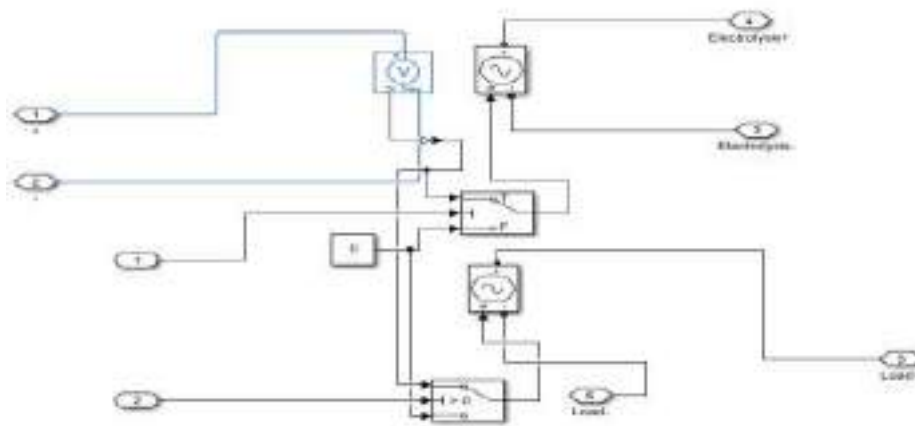


Fig 5.2(b) photovoltaic cell valve operation LI

5.2.1 Description of photovoltaic cell Valve operation : The photovoltaic cell is Simscape so that voltage signal is converted into the Simulink and given it to the controlled voltage source. The controlled voltage source signal is connected & disconnected by using the switch case the switch threshold takes input from the energy regulatory switch. If the command is one then it will connect to voltage signal else it will connects to the constant zero.

6.1 SIMULATION IMPLEMENTATION PROCEDURE

The Simulation implementation procedure deals with the working Procedure & connections.

6.1.1 Connections based on Sources

6.1.1.1 Photovoltaic cell : The photovoltaic cell is Simscape component and it converted into the Simulink by using PS-simulink converter. The positive and negative terminals of the Solar cell is connected to Conversion and Valve operation subsystem. The subsystem converts the Simscape to Simulink and it will take commands from energy regulatory switch to connect with the load and Electrolysis chamber. During off peak time it is connected to the load using the inverter and transform, The Photovoltaic cell is connected to the valve operation during peak time it is directed connected to the Electrolysis chamber. During peak time it is connected to the Inverter which converts the DC to AC. The output frequency of the inverter voltage is 50Hz. The output of the inverter is(79.2V) connected to the transformer primary it is stepped up to the 230V and supplies to the load.

6.1.1.2 Fuel cell : The fuel cell supplies DC voltage and it will takes the input from the Hydrogen tank through outflow regulator. During off peak time the fuel supplied to the fuel cell is negligible (zero.). Such that Electrical generated is also. Whenever the peak time appears the Fuel is supplied to the fuel cell through the outflow regulator by taking command from the Energy regulator switch. The output of the Fuel cell is connected to the Inverter which converts DC to AC. The output voltage of the Inverter(55V) is connected to the Transformer and step-up to produce the 230V and supplies to the load.

6.1.1.3 Thermal power plant : The thermal power plant is base plant. It will supply the power continuously in both peak and off peak the phase alternator with 20KW 50Hz frequency is connected to the three phase transformer which will step down the voltage from the alternator to the 415V and supplies it to the three phase load of 15KW.

6.1.2 Connections based on non electrical apparatus :

6.1.2.1 Hydrogen Tank : The hydrogen tank is connected to the Electrolysis chamber and fuel cell. The Electrolysis chamber is connected to the Hydrogen tank using the Inflow regulator. The output of the Electrolysis chamber is hydrogen gas in molar rate and the hydrogen tank stores the hydrogen in the form of litres, such that the moles is converted into the litre by using the inflow rate regulator .The outflow rate of the Hydrogen tank is connected to the fuel cell through the outflow regulator. The outflow regulator takes three inputs one is command input from the energy regulatory switch, the other two are outflow rate of the



hydrogen tank and volume of the hydrogen tank. The hydrogen tank also takes input for valve 1 & valve 2 opening and closing operation from energy regulatory switch.

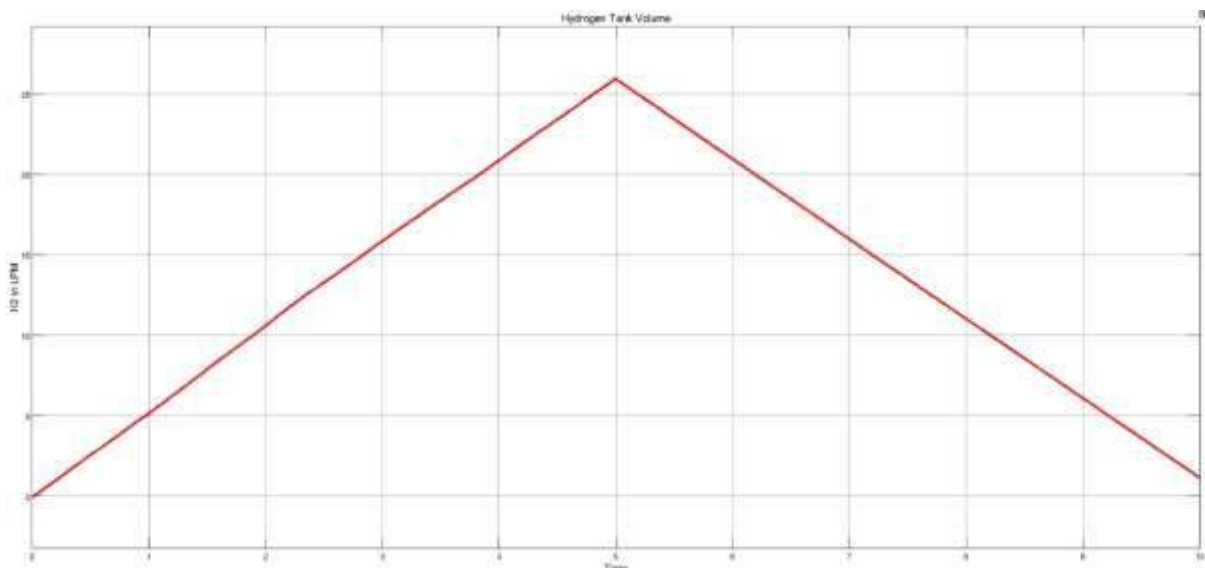
6.1.2.2 PVFC Aqua Cycle System: The PVFC Aqua Cycle System is connected to the Electrolysis chamber through outflow regulator of the PVFC Aqua Cycle System. The outflow regulator will take two input one is outflow rate of the PVFC and other one is volume of the PVFC & provides output to the Electrolysis chamber. It will also connected to the fuel cell through inflow rate regulator using GC constant. The PVFC Aqua cycle System is connected to the energy regulatory switch for on & off of the inflow and outflow valves (Valve-1&valve-2).

6.1.2.3 Electrolysis chamber : The Electrolysis chamber is connected to hydrogen tank and it is connected in between the PV cell valve operator & hydrogen tank. It will take the Electrical energy from the PV cell during the off peak time and converts it into hydrogen gas by splitting the water. The PVFC Aqua Cycle System supplies the water to the Electrolysis chamber. The static water constant is calculated and assigned to switch case to stimulate the water consumption at Electrolysis chamber. The inflow rate of the Electrolysis chamber is connected to the hydrogen tank through in flowrate regulator for converting moles into the litres.

6.2 Working Procedure : They are two types of Simulation one is peak load Simulation and other one is off peak load Simulation it is controlled by energy regulatory switch. The energy regulatory switch will connect to either pulse generator or toggle switch toggle switch for manual operation and pulse generator for automation. In this pulse generator is connected to the energy regulatory switch such the simulation time is 10sec first 5 sec is off peak load condition and next 5 sec is peak time. During peak condition the hydrogen generation at Hydrogen tank and water consumption from the PVFC Aqua cycle system is observed, the hydrogen inflow rate and water outflow rate is also displayed. The voltage of the power plant is also measured. During the peak time the solar cell is connected to the inverter through Valve operator the Output voltages of the inverter and transform is measured and power supplied to the load is measured using the PQ block. The hydrogen is supplied to the fuel through outflow Regulator and the fuel cell generates the electrical energy Output voltages of the inverter and transform is measured and power supplied to the load is measured using the PQ block. Hydrogen consumption and water generation is also measured. The base plant Voltage levels also measured at the peak time here base plant terms to the thermal power plant.

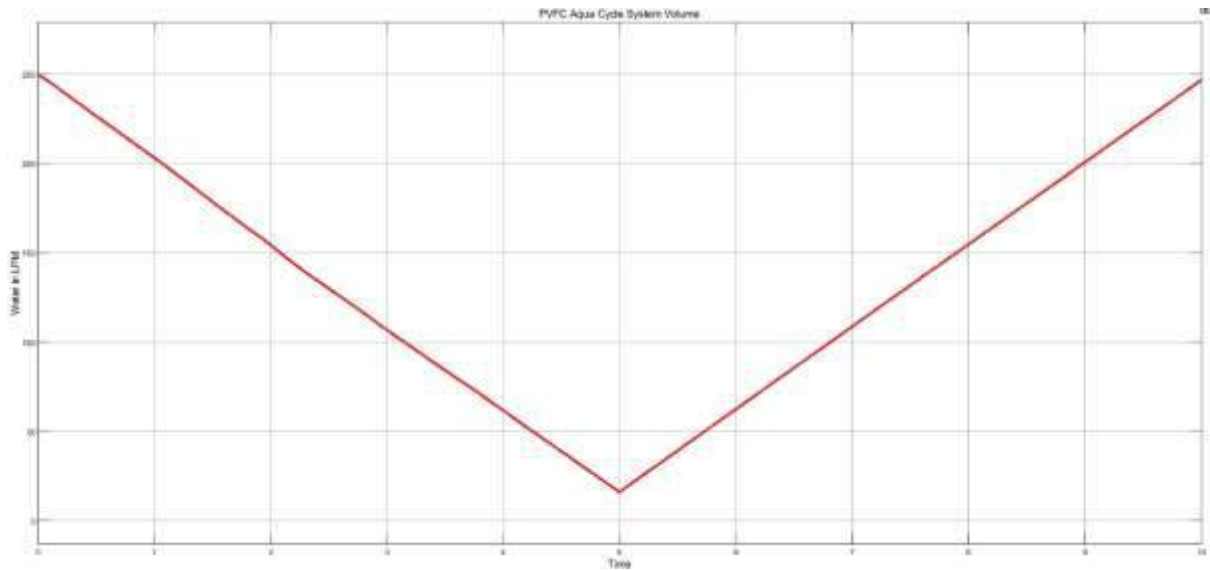
6.3 Outputs :

Hydrogen tank output :

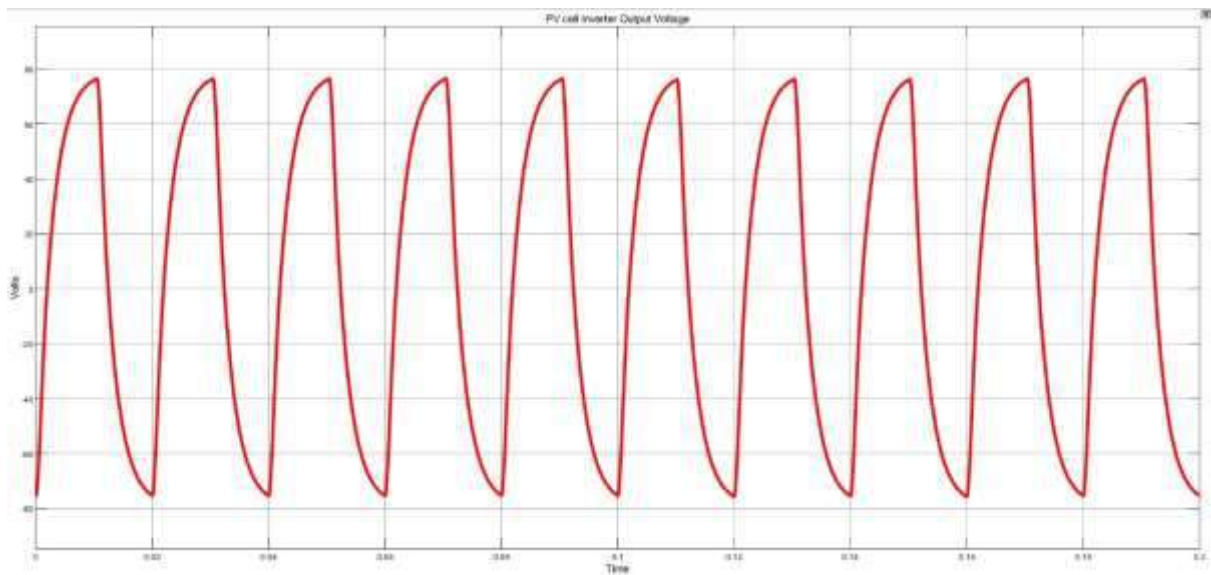




PVFC Aqua Cycle System :

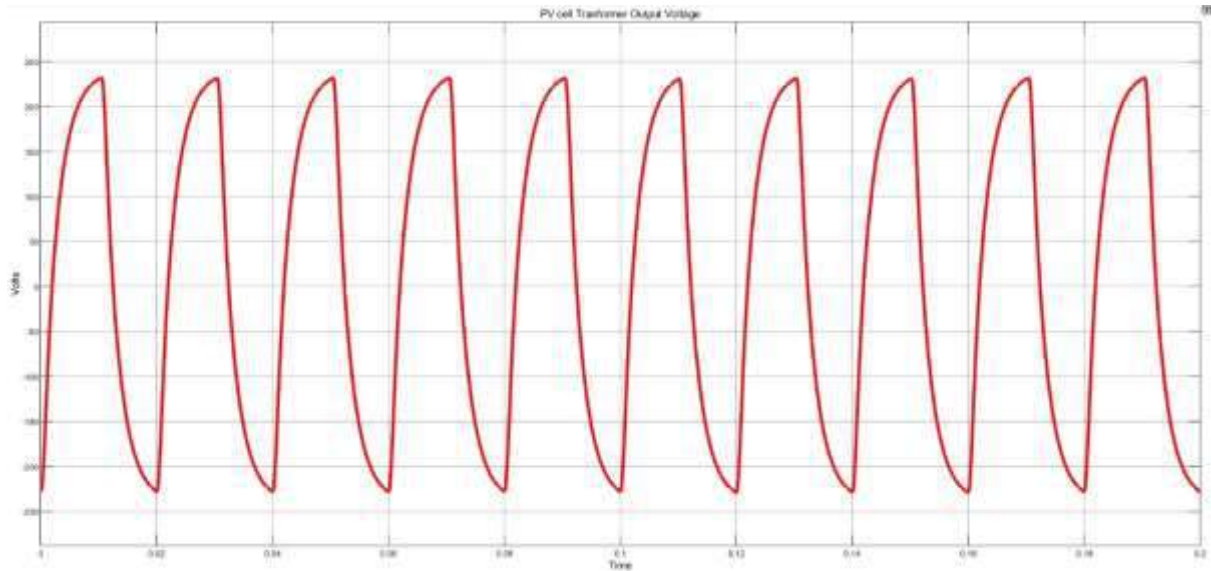


PV-Cell Inverter output voltage :

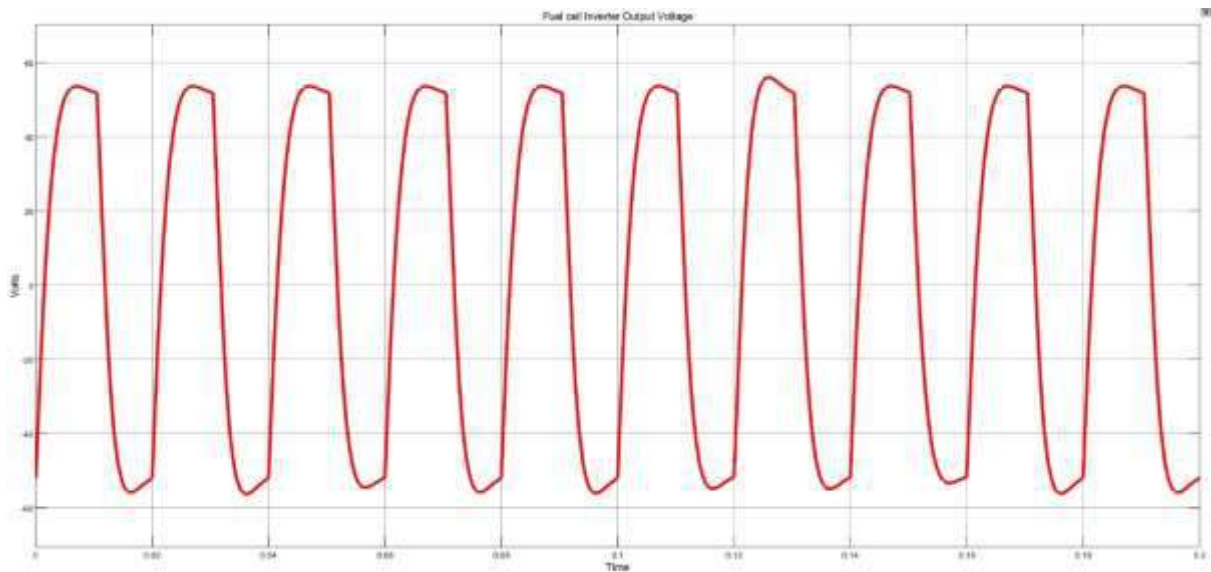




PV cell transformers output voltage :

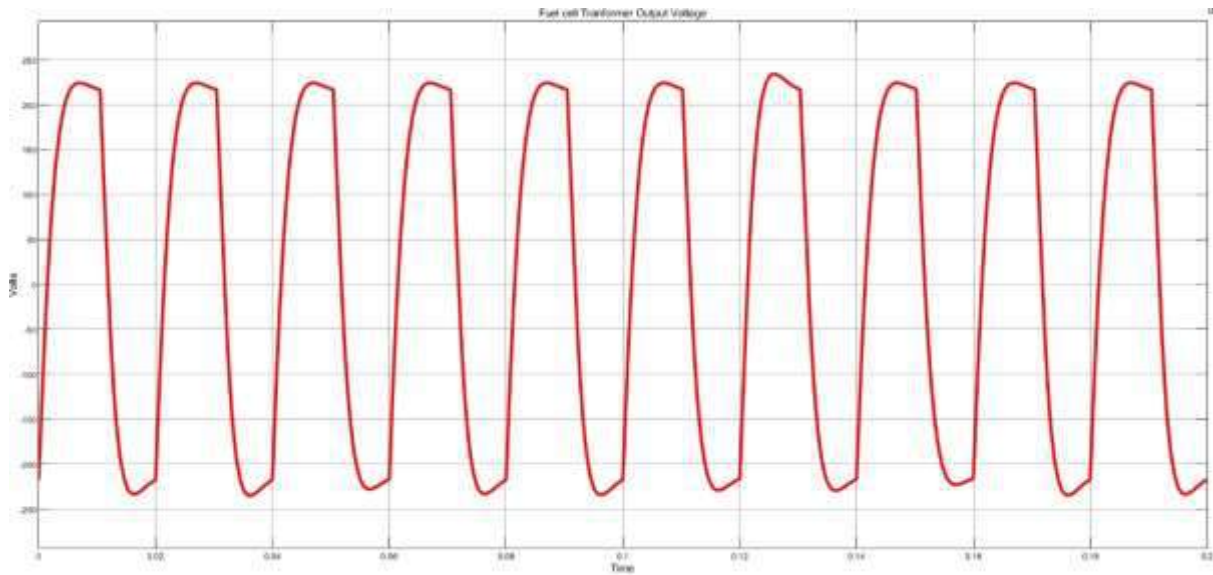


Fuel cell Inverter output voltage :

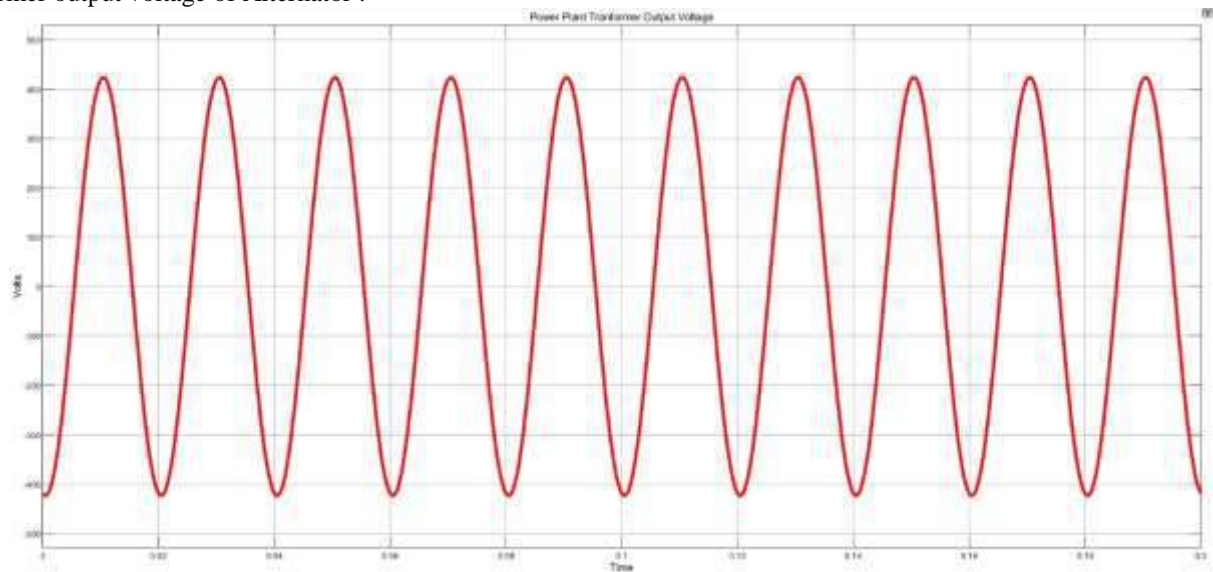




Fuel cell Transformer output voltage :

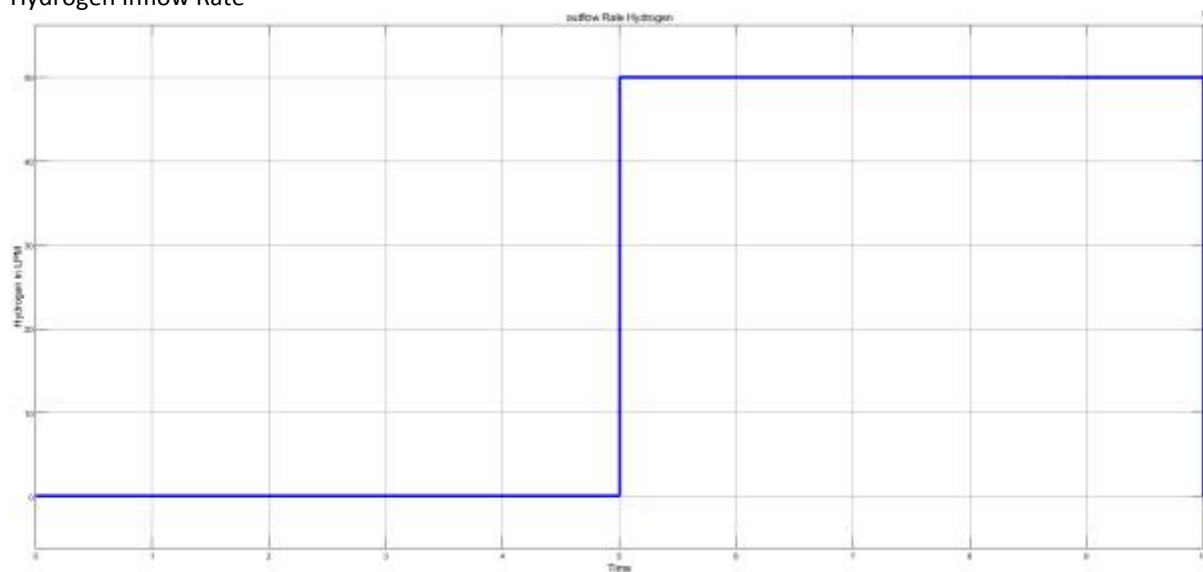


Transformer output voltage of Alternator :

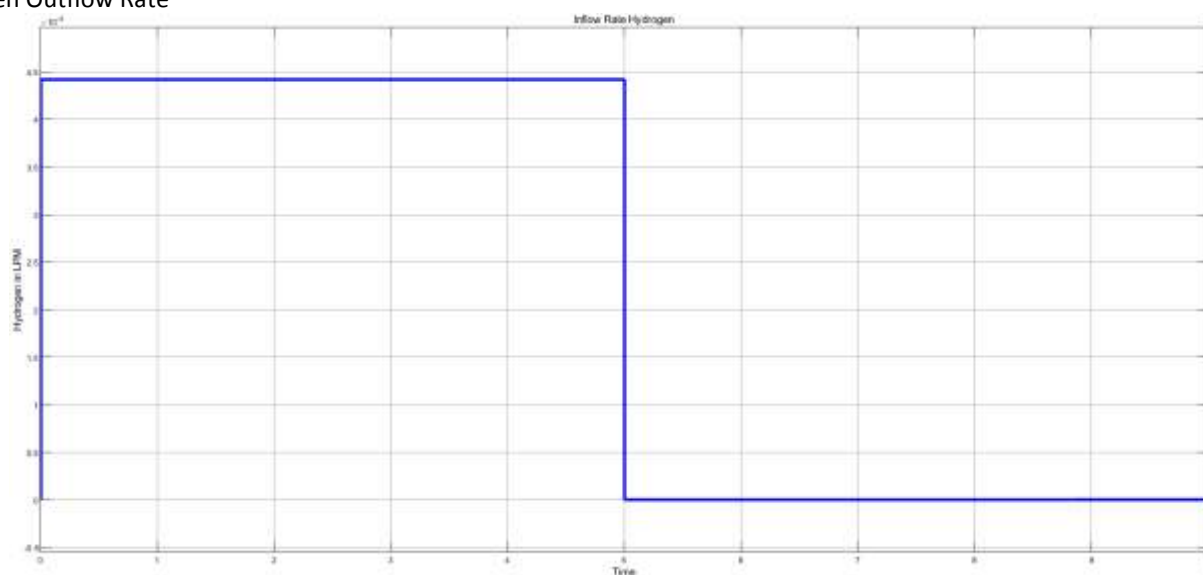




Hydrogen Inflow Rate

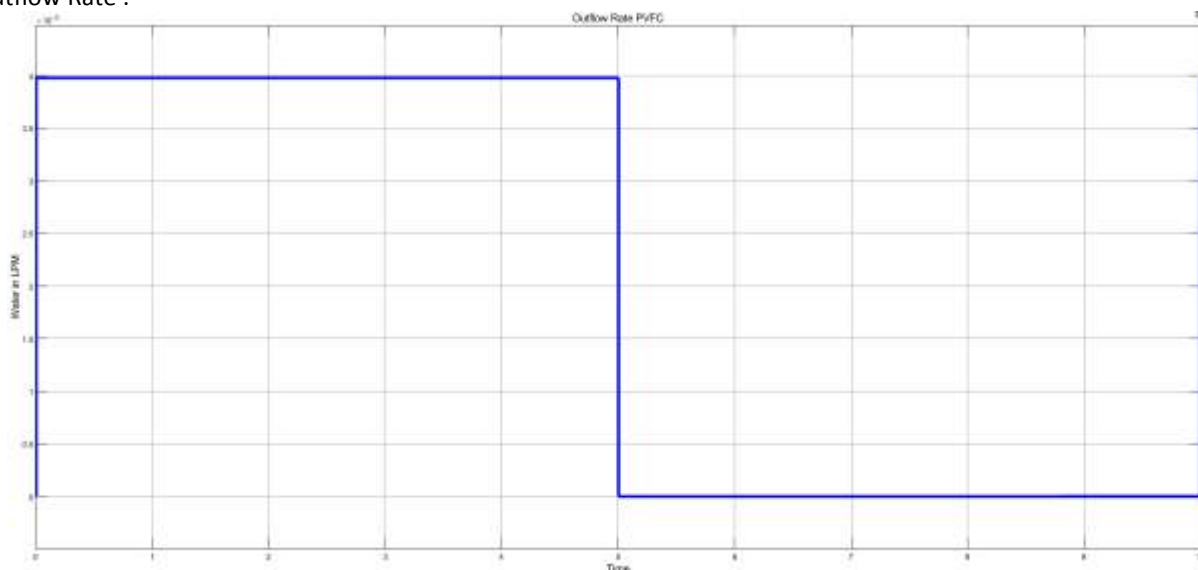


Hydrogen Outflow Rate

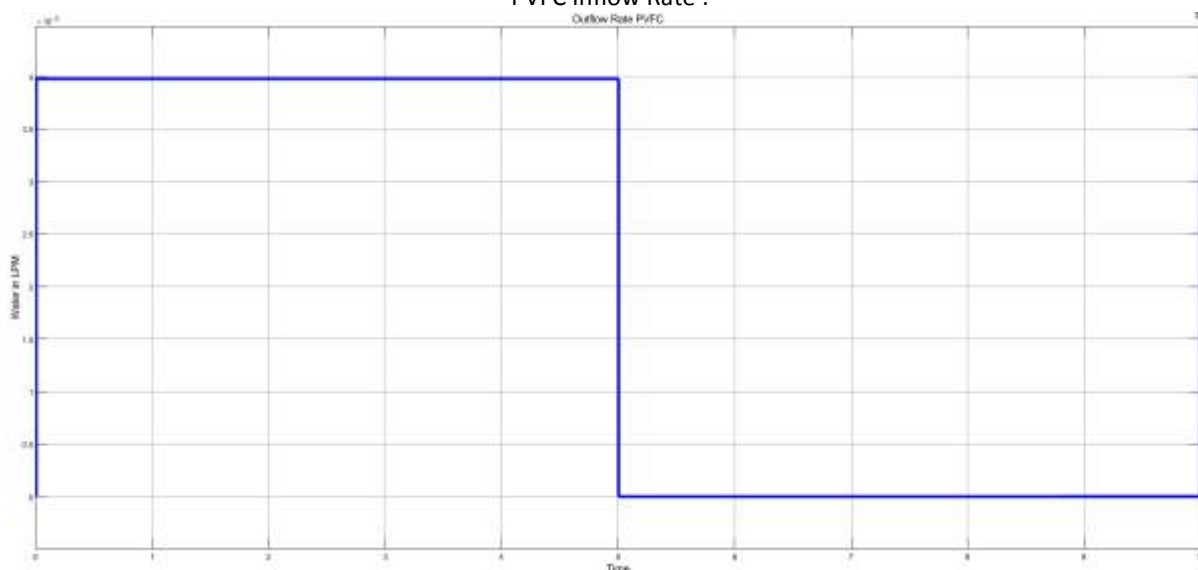




PVFC Outflow Rate :



PVFC Inflow Rate :



CONCLUSION

The project finally reduces the water consumption at the Electrolysis chamber When electrical energy is stored in the form of hydrogen gas. The water collected from the fuel cell is again send back to the Electrolysis chamber. It increased the overall efficiency of system. Decreased the dependency on continuous water supply & small water resources is quite enough to Store large quantity of the power in the form of hydrogen gas. The continuous circulation of water (Aqua cycle) in the closed system will reduce the contamination ratio of the fluid which is directly exposed to the atmosphere In such a way the life Span of the Fuel cell & Electrolysis chamber also increases. It reduces the maintenance cost because the System is automated. Future Scope : It is also used by the vehicles in future. The PVFC Aqua cycle system plays key role at fuel stations to reduce the cost of the fuel. Means the vehicle dumps water from PVFC Aqua Cycle System to the Fuel station and fills the hydrogen.

1. Bulk power stored using the fuel cells in future. The PVFC Aqua System gives solution at water scarcity areas.
2. The system is compact and compatible with any other devices like grid using synchronisation such that at future fuel cells are available in grid.
3. It also helpful in production of rocket fuel for cryogenic engines with less cost and less power utilisation.
4. It also useful in hydrogen production industries for managing water quantity.



REFERENCES

1. D. Martinez, R. Zamora, "MATLAB Simscape Model of An Alkaline Electrolyser and Its Simulation with A Directly Coupled PV Module for Auckland Solar Irradiance Profile", *International Journal of Renewable Energy Research*, Vol. 8, pp. 552-560, 2018



RELIABILITY OF DATA SECURITY IN CLOUD COMPUTING

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ABSTRACT

This paper discusses the safety of data in cloud computing. It's a study of data in the cloud and aspects related to it concerning security. The paper will enter to details of data protection methods and approaches used throughout the world to ensure maximum data protection by reducing risks and threats. Availability of knowledge in the cloud is beneficial for many applications but it poses risks by exposing data to applications which might already have a security loophole in it. Similarly, use of virtualization for cloud computing might risk data when a guest OS is run over a hypervisor without knowing the reliability of guest OS which could have a security loophole in it. The paper also will provide an insight on data security aspects for Data-in-Transit and Data-at-Rest. The study is predicated on all the levels of SaaS (Software as a Service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service).

KEYWORDS: *Cloud computing, cloud models, decryption, encryption, malicious behaviour, intrusion, secured communication.*

INTRODUCTION

Since its inception, the cloud computing paradigm has become widespread in industry and academia [88]. Inexpensive, scalable, convenient, ubiquitous, and on-demand access to shared resources are a number of the characteristics of the cloud that have led to the migration of business processes to the cloud [25], [2]. Cloud computing has attracted the eye of the research community as it has the potential to bring significant benefits to the industry and community [9], [88]. Resources are provided to users and released on demand from a pool of shared resources [4]. On-demand resource provisioning ensures optimal resource allocation and is cost-effective [78]. Consumers (individuals and businesses) not need to invest heavily in information technology (IT) infrastructure [4]. Customers use cloud-provided resources and pay just for what they use. Cloud providers, on the opposite hand, can reuse resources freed by a specific user, leading to better resource utilisation [78]. simple use is another benefit that cloud computing offers. Customers don't need to have special expertise in cloud-specific technologies [5]. Management of technology and services is shifting from the user to the provider of the service [5]. Cloud computing uses various technologies like web services, virtualization, and multi-tenancy to supply virtualized resources to customers. "Cloud services" are provided to customers over the web [25]. Web applications became an important part of cloud computing as they are used to access and manage cloud resources [70]. Customer processes run in virtualized environments, and virtual environments use physical resources [35]. Multiple virtual processes for various users are assigned to the same logically isolated physical machine. This creates a multi-tenant environment within the cloud. Despite the advantages offered, cloud computing isn't without risks, security being the most one [57].

One of the most significant barriers to the adoption of cloud computing is security [28]. Some commercial and research organisations are relying entirely on cloud computing to download digital assets from third-party providers [57]. Traditional IT infrastructure keeps digital activities within an organization's control zone. All processing, movement, and management happen within the organization's administrative domain. On the opposite hand, organisations don't benefit from administrative control over their services and infrastructure in the tube [52]. The presence of an outsized number of unaffiliated users exacerbates the concern [57]. The CSP can trust the users, but it's possible that they will not trust each other. For the explanations stated previously, clients still be uneasy about their digital activities that exist in the cloud, leading to a reluctance to adopt cloud computing [57].

There are various studies within the literature that discuss security issues in cloud computing. The authors of [85], [101] gave a summary of security issues in cloud computing. However, the above research is restricted to discussing security issues, not security solutions. Reference [71] reviewed security issues at various levels of cloud computing. Security solutions also are presented in [71]. However, discussions about the longer term have not yet been comprehensively discussed, and there's no overview of cloud technologies. In [1], the author presented a comprehensive study on his privacy within the cloud, focusing solely on his e-health cloud. Furthermore, the investigation of [1] is restricted to data protection. reference [121] reviewed security and privacy challenges in cloud computing and discussed defence strategies against existing vulnerabilities. However, the



discussion of security issues in [121] focuses on confidentiality, integrity, availability, accountability, and privacy, with little discussion of the technologies that cause vulnerabilities. The authors of [74] identified cloud security issues together with approaches that can be used to address vulnerabilities. Nevertheless, this study lacks discussion of future research directions. Similarly, a study in [39] describes security issues in cloud computing intimately, with a quick description of current and modern security solutions. The add [18] examined common security models for cloud computing, including the cube model, the multi-tenancy model, and therefore the risk assessment model. Furthermore, the authors of [18] discussed the safety risks of cloud computing. However, the risks are described from the attitude of various stakeholders, like customers, governments, and repair providers. Security issues from a technical and operational perspective weren't the subject of the above investigation. Strategies for resolving security issues also are discussed, which components and processes have to be protected and evaluated. It's not detailed how the safety goal is achieved in the current study. Similarly, article [104] discusses security issues in cloud computing and related security solutions. However, the discussion focuses on the privacy portion of cloud security.

In addition, we briefly discuss security issues associated with mobile cloud computing and common strategies leading to solutions. The contribution of this study to the above study is shown in Table 1. "" and "" indicate whether the world specified in the column was discussed in the vote.

The rest of the work is organised as follows. Section 2 provides an architectural framework for cloud computing. Section 3 details security issues within the cloud computing paradigm are detailed in Section 4, and existing solutions in contemporary literature are presented in Section 5. Section 5 highlights security concerns in mobile cloud computing (MCC). Section 6 describes the methodology and open-ended questions, and Section 7 concludes the survey.

Common cloud vulnerabilities, threats, and attacks Cloud computing, like all other area of IT, suffers from many security issues that require to be addressed.

Addresses: 8, 11, 12, and 13. These risks relate to policy and organisational risks, technical risks, and legal and other risks.

Risk 9

Vulnerabilities and Open Issues

The cloud may be a set of technologies, processes, people, and commercial structures. Like all other technologies, people, and commercial structures—even the cloud—have vulnerabilities. Below are a number of them.

Cloud vulnerabilities a number of the open issues and threats that require immediate attention are listed below.

470 465-472 in Procedia computing 110 (2017) 00 (2012) 000-000 Author/Procedia Computer Science

a. Vulnerabilities in shared technology—increased resource usage provides attackers with new opportunities.

a point of attack that can deal damage disproportionate to its importance. An example of sharing

The technology is named a hypervisor, or cloud orchestration.

b. Data Breach - because the burden of data protection shifts from cloud consumers to cloud service providers, the risks of accidental, malicious, and intentional data breach increase.

c. Account-of-Service Traffic Hijacking: one among the greatest benefits of the cloud is that it's the Internet, but the danger of account compromise is the same. Losing access to privileged accounts means loss of service.

i.e., Denial of Service (DoS)-A denial of service attack against a cloud provider can affect all policies.

e. Malicious Insiders-Determined insiders can find more ways to attack and conceal their tracks in the cloud scenario.

f. Internet Protocol-Many IP-specific vulnerabilities like IP spoofing, ARP spoofing, DNS, etc.

Addiction may be a real threat.

G. Injection vulnerabilities—SQL injection bugs, OS injection, LDAP vulnerabilities, etc.

Injections within the management plane can cause major problems for multiple cloud consumers.

H. API and Browser Vulnerabilities: Vulnerabilities in cloud provider APIs or interfaces are significant risks related to social engineering or browser-based attacks. The damage is vital.

Me Changing business models: Cloud computing are often a game changer for cloud customers.

type of business. IT departments and businesses must adapt or face the risks.

Conclusion

Cloud computing security evolves with risk, as risks are often discovered too late to stop.

Incident Cloud computing presents challenges thanks to its disruptive nature, complex architecture, and resources used.

Severe risks are inherent to all or any parties involved. It's important that all stakeholders understand the risks and benefits.

Adjust them properly. Security must be built into every layer of a cloud computing platform.

In order to effectively mitigate risk, incorporate best practises and new technologies.

Consumers, vendors, brokers, carriers, accountants, and every one other should take necessary precautions.

The risk of successfully securing a cloud computing platform versus the risk of facing significant, potentially business-critical risk consistent with recent research, the industry recognises that security technology offers the simplest solutions.

practices, methods, techniques, and techniques for developing systems and services designed for security, sustainability, and resilience. It's important to advance this research to provide such best practices.



More applications and use cases. Further research on the system development life cycle (SDLC) is additionally necessary for cloud consumers to integrate various developments and technological advances.

models that radically improve security and container systems like Docker. Besides, there

Research on training and its impact on human safety is extremely limited. I can work to know it.

Challenges, Requirements, and Impacts of Effective Security Training for Consumers and Other Providers

II.METHODOLOGY

The method used for data collection about the reliability and data security opinions in the user of cloud is internet questionnaire.

Questionnaire

1. Do you ever used any of the cloud storage service?
2. Do you think your data is secured in cloud?
3. Is cloud services friendly to you?
4. In your company or in your college, is there any cloud service used?
5. How much cloud service reliable to you?

This are the question we have spread throughout the cloud users to receive their opinions about cloud services

III.MODELING AND ANALYSIS

The responses of the questionnaires have been generated and the graphs and pie charts of the responses are as follows

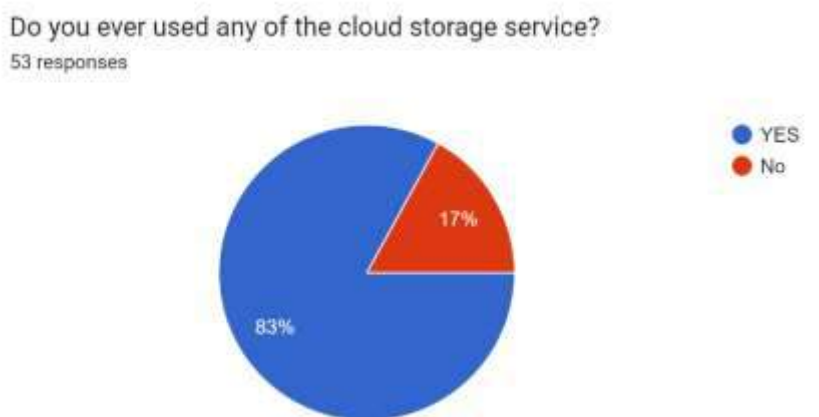


Figure 1

Here the figure one defines that around 83% of the people use the CLOUD STORAGE SERVICES and 17% of them don't use the cloud storage services because of the security concerns. Using the cloud for storage gives you access to your files from anywhere that has an internet connection. In the event of a hard drive failure or other hardware malfunction, you can access your files on the cloud. It acts as a backup solution for your local storage on physical drives.

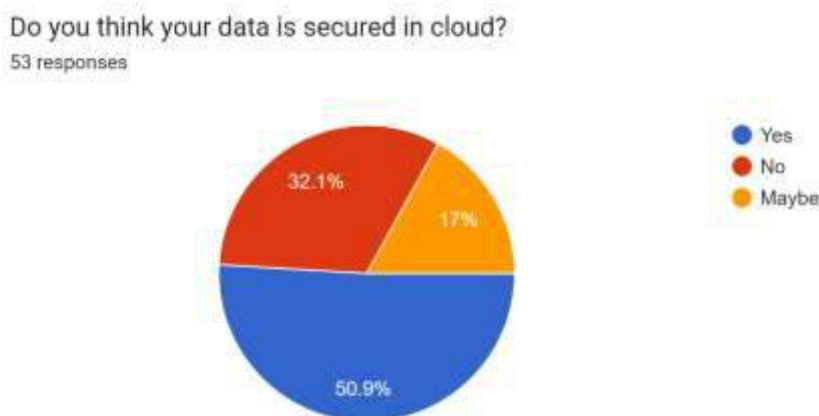


Figure 2



Here the figure defines what people think about their data is secured over the internet cloud or not, as far as the survey is concerned 32% of audience think that their data over the internet is not secured, 17% of the audience thinks that maybe their data is secured over the internet is not, and almost 50% of the data things that their data is secured

Is cloud services friendly to you?

53 responses

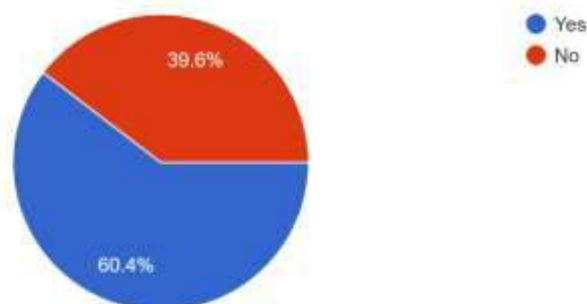


Figure 3

Here the figure defines what people think about their cloud services it is friendly or not, as far as the survey is concerned 39.6% of audience think that their cloud services is not friendly, and almost 60% of the people things that their cloud services if friendly

In your company or in your college, is there any cloud service used?

53 responses

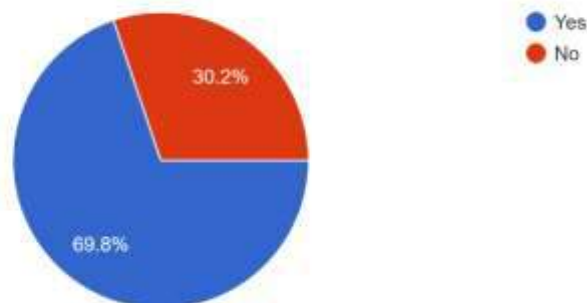


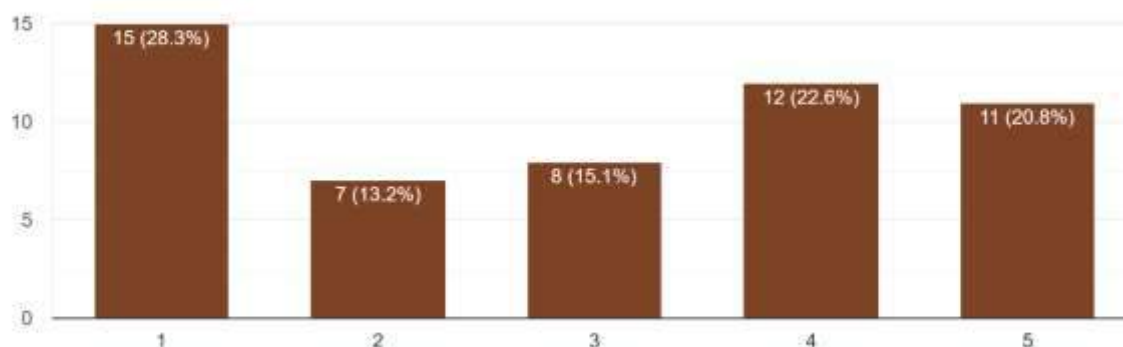
Figure 4

Here the figure defines how many people in their company uses the cloud services or not, as far as the survey is concerned 30.2% of audience not use people use the cloud service in their company, and almost 69.8% of the people use the cloud service in their company



How much cloud service reliable to you?

53 responses

**Figure 5**

Here the figures define how many people think how much cloud service is reliable to them or not, 28% of the people that the cloud service is very poor, 13% and 15.1% of the people think the cloud reliable service is good, 22% and 20.8% of them tell in the service that the reliability of the cloud service they are using is very good and reliable.

IV. RESULT AND DISCUSSION

The responses of the questionnaires have been generated and the graphs and pie charts of the responses are as follows

Here the figure one defines that around 83% of the people use the CLOUD STORAGE SERVICES and 17% of them don't use the cloud storage services because of the security concerns. Using the cloud for storage gives you access to your files from anywhere that has an internet connection. In the event of a hard drive failure or other hardware malfunction, you can access your files on the cloud. It acts as a backup solution for your local storage on physical drives. These figures define how many people think how much cloud service is reliable to them or not, 28% of the people that the cloud service is very poor, 13% and 15.1% of the people think the cloud reliable service is good, 22% and 20.8% of them tell in the service that the reliability of the cloud service they are using is very good and reliable. Figure defines how many people in their company use the cloud services or not, as far as the survey is concerned 30.2% of audience not use people use the cloud service in their company, and almost 69.8% of the people use the cloud service in their company.

V. CONCLUSION

Despite several advantages offered by the cloud computing, it also fosters security concerns that hamper the fast rate adoption of the cloud computing. All of the users whether individual or organization should be well aware of the security threats existing in the cloud. Comprehending the security threats and counter measures will help organizations to carry out the cost benefit analysis and will urge them to shift to the cloud. As the cloud computing utilizes many traditional along with novel.

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MARKETING ANALYSIS INVOLVING DEMAND AND PROFIT ASPECTS IN BADI MAKING OF KEONJHAR DISTRICT OF ODISHA

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ABSTRACT

The objectives of paper are to highlight mainly the marketing analysis and demand as well as profit analysis of Badi making involving Women Badi workers in Keonjhar district of Odisha. The study is based on primary data collected from 200 Women Self Help Groups badi workers respondents of five selected areas.

KEYWORDS: Badi, Marketing, Entrepreneurs, Women, Self Help Group.

JEL Classification: - O

INTRODUCTION

Marketing and availability of finance are essential requisite for successful entrepreneurship and profit maximization. This chapter aims to analyse the marketing of Badi and support provided by Odisha Rural Development and Marketing Society (ORMAS) and Subhashree Badi Federation in Keonjhar District of Odisha. Profit in Badi making activity largely depends on quality of product and location of sale. Marketing has evolved into an awfully vital practical space in management essentially thanks to the increasing offer over the year which is mainly through the competitive market intensity. Every firm wants to be in the apex in the market only when marketing competition will increase. Hence it will build the corporations to show a discrepancy than the newly entrants in business. Selling forms an awfully vital practical space for each firm irrespective of high competition. From the business perspective, selling creates the profits where area unit managed by monetary individuals as well as utilized by the productions in making good services to the product. To get the desired revenues from Badi making, it's very important to satisfy the customers by bringing out new challenges in the market in a much sociable as well as accountable manner. At the structural level, selling could be an important business operate that's necessary in every enterprise even though the organization operates either in profitable or not in profitable manner. To make a product more sellable in the market, promotion plays an important role. So, for this, sales advertisement, sales promotion, marketing and public relations form an important aspect in promotion. In the 4 P's of marketing, promotion has become the most important identity in marketing.

On 14th January, 1991 to render services in promoting and selling the rural product in Odisha, Odisha Rural Development and Marketing Society (ORMAS) have been created by the Panchayat Raj & Water Resources Department, Govt. of Odisha. To channelize in different aspects of marketing to strengthen the various selling channels for the development of small ventures and business enterprises, the rural producers of small and cottage industries adopt new rural way of technology, different style of diversification of development of the products, ultra-modern packaging with certification and branding of the rural products. So, for these reasons for the establishment of strong and effective marketing channels for rural products, ORMAS and DSMSs in each and every district have been successfully operating since last 25 years. For the effective state of Government affairs, various methods in the development program implemented as a capacity building method where all the civil societies and grass root institutions are involved in gaining transparency at various levels where ORMAS plays an apex body in knowledge creation and also in adapting and creating various socio-economic activities to the people. For the sustainability of new initiatives and to work with various agencies/institutions, ORMAS has a much role of facilitator rather than implementer. In the evolvement of ORMAS, moreover its role has not yet been changed while the role of its partners is changing with the tune of time. ORMAS is spreading its role on rural sector.



So keeping this in view, mainly ORMAS is a Knowledge Based Agency where it keeps field level interventions with the cottage industries workers in which Badi making business enterprise is a successful model in Keonjhar district which is taking its dimensions to the next level with partnership at all levels such as state, districts and grass root levels. Its Partnership at Keonjhar district level is with women badi workers affairs, their skill promotion, vocational training centers, district level training institutes, Women Badi workers Business Association, Traders Associations, federations, NGOs/ INGOs, Wholesale Input suppliers, Banks.

OBJECTIVES

The paper has two broad objectives as follows:-

- 1- To study the marketing of Badi in sample study areas of Keonjhar district of Odisha.
- 2- To study the demand as well as profit analysis of Badi making activity in sample study areas of Keonjhar district of Odisha.

METHODOLOGY

For data collection and methodology purpose, a total of 200 women badi workers were taken from 5 sample study areas of Keonjhar district of Odisha. Primary data source is used to collect the data and a structured questionnaire is designed and implemented in extracting information from the respondents. Simple Random Sampling technique is being used in selecting households and Purposive Sampling technique is being used in selecting the areas. Statistical tools viz., Regression models using SPSS Software is used.

REVIEW OF LITERATURE

Malathi Ramanathan (2004): The author through the article “Women and Empowerment, Shri Mahila Griha Udyog Lijjat Papad”, has made an attempt to study the rise and growth of an organization, resulting from a group of women’s practical step to get supplementary earning. It is about empowerment at an organized cooperative level. The article concludes that the organization was positive in its approach in promoting economic empowerment of women and was well recognized. The article has made an attempt to answer the questions like, what are the reasons for success and spread of Lijjat papad as a women oriented organization? In what way have the women of Lijjat papad contributed to bringing about a constructive change in their own lives and that of the people in and around their orbit of work?

Harlod Welsch Earl Young (2009): The authors have focused on a comparative analysis of male and female entrepreneurship along selected demographic, psychological and behavioral dimensions in the article “Male and Female Entrepreneurial Characteristics and Behaviours: A Profile of Similarities and Differences”. The major findings of this study are that no difference exists in personality characteristics between male and female entrepreneurs and it has several important implications such as, female entrepreneurs do not necessarily view themselves as victims of their environment more so than male entrepreneurs.

Lalit Kumar Sharma (2011): The author through the article “Self Help Group as an Effective Strategy and Feasible Approach to Empower Women in India” has highlighted the benefits of psychological, social and economical factors accrued by women participating in SHGs and to explore the merits of SHGs as strategy and approach to empower women in India. Empowerment is a process of awareness and capacity building leading to greater participation, greater decision making power and control and transformative action. The study concludes that women participation in SHG have created tremendous impact upon the life pattern and style of poor women especially in rural areas and empower them at various level not only as individual but also as member of family, community and society as whole.

Madhulata Anand (2011): The author through the book “Women Empowerment” describes status and condition of women at the outset and then makes elaborate on legal and social approach to women empowerment, social problems of women, health and nutritional status of women, women labour and family structure, labours-wage policies concerning women, educational human rights of women, educational system and sexuality and ideology of women in the social context.

Dr.K.Someshwer Rao (2011): The author has highlighted the future challenges to be faced by women and problems of entrepreneurship in the article “Problems of Rural Women Entrepreneurship in India”. The study has identified certain problems of rural women in business. The suggestion is that the state and central governments have to initiate special programmes for the development of rural women entrepreneurs in India.

Shaikh Shafeequr Rahmaan (2012) through their article “Empowerment of Women for Social development” had made an attempt to raise the standard of women and had found that the organization is responsible for empowering women by way of promoting self reliance, self confident, self dependant and educating them to realize their fundamental rights. Lijjat as a trust is a service organization engages in serving poor and destitute and to empower women for social development. The author had enlightened on Empowerment by his golden words i.e., “The women empowerment is not a onetime affair but a continuous process.”

Jennings and Brush (2013) conducted a study to document the development of the body of work known as women’s entrepreneurship research. In this study through the broader entrepreneurship literature the contributions of this work was assessed and



discussed how this broader literature poses challenges (both difficulties as well as opportunities) for scholarship on female entrepreneurs. It was found that this sub-area has come a long way in a very short period of time, surpassing many of the developmental milestones as the broader field of entrepreneurship despite its more recent origins.

Sanchita (2013) analyzed the socio- economic profile of the woman entrepreneurs and interpreted the management problems of women entrepreneurs of small-scale sector in Haryana. The study was based on primary data which was collected by the researcher by conducting a survey of 210 women entrepreneurs of small-scale sector in Haryana (out of the list of 321 made available by the directorate of Industries Haryana, Chandigarh) by personal interview method by using a comprehensive interview schedule. It was recommended that to harness the potential and continued growth and development of women entrepreneurs and to formulate appropriate strategies for stimulating, supporting and sustaining their efforts to run smooth functioning of enterprises, we need to provide them level -playing- field for healthy competition.

Nandini (2014) studied the profile of famous women entrepreneurs in India and analyzed the sectors preferred by women entrepreneurs in India. It further studied the promotional efforts of government for the growth of women entrepreneurship. It was suggested that empowering women with the entrepreneurial skills, information technology, micro and macro finance options will foster economic growth of the nation.

Sarmista Nandy et al (2014), women entrepreneurs have been making a significant blow in all the segments of the economy which is more than 25% of all types of business. As per center for Women's Business Research, 2009 women entrepreneur were growing twice as fast as the other business since 1997 to 2002. During the 2008 economic depression, 5% of high potential women and 4% of high potential men left their employment to establish their own business.

Kauffman Foundation article (2015)'Challenges facing New Entrepreneurs in 2014' identifies tax-related regulations to be specific government regulation posing greatest difficulty for about 41.49 per cent new entrepreneurs out of 617 respondents. Other general challenges faced by new entrepreneurs are unpredictability of business conditions and lack of access to credit.

Junare and Singh (2016)in their work 'An Analysis of Technological Practice among Women Entrepreneurs of different Entrepreneurial Avenues in Selected Cities of Gujarat' on basis of survey conducted on 50 women entrepreneurs of Ahmedabad and Vadodara, cities of Gujarat tries to probe the entrepreneurial avenues they chose to practice their entrepreneurial skills. The result suggests that women are mostly into the business of manufacturing of customized clothing (22 per cent) followed by retail business (16 per cent) and engineering based and handicraft businesses (10 per cent each)

DATA COLLECTION & RESEARCH METHODOLOGY

Table No.1 showing the Marketing of Badi in sample study areas of Keonjhar District of Odisha

Particulars		Atop ur	Dimbo	Dhenkap ur	Old Town	Kashipur	Total
Types of Buyers	Local People	40	40	40	40	40	200
	Tourists	0	0	0	0	0	0
Total							200
Distance (km) from home to sell point	0-1	40	40	40	40	40	200
	1-2	0	0	0	0	0	0
	2 & Above	0	0	0	0	0	0
Total							200
Marketing of the Badi	Local Market	40	0	40	40	40	160
	Through Intermediaries	0	0	0	0	0	0
	Through Cooperatives	0	40	0	0	0	40
Total							200

Source: Primary Data

ORMAS and Subhashree Badi Federation are providing good marketing network to the women Badi workers. They motivate women workers to participate in Pallishree Mela arranged by the Government of Odisha. Table no.1 explains that out of 200 respondents, 40 respondents market their badi through cooperatives whereas 160 respondents market their badi through local market. Since, the cooperatives and federation have a fixed purchase price of Badi and delay in payment, the women Badi workers prefer to sale their Badi to the local people and traders. Out of 200 respondents, all respondents sell the badi to the local people. The local traders of Badi are very active in the study area to purchase from the women Badi workers and sale to the retail shops and wholesalers.



Even many local people purchase Phula Badi for their home consumption. Therefore, all 200 respondents sell their badi within a range of 0-1 km of distance from the selling point.

Demand Analysis of Badi in sample study areas of Keonjhar district of Odisha

Demand Analysis of badi is conducted to find out the customer demand and to take business decision regarding price and production of badi. The present research work made an attempt to determine the factors influencing demand for badi in Keonjhar District. Linear, logarithmic and quadratic regression models are used to test the validity of demand theory. The purpose of using three models is to examine whether the results vary with change in functional forms of regression. It is observed that the results are similar in all three regression models. Further, different regression models are fitted to check the robustness of results. The results of three regression models are presented below Table No.2.

Table No.2 Showing the Model Summary and Parameter Estimates								
Dependent Variable: Quantity								
Equation	Model Summary					Parameter Estimates		
	R Square	F	df1	df2	Sig.	Constant	b1	b2
Linear	.462	170.195	1	198	.000	16.387	-.039	
Logarithmic	.524	218.217	1	198	.000	58.303	-9.395	
Quadratic	.611	155.014	2	197	.000	37.046	-.222	.000
The independent variable is Selling Price.								
Source: Computed by Author								

Table No.2 shows that there is negative relation between demand of badi and sale price. The estimates of regression coefficients in all three regression functions are statistically significant at 1 per cent level and consistent with the demand theory.

Profit Analysis of Badi making Activity in sample study areas of Keonjhar district of Odisha

Profit is the primary objective of badi making activity which motivates the women workers to take loan from bank and federation in the district and it is observed that there is variation in profit in five different study areas. Therefore, the monthly profit from Badi making activity of different workers is presented in Table No.3.

Table No.3 showing Monthly Profits from badi making activity

Profit Range (Rs)	Atopur	Dimbo	Dhenkapur	Old Town	Kashipur	Total
10000-20000	35	40	13	14	35	137
20000-30000	5	0	27	26	5	63
30000 & Above	0	0	0	0	0	0
Total	40	40	40	40	40	200

Source- Compiled from primary data

In Atopur and Kashipur area, the profit of 35 women workers are in the range of Rs. 10000 – 200000 whereas 40 women workers in Dimbo area, only 13 and 14 in Dhenkapur and Old Town area belong to same profit range. Hence, it is found that 27 and 26 women workers in Dhenkapur and Old Town area earn monthly profit in between Rs.20000- 30000. This is primarily because of higher sale price of Badi in these areas.

Table- 4 showing Profit per kilogram and Profit per day from Badi Making activity

Particulars	Profit Range (Rs)	Atopur	Dimbo	Dhenkapur	Old Town	Kashipur	Total
Profit earn per Kg (Rs)	0-100	37	40	16	22	37	152
	100-200	3	0	24	18	3	48
	200-300	0	0	0	0	0	0
Profit Earn per Day (RS)	0-500	26	0	0	40	26	92
	500-1000	14	40	40	0	14	108
	1000-1500	0	0	0	0	0	0

Source- Compiled from primary data



Table No.4 represents a comparative picture of profit per kg of Badi and profit per day of women Badi workers. The profit per kg is in the range of Rs.100 -200 are 48 badi workers out of which 24 belong to Dhenkapur and 18 badi workers belong to Old Town area. 152 Women Badi workers earn profit within Rs.100 per kg. It is clearly visible from the table that profit per day of Badi workers are quite higher than the minimum wage rate fixed by the Government. 108 Badi workers earn profit per day in the range of Rs. 500-1000. So, Badi making is a lucrative occupation for the women in the study areas.

FINDINGS OF THE STUDY

The present research work is an area specific and product specific micro research study based on women only. Since this is an exhaustive study on badi making conducted for the first time in a tribal dominated district of Odisha, all findings are original in nature. Some of the key findings of the study are outlined below.

- 1- From all the 200 respondents, local people form the primary buyers from the women badi workers.
- 2- All the 200 respondents sell their produce in the range of 0-1 kms from home to selling point.
- 3- Out of 200 respondents, 160 respondents market their product in the local market whereas rest 40 respondents market their product through cooperatives.
- 4- There is negative relation between demand of badi and sale price. The estimates of regression coefficients in all three regression functions are statistically significant at 1 per cent level and consistent with the demand theory.
- 5- In Atopur and Kashipur area, the profit of 35 women workers are in the range of Rs. 10000 – 200000 whereas 40 women workers in Dimbo area, only 13 and 14 in Dhenkapur and Old Town area belong to same profit range. Hence, it is found that 27 and 26 women workers in Dhenkapur and Old Town area earn monthly profit in between Rs.20000- 30000. This is primarily because of higher sale price of Badi in these areas.
- 6- The profit per kg is in the range of Rs.100 -200 are 48 badi workers out of which 24 belong to Dhenkapur and 18 badi workers belong to Old Town area. 152 Women Badi workers earn profit within Rs.100 per kg. It is clearly visible from the table that profit per day of Badi workers are quite higher than the minimum wage rate fixed by the Government. 108 Badi workers earn profit per day in the range of Rs. 500-1000. So, Badi making is a lucrative occupation for the women in the study areas.
- 7- SHG Badi workers have better marketing facility than Non-SHG badi workers. ORMAS attached with SHG Badi workers to facilitate the marketing facility which Non-SHG badi workers don't have. Due to ORMAS, SHG Women badi workers sell their badi in nearby shops, grocery shops, hotels, stall and fairs inside and outside the district whereas the Non-SHG badi workers sell badi in their home only. Owing to this, it can be said that marketing and market orientation is a trait which is associated with market related implementation to manage their business SHG Women Badi workers had medium to high level of market orientation as the SHG Badi workers had taken up entrepreneurial activities, while in case of Non-SHG Badi workers they are not involved in entrepreneurial activities and thus low level of market orientation.

SUGGESTIONS

Since badi making is a profitable occupation and it leads to economic empowerment of women in Keonjhar district, there is an urgent need to promote this activity. It is important to create awareness about the various schemes of government for promoting entrepreneurship among women. After the field survey and analysis of socio economic status of women Badi workers, the suggestions are as follows-

1. Quality control is an important aspect in any business activity or in any enterprise, so when the badi workers are preparing the badi there should be a vigilant eye on the quality of the badi from preparation to final sell of it. The quality of Phula Badi depends on the ingredients used, the processing technique and the frame used in badi making. The composition of ingredients can be improved by adequate research to increase its durability and taste. Therefore it is suggested to establish a Research Centre for Phula Badi in Keonjhar district.
2. Government should take initiatives to provide training to the WSHG Badi workers regarding processing, sources of capital, marketing and techniques of export to foreign countries. To get benefits from micro credit schemes numerous training as well as literacy programmes are need of the hour for the women badi workers. To empower the women badi workers and in providing them with micro credit facility, training in rights to legal literacy and gender sensitization are very much essential.
3. It is suggested to establish a Badi Promotion Fund by the government which can provide timely soft loans and financial assistance to the women badi workers in the district.
4. The members ought to be necessarily intensified with accounts keeping and book keeping knowledge which will increase the working of the SHGs in the cluster.
5. WSHG involved in badi making should be more pro-active with enthusiasm and dynamism to channelize their savings in group activity. NGO's should come forward to act as a helping hand to the badi workers.



6. Banks should come forward to provide adequate credit to the Badi workers in accordance to their needs. The lending procedure should be simple and more flexible for the SHG badi workers.
7. District authority should organize more periodical exhibitions and trade fairs in the districts as well as block level where the badi can be displayed in the stalls. In order to develop badi workers strength in the group, frequent seminars and meetings should be organized.
8. Regarding the designing of the badi, training in new technology and marketing of the badi, simultaneous intervention by district authority, state professional bodies and voluntary organizations should be with the badi workers to make them successful entrepreneurs.
9. For the benefits of the badi workers in the long run, Government should make right approach of policy implications to decrease their poverty and increase their aspirations to self-reliance and development in badi making business.
10. The women badi workers both in SHG and Non-SHG and also in Federation linked SHG, the women give the shape of the badi manually and also in many occasion it is time consuming, so in order to save time, there should be a mechanized way of giving the shape and design to the badi.

CONCLUSION

The “Badi” making industry is one of the home-based processing units which have provided ample opportunities of employment to the women of low socio-economic status. In this study, an attempt is being made to access indigenous method of badi preparation of household level to motivate the women entrepreneurs for popularizing this traditional food. WSHG Badi workers prove to be a powerful tool for the socio-economic development of women and it provides a platform to the women to discuss their problem which enhances their skills and to improve their living standard. This study shows that the positive impact of financial gain on badi workers has been increased. It also brings changes in the decision-making power of the women. The communication skills of the Women Badi workers have been developed because they communicate freely with outsiders without any hesitations. Though SHG women badi workers are socially and economically developed and their living standard has improved still then they need support from their family members, society and government.

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ON THE MORPHOBIOLOGICAL CHARACTERISTICS OF SOME ENDEMIC PLANTS DISTRIBUTED IN THE FERGANA VALLEY

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ABSTRACT

The article presents information on revealing the morpho-biological characteristics of some endemic plants scattered in the Fergana Valley, signs of adaptation to environmental conditions, and preservation.

KEY WORDS: *endemic plant, plant protection, flora, rare, endemic, morpho-biological features, species, genus and family, life forms.*

INTRODUCTION

Over the next two decades, the global crisis of biological diversity continues, despite increasingly large-scale measures. Sustainable management of biological resources and their rational use require targeted rapid and decisive measures aimed at preserving specific species and ecosystems. For this, it is necessary to further strengthen the capacity to study and systematically monitor biological diversity at the national and international level, improve the functional activity of natural ecosystems, and develop a set of measures.

It is known that plants are effectively used in all spheres of the national economy. Examples include animal husbandry, medicine, food industry and other fields. But because of this, the use of plants more than the specified amount has a negative effect on the vegetation cover. In the continuation of such actions, the flora of plants is decreasing in number as a result of anthropogenic factors, some species are on the verge of extinction, a large number of plant species are included in the Red Book of Uzbekistan, protection of plants, their preservation, reproduction and expansion of their distribution area, and the identification of environmental factors affecting them. and confirms that the analysis is one of the current issues of the day.

Fergana Valley has been the object of geobotanical research. A number of scientists conducted their scientific research in this field, including M.M. As a result of Arifkhanova's many years of research, a monograph entitled "Rastitel'nost' Ferganskoy doliny" was published [1967]. The monograph is dedicated to the study of the vegetation cover of the Fergana Valley not only in Uzbekistan, but also in neighboring Kyrgyzstan and Tajikistan.

Fergana Valley, including its separate basins [Arifkhanova M.M., Pratorov O'P.], [Kholkoziev P.Kh., 1980], [Madumarov T.A., 2005], [Tojiboev K.Sh., 2006, 2010] et al. Despite the large number of conducted researches, there are not enough scientific works on the whole flora of the valley and the rare and disappearing endemic plant species and their analysis.

Our republic, in particular, has studied the flora of the Fergana Valley, but it cannot be said that it has been completed. Because many areas are studied in general. Therefore, according to the information based on new studies, some genera or species are newly observed or added.

In addition, depending on the level of exploitation of plants, some plant resources are endangered, while others are well preserved.

Based on this, in our article, we set ourselves the goal of identifying unique, endemic species in the flora of Uzbekistan, particularly the Fergana Valley, studying their morpho-biological characteristics, and clarifying the tasks of protection.

MATERIALS AND METHODS

The object dedicated to the composition of the rare and endemic plant species distributed in the Fergana Valley is the plant species alien to the local flora and introduced from other flora for various reasons. The information provided in the article was prepared on the basis of field research and literature data devoted to the study of the flora and vegetation cover of this Fergana valley. Information on the composition and distribution of rare and endemic plant species distributed in the regions of the Fergana Valley was used in brochures such as "Identifier of plants of Uzbekistan" (1987) [12], "Identifier of plants of Central Asia" (1963-1993).

Herbarium samples of rare and endemic plant species distributed in the Fergana Valley were used. The information provided on the sites vvv.ziynet.uz, wikipedia.org was also used. M. in the formation of the composition of the species of the Karrak family. M. From Arifkhanova's monograph "Vegetation cover of the Fergana Valley" (1967), T. T. The results of



Rahimova's scientific research in Chortoq hills (1973-1974) and K. Sh. The results of Tajiboev's research on "Vegetation cover and meadows of the Chodaksoy Basin" were used.

Methods - the information given in various literature about the species that can be found in this area are widely used and generally accepted methods in floristry. Among the widely used methods was the route method, that is, organized field trips to different parts of the region.

RESULTS AND DISCUSSION

Below we present data on the study of morphological characters of plants endemic to the Fargona Valley.

LILIACEAE – Family

Gagea Salisb. – Genus

Gagea adylvii Levichev & F. Karim. ined.

Material: Namanganskaya obl. Namangansky district. Predgor. Chatkal ridge. 700 m. 15.04.2011, Karimov; Bibliography: ined!!; Life form: Perennial herb; Altitude region: highlands; District: Fergana; Region: Namangan; Area type: Ferganasky.

Gagea chorkessarica Levichev & Karimov, ined.

Material: Namanganskaya obl. Papsky district. predgor. Kuraminsky xr. Chorkesar 820-900 m., 04.05.2012, Karimov; Bibliography: ined!!; Life form: Perennial herb; Altitude region: mid-mountain; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

Gagea khassanovii Levichev & F. Karim., ined.

Material: Namanganskaya obl. Namangansky district. s/x Samarkand predgor. Chatkal ridge, 15.04.2011, Levichev, Karimov; Bibliography: ined!!; Life form: Perennial herb; Altitude region: highlands; District: Fergana; Region: Namangan; Area type: Ferganasky.

Gagea namanganica Levichev & Karimov, ined.

Material: Namanganskaya oblast, Namangansky district, Samarkand savkhoz, pred. Chatkalsky ridge, 15.04.2011, Karimov, son. Bibliography: ined!!; Life form: Perennial herb; Altitude region: highlands; District: Fergana; Region: Namangan; Area type: Ferganasky.

Gagea pallidula Levichev & Karimov, ined.

Material: Namanganskaya oblast, Papsky district, foothills of the Kuraminsky ridge, 10.04.2012, Karimov; Bibliography: ined!!; Life form: Perennial herb; Altitude region: highlands; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

Gagea uyguriensis Levichev & Karimov, ined.

Material: Namanganskaya oblast, Papsky district, foothills of the Kuraminsky ridge, 04.05.2012, Karimov; Bibliography: ined!!; Life form: Perennial herb; Altitude region: highlands; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

Tulipa intermedia Tojibaev et J.J. de Groot

Material: Uzbekistan. Ferghana Depression: Kurama Mt Range, Pap-Chust foothills, vicinity of Muruldi and Kandisai villages, Artemisia steppe, 30.03.2013, K. Tojibaev 156 STONE; Bibliography: Nordic Journal Botany 32(5): 546. (2014); Life form: Perennial herb; Altitude region: highlands; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

Tulipa scharipovii Tojibaev

Material: Tien-Shan Occidentalis, montes Kuramensis, propepagum Uygursay, N 40°54'54.7", E 71°03'28.1", h = 530 m.s.l., 20.03.2009, Tojibaev; Bibliography: Linzer Biologische Beiträge 41: 1063 (2009); Life form: Perennial herb; Altitude region: highlands; District: West Tien-shon; Region: Namangan; According to the Red Book: Krasnaya kniga Uzbekistana (2009), category 2; Area type: Chorkesarsky.

IRIDACEAE – Family

Iris L. – Genus

Iris austrotschatkalica Tojibaev, F. Karim. & Turgunov

Material: West Tian Shan. Southern Chatkal. Ungor-Tepa mountains. 3 km north of the Paramon village. Stony slopes, 1200 m a.s.l. 41°25'18.69" N, 71°43'44.39" E. 24.04.2010, Karimov, Turgunov; Bibliography: Turczaninowia 17(4): 12 (2014); Life form: Perennial herb; Altitude region: lower mountain; District: Fergana; Region: Namangan; Area type: Ferganasky.

AMARYLLIDACEAE – Family

Allium L.

Allium adylvii Tojibaev & R.M.Fritsch ined.

Bibliography: ined!!; Life form: Perennial herb; Altitude region: highlands; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

Allium chorkessaricum F.O. Khass. & Tojibaev



Material: Uzbekistan. Kuraminsky ridge, Parda-Tursun, Novbulak, 41°07'13.9" N, 70°48'24" E, 2900 m, 28.06.2009, Tojibaev; Bibliography: Stapfia 92: 27 (2010); Sennikov vo flora Uzbekistana Volume 1:95 (2017); Life form: Perennial herb; Altitude region: mid-mountain; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

***Allium haneltii* F. O. Khass. & R. M. Fritsch**

Material: Uzbekistan. Kuraminsky ridge, u k. Chorkesar, vys. 900 m, 30.05.1997, Khasanov, Fritsch 637; Bibliography: Linzer Biologische Beiträge 30: 285 (1998); Sennikov vo Flora Uzbekistana Volume 1:60 (2017); Life form: Perennial herb; Altitude region: highlands; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

***Allium kuramense* F. O. Khass. & N. Friesen**

Material: Uzbekistan. Montes Curamensis, in fissuris rupium prope pagum Charkesar, alt. 900 m, 30.05.1997, Khasanov, Fritsch 1636; Bibliography: Linzer Biologische Beiträge 30: 287 (1998); Sennikov vo Flora Uzbekistana Volume 1:85 (2017); Life form: Perennial herb; Altitude region: highlands, lower mountains; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

***Allium orunbailii* F. O. Khass. & R. M. Fritsch**

Material: Uzbekistan. Tian-Shan Occidentalis, Montes Kuramensis, prope pagum Chorkesar, 700 m, 25.05.1998, Fritsch, Khasanov 1676; Bibliography: Stapfia 80: 385 (2002); Sennikov vo Flora Uzbekistana Volume 1:82 (2017); Life form: Perennial herb; Altitude region: highlands, lower mountains; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

***Allium scharobitidini* F.O. Khass. & Tojibaev**

Material: Uzbekistan. Kuraminsky ridge, vozle kish. Chadak, 41°06'51.7" N, 70°36'57.4" E, vys. 2170 m, 28.06.2009, Tojibaev; Bibliography: Stapfia 92: 27 (2010); Sennikov vo Flora Uzbekistana Volume 1:72 (2017); Life form: Perennial herb; Altitude region: mid-mountain; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

***Allium tatyanae* F.O. Khass. & F. Karim.**

Material: Uzbekistan. Ferganskaya valley, Namangansky district, mountains of Yangikurgan and Ungur, 41°24'58.88" N, 71°43'49.9" E, vys. 1239 m, 28.04.2011, Karimov, Batoshev; Bibliography: Stapfia 99: 211 (2013); Sennikov vo Flora Uzbekistana Volume 1:76 (2017); Life form: Perennial herb; Altitude region: highlands, lower mountains; District: Fergana; Region: Namangan; Area type: Ferganskyy.

***Astragalus austroferganicus* Kamelin & R. M. Vinogr.**

Material: Uzbekistan. Willis Ferganensis, districtus irrigationalis Jangi-aryk. 21.06.1928, Joffe 398; Bibliography: Vinogradova Opredelitel Rastenii Sredney Azii 6:203 (1981); Life form: Perennial herb; Altitude region: highlands, lower mountains; District: West Tien-shon; Region: Namangan; According to the Red Book: Krasnaya kniga Uzbekistana (2009), category 0; Area type: Zapadnotyanshansky.

***Astragalus rubellus* Gontsch.**

Material: Systema fl Syrdarja. District Fergana. In arenis mobilibus prope Karakalpak. 01.05.1913, Dolenko 314; Bibliography: Kovalevskaya Opredelitel Rastenii Sredney Azii 6:161 (1981); Goncharov and Borisova Flora SSSR 12:180 (1946); Goncharov Flora Uzbekistana 3:520 (1955); Life form: Perennial herb; Altitude region: plain; District: Central Fergana; Oblast: Fergana; According to the Red Book: Krasnaya kniga Uzbekistana (2009), category 1; Area type: Pritashkentky.

***Oxytropis schachimardanica* Filim.**

Material: Jugum Alaicum. In viciniis pagi Schachimardan montes Izbassarenses, 8.06.1948, Schafeev; Bibliography: Filimonova Opredelitel Rasteniy Sredney Azii 6:352 (1981); Life form: Perennial herb; Altitude region: mid-mountain; District: Fergana-Aloy; Oblast: Fergana; Area type: Ferganskyy.

***Parrya saxifraga* Botsch. & Vved. (=Neuroloma saxifraga (Botsch. & Vved.) Botsch.)**

Material: Zapadnyy Tian-shan. Pool Rack Angren. Verkhovya reki Angren po doroge ot saya Orta-aylyk do perevala Kem-saz. kamenisto shchebenesto pochva, 30.07.1938, Pyataeva and Momotov 401; Bibliography: Parrya saxifraga Botsch. & Vved. Bochantsev and Vvedensky v Botanicheskie Materialy Herbaria Botanicheskogo Instituta Uzbekistanskogo filila Akademii Nauk Uzbekskoi SSR. 3:15 (1941); Bochantsev and Vvedensky vo Flora Uzbekistana 3:124 (1955); Nikitina vo Flora Kyrgyz SSR. 6:213 (1955); Neuroloma saxifraga (Botsch. & Vved.) Botsch. Pakhomova v Opredelitel Rastenii Sredney Azii 4:123 (1974); Life form: Perennial herb; Altitude region: middle mountain, high mountain; District: West Tien-shon; Region: Namangan; According to the Red Book: Krasnaya kniga Uzbekistana (2009), category 2; Area type: Arashansky.

Scutellaria L. – Genus

***Scutellaria angrenica* Juz. & Vved.**

Material: Tian-Shan occident in declivibus septentrionalibus jugi Kuramanski Lailak-saj 21.06.1940, Usmanov 663; Bibliography: Yuzepchuk vo Flora USSR. 20:175, 511 (1954); Vvedensky vo Flora Uzbekistana 5:286 (1961); Scutellaria pycnoclada Juz. Abdullaeva vo Opredelitel rasteniy Sredney Azii 9:29 (1987); Life form: shrub; Altitude region: mid-mountain; District: West Tien-shon; Region: Namangan; Area type: Arashansky.

**Kuramosciadum Pimenov, Kljukov et Tojibaev – Genus*****Kuramosciadum corydaliifolium* Pimenov, Kljukov & Tojibaev**

Material: Jugum Kurama, Parda Tursun, juxta fontem fluminis Novbulak, in detritis mobilibus, h = 2700–2900 m supra mare, 20.06.2009, Tojibaev; Bibliography: Khasanov v Opredeletel rasteniy Sredney Azii 11:404 (2015); Life form: Perennial herb; Altitude region: high mountain; District: West Tien-shon; Region: Namangan; Area type: Chorkesarsky.

Oenanthe L. – Genus***Oenanthe fedtschenkoana* Koso-Pol.**

Material: Turkestan, Kokan, O. Fedtschenko; Bibliography: Shishkin vo Flora SSSR 16:533 (1950); Korovin vo Flora Uzbekistana 4:378 (1959); Nikitin and Flora Kyrgyz USSR. 8:73 (1959); Pimenov v Opredeletel Rasteniy Sredney Azii 7:262 (1983); Pimenov Krasnaya kniga Uzbekistana 1:114 (2009); Life form: Perennial herb; Altitude region: plain; District: Central Fergana; Oblast: Fergana; According to the Red Book: Krasnaya kniga Uzbekistana (2009), category 0; Area type: Ferganskyy.

CONCLUSIONS

According to the results of the study, 22 species of Fergana region, 9 species in Namangan region, and 1 species of plants distributed in the territories of Andijan region, out of total 39 species of plants included in the red book of Uzbekistan from Fergana valley endemic plant species. Of these, 3 types of plants are distributed in all regions of the valley. 4 types are found in Fergana and Namangan regions.

It is necessary to increase the research conducted in the field of preservation, reproduction and protection of rare plants to the level of today's demand. Otherwise, the number of species of rare plants will increase year by year in the valley.

As a result of the conducted research, the number of plant species, genera and families distributed in the Fergana Valley area, as well as their regional distribution and life forms were determined. Based on this, 488 genera belonging to 78 families and 1350 species are distributed in the valley area, of which 336 species grow in the desert, 437 species grow in the hills, 620 species grow in the mountains. According to the life form, 21 species of plants distributed in the region are trees, 124 species are shrubs, 26 species are shrubs, 790 species are perennial grass, 389 species were found to be annual and biennial grass plants.

Of course, among these plants, there are not a few species that are of great importance in the national economy. There is no doubt that their preservation, protection, and their use based on a scientifically based plan is the demand of the day. Their rational use requires comprehensive study of plant species.

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LEADERSHIP DEVELOPMENT STRATEGIES AND EMPLOYEE TASK PERFORMANCE

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ABSTRACT

This paper aims at examining the impact of leadership development strategies on employee task performance. This study adapted coaching/mentoring, training/development, and integration/delegation as strategies of leadership development, while the contingency theory was adapted as the theoretical foundation for the study. Findings revealed that the combined effect of these identified factors has an impact on employee task performance. The leadership development strategies prove a synergic effect and increase the overall employee task performance. The paper concludes that leadership development strategies have a significant impact on employee task performance thus we recommend that management should ensure that relevant coaching and mentoring programs are put in place to help employees improve their level of task performance, and continuous training should be organized for employees to improve their level of performance.

KEYWORDS: *Task Performance, Leadership Development Strategies, Coaching, Training, Integration*

1. INTRODUCTION

In every organization, employees are the most important assets. Their roles are fundamental to achieving all organizational goals and objectives in the workplace. Therefore, all implemented work cultures, strategies, and policies should produce a more favorable work environment that promotes growth and personal development for every employee. This is because every employee leans on the system's support in the discharge of responsibility. Unless an employee's career training is linked to organizational goals, employees are, in other words, free to act in any way that meets their objectives. To prevent this, a strategic leadership development program is required. Through a structured and guided development strategy, employees will be assisted in reaching their full potential. Since the advent of globalization, which has transformed existing business models, researchers have given a lot of attention to the concept of leadership. What is undeniably true is that effective leadership has influenced others to achieve desired outcomes (Hegarty & Moccia, 2018).

Whereas leadership can also be defined as guiding people to do things they have never done before or facilitating employees to show commitment to their work and contribute their best efforts to help organizations succeed (Leroy, Segers, Van Dierendonck, & Den Hartog, 2018), team leaders are constantly faced with the task of moving the team from where they are to a more desirable place. Process changes are required by the oil and gas industry's work culture for employees to be more efficient, effective, and satisfied at work. To develop an effective workforce, leadership strategies should engage best practices in training, skills, education, and the accumulation of relevant experience. While the need for leaders and leadership practices has changed significantly with time, there has been a relatively significant increase in leadership over the years. This concept has been reshaped over time resulting in current ideas on leadership which propose that the best form of leadership is to act by the situation and respond with specific actions that aid in the resolution of contingencies (Zeb, Ahmad, & Saeed 2018).

Such responses are products of intensive and target-driven training. Since studies have found that leadership practices have a notable impact on employees' behavior and contributions to the organization and, consequently, result in an impact on employees' performance and productivity, researchers have also investigated leadership practices and training strategies for their ability to improve employee performance by influencing attitudes, motivation, and behavior (Marescaux, Winne, Forrier 2019). Both the improvement in employee performance and the efficient leadership strategies deployed towards achieving them have been found to have an impact on organizational culture and success. Therefore, to manage employee-related uncertainties in a dynamic business environment, appropriate leadership styles and practices must be adopted. In essence, leadership consists of every quality and skill that could affect the realization of objectives and the well-being of employees in an organization (Putri, Mirzania, & Hartanto, 2020). Organizations gain maximally through effective leadership that stimulates employees' ability to adapt their attitudes and behavior to varying job roles and demands within the organization. Despite the various studies that have



been carried out, there still seems to be a low level of employee effectiveness. As a result, this study focuses on the evaluation of leadership development strategies, styles, and practices, as well as their relationship with employee workplace effectiveness.

1.2 Aim and Objectives of Study

The primary aim of the study is to investigate the relationship between leadership development strategies and employees' workplace effectiveness and the specific objectives of this research are to:

- i. Investigate the effect of coaching & mentoring on employee task performance.
- ii. Study the relationship between coaching & mentoring and employee task performance
- iii. Identify the effect of training & development on employee task performance

2 CONCEPTUAL FRAMEWORK

2.1 Literature Review

2.1.1 Leadership Development Strategies

The concept of leadership development involves the processes by which employee competencies and preparation for leadership and management roles within the firm are developed. A leadership development strategy is deployed towards the development of abilities and the formation of perspectives for motivating and guiding persons toward the accomplishment of certain goals. It comprises elements such as education and growth, individual decision-making involvement, coaching, job empowerment, and authorization. (Ollrich, 2005). In today's economic and competitive environment, leadership development is becoming an increasingly vital and strategic requirement for firms. (Sheri-Lynne, & Parbudyal 2007). Leadership, therefore, is the ability to motivate others to work hard to achieve specific goals. This will be explored in the study and the connection between leadership development and leadership strategies will also be assessed. The research of Turner, Baker, Schroeder, Johnson, & Chung, (2018), indicate that the formulation of leadership development strategies helps in clarifying the way leadership strategies are executed. The research also explored the implication of leadership development strategies for recruitment and talent management, and its results outline approaches to leadership development. Furthermore, it revealed that many businesses fail to align the goals of leadership strategy, leadership development strategies, and business strategy, and this, consequently, disrupts successful leadership development.

Overall, the coaching and mentoring sessions influenced employees and leaders to develop supporting skills, own each other's problems, and offer professional support and development. This supports the view that coaching and mentoring sessions facilitate improved communication between leaders and employees, build a more supportive culture, and distribute leadership roles (Yarborough, 2018). Therefore, leadership development practices are essential in delivering individual-level leader outcomes. In line with the points mentioned above, Subramony, Segers, Chadwick & Shyamsunder (2018) support the view that leadership development practices influence the development of interpersonal skills, knowledge, and abilities. Their study reveals that human capital and social capital mediate the relationship between Leadership Development Programs (LDPs) and sales growth which in turn reflects the underlying impact of investing in leadership and delivering organizational performance.

2.1.2 Coaching and Mentoring

Coaching and mentoring are not new phenomena in the realm of human resource management training and development. Coaching and mentoring are human activities that are focused on the learning and development of individuals (Neupane, 2015). Coaching is a method of delivering large-scale results because it initiates a powerful working relationship and a unique communication style between participants. It can address goal setting, strategic planning, creating engagement, motivating and inspiring, teamwork, problem-solving, career development, delivering feedback, appraisal, and relationship alignment in the workplace in a variety of ways. (Whitmore, 2017).

Coaching and mentoring improves employees' talents through an effective learning process that goes beyond typical training approaches. It analyses skill inadequacies and plans/organizes internal development programs to bridge identified skill gaps to change employee behavior and improve work performance (Gilley, 1996). Individual growth is the primary goal of coaching and mentoring, and many firms are now focusing on creating successful coaching and mentoring programs to boost employee morale and productivity (Hahn, 2008).

According to Bartlett (2001), there is a positive relationship between coaching/mentoring and employee commitment, and HR professionals should adapt new research methods to demonstrate to organizational decision-makers that coaching and mentoring contribute to desired workplace attitudes, which may influence behaviors such as absenteeism and turnover. According to Lee and Bruvold (2003), comprehensive coaching and mentoring programs are favorably associated with productivity, staff retention, and organizational success. Although the source of competitive advantage indeed refers to human resources rather than the strategies used to attract, utilize, and retain them, coaching and mentoring may be regarded as a solid beginning point for developing a pool of superior employee resources and talents (Agwu & Luke, 2015). In the business sector, the workforce is critical since it is the engine that drives business operations and organizational growth (Talukder & Jan 2017). Many intrinsic and



external factors can influence workforce performance (Talukder & Jan 2017). Coaching and mentoring are essential extrinsic variables that drive workforce and corporate performance achievement (Sidhu & Nizam, 2020).

2.1.3 Training and Development

Training and development are one of the most important aspects of an organization's human resource management. It refers to learning activities aimed at acquiring specific knowledge and abilities to complete a specified goal (Cole, 2002). Training focuses on a specific activity or duty, such as the need for efficient staff to operate newly acquired machinery or an efficient sales force to maximize sales volumes. Furthermore, training and development is a systematic and planned function that helps to modify employees' behaviors through learning activities, programs, and events that assist in achieving the abilities, knowledge, competencies, and skills to do the job successfully and efficiently (Hinkin & Tracey, 2010). Training and development is thus a systematic process of growing people's professional understanding, knowledge, and abilities to help them improve organizational and individual performance. According to Dessler (2011), firms can achieve their commercial objectives, overall organizational values, and mission, and foster an innovative culture through staff training and development and performance enhancement. It can also help to boost the company's productivity and profitability by improving personnel competencies.

Furthermore, the specialized skills, knowledge, and competencies gained via training and development help to improve employee satisfaction, which in turn helps to reduce staff turnover (Siddiqui, 2008). Training and development also provide competitive advantages for companies by reducing accidents, scarp, and damages; eliminating performance deficiencies; meeting additional needs of employees, and encouraging them to stay in the associated company for an extended period, all of which help to improve customer service (Aswathappa, 2007). As a result, training and development in a firm are one of the most important tools for improving staff competence, and work qualities, strengthening management accomplishment, lowering production costs, increasing employee morale, and decreasing employee turnover (Cole, 2002). They also help to bridge the gap between organizational occurrences and desired employee competence levels. According to Singh (2014), numerous scholars debate the necessity of training and development as well as the costs associated with these activities, but they all agree that training and development improve individuals' capacities.

According to most authors, staff training is a sophisticated human resource strategy that can have a significant impact on an organization's success (Adefope, 2017). Organizations can increase their employees' leadership development by offering refresher courses, organizing scholarships, doing on-the-job training, or sending their employees to formal education to improve their talents for organizational performance goals. Employees may also choose to fund their professional development. This should be well accepted so that after acquiring new abilities that improve organizational performance, employees are considered for advancement as a motivating element, and a motivated workforce almost always assures good performance (Kinya, Cheron, & Moguche, 2020).

2.1.4 Integration and Delegation

According to Heller and Hindle (1998) delegation can range from a major appointment such as the leadership of a team to other smaller tasks, such as the examination of reports in an organization. Effective delegation involves the situation of increased responsibility that can provide the subordinate with an enriched level of satisfaction as well as a greater sense of self-worth. Effective delegation is a type of employee psychological empowerment that often, forms the basis for superior performance. The unending process of effective delegation is integral to the manager's role. The process begins with the analysis, selecting the tasks that the manager could, and should delegate when such tasks are selected, the parameters of each should be clearly defined. This helps the delegator to appoint an appropriate subordinate and to provide as accurate information about the job as possible. In any role, proper briefing or orientation is essential because the delegator cannot hold people or the employee responsible for vague or undefined tasks so delegated (Ugoani, 2020).

The critical factor that an organization needs to succeed involves developing abilities in subordinates and motivating and empowering them. A good leadership style enhances delegation and can motivate subordinates better for higher performance. Also, a leader's attention to corporate goals can motivate subordinates most effectively. Effective motivation depends on having clear objectives which will be achieved with good management. Abilities are learned, and never inborn, therefore, the processes of training, and development are necessary to develop abilities based on skills. Delegating authority is a measure of psychological empowerment that can effectively boost employee performance. It is a unique leadership technique that helps subordinates and allows them to participate in decision-making and enhances subordinate feelings of self-esteem and encourages the development of open communication and relationship building in the workgroup (Ugoani, 2020).

Effective delegation enhances learning. Learning develops the mind and objective reasoning. It is useful in terms of personal development and a sense of growth that builds confidence. As confidence increases, so will self-control and self-awareness which broadens the ability for performance. Zhang, et al (2017) posit that authentic leadership promotes positive emotions among employees and therefore encourages them to seek feedback from their superiors. According to them, when power and authority are delegated to employees, they have more freedom to work autonomously and experience a range of positive outcomes such as higher job satisfaction, organizational commitment, innovative behavior, and task performance. They emphasize that psychological empowerment is positively related to increased intrinsic task motivation.



Consequently, the delegation of authority to employees gives the customer a higher level of care and attention, builds customers' positive perceptions of the organization, and creates loyalty and mutual respect for an organization (Al-Jammal, Al-Khaawneh, & Hamadat, 2015). The results of applying this principle have enhanced employees' competence, provided different functional rights to them, and the necessity to transform from dictatorship to democracy which is associated with modern trends of management and employees' desires and wishes. In addition, managers will be able to maintain their positions and preserve the process of facilitating business affairs and employees' loyalty, enabling them to be retained through achieving performance efficiency (Al-Jammal, Al-Khaawneh, & Hamadat, 2015).

2.1.5 Employee Task Performance

Task performance can be defined as the proficiency with which an individual worker executes major job-related tasks. The concept of task performance can be likened to other synonymous concepts such as – “job-specific task proficiency”, “technical proficiency”, and “in-role performance” like work quality, work quantity, and job knowledge.” (Campbell, 1990; Griffin, Neal, & Parker, 2007; Maxham, Netemeyer, & Lichtenstein, 2008). Task performance is defined as the proficiency with which job incumbents execute activities that are officially known as part of their jobs which add to the organization's technical core either directly by executing a part of its technical process, or indirectly by providing it with needed materials or services (Borman & Motowidlo, 1993). The studies note that the level of contribution should be included in task performance; direct contributions in the case of production employees or indirect in the case of supervisors. Also, Murphy (1989) defines task performance as “the accomplishment of tasks within an incumbent's job description.” Furthermore, as days go by, more focus is on specific aspects of task performance such as innovation and customer-focused behavior which have significantly become relevant as institutions place a larger emphasis on customer service (Sonnentag & Frese, 2001).

Task performance is a job incumbent's behavior that relates to the individual's ability to transform raw materials into goods and services specific to the job and core technical skills. (Cheng, Chiu, Chang, & Johnstone, 2014). The key elements related to the task performance concept are knowledge, skills, ability, attitude, work itself, and commitment (Cheng & Osman, 2021). Murphy and Margulies (2004) define task performance as the accomplishment of tasks within an incumbent's job description. Campbell et al. (1993) also include elements related to task performance in their taxonomies of job performance (e.g., core technical proficiency, general soldiering proficiency, job-specific task proficiency, and non-job-specific task proficiency).

Researchers conceptualize task performance as behaviors that contribute directly or indirectly to the technical core and behaviors that are recognized as part of the job or job description. However, Rotundo (2000) notes that restricting a definition of task performance to include only those behaviors listed in a job description is problematic because job descriptions for the same job may differ from one organization to the next, which makes it difficult to compare performance across organizations. Furthermore, Rotundo notes that jobs are constantly changing without these changes being reflected in job descriptions. Therefore, measures of performance that depend on the content of a job description may not be accurate. Based on these arguments, Rotundo recommends that task performance be viewed as actions and behaviors that contribute directly or indirectly to the production of a good or the provision of a service.

2.2 Theoretical Framework

The study anchors its root on the contingency theory which recommends that no leadership style is precise as a stand-alone as the leadership style used is reliant upon the factors such as the quality, situation of the followers, or several other variables. “According to this theory, there is no single right way to lead because the internal and external dimensions of the environment require the leader to adapt to that particular situation”. In most cases, leaders do not change only the dynamics and environment, employees within the organization change. In common sense, the theories of contingency are a category of behavioral theory that challenges that there is no one finest way of leading/organizing and that the style of leadership that is operative in some circumstances may not be effective in others (Greenleaf, 1977).

Contingency theorists assume that a leader is the focus of a leader-subordinate relationship while situational theorists opine that the subordinates play a pivotal role in defining the relationship. Although situational leadership emphasizes mostly the leader, it translates the significance of the focus into a group dynamic. “These studies of the relationships between groups and their leaders have led to some of our modern theories of group dynamics and leadership”. The theory of situational leadership proposes that the style of leadership should be accorded to the maturity of the subordinates (Bass, 1997). “The situational leadership model, first introduced in 1969, theorized that there was no unsurpassed way to lead and those leaders, to be effective, must be able to adapt to the situation and transform their leadership style between task-oriented and relationship-oriented”. Contingency theory focuses on the selection of leadership in the environment where the leadership is required; whichever type of leadership fits the best in the organization is applied there. This theory indicates that there is no singular form of leadership style which is suitable for all industrial environments but, instead, it varies from organization to organization.



2.3 Relationship between Leadership Development Strategies and Employee Task Performance

Imran and Tanveer (2015) examined the impact of training and development on employees' performance in banks in Pakistan. The study aimed to examine how training and development impact the performance level of employees in banks in Pakistan. The study employed the descriptive survey design. Data collection was done using a questionnaire with a sample size of 150 through convenience and referral sampling to select employees from six banks in Pakistan. Data collected were analyzed using frequency tests and bar charts on the response rates using SPSS. The result of the study revealed that training and development had a positive impact on the job performance of employees in the banks. The result also showed that training and development had a positive impact on job knowledge, work quality, functional skills, motivation, and loyalty thereby improving performance.

Oladimeji and Sowemimo (2020) examined the effect of mentoring on employee job performance in the Nigerian service sector. The study aimed to evaluate employee job performance by considering the effect of mentoring on the performance of employees in the Nigerian service sector. The study used the descriptive survey research design with a population of 460 employees and the sample size of 250 employees was drawn using the Taro Yamane sample determination formula while the quota sampling technique was used in the distribution of the research instrument. The instrument for data gathering was a well-structured questionnaire while the analysis was carried out using correlation and regression models through SPSS and Microsoft Excel statistical tools. The result of the study showed that mentoring and its dimensions are positive and significantly related to employee performance in the Nigerian service sector.

Prechawong, Anmanatrakul, Pinit, and Koul (2020) conducted a study on the influence of mentoring and coaching relationships on the job satisfaction and life satisfaction of vocational teachers in Thailand. The study aimed to investigate the pros and cons of mentoring and coaching for teachers and examine the effects of mentoring and coaching relationships on the job satisfaction and life satisfaction of teachers. The study used a sample of 44 vocational teachers selected from 7 provinces. Data was collected using questionnaires and the analysis was carried out using correlation and linear regression statistics. The result of the study revealed a strong, positive and significant relationship between mentoring and coaching and the job satisfaction of vocational teachers in Thailand.

Sidhu and Nizam (2020) also explored coaching and employee performance using the mediating effect of rewards and recognition in the Malaysian corporate context. The study aimed at examining the impact of workplace coaching on employees' performance in Malaysia. The study adopted a survey research design. The study used the convenience sampling technique in selecting respondents for the study. The questionnaire was used to collect data for the study and the data collected were subjected to analysis using SPSS Amos Confirmatory Factor Analysis, Structural Equation Modelling, and Regression Analysis. The results of the study revealed that coaching had a positive and significant impact on the performance of employees in Malaysia.

Neupane (2015) examined the effect of coaching and mentoring on employee performance in the UK hotel industry. The research aimed to find out if coaching and mentoring affected the performance of employees in the UK hotel industry. The study used the cross-sectional survey method. A sample of 172 managers and supervisors was chosen for the study using a convenience sampling technique. The data for the study was collected using a structured questionnaire. The data collected was analyzed using the arithmetic mean, correlation, and regression with the aid of SPSS 20. The result of the study confirmed that coaching and mentoring are positively related to employee performance. The result also revealed that coaching has a significant and positive correlation with the overall performance of the organization.

3. CONCLUSION AND RECOMMENDATION

Based on the research findings of this study, it is very evident that there is a significant and positive relationship between coaching and mentoring, training and development, and integration and delegation which all form the dimensions of leadership development strategies with employee task performance. This suggests that there is a direct link between leadership development strategies and employee task performance. When organizations put in place necessary leadership development strategies that are aimed at developing and improving the employees, it will help in the enhancement of the workplace performance of employees. Thus, we recommend that:

- Management should ensure that relevant coaching and mentoring programs are put in place to help employees improve their level of task performance.
- Management should make sure that there is continuous training for employees to improve their level of performance in terms of tasks assigned to them.
- Management of oil and gas firms should create an environment that gives room for delegation of authority that will help employees in their quest to develop their leadership skills.

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FACTORS THAT INFLUENCE ELDERLY WITH MOBILITY IMPAIRMENT TO UTILIZE MEDICAL REHABILITATION SERVICES

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ABSTRACT

The elderly population continually grows globally, necessitating health systems that cater to their needs, including medical rehabilitation since they are more susceptible to being mobility impaired which has been linked to a reduced quality of life for the elderly, rendering them reliant on others for basic daily life needs. Lack of rehabilitation for an impairment can lead to disability but most African countries struggle to provide rehabilitation services for people with diverse impairments so this leaves elders with mobility impairment at a great disadvantage. The study aims to identify the factors that influence mobility impaired elders to utilize medical rehabilitation services in the Ho Municipality of Ghana.

METHODOLOGY: *A qualitative study with 25 subjects purposively sampled were interviewed at the Ho Regional Hospital, and results analysis were carried out thematically. 5 rehabilitation therapists were interviewed on challenges faced when administering medical rehabilitation services provided at the facility while 20 elders with mobility impairment were interviewed on considered before using medical rehabilitations of the facility. Nvivo version 12 was used to evaluate the analysis.*

RESULTS: *Organizational challenges like not enough skilled workers created more workload for the rehabilitation therapists. The elders with mobility impairment identified personal and environmental factors affected their use of the services.*

RECOMMENDATION: *The study suggests that specialized health facilities for elders with need to be established with a focus on diverse medical rehabilitative services for those with mobility impairment. Comprehensive courses must also be designed to train skilled therapists to fill working positions that these new facets will create.*

KEYWORDS: *Physiotherapy, Mobility Impairment, Elders, Medical Rehabilitation Services, Rehabilitation Therapy.*

1.0 INTRODUCTION

Ageing is assumed to be associated with increased health care expenditures but the association is also viewed as a diversion from important issues (Hazra, Rudisill, & Gulliford, 2018). One of the signs of aging is the gradual loss mobility which can be truly cumbersome as it is negatively linked with disability, poor health outcomes which heavily impacts the quality of living (Billot et al., 2020). For elders with impairments, the path to social participation can be uneasy (Raymond, 2019). Persons with disabilities are one of the marginalized groups in society who encounter challenges in all spheres of life, including accessing healthcare (Imoro, 2015). Preventive health care and early health intervention, along with an impaired physical environment, potentially slow down or even reverse the disablement process (Owusu-Ansah & Akanig-ba, 2021). Their reduced bodily functions, relatively weak socioeconomic backgrounds, structural barriers, unsuitable transport system and psychological abuse all combine to restrict access to advanced medical services (Owusu-Ansah et al., 2021). Tailored interventions that tackle the needs of people with mobility impairment are needed to further moderate their risk to other serious illnesses like Cardiovascular diseases. (Wilby, 2019).

At the moment, there are voluminous unmet health needs for rehabilitation services which are expected to increase due increased life expectancy in Africa (Geberemichael et al., 2019). Access to healthcare in Africa manifests in several aspects, including geographical location, accessibility, affordability, availability, and acceptability (O'Donnell, 2007). The absence of essential strategies in advocacy and consumer groups, a national policy, experts at academic, medical and academic levels has landed Ghana's rehabilitation system in jeopardy (Tinney, Chiodo, Haig, & Wiredu, 2007). Some challenges the Ghanaian medical rehabilitation system faced were identified to be associated with availability and stability of therapy equipment, geographical location, quality of service and exclusion of persons with disability in intervention creation (Christian et al., 2016). Another study identified more diverse impediments to rehabilitation services in Ghana to be high medications bills, transportation constraints, extended waiting periods,



forgetfulness about appointment, limited education on rehabilitation, insufficient communal backing and defected communication with healthcare providers (Baatiema et al., 2021).

Access to quality and timely medical rehabilitation services is essential to the health and well-being of all individuals, with no exception to elders, especially those with mobility impairment. A well-planned medical rehabilitation program should be one that targets nullification of obstacles that generally pertain to availability, affordability and accessibility in order to meet the health needs of mobility-impaired elders.

Comprehensive and accessible rehabilitation services can enable people like elders with mobility impairment to regain their independence and aid their participation in their community and workplace (Allen et al., 2022). There has been a decline in the perception of the importance of rehabilitation but then, there is still the need for maintenance of interventions with the focus, on for example, mobility (Macnaughton, Vianya- Estopa, & Latham, 2022). The elderly population in Ghana has been practically deserted to be cared for by the family meanwhile systematic groundwork to command the years ahead have not been clearly mapped out (Saeed, Xicang, Yawson, Nguah, & Nsowah-Nuamah, 2015). The Livelihood Empowerment Against Poverty (LEAP) and National Health Insurance Scheme (NHIS), both of which have components intended for aged, were found to rather exclude the elderly due to insufficient funds, poor targeting, and inaccurate implementation and evaluation of data which made these well-designed programs lose their focus and merit. (Alidu, Dankyi, & Tsiboe-Darko, 2016)

Older adults rely on the NHIS more than their younger counterparts but rehabilitation services and assistive devices are not covered and right from registration for the scheme, elders with mobility impairments face exclusion as they may have to travel for that (Van der Wielen, Channon, & Falkingham, 2018). This has contributed to the numerous challenges that persons with disabilities encounter in accessing healthcare at health facilities (Inclusion Ghana, 2013).

Governments of developing countries like Ghana need not to underestimate the threat of the phenomenon of population ageing but rather, acknowledge and tackle challenges countless research have highlighted, in order to better manage the anticipated doom (Mba, 2010). The Ho Municipal is one of the 261 Metropolitan, Municipal and District Assemblies (MMDAs) in Ghana, and forms part of the 18 Municipalities and Districts in the Volta Region. The Municipality is also the Administrative capital of the People of the Volta Region. At the regional level, curative services are delivered at regional hospitals and public health services are delivered by the public health division of these regional hospitals in addition to supervision and management support of the districts and sub-districts (Adataro et al., 2018). Financial access and quality coverage were deduced as the main issues slowing down access to health services in the Volta Region for both tracer indicators (Sheff et al., 2020).

2.0 LITERATURE REVIEW

Health is becoming a more prominent focus of aid to Sub-Saharan African countries (Leo, 2013). Deaton and Tortora (2015) conducted a survey to find out how Sub-Saharan Africans see their well-being, health, and healthcare systems. The residents of the region have a worse sense of well-being than those in any other part of the world. The same may be said about how Sub-Saharan Africans view their healthcare system. Nonetheless, many in the region believe that improving health care should not be a top priority for their governments (Gyasi & Lulin, 2022). In Sub-Saharan Africa, the world's poorest and youngest region, little attention has been paid to the challenges of old age (Sakuma & Yamaguchi, 2013). Referenced to a study about two decades ago, Sub-Saharan Africa is a continent with a population of 788 million people, many of whom live in poverty and are afflicted by wars and according to the findings of this study, a person with a handicap in Sub-Saharan Africa has a 0% probability of encountering a physician who specializes in an appropriate treatment (Haig, Im, Adewole, Nelson, & Krabak, 2009). In 2019, Saka, Oosthuizen, and Nlooto (2019) reported an estimate of 46 million individuals aged 60 and up living in Sub-Saharan Africa, which includes 48 of Africa's 54 nations but excludes northern Africa. By 2050, this figure is expected to have more than doubled, suggesting that the area would have the greatest growth rate of older persons in the world during this time period.

There is a large body of evidence demonstrating the effectiveness and cost-effectiveness of medical rehabilitation in restoring independence and productivity to people with disabilities (Cardenas, Haselkorn, McElligott, Gnatz, & Rehabilitation, 2001). The focus on achieving a specified health worker density was advised to address human resources for primary health care in Sub-Saharan Africa by Willcox et al. (2015). This is due to the fact that governments and funders that concentrated on educating more physicians, nurses, and midwives did not achieve the promised results in terms of enhancing primary care recruitment and retention.

However, the most compelling argument for including the elderly in current plans for improved human and economic well-being in Sub-Saharan Africa is that, contrary to popular belief, older Africans play critical roles in achieving Basic Developmental Goals (Lowsky, Olshansky, Bhattacharya, Goldman, & Sciences, 2014). Aboderin and Beard (2015) also gave the obvious relevance of older Africans' physical and mental health to be achieving basic development goals, and therefore, their burden of illness and likely unequal access to needed care would give strong economic and social reasons for action.

Moreover, traditional and spiritual beliefs are claimed to play a significant role in defining health or ill-health, accepting a health condition, choosing a treatment approach, and the outcome of treatment, particularly in Africa. Spiritual and traditional reliefs are



having an increasing impact on perceptions of stroke and mobility among older adults in Sub-Saharan Africa, which has implications for stroke rehabilitation success in the region, as suggested in a study by (Nweke, Eze, & Research, 2019). A review that recruited studies done on slum dwellers in Sub-Saharan Africa who are older raised mobility problems as issues which were common among the elderly in these slums. The report accounted for 9.5% of older slum inhabitants in Kenya and over 97 per cent of older slum dwellers in South Africa. Older slum inhabitants who were sick, fragile, and elderly were more likely than others to report mobility issues and the need for walking aids (Alaazi, Menon, & Stafinski, 2021). Importantly, bridging the gap between medical conceptions of health and more global dimensions of well-being among older persons in Sub-Saharan Africa still needs to be done.

Over the past two decades, more than one million people in Ghana have become disabled, with nearly 95 per cent of them not having access to rehabilitation services and facilities (Kendall, Buys, Larner, & rehabilitation, 2000). In 2007, there was a report of a lack of inpatient rehabilitation facilities in Ghana, which was later confirmed. Physical medicine and rehabilitation specialists were also in short supply in the country. There were only two retired occupational therapists and one retired speech-language pathologist to be found in the city's capital. The country's approximately 20 - 30 physical therapists received the majority of their training in Eastern Europe during the Cold War, and they had less than 10 years of service left on average before they were required to retire at the age of 60, on average (Tinney, Chiodo, Haig, Wiredu, & rehabilitation, 2007).

The findings of a 2011 study revealed that the majority of people admitted to a sophisticated trauma unit in Ghana were discharged without receiving adequate rehabilitation services and that the degree to which they were disabled could be measured using the L.I.F.E (Language Independent Functional Evaluation) even while they were still sick and, in the hospital, (Christian, González-Fernández, Mayer, & Haig, 2011). Christian and colleagues published the first study data on Ghana's rehabilitation infrastructure, human resources, and interventions in 2016, marking a significant milestone in the country's history (2016). Significant human resource constraints were discovered as a result of the findings, as hospital-based rehabilitation treatments were primarily provided by 20 physiotherapists and 21 physiotherapy assistants across the nine participating sites. It was discovered that no rehabilitation physicians were employed at any of the facilities evaluated. Therapy for musculoskeletal deficits was carried out using current evidence-based methods, whereas neurologic rehabilitative techniques were restricted to physical rather than sensory-motor modalities in the majority of cases.

Recent studies have discussed patient-centeredness as an increasingly important factor in health care. In medical rehabilitation, it is considered a critical quality and outcome criterion, necessitating the implementation of patient-centered care policies and services in the field of practice. Tinney et al. (2007) discuss the importance of medical rehabilitation leadership and how it can be achieved effectively. If something external begins, it must be effective and quickly replaced by someone who possesses the necessary knowledge and skills. Providing the national and medical leadership necessary to manage the resource allocation process for all levels of rehabilitative care and training required in a comprehensive care system is critical. This individual will need to have extensive experience in medical rehabilitation. This physician will be responsible for setting the tone for team management in an acute care setting. This individual will also benefit from leadership development. According to the authors, in a small country, a medical rehabilitation expert from an academic medical center will lobby the Ministry of Health for rehabilitation resources, which will be provided by the government.

According to the 2010 World Report on Disability, over one billion individuals, the majority of whom are persons with disabilities (PWDs) and older adults, use one or more assistive technology devices (ATDs) (Organization, 2011). A recent study by Alqahtani et al. (2021) on ATDs concluded that, modern advancements in mobility technology, including robotics, intelligent systems, exoskeletons, prostheses, and orthoses, have significantly increased involvement in desired daily activities for millions of people with disabilities and the elderly.

Throughout an evaluation by Needham et al. (2010), the lack of access to rehabilitation staff was obvious and this meant that, more physiotherapy and occupational therapy staff might achieve more. Cultural concerns was raised in a review by Sosnowski, Lin, Mitchell, and White (2015) that challenged the implementation of daily rehabilitation interventions as routine practice in our critical care units. The authors concluded that, critical care nurses are in a unique position to influence change in their organizations, ensuring that early rehabilitation methods are accepted and followed. Nevertheless, understanding the interaction between the environment and mobility in older persons is critical for both prevention and rehabilitation of mobility impairment. Certain aspects of the environment appear to hinder community mobility in older persons more than others, and a diminished capacity to handle important environmental demands on mobility appears to be a feature of mobility handicap in older adults as outlined by Shumway-Cook et al. (2002).

The global population of older individuals is growing, which has substantial consequences for social isolation and loneliness (Alpert & Practice, 2017). Findings from Alpert and Practice suggested that varied therapies for older persons who feel social isolation and loneliness are necessary because data on social support and group-based activities provided social contact, indicating an improvement in this public health issue.



3.0 METHODOLOGY

The research was conducted using a qualitative methodology. This study was conducted at Ho Teaching Hospital in Ho, formerly Volta Regional Hospital and popularly known as “Trafalgar”, located in the Volta region.



Figure 1 Map of Ho Extracted from the Map of Ghana

This study was conducted at the Volta Regional Hospital which boasts of an ultra-modern 340-bed referral specialist hospital for the region's district and primary healthcare facilities and beyond. The hospital's facilities and services include a well-organized Out Patient Department (OPD), Radiology and Imaging, Surgical services including day case surgery and Orthopedics, Obstetrics and Gynecology, including Neonatal Intensive Care, Eye, Ear, Nose, and Throat, Laboratory and Blood Transfusion services, Mortuary, Pharmacy, Pediatric Care, Internal Medicine and Psychiatry, Health information services, catering.

The population in this study consists of mobility-impaired elders and rehabilitation therapists of the Volta regional Hospital and all participants in the study were chosen purposefully in order to focus on specific characteristics of a particular population to better answer questions about medical rehabilitation for mobility-impaired elders. The elders with mobility impairment were involved in the study because they would have the perfect insight on things they considered before utilizing medical rehabilitation studies. Rehabilitation therapists were included in this study because they are the ones who provide rehabilitation services. A total of 25 people were interviewed (5 therapists and 20 mobility-impaired elders). The criteria for inclusion for the elders were: those who were more than 60 years old, mobility impaired and currently receiving rehabilitation treatment at Ho Teaching Hospital. For the healthcare professionals, inclusion criteria were those who work within the physiotherapist unit of the Ho Teaching Hospital. Exclusion criteria were as follows: Mobility impaired persons not more than 60 years and for the health workers, it was those in other units other than Physiotherapy, as that was the unit the hospital stated was where rehabilitation for mobility impairments were undertaken. The mobility impaired elders, and therapists were recruited to help researchers answer their questions. A total of 25 people were interviewed (5 therapists and 20 mobility impaired elders).

To ensure validity, the semi-structured interview guide was carefully framed by the researcher and double checked by the researcher's supervisor before they were administered. The basis of the validity was to ensure that the right questions are asked without ambiguity and minimize bias in the study as much as possible. At the Ho Municipal Hospital, interview guides were pretested with five (5) people, of which three were mobility impaired elders, and two (2) rehabilitation therapists in this group, all of whom worked together to test and refine the instrument before it was used in the final study. The research relied solely on primary sources of information. The information was gathered by the researcher, who two field assistants assisted in their efforts, one a graduate student from the University of Health Allied Science (UHAS) in Ho and the other from the Kwame Nkrumah University of Science and Technology (KNUST).

The thematic analysis developed by Creswell (2009) was used: the first step is to organize the data into different categories based on the information sources. The information provided by participants during in-depth interviews was recorded and later transcribed in accordance with the thematic steps outlined above. Lists of items with a reoccurring pattern were generated from the data, and these lists were then reduced to categories, which were then further subdivided into segments of data that share a common category or code



were discovered. A thorough description of the results was followed by a series of dialogues connected with each theme in support of increasing dependability. Nvivo version 12 was used to evaluate the analysis. Member checking was incorporated as a means of establishing credibility, as the researcher distributed final themes and supporting dialogue to participants in order to elicit feedback from them.

For ethical consideration, the Ho Teaching Hospital's Committee on Ethical Approval granted permission to conduct the study. Informed consent forms had to be signed or thumb-printed by the participants after they had been read out in the local language and their questions had been adequately answered by the research team. Individuals' personal information was replaced with unique reference codes to ensure anonymity and confidentiality. With the permission of the interviewees, the interviews were recorded on tape.

4.0 RESULT AND DISCUSSION

Information on the demographic characteristics of mobility impaired elders and medical therapists was sought. The mobility impaired elders were 60 years and above, most males. Also, most of them were pensioners or retired persons, with secondary and tertiary levels of education. For the rehabilitation therapists used in the study, there were at least 20 years, with tertiary levels of education. They have also worked on mobility impaired elders at the hospitals for at least 3 years. Also, most of them were males and were mainly physiotherapists. The proceeding session provides the study results according to the four specific objectives as presented.

In Table 1, information on the age distribution of the mobility impaired elders considered in the study showed that 35% were between 61 to 65 years. This was followed by 25% for those 66 to 70 years. The least was 5% for those 80 years and above. This shows that the respondents used in the study qualify to be used for purposes and that they can provide the needed responses for the study. Also, 65% of the elderly were males, while the remaining were females. Concerning the elders' type of work, the majority (85%) of them were white and blue-collar workers, with the least being farmers. Also, most of them (about 65%) were educated, while the remaining had primary or no education. On the instrumental activities of daily living (IADL), it was observed that most of them were independent (70%). Respectively, 20% and 10% were partially dependent and dependent. Concerning the economic status of the elderly persons used in the study, it was revealed that 65% do not have enough money. Only 5% of them had enough money for all their needs. 40% of the elderly persons stated that their mobility impairment was a result of a stroke, while 20% and 15% were impaired by fractures and amputations, respectively. Arthritis and obesity accounted for the cause of impairment for the remaining percentage. Finally, half of them (50%) had moderate chronic pain intensity in their condition's intensity of chronic pains. Furthermore, 35% for those with severe intensity, with the least being 15% for the mild intensity of chronic pains.

Table 1 Demographic Characteristics of the Mobility Impaired Elders.

Characteristics	Frequency	Percentage (%)
Age Distribution (in years)		
61–65	7	35.0
66–70	5	25.0
71–75	4	20.0
76–80	3	15.0
80 and above	1	5.0
Gender		
Male	13	65.0
Female	7	35.0
Type of work		
Blue-collar worker	8	40.0
White-collar worker	9	45.0
Farmer	1	5.0
Others	2	10.0
Educational level		
Primary/lack of education	8	40.0
Vocational	2	10.0
Secondary	7	35.0
Bachelor	3	15.0

***Instrumental activities of daily living***

Independent	14	70.0
Partially dependent	4	20.0
Dependent	2	10.0

Economic Status

Enough money for all needs	1	5.0
Enough money to make a living, but not for all needs	6	30.0
Not enough money	13	65.0

Cause of impairment

Fracture	4	20.0
Amputation	3	15.0
Stroke	8	40.0
Arthritis	4	20.0
Obesity	1	5.0

Chronic Pain Intensity:

Mild	3	15.0
Moderate	10	50.0
Severe	7	35.0

Table 2 Demographic Characteristics of Rehabilitation Therapists

Demography of Therapists	Frequency	Percentage (%)
<i>Age Distribution (in years)</i>		
20-29	2	40.0
30-39	2	40.0
40-49	1	20.0
<i>Gender</i>		
Male	3	60.0
Female	2	40.0
<i>Educational Level</i>		
Undergraduate Degree	4	80.0
Master's degree	1	20.0
<i>Rank</i>		
Head of Department	2	40.0
Attending Physician	2	40.0
Fellow	1	20.0
<i>Number of Years in Service</i>		
Less than 3 years	2	40.0
At least 3 years	3	60.0

Information on the age distribution of the therapists in Table 2 showed that 40% each were between 20 to 29 years and 30 to 39 years. The least was 10% for those 40 to 49 years. Thus, majority (80%) of the rehabilitation therapists were between 20 to 39 years. Also, all the rehabilitation therapists were males, with first degrees. The majority (80%) of the ranks were Heads of Department and Attending Physicians. Finally, on the number of years in service, 60% of them have been working as rehabilitation therapists on the issues of mobility impaired elders for 3 years or more. That is, they have more than 2 years of experience on the job. This is very good



for a study such as this. This is because they were able to provide responses based on their long-time service in the organization of concern.

4.1 Factors Influencing Utilization of Medical Rehabilitation

Concerning the factors influencing the utilization of medical rehabilitation by mobility-impaired elders, the results indicate that all the mobility impaired elders interviewed in one way or the other. In particular, the mobility impaired elders understood the factors influencing the utilization of medical rehabilitation as the barriers to effective utilization of medical rehabilitation facilities by the elderly with such conditions. For instance, one mobility-impaired elder particularly stated that he utilizes the medical rehabilitation at the facility because:

It is a public hospital, and most health personnel are very experienced, educated, open-minded, and better than other places I visited.

In terms of the cost of the services, he lamented the non-coverage of the Nation Insurance Scheme, especially not taking care of certain medicines they need. A study by (Pishkhani, Dalvandi, Ebadi, & Hosseini, 2019) concur that most rehabilitation services in Iran were not fully covered by insurance and that significantly had an effect on the devotion to rehabilitation at the long run He specifically mentioned that:

Not really, not really, you know, I am on pension and health insurance does not cover most of the things so, with the little money I have, expensive drugs are being bought with it.

He ended with commenting on the accessibility of such services by stating categorically that:

Average, because coming in, I experienced challenges before I could see the therapist

Another mobility-impaired elder also stated and explained the factors influencing him to go for such services as:

It is not far from my house, and whenever I go there, they are so nice to me, sociable and amicable. Also, it is not that bad. I wish medicines and other things could be taken care of. It is also because if you have a condition that has to lead to a particular department when you go there, they take good care of you. It is also because it is close to where I live and it is a big hospital, and I think they have qualified and experienced doctors and nurses.

In summary and based on the results, the factors influencing the utilization of medical rehabilitation by mobility-impaired elders can be grouped into two. Those as a result of the mobility impaired elders themselves (personal factors) and those emanating from the environment (environmental factors) in which they found themselves. The personal factors include (age, education, income or socioeconomic status, motivation, attitudes and degree of disability, among others) and the environmental factors include identified include (accessible physical environment, accessible services, availability of caring family, attitude of health professionals, accessible transport, cost of services, waiting hours, availability of services, distance to the facility, accessible information, among others). That is, the factors the mobility impaired elders consider before attending the hospital are personal and environmental factors, and these are meaningfully linked to their utilization of physical rehabilitation services at the hospital. The International Classification of Functioning, Disability and Health (ICF) model reported personal and environmental factors as facilitators or barriers to utilizing rehabilitation services (Organization, 2001)). Hence, the findings in the current study are congruent to the descriptions and classifications given by WHO in 2001. Also, in support of the assertion, LaPlante and Kaye (2010) provided an overview of the data on Wheeled Mobility Use, which included a profile of demographics and trends in the use of Mobility Impaired Equipment (Wheeled Mobility) and accessibility in the community in the United States of America (LaPlante & Kaye, 2010). There is some evidence to suggest that the degree of mobility difficulty, as well as other personal factors such as gender, race and income, public financing policies, accessibility of the home and built environment, the availability of and use of other mobility aids, and the availability of personal assistance, appear to determine the situational use and efficacy of WME for people who use WME.

4.2 Knowledge of Mobility Impaired Elders on Medical Rehabilitation

On the knowledge of mobility-impaired elders on medical rehabilitation, when it comes to the length of time they had the condition, they all have knowledge of that. That is, they know the length of time or duration within which they had the condition as well as the major or main cause of their conditions. For instance, once stated:

I had an accident, and the bone in my left leg got fractured, which led to my inability to walk, and since then, I have been unable to walk.

Another respondent stated:

Stroke. I had a mild stroke.

But in all these, it was observed that the health of these mobility-impaired elders is very prime to them. One of them specifically stated:

If I want to live long on earth, I have to take very good care of my health.



Another one also added that:

Growing up, I did not pay a lot of attention to my health. It was getting to the latter part that I started falling sick, and I knew health was very important and since then, I have been up to date on my health issues and concerns.

In summary, with respect to the knowledge of mobility-impaired elders on medical rehabilitation, the study indicated that when it comes to the length of time they had the condition, they all have knowledge of that. That is, they know the length of time or duration within which they had the condition as well as the major or main cause of their conditions. But in all these, it was observed that the health of these mobility-impaired elders is very prime to them.

4.3 Current Care for Medical Rehabilitation

Regarding the current care for medical rehabilitation for mobility-impaired elders at the hospital, the study showed that there are basically two kinds of services these groups of people access. These are physiological or assistive and medical services. Some assistive services or devices include hearing aids, mobility aids, low vision devices, or any assistive device. For medical rehabilitation, they include treatment/surgery, diagnosis, access to, or ever received rehabilitation, received therapy (physical, occupational, speech and language). That is, in the aspect of condition that the patients may be having, especially the elderly, they come with some conditions that affect their balancing and ability to walk. Also, on the availability of policies on the care of mobility-impaired elders, it was seen that the respondents do not have much to say about these policies. One of them has this to say:

There is not much that I can speak of because the policy passed recently was on accessibility. Also, recently, pensioners have been given some money at the various Assemblies, but I do not know how far those have been implemented as well.

The respondents identified a few challenges as the ones that the institution faces in meeting the needs of the mobility impaired elderly. Some of them are:

Usually is based on the assessment and the needs. The assisting devices that the elderly would need as well as the number of personnel trained in that field that the facility would have, are not adequate.

The respondents finally mentioned that to improve elderly care:

A lot of policies need to be passed and implemented. In as much as that is done, a few non-governmental organizations can also establish or promote a field of health care delivery by providing health services to the needs, especially the elderly, so that at the end of the day, they can be integrated into the society and their worth would be felt.

In conclusion, the study showed that there are basically two kinds of services these groups of people access. These are physiological or assistive and medical services. This grounded the findings of researchers(Tinney, Chiodo, Haig, & Wiredu, 2007) when their results showed the absence of occupational therapists and the presence of a few prosthetics, orthotists, and physical therapists, and speech therapists highlighted the fact that Ghana has practically no medical rehabilitation.

4.4 Provision of Resources and Equipment for Medical Rehabilitation

The respondents were of the view that health facilities that provide rehabilitative services are not bad adequate. That is, when it comes to the facility having approved and adequate equipment to manage patients, the respondents were of the view that the facilities and equipment situation at the Ho Hospital in respect of mobility-impaired elders' rehabilitation was not bad. However, unfavorable comments were passed when they were asked about the adequacy of the number of trained human resources available:

.....no because it does not meet the demands because currently, we suffer. That is, instead of attending to about 10 patients a day, you have to attend to more, so you get exhausted, resulting in the rescheduling of patients. Also, due to the inadequate number of trained human resources, patients do not enjoy their benefits to the fullest. This is because, for example, a patient who is supposed to come for three rehabilitation sessions in the course of the week is being reduced.

This very statement supports the study that limited provider ability remains a significant disruption in necessary care(Carvalho, Bettger, & Goode, 2017). However, when it comes to the facility having approved and adequate equipment to manage patients, the respondents were of the view that the facilities and equipment situation at the Ho Hospital in respect of mobility-impaired elders' rehabilitation is not bad. One of them stated that:

Currently, I would rate it on a scale of 80%. They've improved since I came in here. They are on track, so I think they would do more.

In support of this statement, another respondent mentioned that this is because of the nature of the hospital in question. He stated:

It is a 50/50 thing. This is because it depends on the facility's level as it is a Regional, District Hospital, Polyclinic, CHPS compound, among others. For example, in a Regional Hospital, there are adequate services and resources, but in District Hospitals, it falls below and so on.

Carvalho et al. (2017) also named geographical location as a barrier to access to medical rehab services, and this statement proves that too (Carvalho et al., 2017). On what the respondents thought could be done to improve the provision of healthcare for mobility-impaired persons, it was suggested that incorporating mobile health into current healthcare models of rehabilitative care can decrease



hospital visits and provide a longer duration of care. Another stated that care homes should be engaged and encouraged. He stated that:

Very well, Care homes should be engaged and encouraged because they play a very major role by providing a holistic health service to the elderly in the aspect of medical rehabilitation, where they need to be referred as well as community-based rehabilitation which deals with social integration. So, when the elderly is being attended to health-wise, they are also integrated into society, making their worth also felt in the community.

The results of Shakespeare et al. (2009) are consistent with this study. They stated and explained in their study that rehabilitative specialists are hard to come by, and rehabilitation programs are typically more expensive to administer than general healthcare programs, as suggested (Shakespeare, Iezzoni, & Groce, 2009). Researchers (Carvalho et al., 2017) also noted in their study that, even in locations in New England where a very high concentration of physiotherapists was recorded, there were still regions in each locality with these professions below the national average.

Table 3: Summaries of factors that influence the utilization of medical rehabilitation by respondents

THEME	RESPONDENTS	
	Rehabilitation Therapists	Mobility Impaired Elders
AVAILABILITY OF MEDICAL REHAB SERVICES	<ul style="list-style-type: none"> They can only provide physiotherapy even though some clients obviously need more than that. e.g., hydrotherapy, speech therapy The services provided cater to everybody else and not specifically elders with mobility impairment. The facility doesn't design assistive devices. 	<ul style="list-style-type: none"> They can only provide physiotherapy even though some clients obviously need more than that. e.g., hydrotherapy, speech therapy. The decorum of the therapists Referrals are needed before you can access the physio center
EQUIPMENT AND ASSISTIVE DEVICES	<ul style="list-style-type: none"> Lack of specific equipment. Lack of beneficial assistive devices like prosthetic limbs Stress on equipment since a lot of people use the few available equipment and this cause the equipment to wear and teach easily The few technological equipment that break down can cost a lot and take days to fix. Patients have to fund their acquisition of assistive devices. Donations 	<ul style="list-style-type: none"> Some assistive devices are not readily available for purchase The health facility provides assistive devices for ease of movement around the facility. Some assistive devices are expensive but the NHIS doesn't cover that. Lots of other patients come to use the few equipment available and it can't get to their turn sometimes. Some equipment are always broken down. Some assistive devices are uncomfortable to use.
SKILLED PERSONNEL	<ul style="list-style-type: none"> Not enough physiotherapists. Unavailability of certified skilled personnel in other areas of medical rehabilitation. Unavailability of specified assistive device designers. 	<ul style="list-style-type: none"> Distance of the hospital from their homes Transportation could be a hustle in case one uses an assistive like a wheelchair. Costly and time consuming in case one lived far from the hospital. This could prevent them from coming to the hospital three times a week
THE CLIENT'S IMPAIRMENT	<ul style="list-style-type: none"> The level of mobility impairment of an elderly client in terms of severity. 	<ul style="list-style-type: none"> The level of mobility impairment of an elderly client in terms of severity.



5.0 CONCLUSION AND RECOMMENDATION

Concerning the knowledge of mobility impaired elders on medical rehabilitation, the study indicated that when it comes to the length of time they had the condition, they all have knowledge of that. That is, they know the length of time or duration within which they had the condition as well as the major or main cause of their conditions.

The factors the mobility impaired elders considered before attending the hospital are personal and environmental factors, and these are meaningfully linked to their utilization of medical rehabilitation services at the hospital. The study showed that there are basically two kinds of services these group of person access. These are physiological or assistive and physiotherapy. The respondents were of the view that health facilities that provide rehabilitative services are adequate. Still, unfavorable comments were passed when they were asked about the adequacy of the number of trained human resources available.

The government should establish community-based rehabilitation (CBR) programs within the community and provide rehabilitation services in primary health care facilities to reduce transport costs and increase accessibility to the services. Given the increasing number of people with disabilities, it appears that the task of sensitizing healthcare professionals, policymakers and the public about the available rehabilitative services is of paramount importance.

Therefore, the government and other relevant stake holders should increase sensitization and awareness of rehabilitation services to people with physical disabilities, healthcare professionals and the general public, provide more education opportunities to people with physical disabilities, establish a public funding mechanism targeting people with physical disabilities, integrate basic rehabilitation services within the existing health care service delivery and establish community based rehabilitation centers to increase access to rehabilitation services. Here is the need for government to develop community based rehabilitation (CBR) programs and centers within the community to provide primary medical rehabilitation services in order to make rehabilitation services inclusive and accessible to all.

Investments in health facilities to create other forms of medical rehabilitation services can be done. Comprehensive courses must also be designed to train skilled therapists to fill working positions that these new facets will create. Specialized health institutions need to be established to care specifically for medical rehabilitation, focusing on the elderly. Centers that manufacture assistive devices should also be established to make assistive devices quickly obtainable with ease. Educational health campaigns need to be undertaken to sensitize individuals on medical rehabilitation for elders.

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TYPES OF PESTS AND DISEASES WHICH ARE SPREAD IN THE BIOTOPE OF CUCURBIT SCROPS AND MEASURES TO CONTROL THEM

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ANNOTATION

In the article, the conditions of bioecological development of pest species, the dynamics of development during the vegetation period and the criterion of harmfulness, types of diseases are studied in the fields. Information on the biological effectiveness of measures on controlling pests and diseases encountered in the fields is given.

KEY WORDS: cucurbits crops, melon, melon fly, porosity making fly, diseases, control.

INTRODUCTION

Increasing the number of population in the world leads to increasing demand for food products. Among the agricultural crops, the role of cucurbits crops in the food ration is considered significant. Therefore, melons and watermelons are eaten fresh, while pumpkins are eaten processed. In order to continuously provide the population with these products, it is necessary to carry out agrotechnical measures, maintenance work and pest and disease control measures in due time from the period of cultivation to harvest.

In the conditions of the Republic of Karakalpakstan, measures to control pests and diseases, which are considered to be one of the main problems in the cultivation of cucurbits crops, are considered urgent issues.

The main biotic factor that needs to be taken into account is the feeding of pest species and the development of disease species that cause great damage to the yield obtained in the fields of cucurbits crops. In the conditions of the region, it is necessary to carry out scientific researches aimed at solving the actual issues of distribution areas of pests and diseases of cucurbits crops, features of bioecological development and the use of countermeasures.

METHODS OF THE RESEARCH

Scientific research studies include the consideration of species widely used in general entomology and agricultural entomology, development bioecology, dynamics of pests and entomophages, observations and sample collection were carried out using the methods of V.F.Paliy, K.K.Fasulati, E.P.Narchuk.

Studying the degree of development of diseases of cucurbits crops was conducted on the basis of the methodical manual of VIZR, determining the degree of damage caused by parasites - on the basis of the methods of A.I. Dudka, S.P. Wasser, A.A. Ellanskaya, determining the degree of spread of diseases - on the basis of methods A.E. Chumakov, T.I. Zakharova.



RESULTS OF THE RESEARCH

The microclimate and biological factors that can be formed in the biotopes of melon, watermelon and pumpkin plants from the types of field crops in the conditions of the region are considered to be the main factors in the development of pests and diseases. During the vegetation period, under the influence of harmful factors, the vegetative and generative organs of the plant become the main source of nutrition and development. Due to this, pest and disease control measures were carried out from the beginning of the growing season until harvesting. The data collected on the types and diseases of representatives of the two-winged family found in the fields during 2018-2022 in the conditions of our research were analyzed. 15 types of insects were taken into account and divided into groups according to feeding processes in our observations on identifying the types of two-winged insects found in melons from the types of cucurbits crops of the Republic of Karakalpakstan.

Disease-causing parasites belonging to 3 classes, 6 orders, 8 families, 15 genera, 26 species, and 7 forms were identified in our disease detection studies. 22 species and 7 forms of identified parasites are found in melon, 19 species and 2 forms are found in watermelon.

According to the results of the conducted research, among the members of the Diptera family, in the early stages of the vegetation period of the cucurbits crops, midges, black flies, gray flesh flies, cabbage flies, swede flies, apple flies, real mosquitoes, tachin flies, syrphid flies, gallitsa, shrechas, round flies are clearly visible. During the growing season in melon fields, the development of two-winged black fly, *Drosophila* fruit fly, gray flesh fly were observed in rotten fruit and other organic matter.

In our research, among the pests the porosity making flies and the melon fly are considered to cause the main damage to cucurbits crops. According to the results of our observations in the melon fields, the number of porosity making flies and melon fly increases in the fields where controlling measures have not been carried out, and they cause serious damage to the quality and quantity of the harvested crop. It has been proven that in the fields where their number has increased, it reduces the yield up to 80-100%.

A bioecology of interdependent development has been formed on the reception of food by fly species that develop in melon fields. The reason is that the fruits fed on melon fly worms quickly rot, and in the years when this physiological process exists, it was taken into account that other species multiply. As a result, it was taken into account that other fly species lay eggs on the fruits that have started to rot due to the damage of the melon fly, the worms develop, and the mature breed of the next generation flies out. 6.8-23% of pupas collected from the field were other species. Today, scientific research is being carried out on the synthesis of the pheromone in the laboratory conditions by collecting the female breed of the melon fly pest.

The following chemical preparations recommended from 5:00 a.m. to 8:00 a.m. for controlling porosity making flies and melon flies: Detsis, 2.5% em.c. at the rate of 0.7 liters per hectare, Cypermethrin, 20% em.c. - 0.2 l/ha, Nurell-D, 55% em.k.- 0.7 l/ha, Konfidor, 20% em.k.- 0.1 l/ha, Karate, 10% em.k. - 0.25 l/ha, Avaunt, 15% sus.k. - 0.45 l/ha, Enjeo, 24.7% sus.k. - 0.25 l/ha, Fufanon, 57% em.k. - 0.5 l/ha. When they were used 85.0-95.0% biological efficiency was achieved.

When the fungicide Previkur SL 722 s.e.k. (1.5 kg/ha) was used against powdery mildew of melon, its biological efficiency was 87.8% after 15 days, depending on the consumption rate. When fungicides Previkur SL 722, s.e. (1.5 kg/ha), Falcon 46% em.k. (0.4 l/ha), Alto Super 33% em.k. (0.3 l/ha) were used in controlling melon disease, depending on the rate of consumption, biological efficiency of fungicide Falcon 46% em.k. was 89.9%, Alto Super 33% em.k. - 87.7%, Previkur SL 722 s.e.c. - 85.5%.

CONCLUSION

In the agrobiocenosis of Karakalpakstan the melon fly (*Myiopardalis pardalina* Big), a member of the dipteran group that collects in the melon biotope damages fruits, while the porosity making fly (*Liriomyza bryoniae* Kaltenbach) is



considered as a phytophage that damages the vegetative organs, and requires countermeasures.

Fusarium wilt, verticillium wilt, powdery mildew, spotting, rotting of roots and fruits and other diseases were found to be widespread in the cucurbits crops grown in our republic. It is recommended to carry out the countermeasures in the specified cucurbits crops.

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PROSPECTIVE METHODS OF USING ENTOMOPHAGES IN PROTECTING MAIZE AND SUNFLOWER FROM APHIDS IN THE CONDITIONS OF KARAKALPAKSTAN

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ANNOTATION

The article presents the types of aphids that develop and cause damage to maize and sunflower crops in the conditions of Karakalpakstan, the developing type of each species, the period of coming to the field, the damage it causes, and the criterion of economic damage. The biological effectiveness of the natural predator, eaters, and golden-eyed entomophagus cultivated in biolaboratories was determined in controlling aphids, and the technology of using this predator was studied.

KEYWORDS: *sucker, pest, entomophagous, predator, eater, biolaboratory, biological efficiency, economic damage criterion, migration.*

INTRODUCTION

Maize and sunflower crops grown by our farmers are very important in providing industry with raw materials.

At present, food security and ecologically free crop cultivation remain urgent issues on a global scale. Therefore, we must pay attention to the modernization and diversification of our economy, including the agricultural sector, especially the cultivation of food crops. In the recent four years, 300000 hectares of low-yielding cotton and grain fields were replaced by fruits and vegetables, maize, sunflower and other food crops. Of this, 32000 hectares of intensive gardens, 15000 hectares of vineyards, 2000 hectares of modern greenhouses, 114000 hectares of vegetables and potatoes, 72000 hectares of legumes and oil crops, and 52000 hectares of other crops should be cultivated.

In the scientific data of Sh.T.Khojaev, a famous entomologist in Uzbekistan, [4; 5] from pests in maize, maize aphid (*Sipha maydis* Pass.), oat-maize aphid (*Aphis maydis* Fitch.), large grain aphid (*Macrosiphum avenae* F.) and ordinary grain aphid (*Schizaphis graminum* Rond.) are found. It has been determined that they belong to the order of homoptera and the family of aphids (Aphidoidea). Maize, common grain, and large grain aphids have been reported to overwinter as eggs and enter nonmigratory colony-forming aphids. Of these, only the aphid of the grain enters the sheath of the leaves of the plant and survives. The rest live openly. Aphids are especially more in spring and autumn, and decrease in hot summer days, because high air temperatures cause the destruction of aphids, which also increases the natural number of aphids.

According to the scientific data of E.Sh.Toreniyazov [1], it hibernates in the form of maize aphid (*Sipha maydis* Pass.) and in early spring leaves the hibernation and multiplies in the field. It is especially active in spring and autumn. The affected plant will lag behind in growth.



E.Sh.Toreniyazov, A.R.Utepbergenov, A.T.Zayrova [2], E.Sh.Toreniyazov, A.R.Utepbergenov, E.G.Eshmuratov [3] found in their scientific experiments that the application of the golden eyed entomophage to control aphids in maize has a high biological effect.

In solving the above-mentioned problems, filling the table of the population with ecologically free products without letting the cultivated crops die, taking into account the characteristics of the specific external environmental factors of the region and the peculiarities of the bioecological development of pests, fully studying the methods of combating them, the technology of their application, more than 98 percent of the used method it is required to ensure the achievement of biological efficiency.

RESULTS OF THE RESEARCH

In the conditions of Karakalpakstan in 2021-2022, in order to determine the types of aphids that develop in maize and sunflower agrobiocenoses, in the fields of Kungrad, Beruni, Chimbay and Nukus districts, directional control works were carried out at maize and sunflower stations every 10 days. As a result of the control work, the development of maize aphid in the maize station and the development of cucurbits crops aphid in the sunflower crop was revealed. The average density of maize (*Sipha maidis* Pass.) aphids, cucurbits crops aphid (*Aphis gossypii* Glov.) aphids increased from 22 to 185 units per 1 infected plant.

In our conducted experiment, the development dynamics of maize aphid in maize agrobiocenosis was studied. That is, 3 aphids per 1 plant in the 1st option; in the 2nd option, 6 aphids were distributed and in the 3rd option, 10 aphids were distributed, an entomological bag made of cloth was put on it, and the development and reproduction of the aphids was monitored for 20 days. Due to the absence of natural entomophages in entomological small gardens, aphids multiplied very quickly, after 20 days the number of aphids in the 1st option increased to 40, in the 2nd option to 85 and in the 3rd option to 187 (Pictures 1-2).



Picture-1. Development of maize aphid on leaf and stem of sunflower

**Picture-2. The development of cucurbits crops aphid in the basket of the sunflower**

During our experiment, the economic damage caused by aphids during the development period of maize and sunflower was studied. During the flowering and fruiting periods of maize plants in entomological small gardens, 10 maize aphids were distributed to 1 leaf in small garden, and 10 cucurbits crops aphids were distributed to 1 leaf in sunflower, and the increase in the number and damage of the pest was studied. As a result, in our experiment on maize, the weight of grain in 2 cobs in 1 plant was 247 g. In the 1st variant of the experiment, 47 g less yield was obtained in the affected maize. This is 19 percent. In the 2nd option, 21.5 percent and in the 3rd option, 23.8 percent less yield was obtained.

So, it can be seen that the rate of aphid damage during the flowering and fruiting period of the plant is 19, 21.5 and 23.8 percent when 3, 6 and 10 aphids fall on 1 leaf of the plant.

In our experiment, the types of natural predators and eaters found in a swarm of aphids were determined, and their density in the field was studied. As a result, the 7-point type of the ladybug, larvae of the syrphid fly, golden-eyed larvae are found in all types of aphids, and their number is on average 0.5-1.5 per 1 infected plant.

In order to reduce the damage of maize aphid in the maize agrobiocenosis, an additional golden eye predator was used to natural entomophages, and its biological efficiency was determined (Table 1).

Table 1
Biological effectiveness of the golden eye predator in controlling the maize aphid

Number	Variants	Average number of pests in 1 damaged leaf, piece	Biological efficiency, %, in days
1	5:1	185	68,4
2	10:1	168	62,6
3	15:1	161	59,2
4	Control	175	-



As it can be seen from the table, the number of aphids decreased in the options where the golden-eyed predator was used, and in the 1st option, 5:1 ratio (5 aphids : 1 entomophage) achieved 68.4% biological efficiency after 14 days, and in the following options, 62.6 and 59.2%.

CONCLUSION

1. Maize aphid develops in maize agrobiocenosis, and cucurbits crops aphid develops in sunflower agrobiocenosis, causing great damage to the plant.

2. The average number of maize aphids in 1 affected leaf during the growing season of maize is 185 pieces.

3. In the maize and sunflower fields, the natural entomophages of the ladybug, syrphid fly larvae, golden-eye larvae and aphidids are found on the plants affected by maize and cucurbits crops aphids. Their average number in 1 infected plant is 0.2-0.5 pieces.

4. When 3, 6, and 10 pieces of aphids were distributed on 1 leaves covered with entomological bags, after 20 days their number increased to 40, 85, and 187 pieces according to the options.

5. In the agrobiocenosis of maize, the damage of the pest was reduced and the biological efficiency of 68.4 percent was achieved when using the larvae of the golden eye in a ratio of 5:1 in controlling maize aphid.

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RAILWAYS AND CANALS IN THE NINETEENTH CENTURY

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ABSTRACT

I am going to present my paper on the much debated railways and canals system during the beginning of our colonial period. We will try and look back at the work that has been done in the following colonial period we should then claim this with detailed data. We'll try to emulate the ways in which railways and canals had their impact on economy and see their significant contribution and see whether due to incumbency it leads to destruction of our railways and canals system which had great run before that. I'll try and develop step by step talks about canals and railways and their positive impact on Indian economy looking the pre colonial period and try to compare it with the colonial period. We'll study turn by turn and bring the analogies between the two. We are talking about that century when India was colonized by the British and India was going through his own transformation. Let's talk about canals construction in India it has been widely assumed that the canal system were not so good but actually India have the best constructions of canals they have been one of the finest over the years. In terms of dimension they were pretty big and the cross sectional were huge, the throwing capacity of canals were better, the mileage it gives the average were pretty good and they were good in numbers. The canals of India were one of the greatest it has ever been come across though their structures were permanent in the nature. Now talking about railways, the rails ran first time on Indian track in 1853. Railways plays the spectacular role in the progress of country, the beginning of the railways as we have said started in 19th century. The expansion seen with the railways were huge making it to one of the largest railways in the world. The network drawn between the railways were vast in terms of connecting it. The speed with which the railways construction has happened were enormous and marvellous. The best thing that happened with railways was the expansion of trade expansion that has come simultaneously with it which India has enjoyed in the nineteenth century. The cost cutting role the railways had helped Indian entrepreneurs to earn maximum profit with the lower time interval. Railways together with canals we had brief introduction about both of them. Now we'll talk about them in more explained way and see their role.

INTRODUCTION

Railways

Let's look at the essential what railways did for the economy. The lines were drawn every year was in huge number in every successive period more than 1000 kilometres of railway lines spread in succession. The growth of railways comes in the early 60s of nineteenth century and the late 10s of the twentieth century. The consignments were sent in the bulk numbers through the railways and much of which was thankful to the long distance connection between the railway lines. The network system grew rapidly in terms of consignment. The share of railways in terms of expansion it had was grown rapidly over more than 50 percent in the nineteenth century and it can be seen that in the early 20th century it grew to more than 75 percent in it. Like we said the nature of the goods sent through railways were extraordinary in size, it helps to reach the good in shorter span of time and the cost incurred through the railways were very low in number, that's the cost effective nature of the railways that the price of the freight were not raised because of the high transportation cost and simultaneously to high production cost, It was cheap mode of transportation the sense. The bulk transportation of goods was the nature of this transportation and the foremost thing in that regard was the nature of speed it carries. This shaken the transportation in the India which give every region to grow in a bigger sense and in some way specialisation of it. In the following times trade expanded extraordinary, momentarily the trade expansion was fruitful for both the British and the local as well as regional producer of bulk goods and they try to specialise in that sense so a form of regional specialisation can be seen. Through the railways India have become the centre of connecting the merchants of every states and let them grow at a smother pace. This also gave them the opportunity to connect with the rest of the world, which soon give rise to the exports situation in India. Before transposition through railways exist in India. The transportation was way more costly in terms of sending goods from my place to another. Previously the valleys through which goods were send was not very much reliable in the sense. Not just it was unreliable it was strenuous in existence, the roads were terrible in the nature, one cannot be sure about the true



nature of it. The other problems that were faced by the merchants were the very slow nature of the transportation through railways and the amount of deterioration of goods was very high through roads. The positive of the railways was that no restriction was imposed upon the size of the products a manufacturer can produce. Industries grew bigger in size, especially the small scale and help in expansion of it. There were few exception as the river were used in sending food. Their export of rice was the example of it. The rice was exported in the sense, that it was also a cost effective in the sense. It's even cost less in the truest sense. Bengal was one of the passage in which this was used. The civil war in America also ignited the price in the market of textile, which gave Indian manufacturer to grow at a better pace. These were the economic situation faced by the Indian economy in general. It was impossible for the manufacturer to produce goods at the same level of world that such a price, this is where the railways steps in, it provided the glitch which was required to push the scenario of Indian manufacturers. The political reasons were the one that was responsible for the expansion of railways in India by the British investor so that it was going simultaneously in hand with the western countries, as their construction was not going long before so the economic opportunities it gave was one of the reasons why the railways were built at the first hand. Much of the reason of these railways was attributed because it helps them in army expansion from one region to another. The commercial nature of the railways had helped them in expansion. So that the borrowing by the potential investor of the private nature was not so much possible, as it amounts to big investment and no private will be willing to step in because of the risky nature of the investment. British investor find their place in that where in collaboration with the Government of India they started work together. They loaned a amount of money to the government of India. Much to the western and other parts same amount loan system was applied. The government give the investors an incentive to invest their money in railways that was called guarantee every investor was assured to get that guarantee with the loan amount and if that is not received they will give them subsidies in return. This gives British investor an opportunity in a way that they were willing to invest in the railways. This investment helped the private investor to build railways in India. So all this development was build on the assurance of guarantee.

Early 1870s it was seen that the proper construction of railways was executed. Through the usage of districts communities lines were built. The East Indian railway one of the private owner was the key player in building railway lines. The central government also steps in the process in construction of these lines. The projects were also leased to the private lender and later on that time it was eventually owned by the government of India. It has also seen in the later period the acquiring of these entities by the authorities which was centrally governed. The management was held in the hands of private entities but the ownership was governed by the central authorities. The management had their own view of doing stuff and the owners had their own. No one was coming in the other person of doing work. The private company, the district governing authority all the different entities come together to build the largest network of transportation seen. Under the old contracts, totally thirty three entities working on Indian railways. These entities consist of twenty four private entities the largest of them all, not more than four government companies were part of it and lastly the state.

Indian economy sees the stretch of the network grow in number as the data provides it. In a decade it was seen that the 7678 km of stretch was increased to 25,484 km, the per km stretch and after that period there growth can only be seen rising. The Bombay, Calcutta, Madras these were the initial network where the railways lines were built. Their progress can be seen collecting the independence period data every region in the country was served by the railways just few exceptions. It rose to 56,980 km stretch till the 1920s. Till independence almost 78% of the region was covered in that period. The highlight of the point as compared to other forms of transportations was not just the cost effective. The cost per ton kilometre was reduced substantially in size, which gives the benefit over other forms of transportation. The railways were bigger, faster in transportation it was reduced to less than 94 percent which was a huge dip. The benefits accrued to the Indian economy were overwhelming for every interested party in the economy. There was a better trade-off available now, as resources unused by the railways were used by other sector and gives them more benefit over other. The Investors confidence also boosted as the first instalment of the loan they were momentous in sum. The other sectors of the economy also bear the fruits of railways they grown rapidly in size. People used the railway in broader part also. There was a ten fold increase in the usage of railways from the nineteenth to the twentieth century as was not expected that much of the focus was that to the manufacturer, but people also used extensively. In early 1870s from 19 million passengers that was changed to 183 million and exponentially in the later decades manifold.

**Railways: Length of Track, Area Served, Freight carried**

Year	A Lines open (KM)	B Line Length (KM) per 10,000 Sq Km	C Hypothetical area served as % of total area of India	D Freight '000 Metric	E Freight million ton-km
1853	32	0.08	0.0005	-	-
1859	1006	2.45	1.47	-	-
1869	6,848	16.64	9.98	3,396	-
1879	13,639	33.35	19.89	8,967	-
1889	25,589	59.76	35.85	22,606	5,591
1899	37,831	87.81	52.25	40,386	10,084
Early	50,678	117.87	70.72	61,879	15,273 1900s

Canals

India presented one of the best establishment canals in the world. They were momentous in size and not so based on temporary things. In the British India the bigger construction of canals were done. Till the late 19th century 43,800 miles of construction of canals had done which were extra ordinary in size. The cost incurred by the construction of the canals was in millions almost amounting to Rs.382.6 million. Though the return on investment was also quite good in that sense that almost 4 to 5 percent at the net return of the market. However the north and south placed a crucial role in the expansion. Irrigation was very much helpful in the sense that earlier there was the issue of drought with the help of canal system much of it was removed. The very much the returns that were on the irrigation through the public sectors were not higher and it didn't pay-off. The development didn't happen much. As well much of the restrictions were imposed on the irrigations and the raised their hands in this regard. It was majorly seen in the late 1890s, it was weather which came to the aid of farmer and peasant as well. In the same era drought after drought was seen that was the time at which the demand for the irrigations were skyrocketed. In the early 19th century, the kingdoms of Delhi and Tanjore the East Indian company showing the enthusiasm for the construction of irrigation was happening. The north as well as south both witnessing the construction of dams that were built to control the movement of water., the Cauvery delta was the one where the detailed network were created in the north as well west and east of the river were connecting. But the disrepair in both the system was evident in the early nineteenth century. It was later on addressed by the central government as the system of irrigation was pretty much ancient so the Government comes at the rescue and the revival of this lagging sector was appreciated by the both the parties. The military board was set up for much of the development of the public works. This board was responsible for the cost analysis that was strictly watched by them. The government data was strictly scrutinised. The state government was the one that was overseeing the Cauvery works. After the Cauvery work it was necessary for new Government to repairs the work and simultaneously the survey were taken in that manner. In the initial 1830s, the Grand Anicut repair was stepped up. In the year 1838, Arthur cotton re-establishes Grand Anicut which cost around Rs. 83401 to the Raja Veeraman and the permanent form of dam was constructed. The success of which was widespread, the Cauvery delta was where the Grand Anicut was attaining. Later on in the northern India, it was seen that newly restored work of the canals were seen this also made the irrigation avenue much more practical in nature. The levy of water rates was also the part of it. The distributive handle of the networks by the canals was not only handled by the Bengal Engineer but also the maintenance and the management of the entire work. In the year 1836-38 there was the reconstruction and development of the grand Anicut which was inaugurated in the Madras Presidency. The jurisdiction of madras government showed that the record of data calculated by them was 781,306 acres of mere land after that the presidency had climbed over 8 million which was tantamount to 70 percent of irrigation.



The real problem that was faced was the equitable distribution of canal water that could be efficient and equitable. In the other half of the nineteenth century the Public Works Department now working with The Crown, as it was acquired by the later. When this transfer of power was occurring the committee was headed by General Sir Richard Strachey, This committee classified the public work into two categories which was called 'The work of internal improvement' as well as the 'State Work'. By the year 1895-96 there was a 33 percent increase over the figure to Rs 38.3 million, the British India' irrigation capacity almost doubled the investment as compare to the last decade of 1885-86. The revenue on the other hand was almost raised by 47 percent, 62 percent was the net revenue. Madras, North Western provinces and lastly Punjab where the net profits were registered whereas there were also regions that were making Net losses which are Bengal as well as Bombay where they were able to counterbalance each other. The revenue was brought by the old works 'of native origin'. The top earning brackets of the provinces were seeing the real change. Madras was seeing overtaken by the Punjab while the third place has been relegated to North Western Provinces. We let the data to explain it in the following manner where the irrigation sector will show how much that sector that has evolve and the amount spent on the it. Intended to irrigate 1,50,000 acres of land by the 'Orissa undertaking' company annually leading to the profit between 9 and 21 percent. Almost 1,200,000 pound sterling was spent much of it belongs to the government. The following results were short of expectations. In 1867, the mere land of 10,000 was irrigated. The following instruction were given after falling of expectations (1) with public money they won't be constructing anything from now onwards unless the capital expended by them earned them some interest (2) the annual will be used on the ordinary public works expenditure. With regards to the English money market the borrowing at the prevailing rates of exchange added additional risk. Like money amount borrowed in the Indian currency added with the previous loans should be borrowed in India.

India's PWD. Estimated capital value of works completed

Works completed and in operation	Proportion of total Total estimated value	(%)
Canals and other works of Agriculture (irrigation & drainage)	11,000,000	29
Railways	2,750,000	7

CONCLUSION

Through both the analysis we try to bring the analogy and debated on railways and canals and system in general. Exactly for the railways, it played a spectacular in the development of Indian economy in the colonial period. The shipment through freights would have been on a higher side, if that won't have been the case. It would have been used more and more resources for sending of our goods. The international market would not have received such a high supply of Indian goods, as well as the Indian market internally could not able to receive diner goods. Agricultural output was increased due to the help of railways. As well the new jobs that were created because of that can't be underestimated, the populations also received higher amount of income, as well as the numerous other changes that were observed. But in the long run, much of the changes were almost lost and not led to a formal structure of the economy.

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ANTI-COLONIAL NATIONAL LIBERATION MOVEMENT: ASIA AND AFRICA

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ABSTRACT

Colonialism based on territorial conquest has become a legacy of the past but economic and military disparities between the former colonies and the metropolitan powers are substantial even today. The history of the struggle against colonial rule is important not merely to understand the evolution of countries in Africa and Asia but also the regimes that emerged after independence. A comparative study of anti-colonial movements is easier now on the basis of the published works available. In this paper we will discuss the growth of anti-colonial movements in Asia and Africa.

KEYWORDS: *Nationalist Ideologies, Colonial Power, Anti-Colonial Movements, Constitutional Nationalisms, Capitalist Development etc.*

INTRODUCTION

Although there were a few straightforward armed struggles against colonial rule the primarily non-violent struggle led by the Indian National Congress under Mahatma Gandhi was indeed an exception in the history of anti-colonial struggles. The struggles against the French and subsequently the Americans in Vietnam took the course of a violent liberation movement. The rivalry between the Soviet Union and the United States of America as the defender of the free world introduced a measure of conflict in anti-colonial movements after World War II that was absent in the case of those countries that had gained independence during the late 1940s. India and China managed to choose their paths of development after prolonged struggles against foreign domination before the cold war began in earnest. Even smaller countries managed to avoid the consequences of cold war rivalry like Sri Lanka and Burma during the late 1940s. Vietnam and Korea, however, were divided as a result of superpower rivalry after the USA decided to stop peasant armies from bringing communists to power. The history of liberation struggles has been shaped by two decisive factors. One was the extent of leeway left by the colonial power for the colonized to express their nationalist aspirations through open and legitimate channels. The British set up representative or consultative bodies that allowed for more moderate forms of anti-colonial politics to flourish and compete with the more militant expressions of nationalism. The French in many of their colonies did not evolve such mechanism, and the absence of any space for moderate and constitutional politics led to the emergence of the Vietnamese liberation struggle under Ho Chi Minh. In China the defeat of the communist party in the urban centres led Mao to build his base in the rural areas during the 1930s. A powerful and predominantly peasant armed struggle against Japanese aggression (1937-1945), based on a class coalition dominated by the communists, emerged under Mao-tse-Tung. The opportunities for more liberal and moderate politics in China were absent and so the movement took a more radical turn than in India. The second factor in the anti-colonial struggles was the role of external interventions during the cold war. There were countries that fell clearly under one sphere of influence but there were many that were the arenas of contestation. In Malaya the British stayed on to crush the communist movement and in North Korea and North Vietnam the communists assumed complete control under independent leaders with support from China and the USSR. In many countries there were struggles to dominate the national movement and after the Sino-Soviet split of the mid 1960s there were pro-Soviet and pro-Chinese factions in the liberation struggles of many African countries like Angola, Mozambique and Guinea-Bissau. The fate of many small nations was often determined by super power rivalry and negotiation and not the strength of their anti-colonial movements. The role of external factors in attaining national independence cannot be underestimated. Developments in Paris and Lisbon determined the outcome of struggles in French Algeria and Portuguese Angola and Mozambique. If there had not been changes in the political equations in France in 1958 and Portugal in 1974 the liberation of colonies in Africa would have been a more long drawn affair, although their struggles had been long and bloody enough. The decolonisation of Africa was influenced by the colonial powers had divided up many parts of the world without regard to the ethnic, linguistic or religious attributes of their colonised subjects.



NATIONALIST IDEOLOGIES

In a celebrated work, *Imagined Communities* by Benedict Anderson, it has been argued that the idea of the nation and nation-state in its modular form developed in France after the Revolution of 1789. It then spread across the globe with the aid of print capitalism and elites promoting national languages and sometimes creating national languages along the way. Partha Chatterjee has critiqued this derivative discourse of nationalism. According to him, nationalist ideas in India developed in the private and more spiritual domain shielded from the dominant western discourse in the public sphere. The 'construction' of the imagined community has also been questioned. Elements of ethnicity or race cannot be the products of shared imagination alone. The latter view has been advocated by S.A. Smith. Nationalisms can emerge based on one or more elements – language, ethnicity, citizenship and even religion. Scholars differentiate between primordialist and civic nationalisms, cultural and constitutional nationalisms and exclusive and assimilationist nationalisms based on historical evidence. The ideology of Indian nationalism for the most part was concerned with an economic critique of British rule in India as in Naoroji's *Poverty and Un-British Rule in India*. During the late 19th century the element of cultural nationalism too emerged and influenced a small but significant number of people during the anti-colonial struggle. The element of racial antagonism was much less evident in India than in other countries and certainly less so than in Africa. The absence of significant number of white settlers in India, unlike Algeria, Kenya and South Africa, partly accounts for this. Another factor was the historical experience of slavery in Africa: the large scale export of slaves to the New World by Europeans, sometimes in collaboration with local African elites and Arab traders. The white settlers were responsible for creating a strong element of racial antagonism against the white man because they appropriated the best lands for cultivation and the most hospitable areas for habitation. The European powers were responsible for creating racial barriers throughout the colonial world but in Africa these often took more extreme forms. This was particularly true of countries like Algeria, Rhodesia and South Africa. Therefore the economic critique of colonialism was often overshadowed by the critique of white rule and racism as in Fanon's *The Wretched of the Earth*. In all the countries that came under colonial rule there emerged a clear distinction between the rulers and the colonized. The entire literature that flourished after the publication of Said's *Orientalism* in 1978 has been concerned with the unequal power relations between the colonizing power and the colonized people and the construction of both the Orient and the Occident, perceptions of the Other also fashioning conceptions about the Self. European perceptions of Indian society and culture whether by the more flattering Orientalist admirers of ancient Indian literature and religion like William Jones or the more dismissive Utilitarians like Mill or condescending Anglicists like Macaulay were part of the same discourse that in a way Orientalized India. The great veneration for the wisdom of the Vedic texts and Aryan culture shaped Indian responses to European cultural domination. It gave a great impetus to reform of Hinduism as well as a measure of cultural confidence to the Hindu middle classes in their struggle against European cultural domination. In the case of Indian Muslims the decline of the Ottoman Empire and the eclipse of Muslim powers after the 18th century quickened a spirit of revivalism and of Pan-Islamism. Shah Wali-Ullah, Syed Ahmed Bareilvi, Jalaluddin Afghani, the Ali brothers and even Mohammad Iqbal contributed to these trends. Syed Ahmad Khan and Mohammad Ali Jinnah were concerned with the political and economic rights of the Muslims in the subcontinent and were willing to mobilize their community in whatever way they could, even accepting help offered by the British rulers. Religion in the subcontinent has been a very important factor in shaping political identities and nationalism. Identities based on language and region and caste developed too but the identities based on religion became predominant during the closing years of colonial rule and led eventually to the partition of India in 1947. The role of religion has been underestimated in Anderson's emphasis on the construction of national identities based on language. Print capitalism, communitarian competition and colonial policies of divide-and-rule worked to give religious identities the overdetermining role in late colonial India. In many countries with an overwhelming Muslim population or with a significant Muslim minority religion has played a prominent role in developing responses to European cultural and political domination. In Indonesia the growth of nationalism was linked to a kind of Muslim identity although the Sarekat Islam did not have the influence that similar parties have wielded in South Asia and West Asia.. The principles of Panchshila as enunciated in August 1945 dropped all reference to religion to achieve "solid unity" in Indonesia. Sukarno, and subsequently Suharto, endorsed a broadly secular form of nationalism. Also the rise of communist movements in Indonesia and Malaysia before they achieved independence indicates the presence of alternative ideologies. Retreating colonial powers ensured the success of anti-communist nationalists in these countries. Some Arab leaders like Bourguiba of Tunisia thought nationalism was the best antidote against communism because it promoted the interests of the people as a whole. In the West Asian region the colonial powers exercised dominion but did not often set down deep roots. Iraq was under formal colonial rule for a brief period after World War I until 1932 although it was under neo-colonial influence until 1958. Iran too had to endure informal imperialism but not direct colonial rule. Arab nationalism emerged with the development of pan-Arabism, but there was no demand for a single united Arab state. The earliest pan-Arabists conceived of at least three Arab states east of Suez-Syria, Iraq and the Arabian Peninsula. The existence of twenty odd Arab states following colonial wars and the post World War I settlement added the more pervasive influence of local loyalties based on nation-state sponsored nationalism. Arab nationalism was based on tradition as well as new uses of tradition. The achievements of thirteen centuries of Islamic civilisation came to be regarded as those of Arab civilization. Even if Islam and Arabism were not identical they were not perceived as antagonistic to each other. While in North Africa and the Arabian Peninsula Islam played an important role in the development of nationalism this was not true of the central lands of Islam like Egypt and the Crescent which had



substantial Arab Christian populations. Advanced conceptions of Arab nationalism developed in Iraq during the 1930s and 1940s, in Syria during the 1950s, and in Egypt during the 1960s. Secularism and socialism too played a role in shaping the ideology of Arab nationalism. Also there has been a prolonged conflict between the Islamic revivalists and the nationalists in Egypt, Syria, Iraq and Lebanon. The Turkish people were ruled by a modernizer like Mustafa Kemal who abolished the position of the Khalifa, the religious head of the Muslim community, even while Indian Muslims protested against the treatment of Turkey and the Khalifa. A scholar has found some similarities in the developments in Kemalist Turkey and those in Soviet Central Asia during the 1920s and 1930s in terms of modernisation and secularisation from above by an elite, spread of literacy, improvement in the position of women and adoption of the Roman script to develop the national language. The subordination of religion to the state in Turkey was carried out by the introduction of a uniform civil code based on that of Switzerland in 1926. As part of the nationalisation of Islam the Quran was translated into Turkish in 1933 for the first time. During the 1990s there was an attempt to reconfigure nationalism in terms of an Ottoman-Islamic tradition by commemorating the victory of the Ottomans against the Christian West at Constantinople in 1453. In any case religious nationalism in a regressive form became more significant in the Islamic world only after the upsurge against the Shah of Iran in 1979. In the earlier period nationalist elites had supported progressive leaders like Bourghiba of Tunisia, Baath Socialist parties in Syria and Iraq and patriotic leaders like Mossadegh in Iran and Nasser in Egypt.

INTELLECTUAL AND SOCIAL ORIGINS AND VISUALISATIONS OF NATIONALISM

The British conquest of Bengal in the mid-eighteenth century created the basis for a new class of people tied to British interests and by the early nineteenth century a stratum inspired by western ideas of liberalism and culture. The Young Bengal movement and intellectuals like Ram Mohan Roy and Bankim Chandra grappled with western domination and articulated indigenous responses to it. It was only in 1885 that the Indian National Congress was formed by westernized Indians. China was never fully colonized and even the Japanese were unable to go beyond the territories of eastern China, substantial though these regions were. Unlike the Soviet Union, China never offered the right of secession to the national minorities. This was partly because Chinese communists did not need the support of the minorities to fight for freedom or socialism. After the Japanese invasion the Kuomintang and the Communist party were able to accept similar views about the Chinese nation or zhonghua minzu the centrality of the Han people and the inclusion of non-Han borderlands within China. There are problems in identifying the nature of nationalities and nationalism in East Asia which are the product of long term historical factors and also recent state practices. The Vietnamese language has a high proportion of Chinese words because of prolonged contact rather than any genetic connection with the Chinese language. In standard Thai considerable vocabulary is derived from Khmer, which in turn draws on Sanskrit and these three languages are genetically unrelated to each other. The Kachin in Burma developed an ethnic identity largely as a result of politics, not any essential characteristics based on language or ethnicity. Biology and spoken language were less important in shaping differences in the pre-colonial period compared to differences based on locality, kinship and Buddhist or Chinese traditions. Only after the border regions of empires were brought within well defined borders of countries by the early twentieth century that the modern states in East Asia became involved in ethnic classifications. The Han Chinese had regarded other nationalities as barbarians and the Qing and Republican Chinese recognized five major 'races' in China. The ethnic classification or minzu shibie in 1962 put all the minzu on an equal footing within the Chinese nation. Although about four hundred groups were identified on the basis of difference only fifty six minzu were recognized. The Chinese also built up the claims of groups designated the Zhuang in Guangxi and Yunnan by encouraging this identity and allowing them to link up with the Tai-speaking groups of Vietnam and Cambodia. The state plays an important role in promoting claims of minorities or in modifying their rights and claims. In West Africa the colonial intelligentsia began to emerge during the 1840s. Saro pioneers (people of Yoruba descent, liberated slaves educated in Sierra Leone) who settled in Nigeria in 1839 were not the ones who brought European education to the region. The notables of the coast had hired teachers to get the necessary education to profit from the trade of the Atlantic economy from the sixteenth century onwards. Freetown and Lagos drew people from diverse backgrounds. Freedmen from Brazil and the Caribbean, American blacks from Liberia, Jamaican maroons, and indigenous Mende and Temne contributed to the educated community. The Fourah Bay College set up in 1827 in Sierra Leone to train Africans to work for the Church Missionary Society played an important role in West Africa. Links to "the culture of the Black Atlantic" dominated intellectual life until late in the 19th century. Although their numbers were not large the West African intelligentsia had emerged earlier than in other regions. Many members of the West African intelligentsia were deeply influenced by Christianity and sought to find their place as Africans within the framework of the European civilizing mission. The development of African cultural identity and nationalism was influenced by the spread of Christianity in many regions. This set it apart from the Arab and Muslim world as also South and South East Asia. The African nationalism or cultural self assertion took the form of creating African controlled churches with diverse ideologies. In 1937 Lord Hailey in a survey of nationalism saw these black churches as the indicators of a kind of national awakening. It has been argued that although Christian missionaries provided a common language for educated members of different tribes in West Africa they wanted to mould the Africans to suit the interests of the colonizers. The Christian Churches were European dominated and did not deal with the Africans as equals although the access to western education and the Bible added to their self-worth and sharpened a sense of justice. This initially led to the proliferation of splinter African churches and then the denial of equality led them to turn towards nationalism. A more generalized



argument has been that while the Christian missionaries opened up the prospects of a wider world they did not actually bring the Africans closer to achieving what they offered in terms of western capitalist culture. This gap between what they seemed to offer and what actually came to pass produced a range of responses from resistance to more overt forms of rebellion. African nationalism was quickened partly by this process. The inspiration for nationalism has come from turning to the past achievements of the nation or the inner or spiritual life of the people based on religion or culture. In Africa people outside Egypt were proud of the achievements of Pharonic Egypt and the Nile civilisation, but also of traditional tribal culture. Early nationalists discovered and highlighted the strengths of traditional religion or culture. In Thailand, which was not colonized, there was a preoccupation with the idea of civilization and the appropriation from the west of those ideas that were relevant for a civilized life. The west was setting new standards of civilisation as once India and China had. The Sanskrit word for civilisation invented during the 19th century Arayatham did not take off. Siwilai, an adaptation of the word from English or charoen, a fourteenth century Khmer word, became far more popular. In the ethnic interpretation of nationalism the Vietnamese nation had emerged almost a thousand years ago in opposition to Chinese rule, but those who believed in communal solidarity of the village community highlighted its role in linking up with both nationalism and communism in various ways in the 20th century.

NATIONS, NATIONALISMS AND THE PARTITION OF STATES

The incorporation of vast territories in Asia and Africa by the colonial powers was a long drawn process without any method in the mad scramble for colonies. There were economic reasons for acquiring colonies and also strategic considerations which led to annexations. The partition of the non-European world was also carried out to acquire territories that were likely to be of value in the future or simply to prevent a rival from extending his sway in a region. The countries created because of these factors often lacked anything in common except the ruling power. The anti-colonial movements in countries carved out of vast unexplored territories, particularly in Africa, lacked any clear basis for the articulation of a national movement. The boundaries had been drawn arbitrarily by diplomatic negotiations in European capitals and systems of rule introduced with little regard for the tribal, linguistic or ethnic identities of the inhabitants. The national movements were based on the bonds of colour or black racial identity. National movements based on identity of race were, however, undermined by identities based on tribe, religion and language. In West Africa the struggle of the Nigerian nationalists against British rule was partly undermined because of the division between the predominantly Christian south of the country and the Muslim dominated northern region. Ethnic divisions provoked the Igbo to secede soon after independence. After a bloody civil war between 1967 and 1970 Biafra was reincorporated in Nigeria. In East Africa the Mau Mau uprising brought out the ethnic tensions in the country and helped the Kikuyu move from a subordinate position to one of dominance. Those who fought the colonial rulers were often subjected to severe repression and ethnic differences were exploited to perpetuate colonial rule. The Africans have found it easier to create Pan-African ideologies based on shared blackness or Negritude as articulated by Leopold Senghor, Kwame Nkrumah and Jomo Kenyatta than to unite individual countries ignoring tribal identities. The colonial powers too encouraged secessionist demands for economic reasons. Belgian Congo was divided so that the resources of Katanga could be more easily controlled. The division of territories in West Asia was fraught with great difficulties because the discovery of oil in the region had made it a vital matter for major corporations and the colonial powers. Kuwait was carved out as an independent country allegedly to weaken the bargaining power of the oil producing states.. The British recruited disproportionately from the Tiv in Nigeria, Acholi in Uganda and the Kamba in Kenya for the military. In Africa British policy was to rule indirectly through traditional structures of authority which were only subordinated to colonial interests, not undermined or destroyed. On the other hand the French, who believed in greater centralisation of power and incorporation of colonial subjects within Greater France, destroyed traditional social structures. They also promoted an elite based on acceptance of French language and culture disregarding earlier status rankings. Thus the British produced an unranked system of ethnic stratification unlike the French. This allowed ethnic competition under the British which intensified after the colonies became independent. The traditional structures allowed disaffected ethnic groups to organize effectively against oppressive elites in the post-colonial period in the former British colonies. On the basis of data relevant to 48 countries the study has concluded that the former British colonies were marked by more conflict even though grievances were higher in the former French colonies. It is arguable that the exploitation of ethnic differences in British colonies has been underestimated by this study. The British divided Ireland, India, and Palestine before they handed over power to nationalist leaders. Although the British often divided their colonies before they quit them they were more willing to withdraw peacefully from their colonies than the French. The former colonies, both British and French, tried to create federations with or without support from the retreating colonial power. After the Central African Federation created in 1963 failed Uganda, Tanzania and Kenya went their separate ways. Federations often failed because of the anxieties of the more developed national group that it would have to bear the burden of the less developed regions. Gabon had these fears about the Central African Republic that four French colonies tried to set up. Cote d' Ivoire in West Africa and Kenya in East Africa were wary of federation for the same reasons. In South Asia after World War II the strength of the national movement and the breakdown of colonial authority and inter-community relations made a policy of retreat appear eminently sensible.. Notions of nationalism were promoted by the colonial powers and post colonial elites according to various economic and strategic considerations that sometimes brought them together. The idea of Greater Malaysia was promoted by the British after the Malay leader Tunku Abdul Rahman



supported the notion in 1961. Although the Tunku did not particularly want Singapore as part of greater Malaysia he had to go along with the plan to secure the resources of Sarawak and Sabah in Borneo. Thus Malaya that had achieved independence in 1957 accepted Singapore and the Borneo territories as part of Malaysia in 1963. Lee Kuan Yew of Singapore went along with the British strategic plan to protect their interests during the cold war because he too wanted to thwart the rise of communism

CONCLUSION

The historical record does not support any simple theory explaining either the rise of nationalities or national movements or the policy towards them of colonial and post-colonial elites and states. Nationalism is not necessarily connected to capitalist development or industrialisation although they do create the basis for national mobilisation. Language and print capitalism do play a prominent role in the rise of nationalism, but in many cases nationalist elites have promoted the spread of national languages and public education to spread the spirit of nationalism after creating a nation-state. Languages are not always the basis of nationalism since religion has also promoted nationalism. Religious nationalism has been important in many Middle-Eastern countries although other strands of nationalism and other ideologies also co-exist even in this region. Nationalism and the accompanying emphasis on borders, sovereignty and singular identities creates national minorities and sub-national or alternative nationalist ideologies. The rise of nationalism cannot be understood in terms of the opposition between western and indigenous sources of nationalism. The elements that go into making nationalities are subject to long term evolution and the impact of mass mobilisation and state practices. Outside the historical context it is not possible to understand the rise and growth of nationalism in Asia and Africa or anywhere in the world.

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METHOD OF DETERMINING THE UNWASHING VELOCITY OF OPEN DRAINAGE SYSTEMS

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ANNOTATION

In the history of mankind, the development of systems of escape goes back to the distant past. In ancient times, in the countries of Rome, Greece, Egypt, and later in the European regions, the large-scale use of collector-drainage systems was established. The article presents hydrodynamic processes occurring in open drainages. The problems that arise in the design and construction of open drainages are highlighted. The non-wash rate table given in the building codes and regulations was analyzed. The formulas given by the authors for determining the rate of non-washing were studied. Scientific research on the design of open bed collector systems based on the rate of non-washout has been carried out and the results are presented.

KEY WORDS: Reclamation, ditch, hydrodynamics, non-wash speed, flow rate, flow depth.

INTRODUCTION

The field of reclamation, in particular, drainage systems, is particularly important in the development of agriculture [1,2]. Drainage systems are a reclamation facility that serves to turn excess underground water into runoff and divert it away from cultivated areas in irrigated areas. Exhaust systems may vary depending on existing conditions. These consist of open bed collector systems, closed bed collector systems, vertical collector systems, composite collector systems, etc. In irrigated areas, open-bed and closed-bed collector systems are mainly used [3,4]. The advantage of open-bed and closed-bed collector systems is that their use does not require excessive energy resources. In this type of collector systems, the flow is formed and moves based on the laws of hydrodynamics. Ceramic, concrete, asbestos-cement and PVC pipes are mainly used in the construction of closed trenches [5,6]. Open collector systems are built by digging deep collector systems in cultivated fields. Due to the material stability of closed trenches, washing processes do not occur. Only fuzzy printing processes are observed. Due to the fact that the open collectors have a soil bed, washing processes are observed in some cases.

STATEMENT OF ISSUE

One of the important tasks in the process of designing open collector systems is to fulfill the condition of non-washing. Because if washing processes take place in the bed of an open ditch, there is a risk of the ground of the bed moving to the lower parts and muddying the next sections. In addition, as a result of the downward washing of the bottom of the open ditch, the side walls and banks collapse. It is known that several scientific studies have been conducted on the design of irrigation canals based on the non-flush rate [1,8]. As a result of the conducted scientific research, some recommendations have been developed. Recommendations were developed by V.N. Goncharov, G.I.Shamov, A.M.Latyshenkov, B.I.Studenichnikov, Ts.E. Mirtskhulava and others to justify the rate of non-flushing flow in irrigation canals [9,10]. Based on the developed recommendations, a special table for determining the non-washable speed for bonded and non-bonded soils was developed and included in the Construction Rules and Regulations. In these presented tables, it is possible to determine the non-flush velocity at values above the flow depth of 0.5 m. But in most cases in open collector systems, the flow depth is less than 0.5 m, so it is not possible to use this table. It can be seen that the problem of determining the rate of leaching in open collector systems remains relevant.

SOLUTION METHOD

A number of scientific studies have been conducted to determine the non-flush rate in open collector systems. Data from the table used to determine the non-flush rate given in the building codes and regulations were statistically analyzed.



Table 1
Table for determination of non-leaching rate by CN and L

Average size of soil particles	Permissible flow velocities m/s and flow depth, m for homogeneous smooth soil with clay content of 0.1 kg/m ³ ,			
	0,5	1	3	5
0,05	0,52	0,55	0,6	0,62
0,15	0,36	0,38	0,42	0,44
0,25	0,37	0,39	0,41	0,45
0,37	0,38	0,41	0,46	0,48
0,5	0,41	0,44	0,5	0,52
0,75	0,47	0,51	0,57	0,59
1	0,51	0,55	0,62	0,65
2	0,64	0,7	0,79	0,83
2,5	0,69	0,75	0,86	0,9
3	0,73	0,8	0,91	0,96
5	0,87	0,96	1,1	1,17
10	1,1	1,23	1,42	1,51
15	1,26	1,42	1,65	1,76
20	1,37	1,55	1,84	1,96
25	1,46	1,65	1,93	2,12
30	1,56	1,76	2,1	2,26
40	1,68	1,93	2,32	2,5
75	2,01	2,35	2,89	3,14
100	2,15	2,54	3,14	3,46
150	2,35	2,84	3,62	3,96
200	2,47	3,03	3,92	4,31
300	2,9	3,32	4,4	4,94

According to the results of the analysis, in the table used in CN and L, the values for determining the no-wash velocity are not given in cases where the flow depth is less than 0.5 m. It is known that this table was compiled based on the formulas proposed by Ts. E. Mirtskhulava [19,20]. This table is mainly used in the design of channels. Ts. E. Mirtskhulava proposed the following for determining the rate of leaching in open waterbeds for unbound soils:

$$g_{ner} = \lg \frac{8.8h}{d} \sqrt{\frac{2m}{0.44\rho n} [g(\rho_{gr} - \rho)d + 2C_{yn}^n \cdot K]} \quad (1)$$

there: g_{ner} — average flow velocity over the cross section, permissible non-erosive, m/s; m is the coefficient of working conditions, which takes into account (for channels arranged in non-cohesive soils) the influence of sediments in the colloidal state on the erosive capacity of the flow; when the content of clay particles in water is less than 0.1 kg/m³ $m=1$, if these particles are present in water 0.1 kg/m³ or more, $m > 1$; ρ_{gr} , ρ — density of water and soil, kg/m³; n is the overload factor, which takes into account the change in the erosive capacity of the flow under the influence of the pulsating nature of the speeds and other cases of the likely excess of loads on soil particles over the calculated values; d is the average diameter of soil particles, mm; C_{yn} is the fatigue tensile strength of non-cohesive soil, Pa; this parameter takes into account the appearance of appreciable adhesion forces with fine-grained soil (at $d < 0.15$ mm); k - coefficient characterizing the probability of deviation of adhesion forces from the average value, it can be taken $k = 0.5$

RESULTS

For unbound soils, the rate of leaching was determined for values of flow depth of 0.1-0.5 m. The formula proposed by Ts.E. Mirtskhulava was used to determine the rate of non-washing. Calculations were carried out for particles with an average size of 0.05-2.00 mm. The results were tabulated.



Table 2
Table for determining the speed of washing

h, m	0,05 mm	0,15 mm	0,25 mm	0,30 mm	0,50 mm	0,75 mm
0,1	0,46	0,31	0,33	0,32	0,35	0,40
0,2	0,49	0,33	0,34	0,35	0,37	0,43
0,3	0,50	0,34	0,35	0,36	0,39	0,45
0,4	0,51	0,35	0,36	0,37	0,40	0,46
0,5	0,52	0,36	0,37	0,38	0,41	0,47
1	0,55	0,38	0,39	0,41	0,44	0,51
3	0,6	0,42	0,43	0,46	0,5	0,57
5	0,62	0,44	0,45	0,48	0,52	0,59

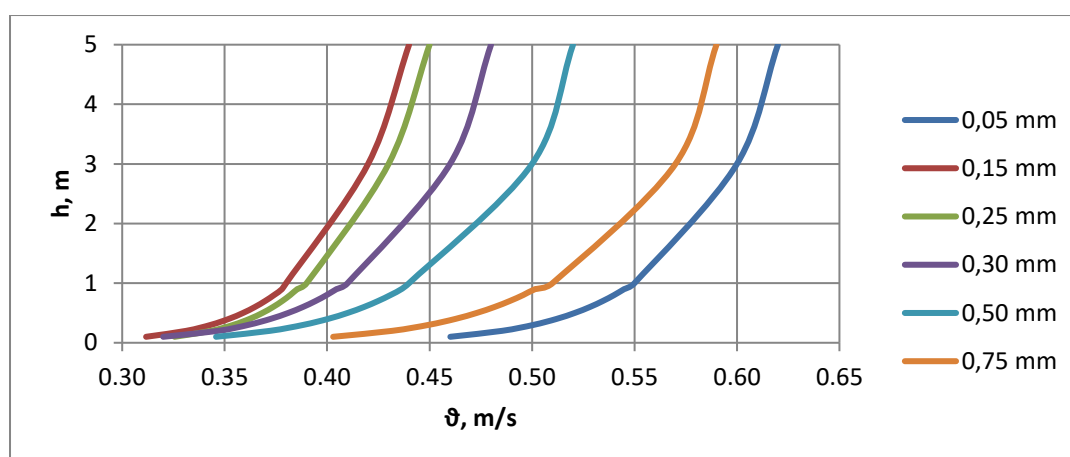


Figure 1. A graph for determining the rate of leaching

Table 3
Table for Determining the rate of washing

h, m	1 mm	2 mm	2,5 mm	3,0 mm	5 mm	10 mm
0,1	0,43	0,54	0,57	0,61	0,71	0,89
0,2	0,46	0,58	0,62	0,66	0,78	0,98
0,3	0,48	0,61	0,65	0,69	0,82	1,03
0,4	0,50	0,63	0,67	0,71	0,85	1,07
0,5	0,51	0,64	0,69	0,73	0,87	1,11
1	0,52	0,66	0,71	0,75	0,89	1,14
3	0,53	0,67	0,72	0,76	0,91	1,16
5	0,54	0,68	0,73	0,78	0,93	1,18

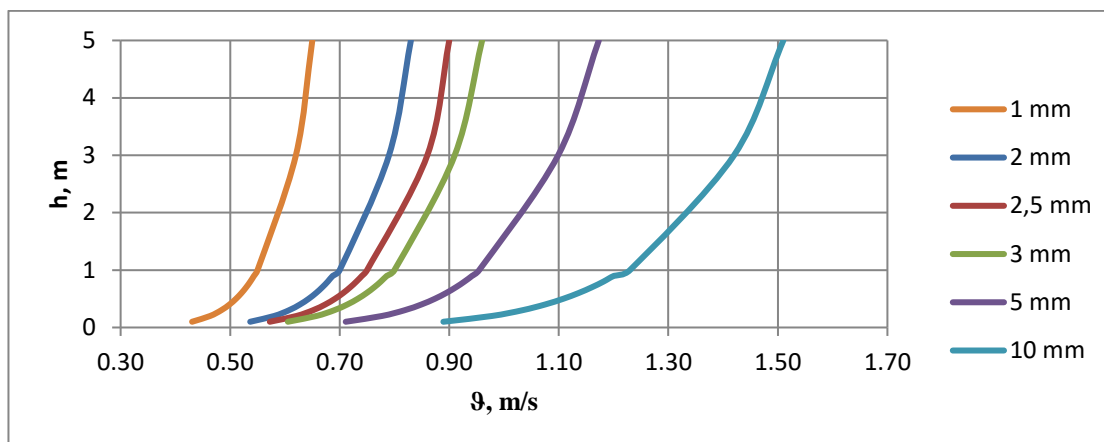


Figure 2. A graph for determining the rate of leaching

CONCLUSION

The rate of leaching was determined for open bed trenches with unbound soil cores. The formula proposed by S.E. Mirtskhulava was used to determine the rate of non-washing. Specific tables and graphs were developed for each primer based on the determined non-leaching rate. With the help of the given table, it is possible to use values of 0.1-0.5 m of flow depth in the design of open collector systems based on the conditions of non-washing.

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CORRELATION BETWEEN THE AMOUNT OF CHLOROPHYLL PIGMENTS “A” AND “B” IN PLANTS WITH ANTHOCYANIN COMBS L-2, L-3, F₁, F_B, F₂

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ABSTRACT

In the article: Based on the results of the experiments, the following scientific opinion is expressed. Experiments have shown that the separate actions of salinization and alkalization did not significantly affect the value of the ratio of chlorophyll “a” to chlorophyll “b”. The absence of significant changes in the value of this indicator indicates that these factors do not affect the light collection complex of the thylakoid membranes of this test crop.

KEYWORDS: *recessive, lethal, mutant, selection, viresens, xanthoviresens, havirs, phenotype, heterozygote.*

INTRODUCTION

In the course of the experiment, mutual relative bonds between the amounts of chlorophyll “A” and “b” pigments were studied even in plants F₁, F_B, F₂, obtained by hybridization of anthocyan cave ridges of different types.

The effectiveness of the pigment system depends on the correspondence of its structure and function to climatic and environmental conditions, especially lighting conditions. Plants that grow under forest shade are usually more light-loving than plants that are light-loving due to their chloroplasts content [1] and have a higher proportion of chloroplast b, which increases the Leaf's ability to collect light in conditions of long red light.

MATERIALS AND METHODS

Most of the scientific research is devoted to the study of the composition of plant pigments in a certain extreme living conditions - deserts, high mountains and tundra, in the extreme northern Taiga [2-4]. Existing data on the composition of pigments in Steppe plants in Mongolia and the Povolj region [3-8] also did not allow to reveal the exact laws of changes in the composition of the pigment due to changes in the width of growth, since not all forms of pigments are analyzed, or caused by insufficiently expanded clouds with a low number of dots [4-10].

Maintaining the structure and function of chloroplast membranes in a stable state under the influence of unfavorable environmental factors ensures a more coordinated operation of the components of the electronic transport chain [5-9].

The results of determining the composition of green pigments indicate that the amount of chlorophylls “A” and “B” in variants with an increased level of alkalization of the root medium was much higher than in the control option [6-11].

The data obtained indicate that the increase in the composition of the pigment correlates with a decrease in plant growth. A strong inverse relationship has been established between height, mass and chlorophyll in its composition. The accumulation of pigments can be the result of ingesting growth processes under the influence of the toxic effects of salts during the ongoing biosynthesis of pigments [7-9]. An increase in the amount of these compounds is an active reaction of plants, in contrast to the negative effects of salt ions.



RESULTS AND DISCUSSION

The results of the experiments showed that even individual actions of salinity and alkalization did not significantly affect the value of the ratio of chlorophyll a to chlorophyll B. The absence of significant changes in the value of this indicator indicates that these factors do not affect the light collection complex of thylakoid membranes of this test crop.

In the course of the experiment, mutual relative bonds between the amounts of chlorophyll "A" and "b" pigments were studied even in plants F₁, F_b, F₂, obtained by hybridization of anthocyanin cave ridges of different types. The data obtained were presented in Table 1.

On the L-2 Ridge obtained as a material, the anthocyanin color developed in all morphobiological parts of the plant. On the L-3 Ridge, the anthocyanin developed on the STEM and on the veins of the true leaves. The beak is green, the flower does not show anthocyanin in the cosachabarg.

The amount of pigments chlorophyll "A" and "b" in plants L-2, L-3, F₁ (L-2XL-3), F_b (L-2XL-3) showed a positive indicator of strength in all of their relative interactions (table).

Correlative dependence of the amounts of chlorophyll "A" and "b" pigments in anthocyanin ridges L-2, L-3, F₁, F_b, F₂ plants.

Table: Correlative dependence of amounts of chlorophyll "a" and "b" pigments in plants with anthocyanin ridges L-2, L-3, F₁, F_b, F₂

№	Material	Color	Chlorophyll "a" + "b"		chlorophyll "a"
			chlorophyll "a"	chlorophyll "b"	"b"
			R	r	R
1	L-2	Anthocyanin	0,90	0,87	0,89
2	L -3	Anthocyanin	0,78	0,78	0,95
3	F ₁ (L-2x L-3)	Anthocyanin	0,85	0,89	0,90
4	F _b (L-2xL-3)xJI-3	Anthocyanin	0,84	0,94	0,87
5	F ₂ (L-2xL-3)	Anthocyanin	0,83	0,95	0,94
6	F ₂ (anthocyanin: dark red)	Anthocyanin	0,89	0,79	0,93
7	F ₂ (anthocyanin: L-2 type)	Anthocyanin	0,90	0,65	0,68
8	F ₂ (anthocyanin: L-3 type)	Anthocyanin	0,87	0,84	0,92
9	Green	Green	0,93	0,95	0,96

Plants F₂ (L-2XL-3) were separated from phenotypic quixate into four groups. They are anthocyanin-dark red, anthocyanin-L-2 Type, anthocyanin-L-3 type and green plants. The highest positive correlation between the amounts of chlorophyll "A" and "b" pigments in these plants was recorded in green-colored F₂ plants. Even in plants of the anthocyanin-dark red, anthocyanin-L-3 type, the amounts of chlorophyll "A" and "b" pigments were observed in all cases of mutual strength positive correlative dependence.

Plants of the anthocyanin-L-2 Type showed a positive (r=0.90) relative relationship of strength between the amounts of chlorophyll "a"+"B" and "a" pigments, and a medium positive relative relationship between the amounts of chlorophyll "a"+"b" and "b" (r=0.65) and chlorophyll "A" and "b" (r=0.68) pigments.

CONCLUSION

In place of conclusion, it can be argued that in all plants L-2, L-3, F₁, F_b, F₂ of anthocyanin ridges of different types, chlorophyll "A" and "b" pigments have a positive correlation relationship of mutual strength.



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A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAM ON KNOWLEDGE REGARDING PREMENOPAUSAL SYMPTOMS AND ITS MANAGEMENT AMONG WOMEN RESIDING IN SELECTED URBAN AND RURAL AREA OF JAIPUR RAJASTHAN

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ABSTRACT

INTRODUCTION: Menopause officially marks the end of female reproduction. Although this life stage is well known, there are actually different stages within menopause that are important to recognize and understand. Menopause itself officially occurs when you stop menstruating. Premenopausal on the other hand, means “around menopause.” It’s also known as the menopause transitional phase and is called such because it happens before menopause. Although they’re both part of the same overall life transition, menopause and Premenopausal have different symptoms and treatment options.

AIM OF THE STUDY: Assess knowledge regarding premenopausal symptoms and its management among women residing in urban & rural areas.

MATERIAL AND METHOD: A pre-experimental one group pre-test post-test study was used in order to evaluate effectiveness of structured teaching programme (the Independent variable) on knowledge regarding Premenopausal symptom (the dependent variable) among women residing in urban & rural areas of selected by non-probability purposive sampling technique in PHC vatika Sanganer Jaipur. Each participant was informed about the study and that they could withdraw at any time and a written consent was also obtained.

RESULT: The finding study showed that after introducing the SIM, 40 (66.66%) women s had good knowledge regarding premenopausal symptoms and its management of women.

CONCLUSION: The finding of this study showed that after introducing the structured teaching programme regarding premenopausal symptoms and its management was effective to enhance the knowledge of women.

KEY WORDS: Knowledge, management, premenopausal symptoms.

INTRODUCTION & BACKGROUND OF THE STUDY

Menopause, also known as the climacteric, is the time in most women's lives when menstrual periods stop permanently, and they are no longer able to bear children .Menopause typically occurs between 49 and 52 years of age. Medical professionals often define menopause as having occurred when a woman has not had any menstrual bleeding for a year. It may also be defined by a decrease in hormone production by the ovaries. In those who have had surgery to remove their uterus but still have ovaries, menopause may be considered to have occurred at the time of the surgery or when their hormone levels fell. Following the removal of the uterus, symptoms typically occur earlier, at an average of 45 years of age.

During Premenopausal estrogen levels average about 20–30% higher than during premenopausal, often with wide fluctuations. These fluctuations cause many of the physical changes during premenopausal as well as menopause, especially during the last 1–2 years of premenopausal (before menopause). Some of these changes are hot flashes, night sweats, difficulty sleeping, mood swings, vaginal dryness or atrophy, incontinence, osteoporosis, and heart disease. During this period, fertility diminishes but is not considered to reach zero until the official date of menopause. The official date is determined retroactively, once 12 months have passed after the last appearance of menstrual blood. The menopause transition typically begins between 40 and 50 years of age



(average 47.5). The duration of premenopausal may be for up to eight years. Women will often, but not always, start these transitions (premenopausal and menopause) about the same time as their mother did.

In India, there is no current health programme that caters the specific reproductive health needs of aging women. Moreover, recently launched reproductive and child health II and National rural health mission programmes only address women in the reproductive age group, ignoring those who have passed the reproductive stage. At one level, there is low awareness on menopausal syndrome and at the other women rush into all available modes of treatment. Majority of women were not aware of therapy of menopause and fewer had heard of hormonal therapy.

Numerous physical and psychological symptoms have been attributed to the hormonal changes of menopause. The presence and severity of symptoms vary tremendously from woman to woman. When a woman begins the process of going into a permanent state of ceasing to have her menses, she can begin to experience premenopausal symptoms. For some the period of transition will take just a few years but, on an average, a woman can expect to be in premenopausal for 10 years. Some have postulated that it is the woman's attitude towards menopause, aging or issues related to self-esteem and body awareness that affect her ability to cope with the menopause transition. Besides all these effects, menopause can affect the quality of life by being a major cause of morbidity due to cardiovascular diseases and osteoporosis in postmenopausal women.

The above facts made the investigator to realize the importance of problem in current situation and created an intention to administer a structured teaching program to the mothers of rural and urban area for manage the problems during pre-menopause.

OBJECTIVES OF THE STUDY

- To assess the knowledge regarding premenopausal symptoms and its management among women residing in urban and rural area by pre-test.
- To assess the knowledge regarding premenopausal symptoms and its management among women residing in urban and rural area by post-test.
- To compare the pre-test and post-test level of knowledge regarding premenopausal symptoms, its management among women.
- To find out the effectiveness of structured teaching programme by comparing pre-test and post-test knowledge score of women regarding premenopausal symptoms and its management.
- To find out the association level of knowledge regarding premenopausal symptoms and its management with their selected demographic variables.

HYPOTHESIS OF THE STUDY

- **H₁:** There will be significant relationship between pre and posttest mean score regarding premenopausal symptoms and its management of women of urban and rural areas.
- **H₂:** There will be significance association between pre-test knowledge of women regarding menopausal symptoms and its management and selected demographic variables.

OPERATIONAL DEFINITION

- **ASSESS:** To make a judgment about something.
- **EFFECTIVENESS:** Significant gain in the knowledge as determined by statistical difference between pre-test and post test scores on knowledge level regarding premenopausal symptoms and its management in selected area.
- **STRUCTURED TEACHING PROGRAM:** A systematically organized, individualized instruction and discussion prepared to educate middle aged women from selected urban and rural areas regarding premenopausal symptoms and its management measures using selected teaching aids for about 45-50 minutes.
- **KNOWLEDGE:** In this study it refers to the correct answers to the questionnaire obtained from knowledge between urban and rural regarding premenopausal symptoms and its management.
- **URBAN:** Urban areas are very developed, meaning there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways. "Urban area" can refer to towns, cities, and suburbs. An urban area includes the city itself, as well as the surrounding areas
- **RURAL:** Rural areas are the opposite of urban areas
- **PREMENOPAUSAL:** Premenopausal is defined as no symptoms of going through per menopause or menopause. It may be period refer 2-5 years of menopause.
- **SYMPTOMS:** Subjective evidence of disease or physical disturbance broadly; something that indicates the presence of bodily disorder.
- **MANAGEMENT:** Management refers to control the symptom of premenopausal symptoms.



ASSUMPTION

- The women of rural and urban area may be cooperate during the study
- The rural women face the problem to manage the premenopausal symptoms compare than urban mothers.
- The structured teaching programme may be helpful for rural and urban women to manage the premenopausal symptoms.

DELIMITATION

- Pre-menopausal women
- Selected rural and urban area.
- Mothers those have symptoms of premenopausal.
- Women want to participate in the study

RESEARCH METHODOLOGY

RESEARCH APPROACH

A Quantitative research approach was used in the study to assess the effectiveness of structured teaching program on knowledge and its management regarding premenopausal symptoms with women residing in selected rural & urban area.

RESEARCH DESIGN

A pre-experimental design, one group pre-test post-test design was adopted for the study.

RESEARCH VARIABLE

- **INDEPENDENT VARIABLES:** In this study, the independent variable was structured teaching program on knowledge regarding premenopausal symptoms and its management.
- **DEPENDENT VARIABLES:** In this study, the dependent variable was knowledge of women working in Urban & Rural area under the PHC, Vatika Sanganer Jaipur.
- **EXTRANEIOUS VARIABLES:** the extraneous variables were age, religion, and education, age of first menarche, diet, residence area and previous knowledge.

POPULATION

In this study the population comprises all the women working in Urban & Rural area under the PHC, Vatika Sanganer Jaipur

SAMPLING SIZE

In the study, Sample consists of a subset of a population selected to participate in a research study. The study will be conducted among 60 women working in Urban & Rural area under the PHC, Vatika Sanganer Jaipur

SAMPLING TECHNIQUE

- Sampling is a complex and technical form but it is basic features are familiar to all of us. In this study, purposive sampling technique was used to draw the sample. Purposive sampling technique is a procedure in which every population member has chooses by the purpose of the study.

RELIABILITY OF THE TOOL

- The tool was tested for reliability using Karl Pearson correlation coefficient formula. Correlation coefficient $r = +0.89$.

**MAJOR FINDING OF THE STUDY**

Table 1
Frequency and percentage distribution of demographic variables among women
(N=60)

S. No	Socio-demographic variable		Frequency	Percentage
1	Age (in years)	35-40 Year	20	33.33 %
		41-45 Year	15	25.00%
		46-50 Year	18	30.00%
		51 and above	07	11.67%
2	Religion	Hindu	32	58.33%
		Muslim	23	38.33%
		Christian	02	03.34%
		Sikh	03	05.00%
3	Education	Illiterate	35	58.33%
		Preschool	10	16.67%
		High School	10	16.67%
		UG/PG	05	08.33%
4	Age of first menarche	10 to 12 years	08	13.33%
		12 to 14 years	25	41.67%
		14 to 16 years	22	36.67%
		16 to 18 years	05	08.33%
5	Diet	Vegetarian	20	33.33%
		Non-vegetarian	40	66.66%
6	Resident area	Urban	30	50%
		Rural	30	50%
7	Knowledge regarding premenopausal symptoms	Yes	20	33.33%
		No	40	66.66%

Table 1 Depicted that the nurse participated in the study, Age-35-40, (20, 33.33%), Religion-Hindu (32, 58.33), Education-Illiterate (35, 58.33%), Age of first menarche- 12 to 14 yr (25, 41.67%), Diet Non Vegetarian (40, 66.66%), Resident area- Urban & Rural areas (30, 50%). Knowledge regarding premenopausal symptoms-No (40, 66.66%).

Table-2
Comparison of pretest and posttest level of knowledge regarding premenopausal symptoms and its management of women
(N=60)

KNOWLEDGE LEVEL	PRE TEST		POST TEST	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
Poor	27	45%	05	08.33%
Average	32	53.33%	15	25%
Good	01	1.66%	40	66.66%
Mean	6.58		10.63	
SD	1.32		0.93	

The table no.2 showed the comparison of pretest and posttest level of knowledge regarding premenopausal symptoms and its management of women. With regard to scores, during pretest 27 (45%) women had poor knowledge, 32 (53.33%) women had average knowledge and 01 (1.66%) women had good knowledge regarding premenopausal symptoms and its management of women while during posttest 05 (08.33%) women had poor knowledge, 15 (25%) women had average knowledge and 40 (66.66%) women had good knowledge regarding premenopausal symptoms and its management of women.

The mean of the level of pretest knowledge regarding premenopausal symptoms and its management the mean, median and standard deviation of first part that was related to concept premenopausal, Regarding premenopausal clinical manifestation, mean, median and standard deviation were 6.58, 7 and 1.32 respectively. About management of premenopausal the mean, median and standard deviation was 3.83, 4 and 0.92.

The mean of the level of posttest knowledge regarding premenopausal symptoms and its management the mean, median and standard deviation of first part that was related to concept premenopausal, Regarding premenopausal clinical manifestation,



mean, median and standard deviation were 10.63, 11 and 0.93 respectively. About management of premenopausal the mean, median and standard deviation was 5.51, 6 and 0.90.

Table-3

Paired t-test to assess the level of knowledge regarding premenopausal symptoms and its management of women

KNOWLEDGE		MEAN	SD	T	P-VALUE
	PRE TEST	6.58	1.32	18.43	0.00
	POST TEST	10.63	0.93		

Table 4. The overall mean of pretest score is 15.67 whereas the mean of post test score is 24.35 with 8.68 mean differences. The median of pretest score is 16 and the median of post test score is 24.5 and the standard deviation of pretest was 1.98 whereas in posttest the standard deviation was 1.46. The t value is 26.12. The tabulated value of 't' is 1.96 at the 0.05 level of significance on 59 degree of freedom. The calculated value is higher than the tabulated value in all aspects of knowledge so we can say that the structured teaching programme regarding premenopausal symptoms and its management can enhance the knowledge of women. It means that the structured teaching programme regarding premenopausal symptoms and its management is effective to improve the knowledge of women. The hypothesis H_1 that was significant relationship between pretest and posttest knowledge score regarding premenopausal symptoms and its management is accepted.

DISCUSSION

The finding study reveal that with regard to scores, during pretest 27 (45%) women had poor knowledge, 32 (53.33%) women had average knowledge and 01 (1.66%) women had good knowledge regarding premenopausal symptoms and its management of women while during posttest 05 (8.33%) women had poor knowledge, 15 (25%) women had average knowledge and 40 (66.66%) women had good knowledge regarding premenopausal symptoms and its management of women. The hypothesis H_1 that was significant relationship between pretest and posttest knowledge score regarding premenopausal symptoms and its management is accepted.

CONCLUSION

The finding of this study showed that after introducing the structured teaching programme regarding premenopausal symptoms and its management was effective to enhance the knowledge of women. Hence there is a need to include these components into the entire educational curriculum. Awareness programme and other teaching programme will be conducted to bring the awareness in the women. So that life, complication and mortality rate can be reduced among the women.

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SURVEY ON E-WASTE REGULATION

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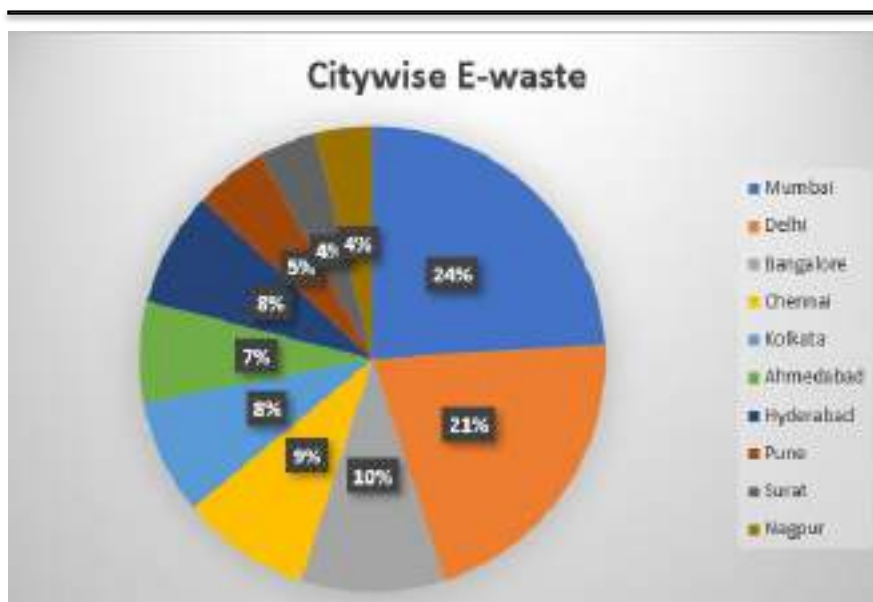
ABSTRACT

In order to reduce and manage the ever-increasing threat of E-waste to the environment and human health, the problem of E-waste has compelled environmental agencies of many countries to innovate, develop, and adopt environmentally sound options and strategies for E-waste management. This paper reviews the e-waste and environmental issues associated with discarded electronic devices. Additionally, the development and implementation of e-waste management plans in developing and developed countries, as well as potential environmental issues related to their disposal, are discussed. Also, the paper highlights the different health issues associated with e-waste generation.

KEYWORDS: e-waste, landfilling

INTRODUCTION

Our groove gives rise to a wide variety of different wastes emerging from different sources. Hence, Municipal waste is the waste that is being created by house folks which include organic waste, papers, metals, plastics, etc. One of the fastest and largest growing manufacturing industries in the world is the electronics industry. Every good thing comes with a price as a result of the growth of the electronics industry, a by-product form which is Electronic waste commonly known as E-waste or end-of-life(EOL) electronics, or Waste Electrical and Electronic Equipment (WEEE). Electronic appliances such as TVs, mobile phones, MP3 players, computers, DVD players, speakers, computer components, laptops, etc which have been disposed of or unwanted by their original users are Electronic waste. The waste which is produced by hospitals and other health care is commonly known as Biomedical waste units Which consist of waste sharps, discarded drugs, anatomical waste, etc. The waste that emerges from production processes, households, and industrial activities is known as hazardous waste. The problem of e-waste has become an instant and long-term consideration which leads to a considerable amount of environmental problems. According to the Central Pollution Control Board (CPCB), E-waste is expanding awfully, with a growth rate of about 31% annually. E-waste includes toxic components which are menacing to human health, such as mercury, polybrominated flame retardants, lead, cadmium, barium, etc. The effect of toxins on human beings includes heart, kidney, skeletal system damage, liver, and brain. In India, e-waste estimates comprise computer attachments (68%), telecommunication apparatus (12%), electrical tools (8%), health tools (7%), and household electrical scrap (5%). There are ten states which contribute 70% of the total e-waste generated in the country which is followed by Tamil Nadu, Uttar Pradesh, Karnataka, Gujarat, West Bengal, Delhi, and Madhya Pradesh, Punjab, and Andhra Pradesh. Of the top ten cities producing e-waste, Mumbai draws up at the top, ensured by Delhi, Bangalore, Ahmedabad, Chennai, Kolkata, Hyderabad, Surat, Puna, Nagpur, and Pune, As in the global context, it is evaluated that more than 53.6 million metric tonnes (Mt) of electronic waste is generated globally every year. The summons of managing e-waste in India is distinct from those of other countries. Consequently, Electronic and Electrical waste are hazardous to the environment and human health, and it also endangers different species. A management system has to be designed to provide environmental benefits from the collection, recycling, and mining of e-waste.

**Figure 1: Top ten Cities producing E-Waste**

E-WASTE MANAGEMENT AND DISPOSAL SYSTEM IN INDIA

The rise of e-waste is extreme in India and there is no genuine disposal system in the country which has led to the limitless amount of e-waste. The matter of e-waste disposal, recycling, and reuse has become the field of serious discussion among economists. It was concluded that electronic waste is going to be a major issue in the near future due to an increase in the living standards of people. Currently, for the recycling of electronic waste, the country is highly dependent on the informal sector as only a few orderly e-waste recycling facilities are available. Approximately 95% of electronic waste is treated and refined in majorly urban slums of the country, where unskilled workers carry out procedures without protective tools, which not only deteriorates their health but also damages nature. India enacted its first environmental law namely, the (EPA) Environment protection Act in 1986, which aims at making people responsible for producing pollution and damage to the environment. Under this Act, the state and central governments can enact legislation to shield nature and people from exposure to harmful waste of the environment, and any violation of this Act is liable for dismissal. The consequence of improper disposal of electronic waste affects air, soil, and water components of the environment. In addition, The Environment, Forest, and Climate change ministry broadcasted the E-Waste Management rules back in 2016, which are strict rules and are part of the government's commitment to nature governance. The rules aim at reuse and recovery of useful items from e-waste.

E-WASTE CAN BE MANAGED IN FOLLOWING SMALL WAYS

- 1) Donating and reselling old working devices instead of throwing them away.
- 2) Giving back e-waste to electronic companies, as many companies accept old products with the aim of recycling and modifying them.
- 3) Buying Environment friendly electronic items.
- 4) Some damaged tools are recyclable, like laptops, mobiles, calculators, etc.
- 5) Keeping products clean so that products' life can be exceeded.

DIVERSE METHODS OF TREATMENT AND DISPOSAL SYSTEMS ARE AVAILABLE WHICH INCLUDES

- 1) Landfilling: along with other municipal waste, e-waste is also openly burnt leaking toxic and hazardous elements into the atmosphere.
- 2) Incineration: Under this method, the waste is burned at a high temperature in designed incinerators, in which the volume of waste is being reduced and the energy produced is taken into use.
- 3) Acid bath: In this procedure, the e-waste is soaked in powerful sulphuric, hydrochloric acid solutions that take away the metal from the e-waste. The recovered metal is additionally reused to form other products.



- 4) Mechanical Recycling: This is the most eco-friendly practice in which the dry separation method is used to recover used motherboard, circuit boards, etc from e-waste and then recycle them. This is done without harming nature.



Figure 2 : Methods of Disposal System

E-WASTE MANAGEMENT IN WORLD

The most important element of e-waste management system around the world are collection , treatment and disposal of e-waste. Almost all the developed nations own some framework which contains sets of rule and regulations , conventions, directives which is aimed at proper collection, treatment and recycling of e-waste, as well as better disposal of non-recyclable waste materials keeping the damages minimum to environment.

The majority of discarded electronics are disposed of through landfills. These electronic items are disposed of with other municipal garbage or are burned openly which cause toxic substances in air.

Compared to developed countries, underdeveloped or developing countries lack a proper e-waste disposal system. In developing countries, the informal sector employs unsafe techniques and practices, resulting in low material recovery.

A comparison of typical disposal systems in developed and developing countries are as follow :-

Developing and transition countries manage e-waste differently. E-waste management guidelines and information are lacking in developing and transitional countries. Most e-waste is disposed of in less complex ways, such as burning and dumping to uncontrolled landfills, which cause significant environmental pollution and occupational exposure to chemicals derived from e-waste.

The most common method to treat and dispose of e-waste are as follow:-

- 1) **Extended Producer Responsibility (EPR)** is a policy that approaches those producers who have significant responsibility for the treatment or disposal of post-consumer products.
- 2) **3Rs(Reduce, Reuse, and recycle)** E-waste often carries metals such as gold, copper, and nickel and rare materials of deliberate value such as indium and palladium. **Most of the precious metals could be recovered, recycled, and used as valuable sources of secondary raw materials.**

A table for differentiating ways of e-waste management in developing countries and developed countries.



Developed Countries	
Japan	Japan promotes a 3R system, where Retailers are required to gather used products, customers are chargeable for funding exercise and transportation by paying recycling fees to distributors. Manufacturers are required to set up pretreatment plants and collection networks. Further, bulk business consumers engage in treatment of electronic waste at their own expenses and return to producers by paying required recycling fees. Many laws have been enacted for managing e-waste in Japan.
Singapore	In Singapore, distributors have started commercial take-back schemes which involve setting prices of used mobile phones based on wear and tear. Respectively, 95% of used phones have been taken back. Second-hand items market is very well developed in Singapore, this all manifests efficient collection of e-waste products.
Switzerland	The first country in the whole World to develop an organized as well as formal waste management system for recycling and scrapping e-waste. Here, the extended producer responsibility principle is used to handle waste which makes retailers and exporters responsible for recycling and disposal. Municipalities are responsible for handling collection points for consumers while producers are responsible for bearing the costs of collection and treatment.

Developing Countries	
South Korea	South Korea has passed an act on the promotion of Conservation and Recycling the resources. The act aims at reducing the amount of e-waste which ends up in landfills and incinerators, and improving the performance and lifespan of such electronic devices.
China	China, one of the world's gifties of electronic items, is facing a huge burden of increasing e-waste generated domestically, there is a steady flow of imported e-waste entering the country from abroad, and their way of managing includes where dealers travel from door to door to buy unused electronic items and later reselling them to the informal sector. Further, the recycling process is done using methods such as scrapping metals by hand, burning toxic elements, disposing of parts in bodies of water, and much more.

HEALTH IMPACTS

E-waste carries countless chemicals which are harmful to human and ecological health. It holds many risky metallic contaminants like lead, beryllium, mercury, cadmium, and brominated flame-retardants. These materials are disturbing and are difficult to recycle sustainably, even in many developing countries. E-waste gives distinct exposure because people are exposed to the complex mixture of chemicals from different sources and through different routes.

Out of these many toxic metals, Lead is mostly used in E-devices which results in various health issues due to environmental pollutants. Lead inscribes biological systems through food, air, soil, and water, which later makes children prone to lead poisoning. Mercury is poisonous in various forms which include inorganic, organic, and elemental. It contains an organic compound named methyl which has been proved to be a neurotoxicant that damages the brain and also causes enduring damage to the lungs, kidneys, and central nervous system.

For a childbearing mother, exposure to toxic e-waste can affect the development of her unborn child for the rest of his/her life such as premature births can happen or stillbirths. Elevated toxic chemicals negatively affect neonatal growth indices and hormone levels in exposed populations.



E-waste generally includes combinations of harmful materials and components down to microscopic levels. The wastes are fragmented down not just for recycling but for recoverable materials like iron, plastic, copper, etc. Though e-waste contains hazardous substances that are harmful to human health, they get strains into the soil, water, and air during treatment, and later adversely affect human health and ecology.

The World Health Organization launched the initiative in 2013, on E-waste and child health which aims at knowledge and awareness of health impacts; improving the health sector, tracking progress, and promoting waste policies.

CONCLUSION

The whole study concludes that electronic waste is harmful as well as hazardous to nature and human health, which needs proper treatment to attain environmental sustainability. The escalating amount of e-waste is related to a lack of knowledge and capability to solve the problem.

Also, the challenges of handling electronic waste in India are contrasting to those in other countries, both developing and developed countries.

E-waste series has resulted in greater suitable use of sources inclusive of technical knowledge and technology for higher E-waste management. The Indian E-waste machine calls for numerous reforms for the environmentally sound and controlled clinical processing of E Waste. Further, studies, concerns, and studies are required for reforming the policies, legislature, and legal guidelines associated with E-waste to fit the Indian scenario. Also, there exists a want for locating the maximum environmentally pleasant recycling/disposal approaches and remedy alternatives for managing the E-waste containing diverse poisonous and dangerous materials.

Don't be so eager to buy more and more, if you cannot dispose of the old things properly. Be a part of the solution rather than increasing the pollution.

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PROBLEMS OF EVALUATION OF MODERN MEDIA CENTERS: INNOVATIVE RESEARCH AND DEVELOPMENT

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Freedom of press and speech is a creative process. There have been many attempts to evaluate this process, but they have all remained on paper. Due to the individuality, inner spiritual reality and contradictions in the social opinion of artistic aesthetic creation, universally recognized measurement and evaluation standards and parameters have not been developed. But because modern information and communication is based on special technology, experts tend to measure and evaluate it in terms of machine-dependent languages and non-machine-dependent languages. Collectively, they are called "programming languages". There are various forms of programming languages, including FORTRAN (Formula Translator), ALGOL (Algorithmic Language), COBOL (Common Business Oriented Language), Pascal, PLI (Programming Language), BEUCBK BASIC (Beginners All Purpose Basic Instruction Code) [1]. Also, there is a procedure for evaluating the activity of media centers depending on the networks of information and communication means. They are called "computer networks". "Today, on a global scale, there should be communication, information exchange, mutual understanding, and proportionality on a global scale. ITO (International Telecommunication Organization), an international telecommunication association, was established to ensure proportionality in the exchange of computers and information. International standards ISO (International Standardization and Organization) has developed standards for putting information into one standard and delivering it to the consumer in the required format and scope. It pioneered global information distribution and developed procedures for distributing them worldwide and implemented them in more than 150 countries. It is observed that the number of users of its information increases by 7-10% on average every month. The Internet once served the needs of military affairs, research and educational institutions, and now it is applied to almost all spheres and directions of social life. The implementation of trade, communication, publishing works through the Internet has expanded the activities of information technologies. Therefore, in some sources, coverage of the population is presented as the most important measure and evaluation criterion of information centers. Therefore, the first criterion is the coverage of population strata, the breadth of service circles.

Today's human society is characterized by development through the use of various technological methods for the collection and transmission of information. Therefore, the second criterion includes the automation of information search systems. They are divided into formal and informal views. Formal systems include special institutions, organizations, and centers established by society (media centers, agencies, publishers, libraries, press, etc.), and informal ones include personal meetings, mobile communications, conversations, SMS correspondence, and communications between the sender of information and the consumer of information. They have attributive, pragmatic and dynamic characteristics, and information services are evaluated according to these characteristics [1].

The third assessment criterion is related to the speed of information transfer processes. Specialists associate these processes with information gathering (collection, storage), their processing, information search and information delivery [1]. In addition, methods of measuring and evaluating information through parameters such as computer and



Internet systems, programs adapted to them, sales and consumption costs of information, consumer relations, operability, speed of communication and technology are also used [2].

But we are interested in the criteria for evaluating the activity of media centers in the formation of social opinion. Therefore, based on the innovative research in media centers, our scientific observations and the opinions of the respondents, we think that the evaluation criteria of media centers, in the form of a socio-philosophical model, can be as follows. It relies on the system of information gathering and distribution, communication organization and cooperation organization:

According to the system of information collection and distribution (parameters of Block A):

1. The level of provision of information and communication technologies of media space (Republic of Karakalpakstan) (A 1);
2. Level of providing media centers in Karakalpakstan with specialists (A 2);
3. Territorial rational placement and infrastructure of media centers (A 3).

According to the system of communication organization (parameters of Block B):

1. Establishing regular contacts with the public and active authors (B 1);
2. The work of studying the dynamics of social opinion has been launched (B 2);
3. Monitoring of attitudes and reactions to information (B 3).

According to the system of cooperative organization (parameters of Block C):

1. Formation of social harmony and unity among information consumers, people, population (C 1);
2. Involvement in social activities that are in line with the development and strategic goals of society (C 2);
3. Turning participation in the activities of local initiatives and self-government bodies into a social need C 3).

According to the activity of media centers, information collection and distribution system (parameters of block A), the following directions are considered:

- satisfaction with information - (a 1);
- emergence of the need for new information - (a 2);
- reflection of information in social opinion - (a 3) etc.

The formation of social opinion is directly related to the provision of media space with modern information and communication technologies. Today, media centers in Karakalpakstan have their own institutional systems, although they are not at the level of fully satisfying the information needs of the region. It is true that in Karakalpakstan, modern information technologies are widely introduced mainly in educational institutions and the press. Almost all newspapers and magazines are made using modern information technologies, such as Xerox, Windows, MS DOS, BMP, PCX, WYSIWYG, Drag and Drop, Object Linking Embedding) programs and files. Text, photos and drawings connected to the Windows program are delivered to the consumer and readers through the tools for enlarging, moving and reproducing. Availability of these technologies varies in different media systems, but the most common are xerox tools. Large-format newspapers, advertisements, banners are prepared on special enlarging equipment. They are mainly used for production purposes in advertising bureaus, art workshops, stained glass and ceramic tile workshops. They are also widely used by shops that print books and brochures, notebooks and calendars. Since their use is often related to the activities of private enterprises, there is no specific information about them. 47% of our respondents indicate that the main part of media centers is newspapers, magazines and television, and according to the opinion of the President, it is necessary to take measures to strengthen their material and technical base. According to Professor N. Tohliev, the volume of information services is 131.1% in Tashkent, 126.8% in Syrdarya, and 114.6% in the Republic of Karakalpakstan [8]. This is the latest indicator within the regions of Uzbekistan. This indicator itself shows how modern information and communication technologies are provided by the media centers of Karakalpakstan.

Effectiveness of media centers depends on professional personnel. In recent years, serious attention has been paid to the training of journalists in Uzbekistan and Karakalpakstan, to introduce them to advanced foreign



experiences, to improve their skills, and to improve their skills in the effective use of information and communication tools. It is appropriate to remember that associations for exchange of experience, dialogue with the public have been established. Nevertheless, there are very few highly professional, skillful and experienced mediators in the media centers of Karakalpakstan. Most of them are busy with delivering a narrow range of messages. There is a lack of personnel who are inclined to artistic-aesthetic creativity in a broad sense, who provide serious, strong philosophical materials on socio-political, economic and cultural topics. According to our calculations, 30-35% of reporters working in the newspapers of Karakalpakstan have studied journalism and philology, all of them have higher education. 40-45% received education in other fields, such as linguistics, culture, art, mathematics and technology. The remaining 20-25% are assistants and technicians. Employees with higher and specialized knowledge are around 60-65% in journals. They have a very small number of employees with secondary education (about 3-5%). There is no specific information about the employees of non-state and private media centers, but there are enough philologists, linguists and representatives of the information and communication field. In the city of Nukus alone, the number of such media centers (including computer services, photocopying, minitypography, polygraphy, advertising workshops) exceeds 200. But such media services are still few in other districts. For example, there are only 1 mini-polygraph services in Tortkol, and in other districts, their functions are mainly performed by photocopy service centers.

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