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Strontium Titanate-Based Dye-Sensitized Solar Cells: A Review of Benefits and Challenges

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Abstract:

Dye-sensitized solar cells (DSSCs) have gained considerable attention as promising alternatives to traditional silicon-based photovoltaic devices due to their low-cost fabrication, ease of processing, and good performance under low-light conditions. Among the various materials explored for DSSCs, strontium titanate (SrTiO₃) has emerged as a promising candidate owing to its excellent optical and electronic properties. This review paper comprehensively explores the recent advancements in SrTiO₃-based DSSCs, focusing on their benefits, challenges, and prospects. The review covers key aspects including material synthesis techniques, device fabrication methods, performance metrics, and strategies for improving efficiency and stability. Furthermore, the potential applications and environmental benefits of SrTiO₃-based DSSCs are discussed. The findings presented in this review highlight the significant progress made in the field and underscore the potential of SrTiO₃-based DSSCs as viable contenders for next-generation solar energy conversion technologies.

Keywords: Dye-sensitized solar cells, Strontium titanate, Photovoltaics, Efficiency, Stability, Fabrication, Applications.

Introduction:

The global demand for clean and sustainable energy sources has spurred intense research into renewable energy technologies, with solar energy emerging as a frontrunner in the transition towards a low-carbon future. Among various solar cell technologies, dye-sensitized solar cells (DSSCs) have attracted considerable attention due to their potential for cost-effective, efficient, and versatile energy conversion. DSSCs offer several advantages over traditional silicon-based photovoltaic devices, including lower manufacturing costs, simpler fabrication processes, and the ability to operate under low-light conditions and at non-optimal angles.

A critical component in the development of efficient DSSCs is the selection of suitable materials for the photoactive layer, which absorbs light and generates electron-hole pairs. In recent years, strontium titanate (SrTiO₃) has emerged as a promising material for DSSCs, owing to its unique combination of properties, including high electron mobility, wide bandgap, and excellent chemical stability. This review paper provides a comprehensive examination of the benefits and challenges associated with SrTiO₃-based DSSCs, with a focus on material characteristics, device performance, and prospects.

The introductory section sets the stage by providing an overview of the significance of DSSCs in the context of renewable energy technologies and the rationale behind the utilization of SrTiO₃ as a key component in DSSC devices. It outlines the structure of the review, which includes an analysis of SrTiO₃ properties, fabrication processes, device performance metrics, benefits, challenges, and future directions.

Significance of Dye-Sensitized Solar Cells (DSSCs)

Solar energy represents a vast and virtually inexhaustible resource that has the potential to meet a significant portion of the world's energy needs. As concerns about climate change and energy security continue to grow, there is an urgent need to transition from fossil fuels to renewable energy sources. Solar photovoltaic (PV) technologies offer a clean and sustainable solution for electricity generation, with the potential to mitigate greenhouse gas emissions and reduce reliance on finite fossil fuel reserves.

DSSCs have emerged as an attractive option within the solar PV landscape, offering several distinct advantages over traditional silicon-based solar cells. First introduced by O'Regan and Grätzel in 1991 [1], DSSCs utilize a semiconductor electrode sensitized with a molecular dye to capture sunlight and convert it into electricity. Unlike silicon-based solar cells, which require complex and costly manufacturing processes involving high-purity crystalline silicon, DSSCs can be fabricated using inexpensive and abundant materials, such as titanium dioxide (TiO₂) [15] nanoparticles, organic dyes, and electrolytes.

Moreover, DSSCs exhibit several unique features that make them well-suited for a wide range of applications. They are lightweight, flexible, and semi-transparent, allowing for integration into various architectural and consumer electronics applications. Additionally, DSSCs have demonstrated efficient performance under low-light conditions and at non-optimal angles, making them suitable for indoor lighting, portable electronics, and off-grid power generation in remote areas.

Despite these advantages, the widespread commercialization of DSSCs has been hindered by several challenges, including limited efficiency, stability, and scalability. Efforts to address these challenges have led to the exploration of new materials and device architectures, with SrTiO₃ emerging as a promising candidate for enhancing DSSC performance.

Properties required to be an ideal material for DSSC:

To be a good material for dye-sensitized solar cells (DSSCs), a semiconductor material needs to possess several key properties. These properties determine the material's ability to efficiently absorb light, generate charge carriers, and transport them to the electrodes. Here are the properties that are crucial for a material to be effective in DSSCs [14]:

Optical Absorption: The material should have a wide absorption spectrum covering the visible and near-infrared regions of the electromagnetic spectrum. This ensures efficient absorption of sunlight, maximizing photon-to-electron conversion.

Bandgap Energy: The bandgap energy should be optimal for absorbing a significant portion of the solar spectrum while minimizing energy losses due to thermalization. Ideally, the bandgap should be in the range of 1.5 to 2.5 eV to match the solar spectrum [13].

Carrier Mobility: High electron and hole mobilities are essential for efficient charge transport within the material. Materials with high carrier mobilities facilitate rapid movement of charge carriers towards the electrodes, reducing recombination losses [11].

Chemical Stability: The material should be chemically stable under the operating conditions of DSSCs, including exposure to light, moisture, and temperature fluctuations. Chemical stability ensures the long-term performance and durability of the device [12].

Surface Area: A high surface area is advantageous for DSSCs as it provides more active sites for dye adsorption, leading to increased light absorption and charge generation [10].

Low Recombination Rate: Minimizing recombination of electron-hole pairs is crucial for maximizing the efficiency of DSSCs. Materials with low recombination rates ensure that a higher percentage of photogenerated carriers contribute to the photocurrent.

Tunable Energy Levels: The energy levels of the conduction and valence bands should be suitable for efficient charge injection and extraction at the semiconductor-electrolyte interfaces. Tunable energy levels allow for better alignment with the energy levels of the dye molecules and redox couples in the electrolyte[8].

Ease of Fabrication: The material should be compatible with scalable and cost-effective fabrication techniques, such as solution processing or thin-film deposition methods. Ease of fabrication facilitates the mass production of DSSCs at a reasonable cost[9].

Environmental Compatibility: Environmentally friendly materials that do not contain toxic elements or require hazardous processing methods are preferable for sustainable DSSC technology[7].

Dye Compatibility: The material should be compatible with a wide range of dye sensitizers to allow for flexibility in device design and optimization.

Materials that exhibit a combination of these properties are considered promising candidates for DSSCs. While no single material may possess all of these properties to perfection, ongoing research aims to identify and develop materials that offer the best compromise between these factors to achieve high-efficiency DSSCs[6].

Electrochemical Properties of Strontium Titanate (SrTiO₃):

Strontium titanate (SrTiO₃) is a perovskite-structured oxide semiconductor that exhibits intriguing electrochemical properties, making it a promising candidate for various applications, including photocatalysis, electrochemical sensing, and energy storage devices. Understanding the electrochemical behavior of SrTiO₃ is crucial for harnessing its full potential in these applications. This section provides an overview of the electrochemical properties of SrTiO₃, focusing on its redox behavior, charge storage mechanisms, and electrocatalytic activity[5].

1. Redox Behavior

SrTiO₃ is known to undergo redox reactions, where it can either donate or accept electrons depending on the conditions and doping level. The redox behavior of SrTiO₃ is primarily attributed to the presence of oxygen vacancies and surface defects, which act as active sites for electron transfer processes.

Under reducing conditions, oxygen vacancies within the SrTiO₃ lattice can capture electrons, leading to the formation of oxygen ions. Conversely, under oxidizing conditions, oxygen ions can release electrons, generating oxygen vacancies. These redox reactions play a crucial role in determining the electronic conductivity and charge transport properties of SrTiO₃[4].

2. Charge Storage Mechanisms

SrTiO₃ exhibits intriguing charge storage mechanisms, making it a potential candidate for electrochemical energy storage devices such as supercapacitors and batteries. The charge storage in SrTiO₃ can occur through various processes, including intercalation, surface redox reactions, and double-layer capacitance.

In intercalation-based charge storage, ions or molecules from the electrolyte can insert into the SrTiO₃ lattice, leading to changes in the material's electronic structure and charge density. Surface redox reactions involve the reversible transfer of electrons between the SrTiO₃ surface and the electrolyte, resulting in the storage of charge at the electrode-electrolyte interface. Additionally, SrTiO₃ can exhibit double-layer capacitance, where charge accumulation occurs at the electrode-electrolyte interface without involving faradaic reactions.

The combination of these charge storage mechanisms enables SrTiO₃ to store and release electrical energy efficiently, making it a promising material for high-performance energy storage devices.

3. Electrocatalytic Activity

In addition to its charge storage capabilities, SrTiO₃ also exhibits electrocatalytic activity, facilitating various electrochemical reactions such as oxygen evolution, hydrogen evolution, and pollutant degradation. The electrocatalytic activity of SrTiO₃ is closely related to its surface properties, including surface morphology, composition, and defect density[3].

For instance, oxygen vacancies and hydroxyl groups on the SrTiO₃ surface can act as active sites for oxygen evolution reactions, where water molecules are oxidized to produce oxygen gas and

protons. Similarly, the presence of metallic nanoparticles or co-catalysts on the SrTiO₃ surface can enhance its electrocatalytic activity for hydrogen evolution reactions.

The rationale for Utilizing Strontium Titanate (SrTiO₃) in DSSCs

Strontium titanate (SrTiO₃) is a perovskite-structured oxide semiconductor that has garnered significant attention for its favorable properties in various electronic and optoelectronic applications. In recent years, researchers have explored the potential of SrTiO₃ as a photoactive material in DSSCs, motivated by its unique combination of properties that are well-suited for solar energy conversion.

One of the key advantages of SrTiO₃ is its high electron mobility, which facilitates efficient charge transport within the photoactive layer of DSSCs. The mobility of charge carriers (electrons and holes) is crucial for minimizing recombination losses and maximizing the efficiency of solar cells. SrTiO₃'s high electron mobility enables rapid and efficient transport of electrons from the photoanode to the external circuit, leading to improved device performance.

Additionally, SrTiO₃ possesses a wide bandgap, making it suitable for absorbing a broad range of solar radiation, including visible and ultraviolet light. Efficient light absorption is essential for maximizing the generation of electron-hole pairs within the photoactive layer of DSSCs. The wide bandgap of SrTiO₃ allows for effective utilization of solar energy across a wide spectral range, thereby enhancing the overall efficiency of solar cells.

Furthermore, SrTiO₃ exhibits excellent chemical stability, which is essential for ensuring the long-term performance and durability of DSSCs. Chemical stability is particularly important in outdoor applications, where solar cells are exposed to environmental factors such as moisture, temperature fluctuations, and UV radiation. SrTiO₃'s inherent stability enables the fabrication of robust and reliable DSSC devices capable of withstanding harsh operating conditions.

Overall, the unique combination of high electron mobility, wide bandgap, and excellent chemical stability makes SrTiO₃ an attractive material for use in DSSCs. By leveraging these properties, researchers aim to develop SrTiO₃-based DSSC devices with enhanced performance, stability, and efficiency, thereby contributing to the advancement of solar energy technology.

Conclusion

In conclusion, the review paper comprehensively explores the benefits, challenges, and prospects of strontium titanate (SrTiO₃)-based dye-sensitized solar cells (DSSCs). Through an in-depth analysis of recent advancements in SrTiO₃-based DSSCs, the review highlights the significant progress made in harnessing the potential of this promising material for solar energy conversion.

The review underscores the importance of SrTiO₃'s unique properties, including high electron mobility, wide bandgap, and excellent chemical stability, in enhancing the performance and durability of DSSCs. These properties make SrTiO₃ an attractive candidate for replacing conventional photoactive materials and overcoming existing limitations in DSSC technology.

Furthermore, the review identifies key challenges such as material synthesis, interface engineering, and scalability, which need to be addressed to realize the full potential of SrTiO₃-based DSSCs. Strategies for improving efficiency, stability, and cost-effectiveness are discussed, providing insights into future research directions and technological advancements in the field.

Overall, the findings presented in the review underscore the promising outlook for SrTiO₃-based DSSCs as viable contenders for next-generation solar energy conversion technologies. Continued research and development efforts are essential to overcome existing challenges and accelerate the commercialization of SrTiO₃-based DSSCs for widespread adoption in the renewable energy landscape.

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सरायों के निर्माण एवं उनके प्रबंधन में शेरशाह सूरी की भूमिका (एक ऐतिहासिक अवलोकन)

नीरज द्विवेदी

शोधार्थी – देवी अहिल्या विश्वविद्यालय इंदौर

सारांश – शेरशाह सूरी मध्यकालीन भारतीय इतिहास में अपने अदम्य साहस एवं लोक कल्याणकारी कार्यों के लिए विख्यात है। प्रसिद्ध इतिहासकार कालिका रंजन कानूनगो अपनी पुस्तक "शेरशाह एवं उसका समय"में उसे मुगल सम्राट अकबर से ऊंचा स्थान प्रदान करते हैं। वुल्जले हेग शेरशाह सूरी को भारत के मुसलमान सम्राटों में सबसे महान मानते हुए उसे एक कुशल प्रशासक एवं उत्कृष्ट प्रबंधन कर्ता मानते हैं। अपने अल्प शासन काल में ही उसने अपने साम्राज्य में सुव्यवस्थित शासन प्रणाली लागू की। आवागमन के साधनों का विस्तार करते हुए उसने अनेक सड़को का निर्माण करवाया। यात्राओं को सुखद एवं निरापद बनाने के लिए उसने प्रत्येक दो कोश की दूरी पर 1700 सरायों का निर्माण करवाया। हिंदुओं और मुसलमानों के लिए इन सरायों में अलग-अलग खंड बनवाए गए, जहां उनके लिए भोजन, पानी व विश्राम का प्रबंध किया गया। शेरशाह ने नियम बनाया कि जो कोई भी इन सरायों में आए, उसे सरकारी पैसे से उसकी हैसियत के मुताबिक खाना दिया जाए। सरायों में व्यापारियों की सुरक्षा के लिए शहना नियुक्त किए गए। इन सरायों का प्रयोग डाक चौकिया के रूप में भी किया जाता था, जिसके लिए प्रत्येक सराय में दो घोड़े रखे जाते थे। शेरशाह ने प्रत्येक सराय में बाजार खुलवाएं, जिससे व्यापार – वाणिज्य में भी उल्लेखनीय प्रगति हुई। सरायों के निर्माण के परिणाम स्वरूप लंबी दूरी की यात्रा करना भी पहले की तुलना में काफी सुखद हो गया। निःसंदेह ये सरायें काफी लोकप्रिय रही होंगी, क्योंकि बाद में इस्लाम शाह के शासनकाल में शेरशाह द्वारा बनवाई गई हर दो सराय के बीच में एक तीसरी सराय का निर्माण कराया गया। डॉक्टर कालिका रंजन कानूनगो इन सरायों को "शेरशाह सूरी के साम्राज्य रूपी शरीर की धमनियां मानते हैं"।

शब्दकुंजी – शेरशाह सूरी का साम्राज्य, अवस्थिक, भटियारा वर्ग, सरायों का प्रबंधन, डाक चौकियां, स्थानीय मंडियां, स्थानीय उत्तरदायित्व का नियम।

प्रस्तावना – सराय शब्द का शाब्दिक अर्थ यात्रियों के ठहरने का स्थान है। "सराय" आमतौर पर ऐसे भवन या प्रतिष्ठान होते हैं, जहां यात्रियों के ठहरने, भोजन और पेय पदार्थों की व्यवस्था होती है। सराय अधिनियम 1867 के अनुसार "सराय से तात्पर्य किसी ऐसे भवन से है, जो यात्रियों के आश्रय एवं विश्राम के लिए प्रयोग में लाया जाता है।" इनका निर्माण मध्यकाल में व्यापारियों, तीर्थ यात्रियों एवं देशाटन करने वालों के प्रवास के लिए किया जाता था।

प्राचीन काल से ही अनेक राजाओं, महाराजाओं, व गणमान्य व्यक्तियों ने मार्गों को सुरक्षित बनाने, व्यापार एवं वाणिज्य की उन्नति, जन कल्याण, ख्याति तथा पुण्य की अभिलाषा से अनेक सरायों का निर्माण कराया। भारत में यात्रियों के आश्रय की अवधारणा अत्यंत प्राचीन काल से विद्यमान है। सम्राट अशोक के अभिलेखों में उल्लेख मिलता है, कि उन्होंने सड़को के किनारे अनेक आश्रय स्थलों का निर्माण करवाया। गुप्त कालीन शासकों ने भी अवस्थिक नामक अधिकारी की नियुक्ति धर्मशालाओं के संचालन के लिए की। हेंगसांग सी-यू-की में उल्लेख करता है कि भारत के सभी नगरों एवं राजमार्गों पर पुण्यशालाओं का निर्माण किया गया है।

मध्य काल में अनेक मुस्लिम शासकों ने सुरक्षित और सुखद यात्रा के उद्देश्य से अनेक सरायों का निर्माण करवाया, जिनमें शेरशाह सूरी विशेष प्रसिद्ध है। शेरशाह सूरी का दादा इब्राहिम सूर था। वह अफगानिस्तान में गोमल नदी के किनारे पेशावर के निकटवर्ती पहाड़ी प्रदेश का रहने वाला तथा घोड़ों का व्यापारी था।

बहलोल लोदी के शासन के अंतिम समय में वह भारत आया। इब्राहिम सूर और उसके बेटे हसन खां सूर ने बरनाल के जागीरदार महावत खा सूर के यहां नौकरी कर ली तथा बजवाड़ा नामक स्थान पर बस गए। यहीं पर हसन खान सूर की पत्नी के गर्भ से 1472 ईस्वी में हिंदुस्तानी मुस्लिम पुनर्जागरण के नायक शेरशाह सूरी का जन्म हुआ। शेरशाह सूरी के बचपन का नाम फरीद था। फरीद हसन की चार पत्नियों में पहली पत्नी का पुत्र था। 1494 ईस्वी में फरीद शिक्षा प्राप्त करने के लिए अपने पिता की जागीर सहसारांम से जौनपुर आ गया, जो उस समय इस्लामी संस्कृति व शिक्षा का केंद्र होने के कारण भारत का सिराज कहा जाता था। शिक्षा प्राप्ति के बाद उसने 21 वर्षों तक अपने पिता की जागीर का कुशलता पूर्वक प्रबंध किया। उसे शेरखा की उपाधि बिहार के अफगान शासक मुहम्मदशाह ने बिना किसी अस्त्र-शस्त्र के शेर का शिकार करने के उपलक्ष्य में दी। चौसा और कन्नौज के युद्ध में हुमायूं को परास्त करने के उपरांत 10 जून 1540 को हिंदुस्तान के बादशाह के रूप में उसका विधिवत राज्याभिषेक हुआ। शेरशाह सूरी ने सिर्फ 5 वर्ष तक शासन किया, मगर इतने कम समय में ही उसने हिंदुस्तान की सूरत बदल दी। उसके व्यक्तित्व में शेर की बहादुरी और लोमड़ी की चालाकी का मिश्रण था। शेरशाह सूरी ने धार्मिक सौहार्द को बढ़ावा दिया। शासन के प्रत्येक क्षेत्र में नए सुधार लागू किए। राजधर्म का पालन करते हुए उन्होंने हिंदू और मुसलमानों के साथ समान व्यवहार किया। वाक्यात ए मुस्ताकी के लेखक रिजकुल्लाह लिखते हैं कि वे अपने लोगों के लिए पिता समान थे। इस प्रकार जनता के लिए उत्तरदायी शासक के रूप में शेरशाह सूरी का नाम इतिहास में दर्ज है।

शोध पत्र का उद्देश्य – प्रस्तुत शोध पत्र का उद्देश्य अफगान शासक शेरशाह सूरी के शासन काल में सरायों के निर्माण, प्रशासन एवं संचालन से संबंधित तथ्यों का विश्लेषण कर, व्यापार एवं वाणिज्य की उन्नति में सरायों के योगदान का समग्र मूल्यांकन करना है। किस प्रकार ये सरायें डाक घर के रूप में भी कार्य करती थीं। मार्ग को निरापद बनाने के लिए सरायों के आस-पास गांव बसाए गए। शोध पत्र के माध्यम से शेरशाह सूरी द्वारा किए गए लोक हितैषी कार्यों एवं जन कल्याणकारी नीतियों की विवेचना की गई है।

अध्ययन का क्षेत्र – प्रस्तुत शोध पत्र में सूर शासक शेरशाह सूरी द्वारा देश के विभिन्न हिस्सों में निर्मित सरायों के प्रबंधन और संचालन का प्राथमिक एवं द्वितीयक स्त्रोतों की सहायता से विश्लेषण किया गया है। सरायों के निर्माण का आवागमन, व्यापार-वाणिज्य तथा डाक व्यवस्था पर पड़ने वाले प्रभावों का अध्ययन किया गया है।

शोध विधि – प्रस्तुत शोध पत्र में तथ्यों का संकलन मुख्यतः प्राथमिक स्रोतों के विश्वसनीय अनुदित ग्रंथों तथा द्वितीयक स्त्रोतों का प्रयोग कर किया गया है। विभिन्न पत्र-पत्रिकाओं के माध्यम से भी जानकारी एकत्रित की गई है। शोधकार्य हेतु ऐतिहासिक अनुसंधान विधि का प्रयोग करते हुए समस्या से संबंधित साहित्य का अध्ययन एवं विश्लेषण करके इतिहास की वर्णनात्मक शोध विधि का प्रयोग किया गया है।

सरायों के निर्माण, प्रबंधन एवं संचालन में शेरशाह सूरी की भूमिका – शेरशाह सूरी की सबसे बड़ी देन साम्राज्य के एक छोर से दूसरे छोर तक कानून एवं व्यवस्था की स्थापना करना था। शेरशाह सूरी ने सड़कों और संचार व्यवस्था के सुधार पर बहुत अधिक बल दिया। उसने यात्रियों की सुरक्षा हेतु मार्गों को निरापद बनाने का भरपूर प्रयास किया। इसके द्वारा उसका उद्देश्य सेना के संचालक को सुगम बनाना तथा व्यापार और वाणिज्य को बढ़ावा देना था। स्थानीय उत्तरदायित्व का सिद्धांत लागू करते हुए चोर-लुटेरे तथा उनसे मिली-भगत करने वाले जमींदारों के ऊपर उसने कठोर कार्यवाही की। उदाहरण के तौर पर फतेह खां जाट, जिसने लाहौर से दिल्ली तक अराजकता फैला दी थी, के खिलाफ उसने सख्त कार्यवाही की। संभल

और लखनऊ की सरकारों के अधिकारियों ने अपने क्षेत्र में चोर-लूटेरों के विरुद्ध अत्यंत कठोर कार्यवाही की। कन्नौज का सूबेदार अपने क्षेत्र के विद्रोहियों और लूटेरों से बहुत सख्ती से पेश आता था।

शेरशाह सूरी ने व्यापार और वाणिज्य की उन्नति तथा आवागमन को सुगम बनाने के उद्देश्य से अनेक सड़कों का निर्माण करवाया, जिनमें चार सड़कें अत्यधिक प्रसिद्ध हैं।

1. पूर्वी बंगाल के सोनार गांव से सासाराम, दिल्ली, आगरा होती हुई काबुल तक। यह शेरशाह द्वारा निर्मित सबसे लंबा राजमार्ग था। शेरशाह के समय इसे सड़क ए आज़म या बादशाही सड़क कहा जाता था। ब्रिटिश काल में यह मार्ग ग्रांड ट्रंक रोड नाम से प्रसिद्ध हुआ।

2. दूसरा मार्ग आगरा से मांडू होते हुए बुरहानपुर तक जाता था।

3. तीसरा मार्ग आगरा से जोधपुर होते हुए चित्तौड़ तक जाता था।

4. चौथा मार्ग लाहौर से मुल्तान तक जाता था। मुल्तान पश्चिमी और मध्य एशिया की ओर जाने वाले कारवाओ की रवानगी का स्थल था।



शेरशाह द्वारा निर्मित संभू सराय – स्त्रोत पंजाब टूरिज्म

शेरशाह सूरी ने सड़कों के किनारे यात्रियों के विश्राम एवं सुरक्षा के दृष्टिकोण से प्रत्येक 2 कोश की दूरी पर विशाल किले नुमा मजबूत भवन के रूप में 1700 सरायों का निर्माण किया। इनमें से कुछ आज भी विद्यमान हैं। तारीख ए शेरशाही के लेखक अब्बास खां शेरवानी लिखते हैं कि हिंदुओं और मुसलमान के लिए इन सरायों में अलग-अलग खंड बनवाए गए, जहां उनके लिए भोजन, पानी व ठहरने का प्रबंध किया गया था। मुसलमान के लिए मुसलमान और हिंदुओं के लिए ब्राह्मण रसोइए रखे गए। शेरशाह ने नियम बनाया कि यदि कोई भी व्यक्ति सराय में आए तो उसे सरकारी खर्च से उसकी हैसियत के मुताबिक खाना दिया जाए और उसके टट्टू को घास और दान प्रदान किया जाए।

सरायों में यात्रियों के लिए गर्म और ठंडे पानी तथा खाट की व्यवस्था होती थी। यात्रियों के लिए कच्चे और पके हुए भोजन की व्यवस्था की गई थी। प्रत्येक सराय में पानी की व्यवस्था के लिए एक कुआं होता था। सरायों में मस्जिदों का भी निर्माण किया गया और प्रत्येक मस्जिद में एक इमाम और एक मुअज्जिन की नियुक्ति की गई और उनके लिए वजीफा तय कर दिया गया। यात्रियों की सुरक्षा के लिए सरायों में एक

शहना और कई नौकरों की नियुक्ति की गई। इन सरायों का उपयोग डाक चौकियों के रूप में भी किया गया। डाक लाने ले जाने के लिए प्रत्येक सराय में दो घोड़ों की व्यवस्था की गई। इस प्रकार मंजिल दर मंजिल घोड़े बदलकर 300 कोश की दूरी का संदेश एक दिन में ही पहुंचाया जा सकता था। शेरशाह द्वारा निर्मित ये सराय स्थानीय कृषि उपज विपणन मंडियों का भी कार्य करती थी। उसने प्रत्येक सराय में बाजार खुलवाएं। सरायों के रख रखाव एवं संचालन के लिए मदद ए मास भूमि प्रदान की गई। अकबर के शासन काल में लिखी गई अफसाना ए शाहन से जानकारी मिलती है कि शेरशाह ने हर सराय में एक चिकित्सक की भी नियुक्ति की। जहागीर के शासन काल में लिखी गई तारीख ए दाऊदी का लेखक अब्दुल्ला हमे बताता है कि इन सेवाओं बदले यात्रियों से कोई शुल्क नहीं लिया जाता था। सरायों के निर्माण के परिणाम स्वरूप भटियारा नामक श्रमिक वर्ग का उदय हुआ। इन सरायों ने कस्बों के विकास में अत्यंत महत्वपूर्ण योगदान दिया।

इतालवी यात्री मनुची अपनी पुस्तक स्टोरिया द मोगोर में लिखता है कि जब वह डाकू राजा बन गया तो अपनी प्रजा के साथ बड़ी दयालुता और भलाई का व्यवहार करना कभी नहीं भुला।

शेरशाह सूरी द्वारा निर्मित ये सराय काफी लोक प्रिय हुई। डॉ. कानूनगो के शब्दों में – “ये सराय शेरशाह के साम्राज्य रूपी शरीर की धमनियां थीं” और यह सड़क व सराय शेरशाह के शासन की सफलता के लिए इसलिए और भी आवश्यक थी क्योंकि प्रायः अधिकारियों का स्थान परिवर्तन, व्यवसाय संचालन और सैन्य दलों का निरंतर आना जाना लगा रहता था।

इन उपायों से वाणिज्यिक क्रियाकलापों को बहुत प्रोत्साहन मिला। सेना का एक स्थान से दूसरे स्थान तक आवागमन आसान हुआ।

शेरशाह सूरी का मूल्यांकन – हैदर द्वितीय के उपनाम से प्रसिद्ध शेरशाह हिंदुस्तानी मुस्लिम पुनर्जागरण का नायक व शासन सुधारों में अकबर का पथ – प्रदर्शक था। शेरशाह वास्तव में मध्यकालीन भारत के इतिहास में एक विलक्षण व्यक्तित्व है। गुण और योग्यता के कारण वह एक अत्यंत साधारण स्थिति से उन्नति कर अफगान पुनर्जागरण का नेता तथा भारत में उत्पन्न सबसे बड़े शासकों में से एक बन गया। उसके सैनिक चरित्र में सावधानी एवं साहस का अद्भुत संयोग था। उसका राजनीतिक चरित्र सामान्य रूप से न्याय युक्त एवं मानवता पूर्ण था। डॉक्टर कानूनगो उचित ही कहते हैं कि – हिंदू धर्म के प्रति उसका रुख घृणा पूर्ण उदासीनता का नहीं, बल्कि सम्मान पूर्ण भावना का था। वह बाहर से मुस्लिम और अंदर से हिंदू था।

शेरशाह सूरी सिर्फ एक सफल विजेता ही नहीं, बल्कि एक दैदीप्यमान शासन पद्धति का निर्माता भी था, जिसकी प्रशंसा उसके शत्रु मुगलों के स्तुति गायकों ने भी की है। पांच वर्षों के उसके छोटे से कार्यकाल में शासन की प्रत्येक शाखा में विवेकपूर्ण व हितकर परिवर्तन लाए गए। आर. पी. त्रिपाठी, जदुनाथ सरकार जैसे उच्च कोटि के इतिहासकारों ने कई मायनों में शेरशाह की तुलना शिवाजी से की है। प्रसिद्ध इतिहासकार विसेंट स्मिथ लिखते हैं, कि यदि शेरशाह बच्चा रहता तो इतिहास के रंग मंच पर महान मुगल न आए होते। मिस्टरकिन तो इसकी प्रशंसा करते हुए लिखते हैं कि किसी भी सरकार ने, यहां तक कि अंग्रेजी सरकार ने भी इतनी बुद्धिमत्ता नहीं दिखाई, जितनी इस पठान ने।

इस प्रकार निःसंदेह शेरशाह भारतीय इतिहास का एक महान शासक है।

शेरशाह के मूल्यांकन में इतिहास लेखन संबंधित विवाद – परंपरागत इतिहास लेखन में शेरशाह के शासनकाल को महान उपलब्धियों का शासन काल माना जाता है। शासन के लगभग सभी क्षेत्रों में उसे अकबर का पूर्वगामी बताया गया है। पर बाद में किए गए शोधों के आधार पर यह माना जाता है, कि कुछ कारणों से शेरशाह की उपलब्धियों को थोड़ा बढ़ा-चढ़ाकर दिखाया गया है। प्रथम शेरशाह के मूल्यांकन के लिए आधुनिक इतिहासकार प्रायः एक ही स्रोत अब्बासखां शेरवानी द्वारा लिखित तारीख ए शेरशाही पर

निर्भर है, जो उसके व्यतिव से अत्यधिक प्रभावित था और उसकी उपलब्धियों को बढ़ा-चढ़ाकर प्रस्तुत किया है। दूसरा कारण कुछ ब्रिटिश इतिहासकारों की भूमिका है। कुछ ब्रिटिश विद्वानों ने अकबर के कद को छोटा दिखाने के लिए शेरशाह के कद को बढ़ा-चढ़ाकर दिखाया। इसलिए शेरशाह का मूल्यांकन करते समय सावधानी बरतने की आवश्यकता है।

निष्कर्ष – शेरशाह सूरी की सरायों ने 16 वीं शताब्दी में उसके शासन काल के दौरान व्यापार, वाणिज्य और संचार को बढ़ावा देने में महत्वपूर्ण भूमिका निभाई। शेरशाह ने रणनीतिक रूप से प्रमुख व्यापार मार्गों पर सरायों का निर्माण करवाया, जिससे उसके साम्राज्य में माल, लोगों और सूचनाओं की आवाजाही आसान हो सके। ये सराये व्यापारियों, और यात्रियों के लिए एक सुरक्षित विश्राम स्थल का कार्य करती थी, जहां उनके जानवरों के लिए भोजन, आश्रय और अन्य सुविधाएं उपलब्ध होती थी, जिससे व्यापार और वाणिज्य को बढ़ावा मिला। व्यापार और वाणिज्य को बढ़ावा देकर, शेरशाह की सरायों ने उसके साम्राज्य के भीतर आर्थिक विकास में योगदान दिया, जिससे उसकी प्रजा में समृद्धि आई और धन की वृद्धि हुई। सराय संचार के केंद्र के रूप में भी कार्य करती थी, जहां यात्री समाचार और सूचनाओं का आदान-प्रदान कर सकते थे, जिससे साम्राज्य के भीतर विभिन्न क्षेत्रों और संस्कृतियों को जोड़ने में मदद मिलती थी। इन सरायों ने सामाजिक समन्वय को बढ़ाने का कार्य किया। सरायों के निर्माण के लिए सड़कों और पुलों जैसे बुनियादी ढांचों का विकास किया गया, जिससे व्यापार और संचार में और वृद्धि हुई। शेरशाह के कुशल शासन और बुनियादी ढांचे के विकास पर ध्यान केंद्रित करने, जिसमें सरायों का निर्माण भी शामिल था, ने एक स्थायी विरासत छोड़ी, जिसने बाद के शासकों को भी प्रभावित किया। शेरशाह की सैनिक सफलता में सरायों ने महत्वपूर्ण भूमिका निभाई। ये सराये सेनाओं के लिए विश्राम स्थल के रूप में भी कार्य करती थी। शेरशाह ने महत्वपूर्ण सैन्य मार्गों पर सरायों का निर्माण और रख रखाव किया तथा मौजूदा सरायों का विस्तार और सुधार भी किया। इससे कुशल संचार, रसद और सेना की आवाजाही में सुविधा हुई, जिससे सैन्य अभियानों के दौरान सेना को कुमक और रसद की आपूर्ति सुनिश्चित हो सके। परिणामस्वरूप, सरायों ने शेरशाह के सैन्य अभियानों की गतिशीलता और समग्र प्रभावशीलता को बढ़ाया, जिसने विशाल क्षेत्रों को जीतने और प्रशासन में महत्वपूर्ण योगदान दिया।

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Critical Study On Perspectives And Approaches Of Information And Communication Technology (ICT)

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ABSTRACT:

Due to the advancement and spread of new technologies over time, we are now living in the 21st century. The invention of the printing press in the 1440s, the magnetic compass in the 1460s, paper money in the 1600s, the manufacture of steel in the 1850s, electricity and the electric bulb in the 1870s, telegraph lines in the 1880s, penicillin in the 1920s, transistors in the 1940s, computers in the 1950s, and the internet and mobile phones in the 1980s and 1990s are all regarded as major turning points in the development of science and technology. Scientific and technological developments and their applications to materials, manufacturing processes, and industrial use have enabled the development of generations of computers and information technology. Communication technologies have advanced and grown since the 1870s, giving us a fresh, potent, and complementary set of prospects. By combining computers, information technology, and the internet with communication technologies (ICT), the world has created what is today referred to as information and communication technology (ICT).

KEYWORDS: Communication, technologies, information technology, humanity, adoption.

INTRODUCTION:

ICT research has employed a variety of methodologies to better understand its uses and effects in various facets of people's lives. These points of view have been researched in order to connect the current findings to a workable theoretical framework.

Regarding how ICT and development interact, there are primarily two viewpoints. In this domain, Hamelink (1998) distinguishes between utopian (optimistic) and dystopian (pessimistic) approaches. He claims that proponents of a utopian worldview emphasize the advantages of information technology. ICT adoption, in the opinion of those who favor a dystopian future, would just perpetuate historical patterns of economic inequality, power imbalances, and information gaps. Social scientists have long disagreed over how technology fits into society. There have traditionally been three different meta-analytical perspectives on technology (Gendron, 1977). The following discussion covers important viewpoints on the development of ICTs and how they relate to society.

Technology is the invention, modification, use, and knowledge of tools, machines, techniques, crafts, systems, and organizational procedures to solve problems, enhance current issue solutions, accomplish goals, handle applied input/output relations, or carry out certain functions. It may also refer to a collection of similar tools, including equipment, adjustments, setups, and procedures. Technology improvements have a significant impact on how well humans and other animal species can regulate and adapt to their natural environments. The phrase may be used generally or in reference to particular locations.

The impact of technology on society and the environment has been varied. Modern economies, notably the current global economy, and the emergence of a leisure class in many societies have benefited from technology. Numerous contemporary activities harm the ecosystem of the planet by polluting the environment and using up natural resources. A society's values are impacted by different technical applications, and emerging technology usually raises fresh ethical questions.

II PERSPECTIVES AND APPROACHES OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT):

Utopian perspective:

According to the utopian viewpoint, technology is a boon to humanity in every manner (Mesthene 1981: 99). According to utopians, technology is sometimes used as a quick answer for various social problems. These rapid fixes are referred to as "technical cures" by Weinberg (1981). In addition, technology provides answers to problems that it has created. The utopian vision emphasizes technical determinism and promotes rapid technological advancement. Technology's lack of social influence is blamed on the political and economic establishments, which, tragically, control modern life.

According to the utopian viewpoint, the current era is known as the ICE age, media saturated age, new civilization, information revolution, knowledge society, and age of infotainment. It is a technologically focused viewpoint and places a lot of emphasis on historical discontinuity. According to this technologically centered point of view, social structures are impacted by the imperatives of technological development since technology has the power to shape the future. It claims that the digital revolution marked the undisputed start of the post-industrial era in human history. According to proponents of this viewpoint, the benefits of the new global information society will include improved health care, better education, more knowledge, and cultural variety. People now have more options in terms of travel, news media, entertainment, commerce, and education thanks to new digital technology. The Third Wave Civilization's notion of a technological rupture forms its basis.

In a zero-sum society, new social relationships, cultural values, and universal access to necessary resources will all emerge, according to Hamelink. Future virtual communities won't have any conventional restrictions or constraints. Supporters of this viewpoint believe that technology is here to stay and can be utilized to enhance humanity. Many people disagree with such ideas and have dystopian common ground.

Dystopian perspective:

Technology is an absolute failure in a dystopian worldview. They share the idealistic belief that technology has a significant impact on society. However, many see technology as a problem-maker rather than a solution. They favor technological restraints but reject the idea of technical solutions. The failure of social endeavors is blamed on technocrats by dystopians. They claim that technocrats should never make policy decisions.

This viewpoint claims that historical patterns of social and economic inequality, the imbalance of political power, and the gaps between the information-rich (knowledge elites) and the information-poor (the disenfranchised) would only be exacerbated by the proliferation of ICT. According to this perspective, the present political, social, and economic systems will continue to

evolve and transform. There will be massive job displacement and de-skilling if the capitalist mode of production is maintained and managerial control over the production processes is further increased. People will be allowed to participate in smaller decisions in a pseudo-democracy. ICTs will make it easier than ever for governments to keep an eye on their citizens. The individualization of information consumption will become so ubiquitous due to the development of ICTs in the home that the construction of a democratic public opinion will become a phantom. Forced cultural globalization is exemplified by trends toward violent "cultural tribalization" and "Macdonaldization," in which cultural communities are divided into fundamentalist cells with little to no understanding of other tribes. Developing countries are becoming more and more dependent on affluent countries as a result of advances in technology. Such technology is increasing the divide between the wealthy and the poor by restricting access and separating individuals into "haves" and "have-nots." Mark Dery, Ian Prinecke, Kevin Robins, Neil Postman, and Herbert I. Schiller are a few dystopians.

Both points of view have not taken into account the inherent difficulties of predicting the social and economic impacts of technological advancement in the future. According to Hamelink, it is difficult to foresee how any technology will impact society in the future; hence, only specific social decisions may be made for the future. Hamelink is a supporter of the technology-social shaping strategy. This approach, first proposed by MacKenzie and Wajcman (1985), highlights the dynamic interaction between social factors that affect technical innovation and social elements that have an impact on it. Numerous elements, such as location and market dynamics, socioeconomic position, politics, culture, and gender, have an impact on ICTs. He contends that individuals must have a thorough understanding of the forces that govern the growth of ICTs and how these forces interact if they hope to influence the direction of change in ICT in ways that would promote societal advancement.

The importance of ICT (means) or the changing organization in bringing about progress (communicator) is emphasized from both utopian and dystopian perspectives. When ICT is used to bridge the communication gap between a communicator and their audience, it becomes a tool for human growth. These two points of view primarily focus on whether an ICT tool may be used to further human development or whether a communicator, like a Non-Governmental Organization (NGO), can use an ICT tool to improve communities. These viewpoints are predicated on the idea that people are powerless to alter their own behavior or produce novel ideas for society's advancement. Therefore, development must be carried out using a tool or entity made available by a third party. ICTs have a big impact on human interaction by connecting people in different communities.

Neutral school:

The Neutral School holds that technology neither directly affects society nor independently causes or resolves issues. Alternatively, depending on how we utilize it, technology is neither helpful nor harmful. The objectives of the neutral school of thought include technological evaluation, forecasting, and management. The neutral school is more focused on social determinism than utopian or dystopian ideas, and it promotes the idea that social, economic, and political institutions have complete control over the effects of technology. According to the

neutral school, technology shouldn't be the focal point of policy. From a neutral standpoint, the concept of failure is irrelevant since society, not technology, governs how technology affects society.

Mesthene (1981) asserts that the three perspectives are insufficient for educating legislators. Mesthene developed the dual-effects theory based on research he and his colleagues conducted at Harvard University's Program on Science and Technology in the middle of the 1960s. Technology frequently has both positive and negative effects that occur simultaneously and cooperatively (Mesthene 1981: 103). The function of the social analyst is to look into the factors that affect how technology has an impact on society, both positively and negatively, in order to assist society in implementing social, technological, and political changes that will maximize the good benefits while minimizing the negative ones. David Sarnoff is in favor of this strategy.

Contingency approach:

The contingency approach, a fourth perspective, sees technology as a problem-solver and a problem-generator simultaneously. Technology is thought to be flexible. While carefully embracing and advancing technological advancements, it also examines the social and technological barriers to their effective application. Policy is shaped by organizations in the social, political, and technological worlds. Ithiel de Sola Pool's (1977) dual-effects analysis of the social influence of the telephone and Robert Kling's (1980) sociological study of computing are two instances of research that used the contingency technique.

Social Shaping of technology perspective:

The Social Shaping of Technology (SST) approach, which was initially presented in 1985, reflected a growing trend in technology history and social studies. The study of domestic and military technologies, as well as labor process theory, originated at a time when science and technology historians and sociologists were still establishing their footprints in new lands. MacKenzie and Wajcman's technique successfully disproved technical determinism and imaginatively backed the idea that technologies are socially influenced with the aid of earlier "classic works" (by Karl Marx and Marc Bloch) published in 1985.

According to the European Science Foundation/Economic and Social Research Council (1991) and Newby (1992), SST broadens the policy agenda for the promotion and management of technological change and aids in a better understanding of the relationship between scientific excellence, technological innovation, and economic and social well-being. SST is frequently used synonymously with methodology, the social construction of technology, or the sociological study of technology in general. SST contrasts with post-Enlightenment traditions that did not examine technical advancement but instead concentrated only on researching the social adjustments that new technology demanded. SST research suggests that rather than following an innate technical logic, technology evolves as a social product shaped by the context of its production and use. At each stage of the creation and use of new technologies, a set of technical options must be chosen. Along with strictly technical issues, a variety of social elements also influence the societal ramifications of technology and its content.

A long-standing critique of crude forms of technological determinism (Edge 1988) claimed that (i) the nature of technologies and the direction of change were unproblematic or predetermined (possibly because of an internal "technical logic" or economic imperative), and (ii) technology had necessary and predetermined "effects" on work, society, and the environment. This perspective on how technology shapes society is a result of this critique. It was linked to opposition to "technological imperative" beliefs, which stated that some technological routes could not be avoided and were prevalent in British government and business in the late 1970s and early 1980s.

ICT and Development Perspective:

Any view of growth must start with people, their perceptions of development, their communication, and their surroundings. People are already involved in processes that would enable them to affect societal change and personal development, including processes of communication (using a number of means at their disposal), sociocultural development, and political development. Communication experts need to learn how to use modern technology to participate in or act as catalysts for this continuing human progress. Communication is a process in which the communicator connects with, shares, and interacts with the audience (people), according to the definition of communication.

According to James Carey's "ritual perspective" on communication, people constantly share, bargain, and create meanings in social, cultural, and religious contexts. No discussion can occur if the listeners do not use the same medium of communication as the speaker (ICT). Until people start using computers as their medium, they cannot advance. Allowing people to communicate their expectations and meanings using ICT is essential. To disseminate information among them, it is necessary to first recognize these meanings and exploit their modes of communication. Such meanings can be communicated through ICT both within the community and with other communities facing comparable problems and challenges. When they are perceived as active participants in the development process, people are more likely to join them in their pursuit of development through new technology.

Interacting with communities is not made possible by technology on its own, but a shift in perspective can aid in the development of a paradigm that is both sustainable and participatory. With the use of convergence technology, communication professionals can alter their attitudes and behaviors in this regard. It is vital to think about how such technology might be used to build networks that encourage business involvement and promote personal growth.

Convergence Perspective:

Technology advancements have increased people's ability to interact and communicate. ICT can be used to merge several analog communication methods into a single digital system. Multiple jobs can be completed by a single system. When media services like broadcasting, voice telephony, data and text interchange, and online computer services that operate on various networks and platforms converge into a digital form, digital systems are more accurate than analog systems. The term "convergence" refers to the technological fusion of all operations that were previously performed utilizing various tools, mechanisms, and methods into a single digitally computerized system. Given this, Hamelink (1997) asserts that digital technologies are

essential for the convergence of electronics, telecommunications, and data processing technologies. They bring together the formerly disparate and polarized worlds of Internet users, publishers, cable makers, and broadcasters. Personal computers, televisions, and phones are increasingly being incorporated into true multimedia stations. Multimedia personal computers are becoming increasingly integrated with telephones, radios, televisions, VCRs, cameras, and other devices thanks to the technological process known as convergence. Webcasting of radio and television material, voice calls over the Internet, e-mail and chat chats over digital TV decoders, and Internet services made available to TV sets via Web TV and cable networks are just a few recent examples of convergence.

In this study, the social-shaping technology perspective is used since it considers both the influences of technology and society. The context of the study is a human population that is both affected by technology and shapes it to meet their requirements and environmental conditions. It largely focuses on emerging ICTs, such as the Internet, mobile phones, and satellite or dish television, which affect society by reducing social barriers and bridging gaps even when regional norms and values are ignored. If these technologies are made accessible to all students, regardless of gender or rural-urban residence, all students will be able to reduce current gender, rural-urban residence, and class imbalances.

III CONCLUSION:

The evolution of information technology since the 1990s has changed the nature of computer science education as well as other related scientific and engineering disciplines. Additionally, the IT industry has become a significant global employer. The academic curricula of both large and small countries started to change to suit the needs of business for graduates with essential IT skills. The methods used to teach pupils and the tools they use to research have also started to change swiftly. While the larger countries, like China and India, focused on meeting the basic demands by providing opportunities for engineering and science education, smaller countries like New Zealand and Ireland started examining teaching methods, instructional materials, and their impacts on the development of ICT skills. To assess the program's status, plan for the following program, and offer government support for the development of human resources, they carried out formal studies. Researchers also ran time-bound linear experiments to evaluate the changing impacts of teaching tactics and resources on graduates' skills and preparation for future education and the workforce. Between 1991 and 2017, a large number of studies on the effects of ICT on school education were undertaken by the World Bank, OECD members, and other organizations. To prepare India for the future expansion of its human resource base, it is essential to conduct detailed investigations that are modelled after some of the studies conducted overseas.

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Sanskrit in Education: Unveiling Its Impact

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Abstract:

Sanskrit holds a unique place in education, transcending its historical and cultural significance to offer a multitude of benefits in contemporary learning environments. This abstract explores the impact of integrating Sanskrit into education, focusing on cognitive, linguistic, and cultural dimensions. Sanskrit's intricate grammar and syntax stimulate intellectual prowess, enhancing analytical thinking and problem-solving skills. Studies suggest that learning Sanskrit fosters cognitive flexibility, potentially improving overall academic performance. Sanskrit serves as a linguistic foundation, influencing numerous languages across South Asia. Its study not only enriches language skills but also provides a deeper understanding of etymology and linguistic evolution. This, in turn, promotes linguistic diversity and cross-cultural communication. Sanskrit acts as a bridge to ancient wisdom, literature, and philosophical treasures. Integrating it into education preserves cultural heritage, fostering a sense of identity and connection to historical roots. Moreover, exposure to Sanskrit texts promotes a holistic approach to education, emphasizing values and ethics. Concludes by underscoring the need for further research on the practical implementation of Sanskrit in diverse educational settings. Understanding its impact can illuminate new possibilities for curriculum enrichment, cognitive development, and cultural preservation in the global educational landscape.

Keywords: Sanskrit, Education, Linguistics, Cultural Heritage, Cognitive Benefits.

Introduction:

Sanskrit, an ancient Indo-Aryan language, holds a profound historical significance in the realm of Indian education. Its roots are deeply embedded in the Vedic period, where it served as the medium for transmitting sacred texts and hymns, fostering a tradition of oral knowledge transfer. The Gurukul system, an ancient educational model, extensively utilized Sanskrit as the primary medium of instruction, emphasizing the holistic development of individuals. The language's richness extends beyond its utilitarian purpose, delving into an expansive literary and philosophical domain. Classical Sanskrit texts, such as the Vedas, Upanishads, and epics like the Mahabharata and Ramayana, not only encapsulate profound spiritual teachings but also showcase the linguistic finesse and intricate poetics inherent in Sanskrit. The philosophical treatises composed in Sanskrit have been instrumental in shaping the intellectual landscape of ancient India, contributing to the development of diverse schools of thought. The contemporary educational landscape reflects a marked decline in the prominence of Sanskrit. Modern curricula often prioritize other languages, relegating Sanskrit to a peripheral role. This relegation has implications not only for the preservation of cultural heritage but also for the holistic

development of students. Sanskrit's exclusion diminishes access to a vast reservoir of ancient wisdom, hindering a comprehensive understanding of India's cultural roots. In light of this decline, there arises a pressing need for the reevaluation of Sanskrit's role in education. Rediscovering the pedagogical value of Sanskrit can foster a deeper connection with cultural heritage, enabling a more holistic and well-rounded educational experience. Moreover, the incorporation of Sanskrit in contemporary curricula can contribute to linguistic diversity and cognitive development, enhancing students' analytical and linguistic skills. Sanskrit's impact on education, it becomes evident that its historical significance, coupled with its literary and philosophical treasures, warrants a reconsideration of its place in modern learning environments. Embracing Sanskrit not only preserves a cultural legacy but also enriches educational experiences, bridging the gap between ancient wisdom and contemporary knowledge.

Impact on Cognitive Development:

Enhanced Memory: Research indicates that learning Sanskrit can contribute to improved memory retention, fostering stronger cognitive abilities.

Logical Thinking: The intricate grammar and syntax of Sanskrit necessitate analytical thinking, promoting logical reasoning skills among learners.

Language Processing Skills: Studying Sanskrit involves deciphering complex linguistic structures, enhancing language processing capabilities and linguistic awareness.

Focus and Concentration: The precise nature of Sanskrit requires focused attention, potentially enhancing concentration levels and attention to detail.

Problem-Solving Skills: The logical structure of Sanskrit may contribute to the development of effective problem-solving skills, as learners engage in deciphering linguistic intricacies.

Multitasking Abilities: Juggling the nuances of Sanskrit syntax and semantics may cultivate multitasking abilities, as learners navigate various linguistic elements simultaneously.

Neuroplasticity: Some studies propose that learning Sanskrit may stimulate neuroplasticity, potentially impacting brain structure and promoting cognitive flexibility.

Linguistic Foundations:

Root Language: Sanskrit serves as a fundamental root language for many Indo-European languages, providing a historical and linguistic foundation.

Cognate Connections: Studying Sanskrit reveals cognates and shared linguistic elements, enhancing comprehension of related languages within the Indo-European family.

Grammar Analysis: Sanskrit's intricate grammar fosters a deeper understanding of linguistic structures, facilitating analysis and comparison with other languages.

Etymological Insight: Exploring Sanskrit etymology unveils the origins of words, shedding light on language evolution and enriching linguistic studies.

Phonetic Precision: Sanskrit's precise phonetics aids in refining pronunciation skills, contributing to linguistic accuracy and articulation in related languages.

Morphological Mastery: Through Sanskrit, learners grasp morphological intricacies, influencing their ability to decipher and deconstruct words in various Indo-European languages.

Pedagogical Approaches:

Implementing diverse pedagogical methods can enhance Sanskrit education, catering to various learning styles. Incorporating visual aids like charts and diagrams supports visual learners, while interactive activities engage kinesthetic learners. Utilizing storytelling and mnemonics appeals to auditory learners, fostering a holistic learning environment. Additionally, integrating technology, such as language learning apps and interactive online resources, can cater to the preferences of modern learners, ensuring a comprehensive and adaptable approach to teaching Sanskrit.

Cultural and Philosophical Depth:

Sanskrit's inclusion in education unveils a profound impact by fostering a connection between students and India's rich cultural and philosophical heritage. The language, deeply embedded in the country's history, serves as a gateway for learners to explore the roots of Indian civilization. Sanskrit is more than just a linguistic medium; it encapsulates a cultural tapestry woven with philosophical nuances. Students engaging with Sanskrit are immersed in the wisdom of ancient texts like the Vedas, Upanishads, and epics such as the Mahabharata and Ramayana. This exposure facilitates an intimate understanding of the cultural fabric that has shaped India over millennia. The language plays a pivotal role in preserving and transmitting this ancient wisdom. As a classical language, Sanskrit acts as a vessel for the conveyance of intricate philosophical concepts and spiritual insights. Its grammatical structure, enriched with precision and elegance, aids in preserving the subtleties of these profound teachings.

Sanskrit's influence extends beyond linguistic boundaries, becoming a bridge to grasp the essence of Indian philosophy. The intricacies of Advaita Vedanta, Nyaya, and Mimamsa find expression in Sanskrit texts, allowing students to delve into the diverse philosophical schools that have sculpted the intellectual landscape of the subcontinent. Sanskrit, students not only decode the linguistic intricacies but also unlock the doors to ethical and metaphysical inquiries embedded in ancient Indian thought. This exposure fosters a sense of continuity, where the past dialogues with the present, enabling a holistic understanding of cultural evolution. Sanskrit in education serves as a medium to preserve and transmit the cultural and philosophical depth of India. It empowers students to connect with their heritage, fostering a sense of pride and belonging. Through this linguistic journey, learners embark on a profound exploration of the timeless wisdom that has shaped the ethos of the Indian subcontinent for centuries.

Challenges and Solutions:

Challenges:

Limited Availability of Qualified Instructors: One challenge is the scarcity of qualified Sanskrit teachers, hindering the effective integration of the language into mainstream education.

Curriculum Development: Designing a comprehensive and relevant Sanskrit curriculum poses a challenge, as it requires balancing traditional aspects with modern educational needs.

Perceived Relevance: Some may question the practicality and relevance of Sanskrit in contemporary settings, leading to resistance in incorporating it into mainstream education.

Infrastructure and Resources: Insufficient resources and infrastructure for Sanskrit education, including textbooks and learning materials, can impede its successful integration.

Student Engagement: Motivating students to learn Sanskrit can be challenging, as it is often perceived as a complex and less commonly used language in daily life.

Assessment Methods: Developing effective methods to assess students' proficiency in Sanskrit can be a challenge, considering the need for both traditional and modern evaluation techniques.

Solutions:

Curriculum Integration: Integrate Sanskrit into the education curriculum, emphasizing its linguistic and cultural significance.

Teacher Training: Provide specialized training for educators to effectively teach Sanskrit, ensuring quality instruction.

Digital Resources: Develop and promote digital tools and resources for learning Sanskrit, making it accessible to a wider audience.

Community Engagement: Foster community involvement by organizing events, workshops, and cultural activities to create a supportive environment for Sanskrit learning.

Incentives and Recognition: Establish incentives for students and educators who excel in Sanskrit studies, encouraging participation and acknowledging achievements.

Policy Implications:

Inclusion in Curriculum: Incorporate Sanskrit as a part of the standard curriculum, emphasizing its cultural and historical significance. This ensures widespread exposure and understanding among students.

Teacher Training Programs: Develop specialized training programs for Sanskrit teachers to enhance their proficiency and teaching methodologies, ensuring quality education delivery.

Resource Allocation: Allocate adequate resources for the development of Sanskrit learning materials, textbooks, and digital resources to facilitate effective teaching and learning experiences.

Examination Systems: Establish fair and standardized examination systems for Sanskrit, encouraging students to take the language seriously and fostering a sense of achievement. *Promotion of Research:* Encourage and fund research initiatives in Sanskrit linguistics, literature, and pedagogy to continually enrich the educational landscape and promote scholarly contributions.

Community Engagement: Foster partnerships with communities and institutions to create a supportive environment for Sanskrit education, organizing cultural events and activities to enhance the language's relevance and appeal.

Conclusion:

The exploration of Sanskrit's impact on education reveals a plethora of benefits that extend beyond linguistic proficiency. The timeless wisdom encapsulated in Sanskrit texts serves as a reservoir of knowledge, fostering critical thinking and intellectual development. The precision and intricacy of the language contribute to enhanced cognitive abilities, laying a robust foundation for analytical skills. Sanskrit's association with ancient Indian philosophies provides a holistic approach to education, emphasizing not only the acquisition of knowledge but also the cultivation of values and ethical principles. The philosophical underpinnings embedded in Sanskrit literature offer a unique perspective that transcends conventional educational paradigms. As we navigate the complexities of the modern world, there is an urgent need to reintegrate Sanskrit into the educational framework. Its inclusion can bridge the gap between tradition and contemporary learning, fostering a well-rounded educational experience. The integration of Sanskrit can act as a catalyst for cultural preservation, nurturing a sense of identity and heritage among learners. In a globalized society, proficiency in Sanskrit can open doors to a deeper understanding of diverse cultures and philosophies. By embracing Sanskrit, educational institutions can foster an environment that promotes inclusivity and global awareness. This linguistic revival can contribute to breaking down barriers and creating a harmonious coexistence of different worldviews. The revitalization of Sanskrit in education is not merely a linguistic endeavor but a transformative step towards creating well-rounded, conscientious individuals. As we reflect on the potential impact of Sanskrit, it becomes evident that its inclusion is not just a nod to tradition but a strategic move to enhance the quality and depth of education. It is a call to action, urging educational institutions to recognize and unlock the profound benefits that Sanskrit brings to the contemporary learning landscape.

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आजीविका पर सूखे की स्थिति का भौगोलिक अध्ययन

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सारांश

पूरी दुनिया में वर्षा के महत्व और इसके आर्थिक और सामाजिक लाभों को तेजी से महसूस किया जा रहा है। हमारे देश में भी, विभिन्न क्षेत्रों जैसे कृषि, बिजली और ऊर्जा, पर्यटन, नौवहन, परिवहन, उद्योग आदि को अधिकतम प्राप्त करने की दृष्टि से विभिन्न परियोजनाओं की योजना बनाने और उन्हें क्रियान्वित करने के लिए देश के विभिन्न क्षेत्रों से संबंधित वर्षा की जानकारी की आवश्यकता होती है। मौसम संबंधी और/या जलवायु संबंधी स्थितियों से लाभ। वर्षा आधारित कृषि परिदृश्य में, जो भारत के झारखंड राज्य में मौजूद है, वर्षा की घटना फसल की पैदावार के मूल्यांकन में प्रमुख निर्णायक कारक है। राज्य में वर्षा की घटना में भिन्नता मुख्य रूप से विभिन्न जलवायु मापदंडों की परस्पर क्रिया के कारण होती है जिसके परिणामस्वरूप सामान्य या अनियमित वर्षा होती है। राज्य के कई हिस्सों में खरीफ (मानसून) के मौसम में कृषि सूखे जैसी स्थिति का अनुभव होता है। सूखे के मूल्यांकन के लिए कई सूचकांक हैं। सूखा प्रवण क्षेत्र कम उत्पादकता और अस्थिरता की दोहरी समस्या का सामना करते हैं। सूखे को कम करने और सूखा प्रवण क्षेत्रों के लोगों की पीड़ा को कम करने के लिए समय-समय पर संबंधित सत्ताधारी अधिकारियों द्वारा कई उपाय किए गए हैं। आजादी के बाद भारत सरकार और राज्य सरकारों ने सुनियोजित प्रयासों से सूखे की समस्या से निपटने का प्रयास किया है। हालाँकि, सूखे को कम करने के लिए अब तक किए गए कई प्रयासों के बावजूद, समस्या जस की तस बनी हुई है। बी अरुणाचलम (1979) ने बताया है कि ग्रामीण जनता पर सूखे के प्रभाव को कम करने के लिए बार-बार उपायों के बावजूद, सूखा अभी भी एक बड़ी समस्या है जिससे निपटने के लिए अधिक व्यवस्थित दृष्टिकोण की आवश्यकता है।

मुख्यशब्द आजीविका, सूखे की स्थिति, आर्थिक और सामाजिक लाभ, भारत सरकार

प्रस्तावना

पारिस्थितिक तंत्र को एक क्षेत्र और भौतिक वातावरण में जीवित चीजों के संग्रह के रूप में परिभाषित किया जाता है जिसके साथ वे बातचीत करते हैं। उनका अध्ययन सूक्ष्म मिट्टी के कणों से लेकर पूरे ग्लोब तक व्यापक श्रेणी में किया जा सकता है (अर्नस्ट, 2000)। पारिस्थितिक तंत्र में ऐसे घटक शामिल होते हैं जो घनिष्ठ पारस्परिक संबंध में होते हैं, एक घटक में परिवर्तन के कारण दूसरों में परिवर्तन होता है, इस प्रकार पूरे सिस्टम के पारिस्थितिक संतुलन को बिगाड़ देता है। पारिस्थितिक तंत्र प्राकृतिक (जंगल, महासागर आदि), सांस्कृतिक (जैसे फसल और वृक्षारोपण) और अर्ध-सांस्कृतिक (जैसे घास के मैदान) हो सकते हैं, जो एक निश्चित वनस्पतियों और जीवों की विशेषता है और एक निवास स्थान का गठन करते हैं। जीवित जीवों के जलवायु पर्यावरण को इको जलवायु के रूप में जाना जाता है। किसी भी क्षेत्र की उत्पादन क्षमता उस क्षेत्र में मौजूद पारिस्थितिक जलवायु परिस्थितियों पर निर्भर करती है। कोई भी कृषि प्रणाली एक मानव निर्मित पारिस्थितिक तंत्र है जो प्राकृतिक पारिस्थितिक तंत्र की तरह कार्य करने के लिए जलवायु पर निर्भर करती है। मुख्य जलवायु तत्व जो फसल उत्पादन को प्रभावित करते हैं वे वही हैं जो प्राकृतिक वनस्पति को प्रभावित करते हैं। कृषि मनुष्य द्वारा किए जाने वाले प्राकृतिक पारिस्थितिक तंत्र का सबसे व्यापक और नाटकीय परिवर्तन है। हाल ही में, वैश्विक जनसंख्या में वृद्धि एक सतत घटना है, जो अधिक खाद्य उत्पादन के निष्कर्षण के लिए मौजूदा प्राकृतिक पारिस्थितिक तंत्र पर दबाव डालती है।

कृषि मनुष्य का एक पुराना व्यवसाय है, जो लगभग 8000 ईसा पूर्व दक्षिण पश्चिम एशिया में सुमेरियन काल के दौरान शुरू हुआ था। व्यापक अर्थ में कृषि मिट्टी की जुताई करने, फसल उगाने और काटने, पशुओं को पालतू बनाने और पशुओं को पालने की कला या विज्ञान है। यह मानव जाति के भोजन का मुख्य स्रोत है और पृथ्वी के कई विकासशील और विकासशील भागों में आजीविका का प्रमुख स्रोत है। भोजन उपलब्ध कराने के अलावा, कृषि कई कृषि आधारित उद्योगों को कच्चे माल की आपूर्ति भी करती है। हाल ही में, सरकारों, शोधकर्ताओं, नीति निर्माताओं और योजनाकारों के बीच किसी भी पर्यावरणीय गिरावट के बिना किसी दिए गए क्षेत्र की कृषि क्षमता और दक्षता में सुधार करके उत्पादकता के स्तर को बढ़ाने के लिए कृषि विकास की चिंता बढ़ रही है। ये प्रयास मुख्य रूप से बढ़ती खाद्य आवश्यकताओं को पूरा करने के लिए हैं, जिसके परिणामस्वरूप जनसंख्या की घातीय वृद्धि हुई है, खाद्य प्रसंस्करण और कृषि आधारित उद्योगों को पर्याप्त कृषि उत्पादों की आपूर्ति करने के लिए, कृषि पर निर्भर लोगों के जीवन स्तर में सुधार करने के लिए और भूमि, जल और मिट्टी के संसाधनों की स्थिरता बनाए रखने के लिए।

कृषि क्षेत्र को विकसित करने के लिए पूर्व में किए गए प्रयोगों से यह सिद्ध हो चुका है कि आधुनिक कृषि निवेशों और कृषि दक्षताओं के प्रयोग से खाद्यान्न उत्पादन में कई गुना वृद्धि हुई है, लेकिन अभी भी पैदावार की दृष्टि से कृषि की संपन्नता हासिल नहीं हुई है। यह मुख्य रूप से विभिन्न मानवीय गतिविधियों के लिए भूमि, पानी और अन्य संसाधनों पर बढ़ते जनसंख्या दबाव और सिंचाई, तकनीकी और जैव रासायनिक आदानों के अनियंत्रित उपयोग से कृषि भूमि के क्षरण के कारण है। इसके अलावा, अधिकांश खेती योग्य भूमि मिट्टी के कटाव, जल जमाव, लवणता/क्षारीयता आदि के संपर्क में है, और टिकाऊ और पर्यावरण के अनुकूल विकास की दृष्टि से इससे निपटा जा सकता है।

सामान्य तौर पर, यह एक सर्वविदित तथ्य है कि फसलों की प्रकृति और पैटर्न भौतिक, तकनीकी और जैव रासायनिक आदानों द्वारा निर्धारित होते हैं। हालांकि, किसी विशेष क्षेत्र की कृषि क्षमता और क्षमता ज्यादातर मौजूदा भौतिक कारकों, विशेष रूप से मिट्टी और जलवायु परिस्थितियों पर निर्भर करती है। शेष कारक द्वितीयक भूमिका निभाते हैं। कई अध्ययनों ने पुष्टि की है कि फसल की समृद्धि या विफलता के लिए जिम्मेदार अकेला निर्णायक कारक जलवायु है। फसल वृद्धि को प्रभावित करने वाले सभी जलवायु चरों में तापमान और नमी सबसे प्रमुख कारक हैं। चूंकि पौधों की वृद्धि और विकास, कीटों और बीमारियों की घटना, सूखा और बाढ़ आदि का सीधा संबंध तापमान और नमी की स्थिति में बदलाव से है, इसलिए फसलों की पैदावार भी सीधे तौर पर जलवायु की विविधता पर निर्भर करती है। वास्तव में, तापमान पौधों के चयापचय की सभी रासायनिक और भौतिक प्रक्रियाओं को नियंत्रित करता है। उपयुक्त तापमान की स्थिति के बिना, बीजों का अंकुरण और पौधों की वृद्धि मंद हो जाती है क्योंकि बढ़ते मौसम में तापमान पौधों की वृद्धि को नियंत्रित करता है।

सूखे का वर्गीकरण

(1) **मौसम संबंधी सूखा:** यह एक ऐसी स्थिति है जब एक क्षेत्र में सामान्य वर्षा से महत्वपूर्ण (25 प्रतिशत से अधिक) कमी होती है।

(2) **हाइड्रोलॉजिकल सूखा:** मौसम संबंधी सूखा, यदि लंबे समय तक रहता है, तो हाइड्रोलॉजिकल सूखे के परिणामस्वरूप सतह के पानी की कमी और जलाशयों, झीलों, नदियों और नदियों के सूखने, झरने के प्रवाह की समाप्ति और भूजल स्तर में गिरावट का परिणाम होता है। पहले के मौसम में खराब हिमपात के कारण कम हिमपात में हाइड्रोलॉजिकल सूखा परिलक्षित हो सकता है और इसके परिणामस्वरूप बिजली उत्पादन में कमी आ सकती है और उद्योग के साथ-साथ कृषि भी प्रभावित हो सकती है।

(3) **कृषि सूखा:** यह तब होता है जब स्वस्थ फसल की परिपक्वता का समर्थन करने के लिए बढ़ते मौसम के दौरान मिट्टी की नमी और वर्षा अपर्याप्त होती है और चरम फसल की परिपक्वता का कारण बनती है और अत्यधिक फसल तनाव और विल्ट का कारण बनती है।

(4) **सामाजिक-आर्थिक सूखा:** जब कम वर्षा देश के सामान्य आर्थिक विकास को प्रभावित करती है तो इसका परिणाम सामाजिक-आर्थिक सूखे में होता है।

सूखे के लिए जिम्मेदार कारक

भारतीय उपमहाद्वीप में मानसून की बारिश एक वैश्विक घटना का परिणाम है, जो पृथ्वी पर बड़े पैमाने पर हवा के संचलन से जुड़ी है। वर्षा के अनियमित वितरण और इसकी कमी के कारण पानी की कमी हो जाती है, जो कभी-कभी गंभीर होती है, जो अलग-अलग तीव्रता के सूखे का कारण बनती है। सूखे के लिए जिम्मेदार कारकों में से हैं: वायुमंडलीय परिसंचरण के संबंध में भारतीय उपमहाद्वीप के आसपास समुद्र की सतह के तापमान की विसंगति और दक्षिणी प्रशांत महासागर के ऊपर वातावरण में बड़े पैमाने पर दबाव दोलन। अल नीनो का भारतीय उपमहाद्वीप की मानसून गतिविधियों पर भी गहरा प्रभाव है।

सूखे के प्रभाव

अन्य सामान्य असफलताओं की तुलना में सूखा सबसे मध्यम आपदाओं में से एक है। आम जनता के विभिन्न क्षेत्रों (उदाहरण के लिए, अर्थव्यवस्था, जीवन शक्ति, मनोरंजन, बागवानी, जल संपत्ति, जैविक समुदायों और मानव कल्याण) पर इसका नकारात्मक प्रभाव पड़ता है। सूखे के कुछ प्रमुख, भिन्न प्रभावों के बारे में अगले पृष्ठों में बात की गई है।

अर्थव्यवस्था पर प्रभाव

कृषि व्यवसाय, रेंजर सेवा और मत्स्य पालन जैसे भागों पर सूखे का प्रभाव राष्ट्र की अर्थव्यवस्था पर आघात कर सकता है। इन भागों की सतह और भूजल आपूर्ति के अधीन उनकी आवश्यक आवश्यकताएं हैं। सूखे की घटना फसल और पालतू जानवरों की पैदावार में कमी के लिए एक आधार बन सकती है। तदनुसार, एक राष्ट्र की जीडीपी अंत में कम हो जाती है और इस प्रकार अर्थव्यवस्था भी।

बी) पर्यावरण पर प्रभाव

पर्यावरण पर सूखे के प्रभाव को विविध प्रजातियों, प्राकृतिक जीवन पर्यावरण, वुडलैंड्स सहित हरियाली को नुकसान के रूप में देखा जाता है; दृश्य गुणवत्ता का ह्रास, जैव विविधता की हानि, और मिट्टी का विघटन। यदि क्षणिक प्रभाव होने चाहिए तो विशिष्ट स्थितियों को बहाल किया जाता है। हालांकि, जब ये प्रभाव लंबे समय तक प्रतीक्षा करते हैं, तो नुकसान भी अपरिवर्तनीय हो सकते हैं। उदाहरण के लिए, दृश्य की गुणवत्ता में गिरावट के कारण विस्तारित मिट्टी का विघटन, प्राकृतिक लाभप्रदता के स्थायी नुकसान में आ सकता है।

ग) समाज पर प्रभाव

शुष्क मौसम का सामाजिक प्रभाव इसकी निरंतरता और सबसे दूर के बिंदु पर अपेक्षित है। फसल की कमी, और परिणामी ऋण, किसानों की आत्महत्या के लिए भारत में एक विशिष्ट झुंझलाहट है। यह भोजन की कमी के कारण मानव जीवन की हानि भी ला सकता है, जो आम जनता में भी उन्माद और हिंसा का कारण बन सकता है। महान शुष्क मौसम के बीच जल ग्राहक संघर्ष आम हैं, जो आम तौर पर राजनीतिक, सामाजिक और आधुनिक प्रकृति के होते हैं। प्रतिक्रिया के संबंध में सामाजिक संकट सरकार के साथ खुली निराशा ला सकता है। भारत जैसे उभरते देशों में सबसे प्रसिद्ध चिंता सूखा है, जो विशेष रूप से या गोल चक्कर में गरीबों और सीमांतों को सबसे ज्यादा प्रभावित करता है।

कृषि जलवायु विश्लेषण

जनसंख्या की तीव्र वृद्धि भोजन, आश्रय और ऊर्जा के लिए विशेष रूप से भूमि, मिट्टी और जल संसाधनों पर अत्यधिक दबाव डालती है। इससे कृषि द्वारा भूमि से उत्पादन में वृद्धि होती है। भारत जैसे कृषि प्रधान देश

में यह समस्या और भी अधिक महत्वपूर्ण और चुनौतीपूर्ण है। हाल के वर्षों में कृषि जलवायु क्षेत्रीयकरण की अवधारणा लोकप्रियता प्राप्त कर रही है क्योंकि किसी दिए गए क्षेत्र की जलवायु कृषि क्षमता और उपयुक्तता निर्धारित करने में महत्वपूर्ण भूमिका निभाती है। कृषि जलवायु परिस्थितियों के उचित ज्ञान के बिना उचित फसल पद्धति और पूरक सिंचाई के प्रभावी कार्यान्वयन संभव नहीं है। क्षेत्रीयकरण के माध्यम से मौजूदा भूमि, नमी और मिट्टी के संसाधनों के संदर्भ में वैज्ञानिक मूल्यांकन प्राप्त किया जा सकता है, जो बदले में क्षेत्र की कृषि क्षमता को समझने में मदद करता है। चूंकि फसल की वृद्धि के लिए मिट्टी की नमी एक निर्णायक कारक है, इसका अनुमान लगाना भी बहुत आवश्यक है। यदि उत्पादन को नमी की कमी से सीमित नहीं करना है, तो जिस मात्रा में यह प्राकृतिक आपूर्ति फसल की मांग को पूरा करने में विफल रहती है, उसे घटा कहा जाता है, सिंचाई द्वारा आपूर्ति की जानी चाहिए। सिंचाई के अभाव में, सूखे की लंबी अवधि के दौरान मिट्टी में नमी तेजी से कम हो जाती है। परिणामी पानी की कमी पौधों के स्वस्थ और समृद्ध विकास को बाधित करती है, जिससे पैदावार पर प्रतिकूल प्रभाव पड़ता है। पहले के अध्ययनों से संकेत मिलता है कि किसी क्षेत्र की फसल उपयुक्तता पूरी तरह से उस विशेष क्षेत्र में पानी की उपलब्धता पर आधारित होती है। उच्च जल क्षमता के साथ विभिन्न प्रकार की फसलें उगाई जा सकती हैं, जबकि जल तनाव की स्थिति में सीमित गुंजाइश होगी और फसलों की कुशल उत्पादकता के लिए जलवायु संबंधी खतरों का अधिक जोखिम होगा। विक्टर एट अल., (1991) ने पाया कि पैदावार के मामले में कृषि की समृद्धि प्राप्त की जाएगी यदि फसलों और फसल प्रणाली का चयन पानी की उपलब्धता अवधि और फसल विकास अवधि के साथ समायोजित किया जाए। माथेर (1974) ने यह भी पाया कि नमी की स्थिति में परिवर्तनशीलता जैसे कि पानी का भंडारण, पानी की अधिकता और पानी की कमी किसी दिए गए क्षेत्र में अलग-अलग फसलों को उगाने की अनुमति देती है क्योंकि सभी फसलों और पौधों को विभिन्न मौसमों में पानी की विशिष्ट आवश्यकता होती है। हुसैन (2001) ने उप-उष्णकटिबंधीय क्षेत्रों में उच्च उपज वाले किस्म के बीजों की सफलता का विश्लेषण किया और पाया कि चावल और गेहूं के उच्च उपज वाले किस्म के बीजों ने केवल उन क्षेत्रों में अच्छा प्रदर्शन किया जहां मिट्टी की नमी को फिर से भरने के लिए समय पर सिंचाई की जाती है, जब भी आवश्यकता हो। यह भी पुष्टि की जाती है कि पानी की गंभीर कमी की अवधि के दौरान पैदावार में भारी कमी आई थी। सिंह और ढिल्लों (1998) ने संकेत दिया कि किसी क्षेत्र की कृषि समृद्धि के लिए नमी निर्णायक और मूलभूत कारक है। किसी विशेष क्षेत्र में यदि फसलों का चयन उपलब्ध नमी की स्थिति के आधार पर किया जाता है, तो सुनिश्चित उपज प्राप्त करने की गुंजाइश होगी और सूखे के प्रभाव को काफी हद तक कम किया जा सकता है।

मौजूदा सिंचाई की स्थिति

राज्य में सिंचाई के महत्वपूर्ण स्रोत नहर, तालाब और नलकूप, कुएँ और अन्य स्रोत हैं। झारखंड सरकार के सिंचाई विभाग से प्राप्त सिंचाई आँकड़ों के विश्लेषण से पता चलता है कि वर्ष 2001-2002 में राज्य का कुल सिंचित क्षेत्र 1.99 लाख हेक्टेयर था, जिसमें से कुछ हद तक प्रमुख (94,750 हेक्टेयर) द्वारा सिंचाई उपलब्ध कराई जाती है। मध्यम (18,800 हेक्टेयर) और लघु सिंचाई (68,520 हेक्टेयर)। कुल शुद्ध बोए गए क्षेत्र में सिंचित क्षेत्र के अनुपात के विश्लेषण के लिए वर्ष 1997-98 से संबंधित जिलेवार डेटा और स्थानिक पैटर्न का उपयोग किया गया है। अध्ययन ने संकेत दिया कि रांची में शुद्ध बोए गए क्षेत्र (67 प्रतिशत) में सिंचित क्षेत्र का उच्च अनुपात है। पलामू और गरवा जिलों में भी क्रमशः लगभग 30 प्रतिशत और 24 प्रतिशत शुद्ध बोया गया क्षेत्र सिंचित है। गोड्डा, पाकुड़, हजारीबाग, कोडरमा, चतरा और गिरिडीह में 10 से 14 प्रतिशत शुद्ध बोया गया क्षेत्र सिंचित है। शेष जिलों में सिंचित क्षेत्र का शुद्ध बोए गए क्षेत्र का प्रतिशत 8 प्रतिशत से कम है।

जिलों में सिंचाई के स्रोतों का अध्ययन कि कुँ सिंचाई का सबसे सामान्य साधन हैं, जो शुद्ध सिंचित क्षेत्र का लगभग 32 प्रतिशत योगदान देता है। यह ज्यादातर राज्य के दक्षिण-पश्चिमी और उत्तर-मध्य जिलों में प्रचलित है। नहरें राज्य के शुद्ध सिंचित क्षेत्र का लगभग 16 प्रतिशत सिंचित करती हैं, विशेषकर दक्षिण-मध्य और उत्तर-पश्चिमी जिलों में। तालाब भी राज्य के शुद्ध सिंचित क्षेत्र का लगभग 16 प्रतिशत योगदान करते हैं और उत्तर-पश्चिमी और पूर्वोत्तर जिलों के कुछ हिस्सों में महत्वपूर्ण हैं। नलकूप सिंचाई के तहत शुद्ध क्षेत्र 13 प्रतिशत उत्तर-मध्य जिलों में विद्यमान है। इनके अलावा अन्य स्रोत भी शुद्ध बोए गए क्षेत्र का लगभग 23 प्रतिशत योगदान करते हैं।

खरीफ मौसम के दौरान फसल पैटर्न

राज्य की कृषि फसलों के आंकड़ों से पता चला है कि राज्य में व्यापक रूप से उगाई जाने वाली प्रमुख फसलें धान, मक्का, दलहन, तिलहन और अन्य बाजरा जैसे ज्वार (मोती बाजरा), बाजरा (बुल रश मिलिअट) और रागी (फिंगर मीलीट) हैं। बक गेहूँ। मुख्य रूप से उगाई जाने वाली दालों में अरहर (सिटिसस काजन), काला चना (हॉर्स बीन), हरा चना (किडनी बीन) और कुर्ची शामिल हैं। मुख्य रूप से उगाई जाने वाली तिलहनी फसलें मूंगफली, तिल, सूरजमुखी और सरगुजा (गुइजोटिया एबिसिनिका) हैं। अध्ययन से संकेत मिलता है कि झारखंड राज्य में धान के तहत शुद्ध बोया गया क्षेत्र सबसे अधिक (1520 हजार हेक्टेयर) था, इसके बाद दलहन (139 हजार हेक्टेयर), मक्का (133 हजार हेक्टेयर), तिलहन (30 हजार हेक्टेयर) और अन्य बाजरा (26 हजार हेक्टेयर) था। धान का रकबा रांची (243 हजार हेक्टेयर) में सबसे अधिक है, इसके बाद पश्चिमी सिंहभूम (172 हजार हेक्टेयर) है। मक्का की खेती में गिरिडीह पहले और पलामू तीसरे स्थान पर है। जबकि, सिमडेगा में दलहन की खेती का क्षेत्र अधिक है, जिसके बाद रांची का स्थान है। अंत में, तिलहन का क्षेत्रफल सिमडेगा और गुमला में अधिक है।

रबी मौसम के दौरान फसल पैटर्न

मुख्य रूप से सिंचाई सुविधा की कमी के कारण रबी मौसम के दौरान शुद्ध बोए गए क्षेत्र का लगभग 9 प्रतिशत ही खेती की जाती है। मुख्य रबी फसलों में दालें (चना, मसूर, और पेस), गेहूँ, तिलहन (सरसों, अलसी, सास लोअर (कुसुम) और सूरजमुखी) और मक्का शामिल हैं। लगभग 71.7 हजार हेक्टेयर पर कब्जा करके सभी रबी फसलों में दलहन हावी है, इसके बाद गेहूँ (65.4 हजार हेक्टेयर), तिलहन (44.0 हजार हेक्टेयर) और मक्का (6.2 हजार हेक्टेयर) का स्थान है। जिलेवार विश्लेषण से पता चला है कि सभी जिलों में सबसे अधिक क्षेत्र में दलहन और गेहूँ का कब्जा है। अधिकांश दक्षिणी और पश्चिमी जिलों में दालों का अधिक क्षेत्र है। अधिकांश उत्तर मध्य जिलों में गेहूँ का रकबा अधिक है। तिलहन उत्तर मध्य जिलों को छोड़कर लगभग सभी जिलों में उगाए जाते हैं। मक्का की खेती केवल पूर्वोत्तर जिलों तक ही सीमित है। फसल पैटर्न के अध्ययन से संकेत मिलता है कि केंद्रीय जिलों में ज्यादातर गेहूँ की दालें एक साथ उगाई जाती हैं। पूर्वोत्तर के जिलों में गेहूँ-दाल-तिलहन मिलाकर उगाई जाती है। जबकि, दक्षिणी और पश्चिमी जिलों में अधिक संख्या में फसलें यानी गेहूँ-मक्का-दाल-तिलहन की खेती होती है।

कृषि सूखा मूल्यांकन की आवश्यकता

मूल्यांकन का उद्देश्य किसी चीज के स्तर को मापना है। खेती की व्यवस्था और प्रशासन में सूखे का मूल्यांकन सबसे महत्वपूर्ण दृष्टिकोणों में से एक है। सूखे जैसी परिस्थितियों में स्थितियों के विकास के लिए उपयुक्त गतिविधियों की व्यवस्था करने के लिए ग्रामीण सूखा मूल्यांकन एक आवश्यक घटक है। यह जिलों में पिछले सूखे की जांच और समझ का अनुरोध करता है; क्या अधिक है, घटनाओं के समय के लिए इसका प्रभाव। सूखा मूल्यांकन मॉडल तैयार करने के लिए सूखे के विचार का व्यापक होना जरूरी है। ऐसे क्षेत्र जहां आबादी का एक प्रमुख हिस्सा कृषि व्यवसाय के अधीन है, कृषि सूखे की घटनाओं से गंभीर रूप से प्रभावित होते हैं। कृषि सूखा पूरे क्षेत्र में आबादी और जानवरों में आशा की हानि लाता है। कृषि उत्पादन में

कमी से सरकारी संपत्तियों पर अतिरिक्त दबाव पड़ सकता है। इन संपत्तियों को अन्य लाभकारी उद्देश्यों के लिए इस्तेमाल करने के लिए निहित किया जा सकता है। एक खतरनाक वायुमंडलीय विचलन के रूप में अभिव्यक्त, सूखे से दुनिया के अधिकांश शुष्क क्षेत्रों में अधिक ध्यान देने योग्य आपदाओं में बदलने की उम्मीद है। नतीजतन, सूखे और पोषण सुरक्षा पर उनके प्रभाव के बारे में और अधिक देखने के लिए परीक्षा एक आवश्यकता है। मौजूदा दृष्टिकोणों की तुलना में बेहतर दृष्टिकोण के साथ कृषि सूखे के मूल्यांकन ढांचे की आवश्यकता पर ध्यान दिया गया है।

कृषि सूखा आकलन में रिमोट सेंसिंग और जीआईएस

हाल के वर्षों में, कृषि सूखे के आकलन के लिए रिमोट सेंसिंग तकनीक और जीआईएस वातावरण अच्छी तरह से स्थापित हैं। मॉडरेट रेजोल्यूशन इमेजिंग स्पेक्ट्रोमाडोमीटर (एमओडीआईएस), उन्नत अंतरिक्ष जनित थर्मल उत्सर्जन और प्रतिबिंब (एसटीईआर), उन्नत माइक्रोवेव स्कैनिंग रेडियोमीटर – पृथ्वी अवलोकन प्रणाली (एमएसआर-ई), उन्नत वेरी हाई रेजोल्यूशन रेडियोमीटर (एवीएचआरआर), मृदा नमी और महासागर लवणता (एसएमओएस), (एडवांस वाइड फील्ड सेंसर) एडब्ल्यूआईएफएस, लिस-प्प, ईटीएम+ और इसी तरह, जो पूरे इलेक्ट्रोमैग्नेटिक स्पेक्ट्रम में विभिन्न तरीकों के लिए इनपुट के रूप में काम करते हैं, जो सक्षम हैं विभिन्न सुदूर संवेदन तकनीकों के माध्यम से कृषि सूखे की पहचान, स्थान और गंभीरता। भौगोलिक सूचना प्रणाली (जीआईएस) शक्तिशाली उपकरणों में से एक है और, सुदूर संवेदन तकनीकों के संयोजन में, अंतिम परिणाम जो इन तरीकों से प्राप्त किए जा सकते हैं, वे सूखे से संबंधित मापदंडों जैसे वर्षा, मिट्टी की नमी, फसल क्षेत्रों पर उत्पाद हैं।

सूखा और सामाजिक आर्थिक स्थितियाँ

सूखा एक जलवायु संबंधी विसंगति है, जो या तो सामान्य से कम वर्षा, अनियमित वर्षा वितरण, उच्च पानी की आवश्यकता या सभी कारकों के संयोजन के परिणामस्वरूप नमी की कमी की आपूर्ति की विशेषता है। बढ़ती आबादी की बढ़ती जरूरतों के संबंध में सूखे की भेद्यता, विशेष रूप से खाद्य मोर्चे पर, बड़ी चिंता का विषय बन गई है। बेहतर प्रबंधन प्रथाओं के बावजूद, भारत में, कृषि को एक जुआ माना जाता है क्योंकि कृषि उत्पादकता मानसून की अनियमितताओं से काफी प्रभावित होती है। लंबे समय तक बारिश की कमी के कारण सूखा पानी की भारी कमी का परिणाम है, जो विभिन्न मानवीय गतिविधियों को प्रभावित करता है और व्यापक फसल विफलता, अपर्याप्त भूजल संसाधन, झीलों/जलाशयों में कमी, पीने के पानी की कमी और जैसी समस्याओं को जन्म देता है। चारे की उपलब्धता में कमी आदि। प्रायः कोई क्षेत्र अपने द्वारा अनुभव की जाने वाली दीर्घकालिक जलवायु परिस्थितियों के आधार पर पानी की कमी के एक निश्चित स्तर को अपना लेता है। इन स्तरों से कोई भी नकारात्मक विचलन इस कमी की तीव्रता और अवधि के आधार पर सूखे की स्थिति पैदा करता है। इस प्रकार सूखे की स्थिति एक क्षेत्र से दूसरे क्षेत्र में भिन्न होती है। साथ ही किसी क्षेत्र में सूखे का प्रभाव इस बात पर निर्भर करता है कि कौन सी आर्थिक गतिविधि प्रभावित हुई है। क्योंकि सूखा कई आर्थिक और सामाजिक क्षेत्रों को प्रभावित करता है, विभिन्न विषयों द्वारा बहुत सारी परिभाषाएँ विकसित की गई हैं और इसे परिभाषित करने के लिए अपनाए गए दृष्टिकोण भी क्षेत्रीय और वैचारिक विविधताओं को दर्शाते हैं।

सूखा प्रवण क्षेत्रों की सामाजिक आर्थिक स्थितियाँ

सूखे का प्रभाव जल संतुलन की कमी है जिसमें मुख्य वर्षा ऋतु के दौरान क्षेत्र की विभिन्न फसलों और वर्षा पैटर्न की मिट्टी की संरचना वाष्पीकरण की स्थिति शामिल होती है। उगाई जाने वाली फसलों के प्रकार और उनकी किस्मों पर उचित मार्गदर्शन के लिए पर्यावरण की स्थिति के अधिक विस्तृत विश्लेषण की आवश्यकता है, चरागाह विकास, बागवानी, वृक्षारोपण और वानिकी के उपयोग में पर्यावरण की स्थिति और भूमि की गुणवत्ता का अधिकतम उपयोग करने के लिए उचित भूमि उपयोग उपलब्ध।

खेत की आबादी को नामांकित करने वाला मूल क्षेत्र सूखे और अकाल की संभावना है, जिससे यह न केवल घरेलू खपत के लिए सामान्य क्षेत्र में जितना संभव हो उतना उत्पादन करने के लिए मजबूर हो जाता है, बल्कि अगले वर्ष के लिए भी आगे बढ़ जाता है जब खाद्य फसलें विफल हो सकती हैं। यह तपस्वी परिसर खराब भूमि उपयोग की ओर जाता है और किसी भी तरह खाद्यान्न की आवश्यकताओं को पूरा नहीं करता है। यदि खेतिहर आबादी को इस डर के परिसर से बाहर लाना है, और उस भूमि पर अधिक मूल्यवान नकदी फसलों को उगाने के लिए राजी करना है, जो अब उपलब्ध तकनीक से संभव है, या चरागाह विकास और पशुपालन में परिवर्तन करना है, तो कुछ गारंटी होनी चाहिए कि उन्हें अपनी वर्ष भर की खाद्यान्न आवश्यकताएँ पास की उचित मूल्य की दुकानों से उचित मूल्य पर प्राप्त हो जाएँगी। अपने विशाल खाद्य वितरण संगठन के साथ देश अब यह गारंटी देने की स्थिति में है, बशर्ते आवश्यकताओं का अनुमान ब्लॉक स्तर पर विस्तार से लगाया गया हो, फसल में हुए परिवर्तनों के लिए आवश्यकताओं को समायोजित किया गया हो और मौसम के दौरान आवश्यक खाद्यान्न उपलब्ध कराया गया हो। आस-पास उचित मूल्य की दुकानें। फसल वृद्धि की महत्वपूर्ण अवधि के दौरान वाष्पोत्सर्जन संतुलन बनाए रखने पर फसलें अधिकतम प्रतिफल देती हैं। अन्य अवधियों में, बिना किसी गंभीर नुकसान के फसलों द्वारा मामूली तनाव का सामना किया जा सकता है। दूसरी अवधि में थोड़ा कम पानी देना कोई गंभीर बाधा नहीं है। दूसरी ओर, पानी की पर्याप्तता की मानसिकता उत्पादकता को बचाती है। यहां पानी के उचित और किफायती उपयोग के सिद्धांत का अनुवाद करने के लिए प्रयोगशाला को जमीन के करीब पहुंचने की जरूरत है।

फसलों के लिए सूखे में उपलब्ध पानी का बेहतर उपयोग करने के लिए सिंचाई में अधिकतम कवरेज देने के लिए, कम पानी की आवश्यकता वाली फसलों का चयन करके और सिंचाई प्रणालियों में पानी के उपयोग पर कठोर नियंत्रण करके, नहरों को जोड़ने जैसे नियंत्रण के लिए सभी सहायकों को लागू करके और नहर नियंत्रण यदि इस पद्धति का पालन किया जाता है, तो सकल फसली क्षेत्र के 30 प्रतिशत से अधिक पर ध्यान दिया जाएगा।

निष्कर्ष

सूखे की गंभीरता न केवल एक विशिष्ट सूखे प्रकरण की अवधि, तीव्रता और स्थानिक सीमा पर निर्भर करती है, बल्कि एक क्षेत्र की जल आपूर्ति पर मानवीय गतिविधियों और वनस्पति द्वारा की गई मांगों पर भी निर्भर करती है। सूखे की विशेषताएं, इसके दूरगामी प्रभावों के साथ, समाज, अर्थव्यवस्था और पर्यावरण पर इसके प्रभाव को पहचानना और इसकी मात्रा निर्धारित करना कठिन बना देती हैं। किसी क्षेत्र के सूखे जलवायु विज्ञान की बेहतर समझ ऐतिहासिक घटनाओं की आवृत्ति और तीव्रता पर महत्वपूर्ण जानकारी प्रदान करेगी। उन कारकों की पहचान करना जो बताते हैं कि कौन और क्या जोखिम में है और क्यों (अर्थात् भेद्यता के पीछे अंतर्निहित कारक) भविष्य में सूखे की घटनाओं से प्रभावों को कम करने के लिए विभिन्न प्रकार के शमन कार्य और कार्यक्रमों के विकास और कार्यान्वयन का नेतृत्व कर सकते हैं। वर्तमान शोध कार्य झारखंड राज्य के पलामू जिले के सूखा प्रभावित क्षेत्र से संबंधित है। पलामू पिछले चार दशकों से सूखा प्रवण जिला रहा है और जिले में अक्सर विभिन्न तीव्रता का सूखा पड़ा है। जिला सूखा प्रवण क्षेत्र विकास कार्यक्रम योजना के लिए, जिले में मौजूदा स्थितियों के विचार को आधार के रूप में आवश्यक है। इसके अलावा, क्षेत्र/जिले में उपलब्ध संसाधनों और समस्याओं को स्थानिक संदर्भ में देखा जाना चाहिए, जो किसी भी क्षेत्र के संतुलित क्षेत्रीय विकास को प्राप्त करने में मदद करता है।

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Critical Review On Supply Chain Management In Online Retail

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Abstract:

The online retail industry caters to net-savvy customers who are willing to pay for comfort and quality by offering the convenience of "anytime, anywhere" ordering. While consumers in large cities can save time and avoid issues like traffic, consumers in small cities and rural areas have a great opportunity to buy the "in" items. With regard to retailers, setting up and sustaining physical stores requires a significant investment in real estate as well as other expenses. Virtual stores are simple to set up, and features like price comparison can draw customers. In this article, critical review on supply chain management in online retail has been discussed.

Keywords: Supply, Chain, Management, Online, Retail

INTRODUCTION:

Online retail has become a major player in the retail industry as a result of brick-and-mortar organised retail's restricted reach and the difficulties customers confront owing to traffic, a lack of time, and other factors. With a 40% annual growth rate and a distribution that includes both urban and rural areas, 140 million Indians are thought to be internet users. This creates a favourable environment for the development of "e-tailing," which is short for "Electronic Retailing," in which customers visit online portals to choose and purchase goods.

REVIEW OF LITERATURE:

According to A.S. Grover and A.A. Syed (2019), effective supply chain management has a cascading effect on all aspects of retail. Everything depends on the supply chain, from sourcing raw materials based on demand forecasts to accelerating production to getting the product to stores and then consumers. Experts agree that the efficient use of labor and the use of technology, in addition to infrastructure and taxation issues, are what really help supply chain management. Whether the Indian retail industry has made active investments to ensure the efficient operation of its backend supply and logistics is still up for debate. [1]

According to M.S. Rathore et al. (2019), globalization and liberalization were responsible for the current ontology and epistemology of supply chain management. Research methodologies for the subject matter covered by supply chain management have changed. This study examines the effectiveness and efficiency of H&M's supply chain management by analyzing its global operations, supply chain practises, and performance. The recent technical integrations of Big Data, Artificial Intelligence, Data Matrix, Block Chain, Coded Couture App, and Monki X HoloMe to H&M's Supply Chain Operations are also evaluated and analyzed in this research. This essay makes an attempt to understand the transformation by contrasting and comparing the top two clothing retailers, H&M and Zara. Any supply chain debate including these is centered on their distinctive methodologies. The study's goal is to identify the supply chain management flaws and strengths of H&M as well as potential areas for improvement. [2]

According to S.S. Kamble et al. (2019), the Internet of Things (IoT) is anticipated to play a big role in providing supply chains with real, practical, and lucrative benefits, improving the effectiveness and productivity of operational processes. IoT systems give decision-makers fresh perspectives on value creation and the value proposition, assisting them in fortifying their relationship with customers and implementing more efficient practises and policies. Retailing companies are under pressure to redesign their marketing tactics so that they take into account shifting consumer behavior as the food retailing environment becomes more complicated and adaptable. The Internet of Things (IoT) is anticipated to assist merchants in regulating the quality of food products, planning waste management of goods that have passed their expiration dates, managing store temperatures, freezers, and other equipment that lowers energy use. IoT adoption is still in its infancy despite the immense promise it holds for food retail supply chains. Therefore, using a two-stage integrated ISM and DEMATEL methodology, this study tries to identify the many obstacles that the use of IoT in the retail supply chain in the Indian context faces. It also looks at the interdependencies between the components. The main forces behind the adoption of the Internet of Things were found to be a lack of government rules and a poor internet infrastructure. [3]

According to Vishal Srivastava et al. (2019), this paper is an effort to pinpoint the challenges facing the rapid expansion of the Indian retail business. This essay synthesizes numerous concurrent studies and examines various business facets of the nation from 2000 to 2010. It recognized the significant operational & infrastructural difficulties organized retails in the Indian market face in order to grow sustainably. The study is only focused on the main issues that significantly affect the organized Indian retail business as a whole. Additional research on the market's numerous sub segments may reveal a few additional pertinent difficulties. The retail business has tremendous employment and economic growth potential. India would undoubtedly benefit from the favorable retail environment in return. Accordingly, carefully thought-out tactics that take the aforementioned difficulties into account will increase the segment's profitability. [4]

According to P. Divakaran and M. Muthukumar (2018), globalization has increased competitiveness in Indian industries. As a result, every sector is working to enhance its processes in an effort to safeguard its commercial interests and produce products that are both more affordable and of higher quality. Industries are attempting to rethink, reorganize, and reengineer their conventional processes in order to achieve this goal. The effectiveness of the supply chain as a whole is prioritized over the effectiveness of individual supply chain functions. Supply chain management is a multifaceted process that encompasses numerous difficulties on numerous levels. To decrease cost, defect, and cycle time as well as to improve customer relationship management, market growth share, productivity, and product and service management, many organized retail outlets implemented six sigma concepts. The goal of the current research is to determine the value of supply chain management in organized retail markets and its effects on these markets. And to identify the weak points in organized retail shop supply chain management (Critical to customer, critical quality and voice of the customer and even in terms of mediators). The supply chain plays a crucial role in the organized retail market in India because the Indian consumer demands a variety of product mixes at reasonable prices. This is true for all the

different offerings that a company chooses for its customers, whether it be in terms of price, service, or the speed with which it can adapt to the consumer's constantly changing preferences. Customers today exhibit good product knowledge and awareness. They are also aware of the identity of the manufacturer and the fundamental goals of the manufacturer with regard to the consumer. The clients of today are extremely intelligent, clever, talented, and busy, and they expect everything to be at their fingertips in a comfortable and convenient manner. By giving customers the convenience of time, place, and possession, the retail sector consistently conveys to customers that all goods will be available under one roof and in their hands. Therefore, supply chain management has the full obligation to ensure its success in this regard. No one can predict the success or even expansion of the retail industry in its absence. [5]

According to S. Bhagat et al. (2018), supply chain management has transformed how business is conducted. With more people choosing to make purchases online, the industry for e-retailing has exploded in India. The fundamental component of supply chain management is enabling collaboration between trading partners and providing real-time information on e-commerce platforms. This essay discusses supply chain management's role in online e-commerce and how it has grown to be the backbone of the sector. Consideration is given to the supply chain management for the Indian e-commerce behemoth Flipkart, as well as the chances and problems they will encounter in the near future. [6]

According to A. Kumar and G.S. Kushwaha (2018), competition in the modern business environment is now between the firms' supply chains rather than between them. One of the largest systems for food supply and distribution carried out through fair price shops is India's public distribution system (FPS). The study's justification is that there is a sizable vacuum in the empirical research on fair price shops (FPS). The purpose of the paper is to ascertain the connection between various supply chain management techniques and the operational effectiveness of the fair price shops in India. The theoretical framework is put out by the authors, who also empirically test the model. The goal of the study is to increase the body of knowledge in the field of supply chain management. The paper chose an exploratory combined descriptive design. From a list of 200 Fair Price stores that was available on the government website, the authors chose 200 at random and designated the important individuals from each store as the respondents to fill out our questionnaire. With the aid of a standardized questionnaire, the results were gathered. In the months of March and April 2017, MBA students sent 200 questionnaires to fair price stores dealers in Bhopal, Madhya Pradesh (India), who met the criteria for the screening questions. A total of 87 usable questionnaires were collected, with a response rate of 43.5%. To evaluate the theoretical model and hypothesis, the authors used PLS-structural equation modelling (SEM). According to the study, three aspects of SCM practices are significantly and favorably related to operational success. The study offers empirical insights into the operational success of the fair price stores and how change is brought about. It implies that the effectiveness of fair price shops is positively & significantly correlated with supply chain management strategies. This essay focuses on the significance of supply chain management methods for fair price shops' daily operations and offers the insight that, when used correctly, these strategies will provide an advantage. The study directly assesses the impact of supply chain

management techniques on the operational performance of the fair pricing shops in India. It satisfies a requirement to investigate how supply chain management methods can affect the performance of fair price shops. The size of the sample is this study's main drawback. The findings of the study might not be applicable to everyone. Therefore, it is recommended that researchers test the suggested framework on a larger scale. [7]

According to Nimna V.P. (2017), the way that consumer wants are met is changing as global marketplaces grow more linked. As both large and small firms search for the best deal, a variety of sources can be used to purchase raw materials, labour, and output. Because of this, supply chain management is crucial to the development of the e-commerce industry. Coordination and management of the flow of a company's goods become increasingly crucial to guaranteeing efficient and effective operations as production moves toward a more global scale. In this essay, the importance of SCM in e-commerce activities is explained. [8]

According to Giada Martino et al. (2017), a single company lacks the ability to be competitive in today's global markets if it is not a part of a network that, operating as a single entity, is able to respond to demand dynamism and volatility. These markets are characterized by extremely fast changes in technology and customer demand, as well as by product life cycles getting shorter and shorter. As a result of their heavy reliance on other network participants, such suppliers or logistics providers, traditional supply chains that are designed from the perspective of global sourcing are extremely susceptible to disruptions. The ability to appropriately identify and manage risks related to the various phases of the value chain as well as external and indirectly uncontrollable issues is essential in this challenging and competitive environment if supply continuity is to be guaranteed. Since the fashion retail industry is so specialized in this area and has such a short life cycle and very unpredictable demand, it is crucial to examine supply chain risk factors. The focus of the work presented here is to prioritize the list of identified risk factors by using the Analytic Network Process approach. The specific case we are referring to is represented by a fashion company that manages an extensive network of wholesalers, directly operated stores, franchising mono-brand stores, and factory outlet stores. This approach is much better appropriate for actual complicated problems that cannot be fully modelled by a straightforward hierarchical structure. The results demonstrate that supply chain efficiency—defined as the proper management of both material and information flows—is regarded as the most important component, even for a demand-driven supply chain like the one in the fashion industry, which is additionally constantly seeking out customer preferences and keeping up with changing fashion trends. [9]

According to Ying Yu et al. (2016), the creation of new business models has fueled the growth of e-commerce and will continue to do so for decades to come. A great number of businesses now engage in e-commerce, which has had a significant impact on logistics. The most recent developments in supply chain management's e-commerce logistics are presented in this article from a practical standpoint. This study reviews international implementations, associated models, and supporting methodologies. In order to learn from these approaches, typical e-commerce logistics organizations from North America, Europe, and Asia Pacific are thoroughly examined.

Opportunities and future perspectives are distilled from the real-world applications so that interested businesses, such as e-commerce and logistics firms, can gain some direction when thinking about going into business. [10]

According to R. Beiter et al. (2015), the Franciscan University Counseling Center reported a 231% rise in yearly visits and a 173% increase in total yearly customers during the previous four years. Numerous colleges have seen this pattern as a result of the serious concerns that mental health issues bring for many college students. This study's goal was to look at the causes of stress, anxiety, and depression in a sample of college students. 374 undergraduate students at Franciscan University in Steubenville, Ohio, who were between the ages of 18 and 24, made up the final sample under analysis. The subjects responded to a survey that asked them about their demographics, the level of concern they had about issues affecting their everyday lives (such as schoolwork, family responsibilities, and sleep), and the Depression Anxiety Stress Scale, a 21-question version (DASS21). Academic achievement, peer pressure, and post-graduation plans were shown to be the top three concerns. Transfers, upperclassmen, and students who live away from campus were the groups of students who reported feeling the most pressured, nervous, and depressed. Colleges must regularly assess their students' mental health and develop treatment plans that are tailored to meet their unique requirements because mental health problems often make it difficult for college students to succeed. [11]

In order to determine the significance given to the application of business intelligence (BI) in their operations, M. Banerjee et al. (2015) reported that the study surveyed executives of a major food retailer in India and explored their perspectives on supply chain management practises, competitive advantage, and firm performance. There are four dimensions for competitive advantage and nine dimensions for SCM practises, all of which are proven to be significantly related to one another. The components of SCM have a significant impact on business performance. Although suppliers' information sharing and participation in strategic decision-making are emerging as critical SCM features, retailers believe that these aspects have little impact on their ability to gain a competitive edge. [12]

According to B. Chitra (2015), supply chain management is one of the most effective engines of company transformation because it gets the right product to the right place at the right time and at the right price. It is one of the most effective cost-cutting and revenue-boosting techniques now in use. SCM is a trend that emerged in response to business process reengineering, total quality management, and enterprise resource planning (ERP), all of which focused solely on an organization's internal operations. SCM aims to connect the internal systems of the company with those of its partners, suppliers, and clients. Electronic commerce, also referred to as e-commerce, e-business, or simply "e-commerce," refers to the purchasing and selling of goods and services using electronic channels like the Internet and other computer networks. E-commerce encompasses more than just online buying and selling. It refers to operational effectiveness at all levels of business. Executives are aware of how important it is to impact business operations, but up until recently, quantitative performance metrics were as rare as corporate executives who had even heard of the term "supply chain management" (SCM). [13]

According to A. Sharma et al. (2015), the term "e-commerce" refers to dealing in goods and services over an electronic medium. The use of e-commerce has been expanding, giving business tycoons new chances to enhance traditional commercial practises and having an impact on the creation of aggressive marketing strategies. This essay emphasizes how the e-commerce concept is only used in a limited way since its key advantages are not fully appreciated. Companies that are prepared to adapt their organisational structures and operational procedures in order to take full advantage of the opportunities presented by e-commerce will reap these rewards. Electronic commerce, on the other hand, refers to the buying and selling of goods, services, and information over computer networks, i.e., the internet. The term "e-commerce" refers to a wide range of commercial activities, from the straightforward internet distribution of information or advertising to the ordering, delivery, and payment of actual goods and services. This essay seeks to describe the function of supply chain management as a backend tool in the success of e-commerce. In essence, this paper's major goal is to investigate the idea of using the marketing mix variables—i.e., items, place, pricing, and promotion—to solve e-commerce-related issues. [14]

According to A. Harsono (2014), as e-commerce and supply chain management (SCM) are essential success elements, researchers and academics have been increasingly interested in the impact of e-commerce on SCM. Dell Inc. was chosen as the subject of a case study since it has endured the current economic downturn since March 2000. This tendency emerged as a result of Dell's success story, which served as an example of how SCM and e-commerce can be integrated and used effectively. Data was gathered by emailing and browsing the Web. This essay first explored the many steps in the supply chain management process, including the transfer of information, goods, and money. The integration of e-commerce into supply chain management was then demonstrated in order to achieve a competitive edge in a fast-paced business environment. Results indicated that supply chains' physical, informational, and financial flows can be impacted by e-commerce. This study, which is both original and empirical, will benefit both academics and business professionals. [15]

According to A. Gurumurthy et al. (2013), the opening up of the domestic economy as a result of globalisation has resulted in a considerable increase in the relevance of supply chain management (SCM) in India. A review of the literature, however, showed that there aren't many studies that make an effort to describe and comprehend the significance of SCM in the Indian business setting. In order to close this research gap, the current study examines the contributions made by academics and industry professionals who addressed a variety of supply chain concerns, particularly from an Indian viewpoint. In accordance with the standard procedures recommended in the literature for conducting such studies, papers concentrating on the SCM situation in India were gathered from a variety of sources. On the basis of the research technique and content, a new taxonomy was also suggested. In addition to determining the routes for future research, this taxonomy allowed for the observation of noteworthy trends and the drawing of some unusual conclusions. There is currently no article in the literature that attempts to summarize the works from India connected to SCM; hence, it is believed that this work would add value by providing a unique contribution to the body of knowledge on SCM. [16]

Electronic commerce, according to R. Monga (2012), is the exchange of goods and services using electronic networks like the Internet and other computer networks. As a result, advances in electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems have been sparked by and benefited from this method of conducting business. The World Wide Web is often used in modern electronic commerce at least once over the course of a transaction, although it may also include other technologies like e-mail, mobile devices, and telephones. With the recent development in e-commerce, particular purchasing habits and preferences have evolved for various groups and ethnicities. Numerous independent marketing, corporate, and even academic studies have tracked and gathered these trends in order to understand how consumers interact with new technologies. This essay lays the foundation by briefly introducing the effects of recent e-commerce trends on consumers. The overall impressions and preferences they have about online shopping, including the choice of products and websites, are then discussed. These generalizations about e-commerce will all be compared to data gathered through survey questions and open-ended dialogues. The best and most practical e-commerce solutions are provided by Indian e-commerce businesses, which also give the utmost consideration to the privacy and security of the e-commerce website. [17]

According to L. Sparks (2010), retailers have taken the lead in the majority of supply chains and have redesigned their relationships with suppliers and other logistic service providers. Nowadays, merchants are active channel controllers who plan supply in response to and anticipation of consumer demand rather than being the passive beneficiaries of manufacturer allocations. This essay examines how retail supply chains and logistics are evolving right now. It examines the supply chains for fashion, groceries, and a few other types of retail industries while using real-world examples to highlight this transition. Then, challenges both present and future are explored [18].

Using information system support and business process orientation as moderators, the article, according to P. Trkman et al. (2010), examines the relationship between analytical skills in the plan, source, make, and deliver region of the supply chain and its performance. A sample of 310 businesses from various industries in the USA, Europe, Canada, Brazil, and China are used in structural equation modeling. The results imply that analytical skills and performance have a statistically significant link. Support for information systems has a much greater moderating impact than does business process orientation. The findings help us better understand the areas where business analytics may have the most influence. [19].

CONCLUSION:

Online shopping is no longer just a passing trend; it has taken on significant importance in today's retail landscape. According to estimates, more than 10% of global consumers have made online purchases of goods and services. To keep customers' trust, it is necessary to adequately address payment methods and delivery concerns. Of course, it should be understood that organised retailing in general and online retail in particular must deal with a number of problems related to things like customer expectations, supply chain infrastructure and management, interactions with suppliers and other service providers, and governmental regulations.

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Analysis of Participation of Women in Agriculture According to Socio-religious Groups in the Context of Hooghly District of West Bengal

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Abstract

Sustainable social progress is not possible without the active participation of Women in every sphere of society. In agriculture and rural economy, Women play a big role through their engagement as independent farmers, labourers, and entrepreneurs. The state of West Bengal has an agricultural-based economy and agriculture is maintained by tiny and family-run farmers. In this agricultural setup, there is an active correlation between farmer's cultural norms and women's participation in the primary field. For analytical simplicity, the Hooghly district of West Bengal has been selected. For focus group discussion, the necessary data have been collected by the field survey through a stratified random sampling procedure. For analytical simplicity, each focus group consisted of ten members and five important aspects such as food security, perception of men's and women's work, and decision-making for agriculture and livestock rearing were held in the survey field. For the analysis, it is noticed that gender division of tasks exists in agriculture. The roles performed by men and women in agriculture comply with the social and cultural norms of the villages. The women play an innovative role in forming Self Help Groups, and generating income-giving plans and executing them in a very enthusiastic manner in villages. These groups also help the members avail of the poultry rearing schemes of the government. However, the groups were not very strong and internal tensions prevented the robust growth of the Self Help Groups in a few villages. Share rearing of small ruminants and poultry forms a viable means of food security and livelihood in villages. This share-rearing does not involve any monetary transaction and builds on the trust and network of the women.

Keywords:

Sustainable, social progress, livestock, Self-help group, care work, total work, crop

1. Introduction

Women have played a crucial role in human progress alongside males. The social, economic, and political development of a nation cannot advance without the active participation of its women. Although the myth suggests otherwise, the hands that rock the cradle may not yet have dominated the earth. Most women, in addition to their traditional home duties, also engage in economic activities, making use of their ability and labour to generate the supplementary money that often determines the difference between a respectable standard of living and abject destitution for their families. Women account for half of the world's population and log two-thirds of all working hours. Only a third of the global revenue goes to her, yet she controls less than 10 percent of the world's resources. This demonstrates that women's economic standing is pitiful, especially in a

country like India.

There can be no long-term, sustainable social progress in today's interconnected society without achieving parity between the sexes and empowering women. It is important to provide women more agency in the public, political, and economic realms. This would make them not just equal partners in the realm of life, but also in the sociopolitical realm.

In East Asia, South Asia, Sub-Saharan Africa, and the Middle East and North Africa, women make up a larger percentage of the agricultural workforce than males do. Eventually, this percentage is substantially greater in a developing nation. In countries where farming is the principal source of income for the poor, the international development community has acknowledged agriculture as a key driver of economic growth and poverty alleviation. Women represent a crucial resource in agriculture and the rural economy through their roles as farmers, labourers, and entrepreneurs; however, almost everywhere women face more severe constraints than men in access to productive resources, which contributes to the underperformance of the agricultural sector in many developing countries. Building on women's contributions and removing these barriers will boost and speed up national governments' and the international community's efforts to accomplish their goals of agricultural development, economic growth, and food security.

More than a quarter of the world's population lives in rural areas, and these women are an essential part of the development processes that are the driving forces behind the world's socioeconomic advancement. In developed nations, women are responsible for 30 percent of the agricultural workforce. The agricultural sector in India employs 8 out of 10 working women, compared to only 63 out of 100 working males. Several reports have highlighted the fact that women's labour force participation is underrepresented in Census and NSS statistics. Scholars believe that women's contributions to agriculture, adjacent industries, and domestic life are often overlooked and underappreciated. Undercounting women as employees and as those available for work is a major source of error in national level statistics, which are typically used as the primary data input in the drafting of development programmes (Bina Agarwal 1985). As a result, women's substantial contributions to the national economy are either ignored or underappreciated.

2. West Bengal's Agriculture Sector

West Bengal is a significant rice-growing state and West Bengali agriculture has been characterized by smallholding peasant agriculture. After the land reforms in the 1980s, the average size of holdings shrank. West Bengali agriculture is dominated by tiny, family-run farms, the upkeep of which is mostly handled by women. There is an interesting correlation between farmers' cultural norms and women's participation in agriculture in West Bengal. Most of the people in this state make their living in agriculture, which puts a strain on the state's limited resources. Since this is the case, size categories are practically limitless. The majority of the population consists of tenant farmers and other landless agricultural workers. In this context, technological applications show a wide range of variations. Irrigation, high-yielding crop varieties, fertilisers, etc. are all examples of agricultural technologies, and it's interesting to note that regions with more advanced agriculture also show signs of progress in education, mass-media contact, and in urban influences, all of which make farmers more open to the new ideas.

It's no secret that agriculture is the backbone of West Bengal's economy. Just 2.7% of India's land area, yet home to 8% of the country's people. Almost majority of the 71.23 million farming households are very poor. Only 0.77 hectares (ha) of land is owned on average. But the State is endowed with a vast variety of natural resources, and its agro-climatic conditions allow for the growth of many different types of crops.

Objective of the Study

Having gender equality in a society means that women and men have the same access to resources and opportunities, as well as the same rights and responsibilities. Women are still statistically more likely to be impoverished and uneducated than males, despite significant progress in both areas. They are often denied less opportunities in healthcare, home ownership, credit, education, and work. With the economy moving away from agriculture and a substantial process of structural change underway, concerns about the future of people's means of support have arisen. In the rural areas of the district, agriculture remains the primary economic activity and primary means of subsistence. Discrimination based on gender makes people susceptible in many areas of their health and well-being. Women, in particular, are said to be behind males in a variety of ways.

The study's overarching goal is to learn more about how numerous influences have affected the fundamental socio-cultural traits of the farmers in the designated district, Hooghly district of West Bengal. The study is motivated by the belief that, in addition to material and monetary considerations, there are also social and cultural elements that have influenced the proportion of women in farming. With the foregoing in mind, the goals of this study are as follows:

- ❖ To examine how women's responsibilities change depending on whether or not they have access to or ownership of agricultural property in the study area.
- ❖ To study how factors such as education, caste, and economic status influence the involvement of women in agricultural activities.
- ❖ To analyze the gender-based wage gaps that exist in the agricultural sector, with a particular focus on the work that are traditionally reserved for women and men.

3. Review of Literature

Gender is a social construction, and feminist geographers have distinct research approaches that demonstrate how gender intersects with other artificial categories (Moss 2002). Different from mainstream social science, feminism offers a new perspective on the world (Lahiri-Dutt, 2011). The development of epistemology has been facilitated by debates over positionality and reflexivity. Conventional quantitative research methods have been challenged by feminists (McLafferty 1995) because they purport to be impartial but in reality have issues with measurement and definition and disconnect researchers from their subjects. However, quantitative approaches are suitable for examining gender gaps in a variety of social and physical settings. Quantitative approaches can be used to evaluate factors such as monetary value and duration (McLafferty, 1995).

Feminist methods have enriched geographical research in recent times. Social processes shape research. These processes influence the decision to select a subject of study. Relations between the researcher and the researched are not exploitative. Intensive research methods, archival

research and extensive surveys may supplement each other.

4. Overview of the Study Area

In view of the major objectives of this study, District Hooghly of West Bengal was selected for analysis, it being the most agriculturally productive district in the State. The CD Blocks of Khanakul I and Khanakul II were selected for their specific characteristics of having unique socio-demographic and occupational profiles.

5. Collecting Data

A mixed methods approach was adopted to address the research question. In this case, we have followed a stratified random sampling procedure (without replacement). The problem was approached through qualitative research methodology. Sampling decisions were taken during data collection. The sample pattern can be easily understood with the help of Table-1

Table-1: The Samples and Focus Group Discussions

Villages	Households Surveyed	Focus Group Discussions	In depth interviews (No.of households)	SC/ST Population
Khanakul Block I				
Arunda	42	5	5	49.2
Ganesh Bazar	88	5	5	54.4
Khamargor	57	5	5	57.2
Khanakul Block II				
Dhanyaghari	85	5	5	11.1
Natibpur	13	5	5	8.72
Ranjitbati	39	5	5	5.09
Total	232	30	30	

(a) Sampling for the Focus Group Discussions and Intensive Interviews

For the focus group discussions, intensive case studies and in-depth interviews purposive sampling was done.

- The variants of purposive sampling that were chosen for the study were:
- Extreme cases, like female-only households.
- Typical cases which were typical for the average or majority of potential cases. The FGDS were done in selective 'paras' containing specific socio-religious groups.
- Critical cases which were very relevant for the study, such as Irrigation-water users, poultry entrepreneurs, 'Paikars' or middlemen.
- Convenience sampling or choosing the most accessible cases under given circumstances.

Thus there was enough diversity of phenomena in the sample. The scope of the study included cases, groups, and events in sufficient diversity. Interview about everyday life in a farming household and time use studies were executed to yield variety of data. Narrative interviews were taken to present the story of agriculture in the chosen village. The first question was generative in nature.

(b) Narrative Interviews

Narrative interviews were administered for one male aged respondent and one female aged respondent in the villages.

Interview Guide:

- What does the green revolution mean to you?
- How did the choice of crops change?
- How has irrigation helped in the change in choice of crops?
- Did women participate in agriculture when you were a child?
- What were the tasks of women in those days of your childhood?
- Do you find any change in the roles women play in agriculture today?
- Do women of all socio religious groups perform the same tasks in agriculture?

© Focus Group Discussions

Each focus group consisted of 10 members. Five such discussions were held in each of the villages. Focus Group Discussions were held on five major aspects:

- Food security, Agriculture and Gathering
- Perception of women's work
- Perception of men's work
- Decision-making for agriculture
- Livestock rearing

(d) Analysis of Data and Information

Secondary data has been analyzed through quantitative as well as qualitative methods.

- The proportions have been calculated to justify the demographic and land- labour relation-based categorization.
- Analysis of primary data from the questionnaire survey has been made by using descriptive statistics. Microsoft Excel software has been run for part of the analysis.
- Systems diagrams and qualitative matrices have been used for the analysis of qualitative data.
- All other information emerging from observations, focus group discussions, intensive case studies and interactive interviews, are based on narrative transcriptions and qualitative analysis.
- Analysis has largely drawn upon the grounded theory framework.

6. Result and Discussion

7.1. The Analytical Approach

The monolithic view of differentiation is rejected here and the multidimensional approach is adopted to view roles, which seemed more realistic in the study area. To explain the relationship between gender and work with an inter-sectionality approach, the analysis has been based on two different sets of criteria:

- a) Socio-religious affiliation:* this involves three groups, namely, Scheduled Caste, Scheduled Tribe, and General Caste (Sub-Groups among Hindus).
- b) Holding of land:* holding has been considered with respect to ownership of landholdings as

well as leasing and sharecropping of land.

The two groups of landowners and tenants sharecroppers have a status distinctly different from landless agricultural labourers. Hence the clubbing of the two land-possessing groups was done. To enable a clear understanding of the gendered dimensions of work, work done by village folk (by number of hours devoted to each category of work) has been categorized into three important types:

- + *Work for crops*: which implies all activities related to sowing, nurturing and harvesting, and post-harvesting work.
- + *Work for Livestock*: implying all activities related to livestock rearing and care.
- + *Care Work*: implying all activities related to the care of the household and its family members, especially the children and the elderly.
- + Total Work (excluding MGNREGA) has also been included in the analysis to assess the total burden upon them.

To find out women's participation in different productive and reproductive activities, a time-use survey has been done. This had been done on a macro scale by the Central Statistical Organization, Govt. of India, though using different units for identifying tasks. It indicated multi-tasking by women in both rural and urban areas. Task Segregation has been assessed across sample households, and shown here by summing up the information in tables, each devoted to a crop, and having information on task-wise remuneration.

7.2. Analysis of Gender Roles across Socio-Religious Groups

The understanding of differences across socio-religious groups is an extremely important dimension of the analysis of social behaviour. Task segregations are made at different levels in the rural scenario – within the household, between males, females, adults, children etc. and within communities, segregation by caste or religion may be visible in some places and absent in others. The emerging patterns speak volumes about how roles are played out.

7.2.1. By the Scheduled Caste Households

i.) Work for Crop

Apart from Jayrampur, women work for less time than men in Scheduled Caste households. In Jayrampur, few men were devoting time to agriculture. Women were participating in work at home and in fields. Men were harvesting paddy for part of the period taken for study in Khamargor and Banhijli. Men were working for two-time slots as agricultural labourers. In the Scheduled Caste households of Palashpai, work for crops was shared almost equally by men and women. In Ganesh Bazar and Arunda, little difference existed between men and women at work for crops.

ii.) Work for Livestock

Scheduled Caste women spend more than one hour per day towards the upkeep of livestock. For men, it is less than an hour. In Jayrampur and Arunda women devote nearly three hours per day to the rearing of the livestock. Livestock keeping is a woman's exclusive activity in Banhijli and Jayrampur for the Scheduled Caste households.

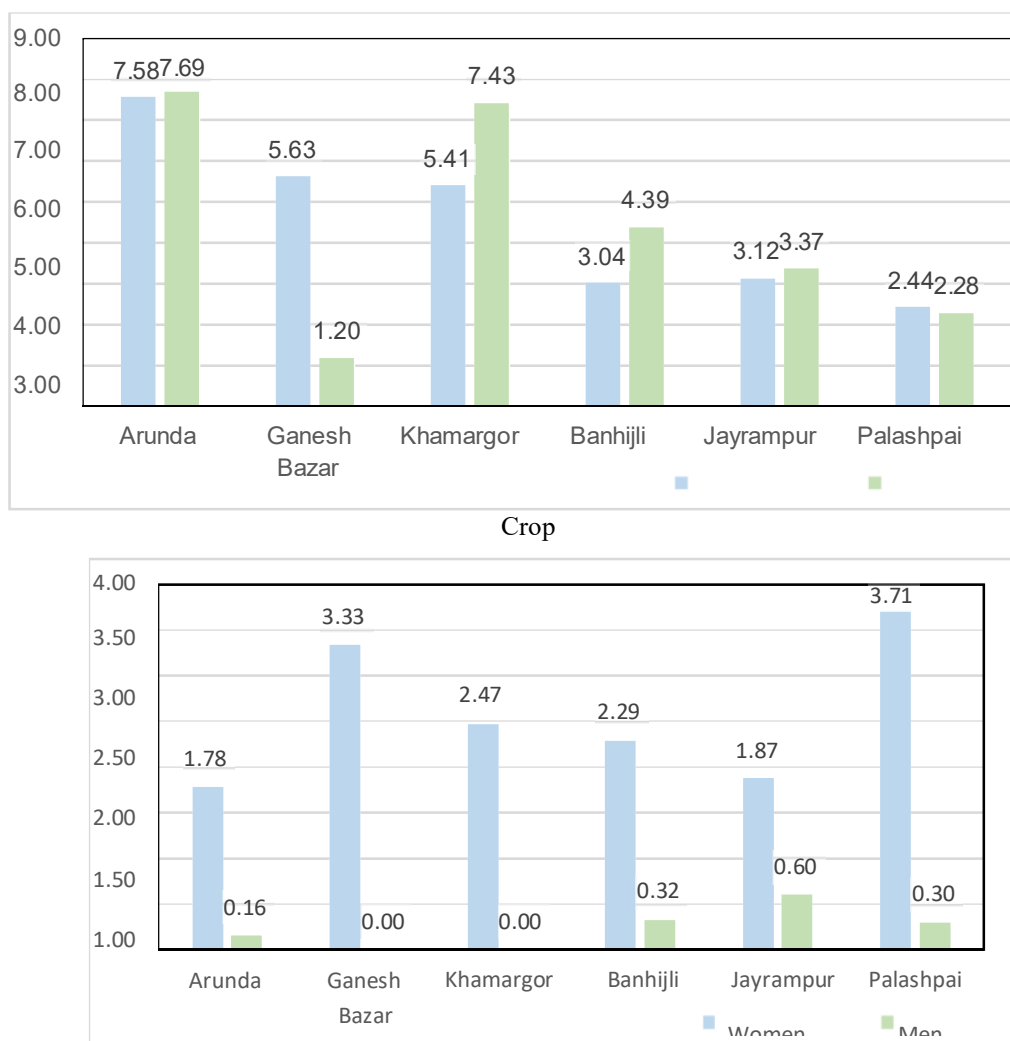
iii.) Care Work

Women of Scheduled caste households contribute substantially towards care work in all the villages. The men contribute less than an hour towards this work. In Ganesh Bazar the hours contributed by women towards care work is less compared to the other villages.

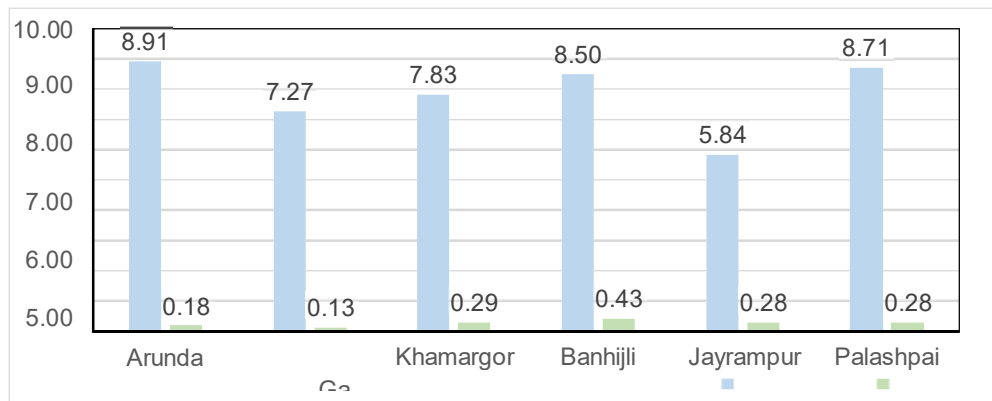
iv.) Total Work (excluding MGNREGA)

Of all the villages the male female difference in work hours for this caste group is the most in Jayrampur. The men work for less than 3 hours in Arunda, where women put in more than 11 hours of work. Men at Palashpai put in largest share of work. For MGNREGA, men and women work for the same work hours.

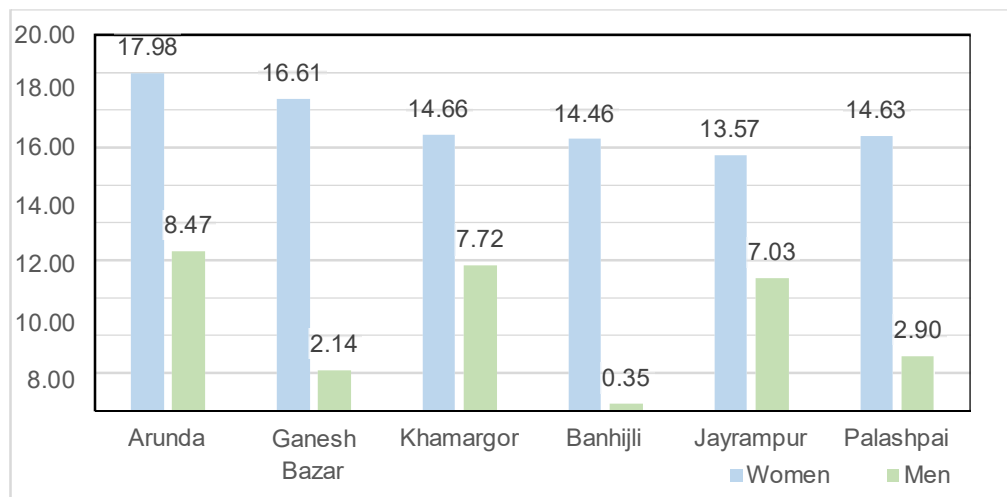
Figure 7.1: Division of Work for Schedule Caste Population in hours per day



Livestock



Care Work



Total work (excluding MNREGA)

7.2.2. By the Scheduled Tribe Households

i.) Work for Crops

Women work more than men for crops in Khamargor. In Ganesh Bazar village, the work done by men and women in terms of hours of work is more or less the same. In Banhijli, men are engaged in tying and transporting paddy for a section of the period.

ii.) Work for Livestock

Scheduled Tribe women devote much more time than their spouses and sons for their livestock keeping. In Banhijli it is a solely women's activity. Men devote less than an hour to livestock keeping in villages Ganesh Bazar, Khamargor and Palashpai.

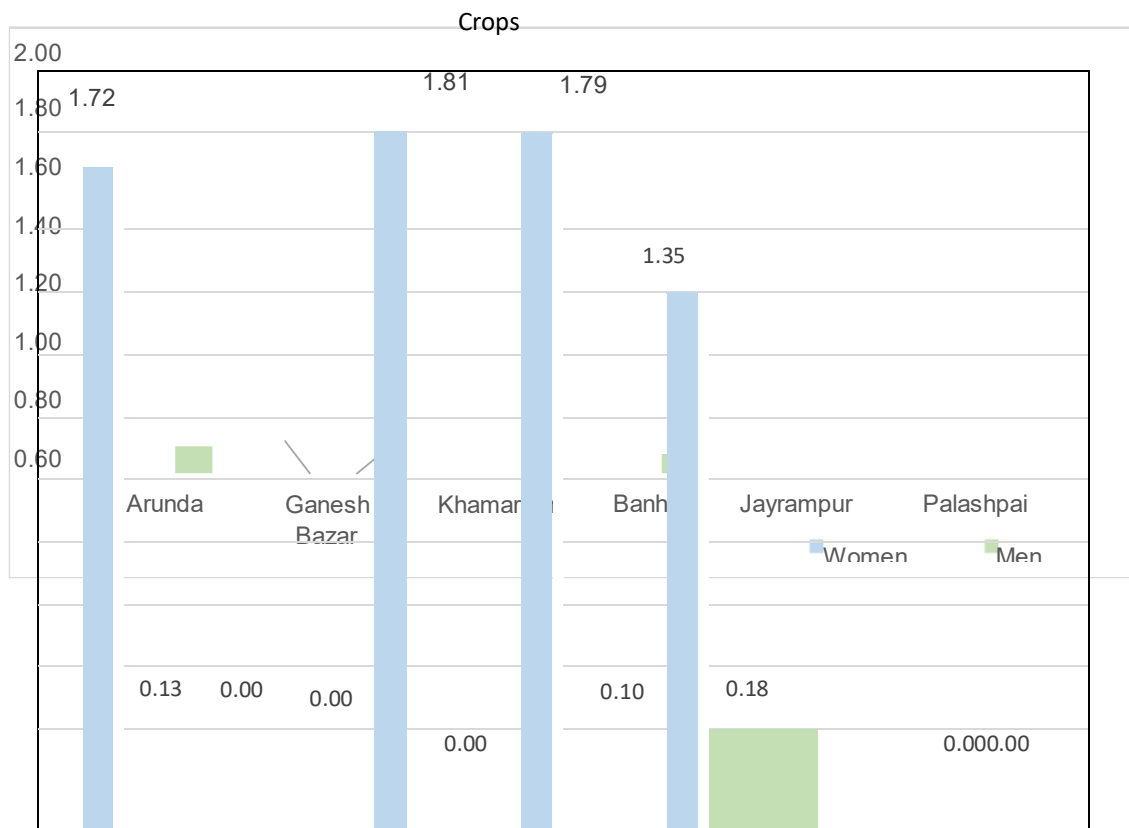
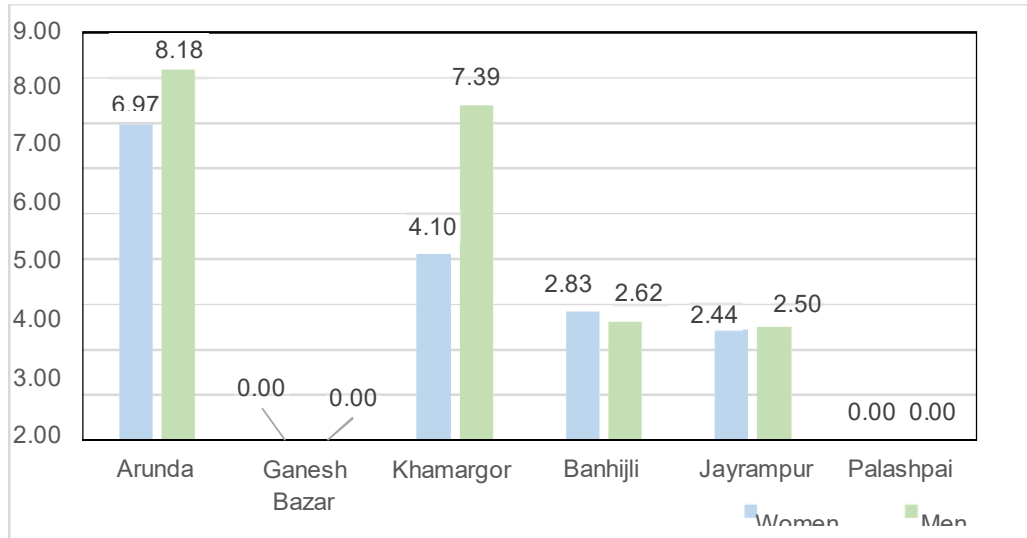
iii.) Care Work

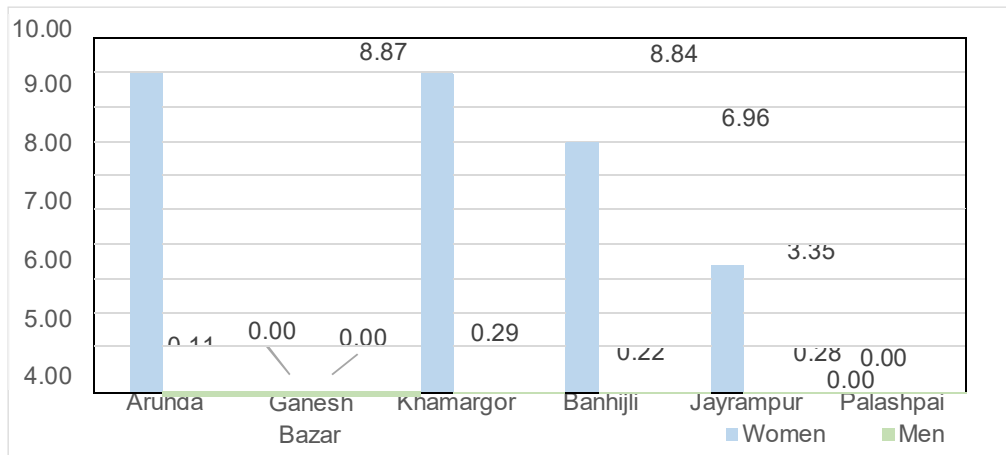
The difference between women and men's share in care work is least in the village of Ganesh Bazar. The difference is most marked in Banhijli village. Women devote more than five hours in work for care in villages Khamargor, Banhijli and Palashpai. Women work for more than 12 hours in villages Khamargor, Banhijli and Palashpai.

iv.) Total Work (excluding MGNREGA)

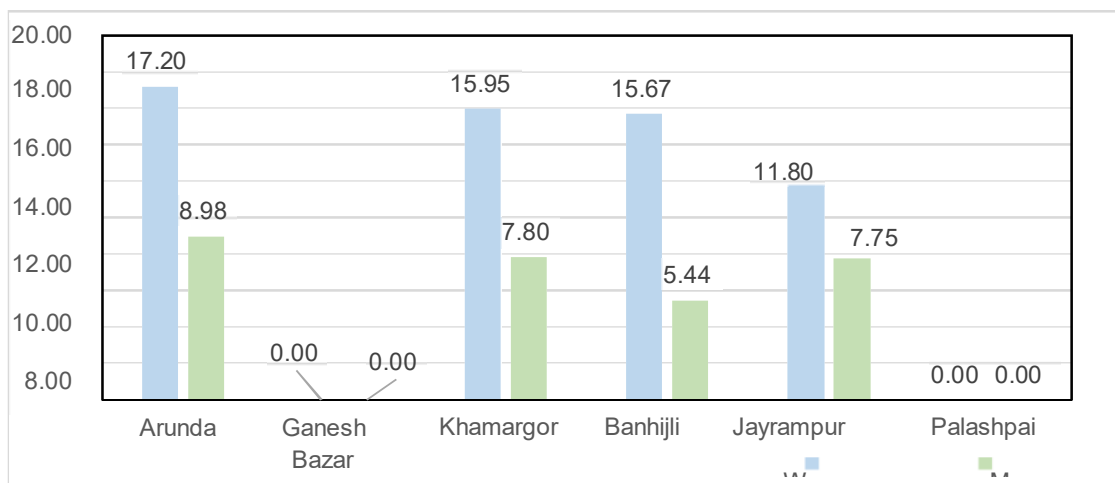
At Ganesh Bazar women work for about 9 hours per day (on an average). Men work longest in Palashpai village followed by Banhijli, Ganesh Bazar and Khamargor. The male-female difference in terms of total Work excluding MGNREGA is most in Khamargor for the Tribal households.

Figure 7.2: Division of Work for Schedule Tribe Population in hours per day (Crops, Live Stock, Care Work and Total Work)





Care Work



Total work (excluding MNREGA)

7.2.3. By the General Caste Households

i.) Work for Crops

The men and women of General Caste households in Arunda spend less than an hour for crops in village Arunda. The difference is most marked between men and women's share of work in Jayrampur where general caste men are mostly occasional farmers. The women there work for more than five hours towards crops. General caste men at Palashpai contribute towards crops for the longest time slot.

ii.) Work for Livestock

The difference between men and women in work for livestock is most marked in Arunda. General caste women in villages Khamargor, Jayrampur devote nearly two hours for livestock keeping. In Jayrampur and Banhijli livestock keeping is an exclusively women's activity in General caste households.

iii.) Care Work:

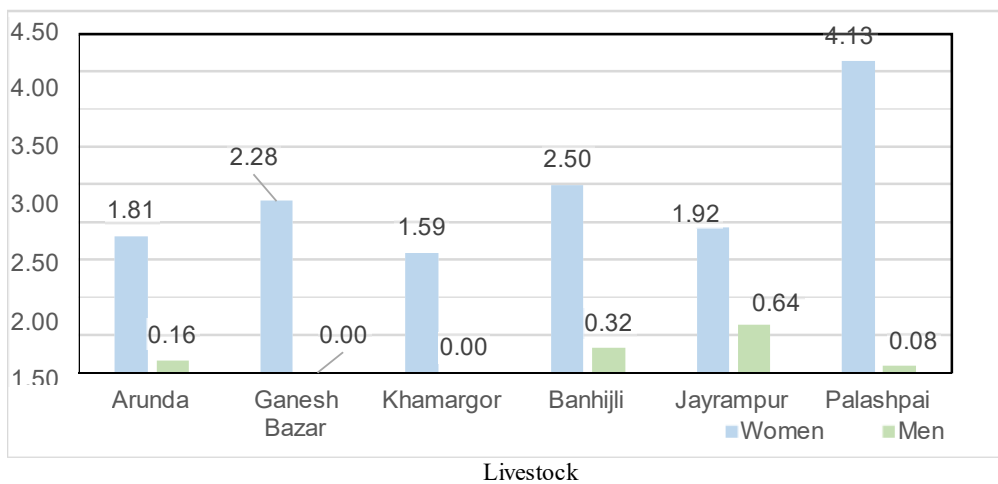
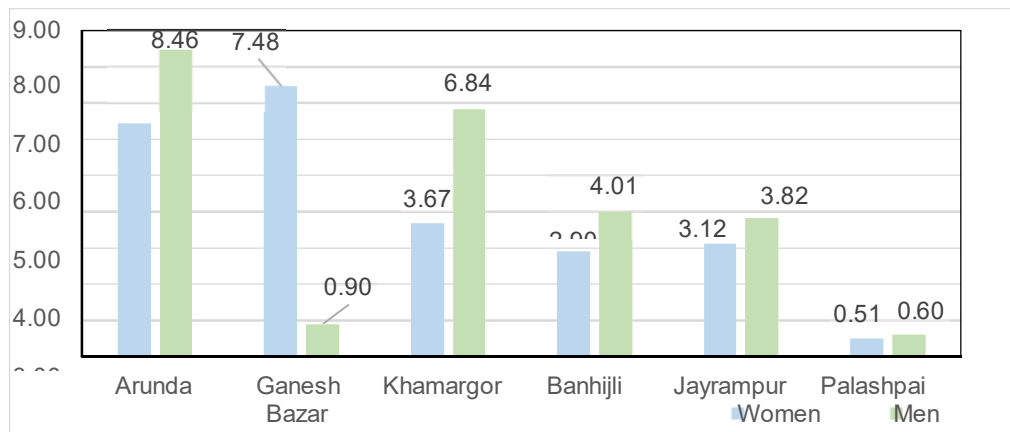
In all the villages studied care work is mostly done by women. Women work for more than six hours towards care in villages Arunda, Khamargor, Banhijli, Jayrampur and Palashpai. The least difference between men's and women's

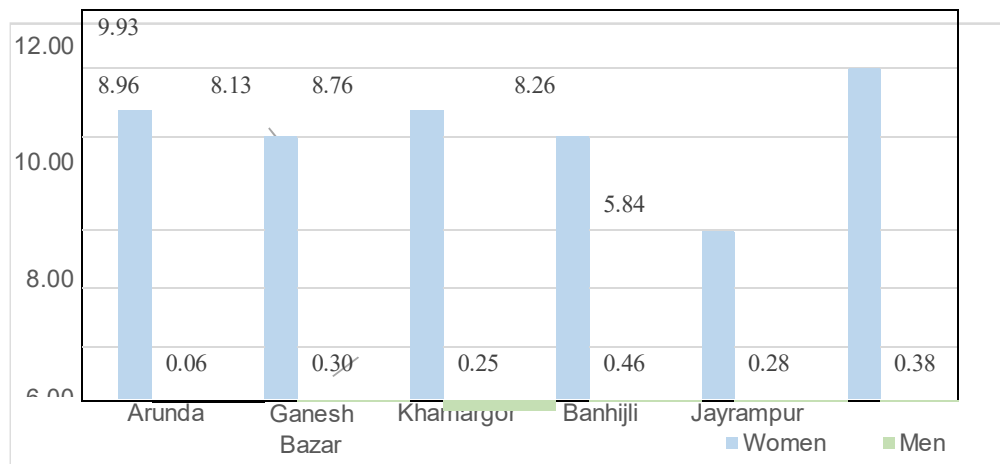
work towards care is observed in Ganesh Bazar village.

iv.) Total Work (excluding MGNREGA)

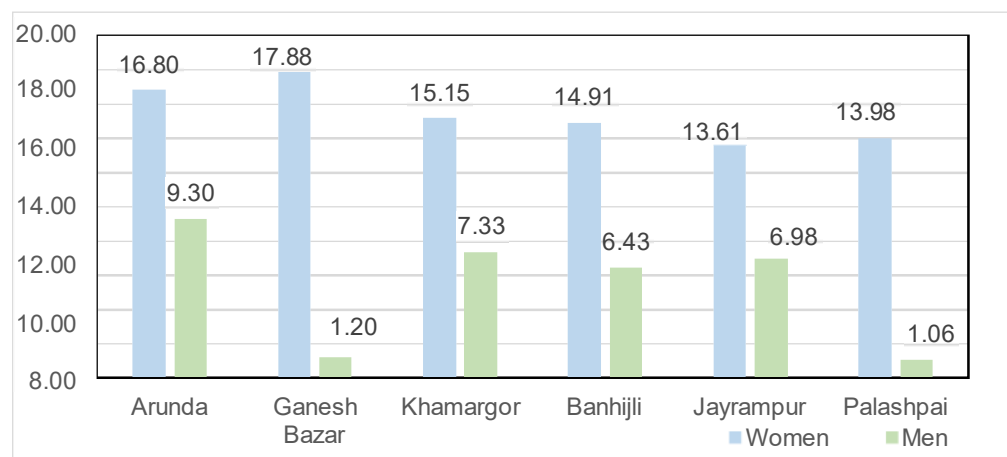
Women work more than ten hours in general caste households in all the villages. The greatest difference between men’s and women’s work is found in Jayrampur village. Men work for more than five hours in a day in villages Ganesh Bazar,Khamargor, Banhijli and Palashpai. Men’s work excluding MGNREGA is least in Arunda.

Figure 7.3: Division of Work for General Population in hours per day





Care work



Total work (excluding MNREGA)

The above analysis attempts to capture gender variations in time spent in three major categories of work. The most interesting aspect of this analysis is the inter-sectionality that has been captured socio-religious groups have been considered to present variability amongst tribal, SC, and General Caste groups of the population.

8. Summarizing the Research Findings

The study proceeded to answer the queries raised above and laid down as objectives of the study. The feminist methodologies seemed to be relevant for this study. The qualitative approach was followed for the analytical aspect.

The definitive conclusions are summarized below:

1. Roles are defined by socio-religious aspects and are manifest in both fixities and flexibilities.
2. Gender division of tasks exists in agriculture. The roles performed by men and women in agriculture are in compliance with the social and cultural norms of the villages.
3. There are social perceptions of what befits a woman while working and earning her

livelihood. These perceptions guide the socialisation of girls from tender age to teen age, the same applies for men.

4. The state with its administrative approaches forms policies, sets goals and guides farming. However the linkages between the farmer and the seed and fertilizer store keeper, the farmer and the owner of the storehouses are more frequent and robust. The decisions that farmers take are influenced by these linkages substantially more than the guidelines provided by the administration.

5. Decision-making is influenced by patriarchy in the villages. Land is considered an asset for men and women are mostly excluded from decision-making on land. Possession of land, however, empowers a woman and commands respect. In the case of livestock women enjoy relative freedom in deciding on their purchase and sale

6. On an individual level, the decisions that a farmer takes hardly allow him or her any autonomy. The decisions on the choice of crops and fertilisers and pesticides are mostly controlled by the sellers of the seeds, fertilizers and pesticides.

7. In all the villages, decision-making on crops, their watering and fertilising at the homestead and home are the women's domain. The market hardly penetrates this zone.

8. Most activities related to livestock and collection from home and homestead are also primarily the woman's domain.

9. Most livestock produce is headed for the market.

10. High paid tasks relate to physical labour (ploughing etc) and exclude women. Otherwise, wages are same for similar tasks.

11. The women play an innovative role in forming Self Help Groups, practice thrift and generate income-giving plans and execute them in a very enthusiastic manner in villages Khamargor and Banhijli. These groups also help the members avail of the poultry rearing schemes of the government. Such fruitful steps were also observed in villages Jayrampur and Banhijli. However the groups were not very strong and internal tensions prevented the robust growth of the Self Help Groups in village Ganesh Bazar and Arunda.

12. Share rearing of small ruminants and poultry forms a viable means of food security and livelihood in villages. This share rearing does not involve any monetary transaction and builds on the trust and network of the women.

13. The public-private divide, discussed so widely in Western literature gets blurred in terms of agricultural work in the home or domestic spaces in the villages. Women perform preparatory tasks for potato cultivation, dung cakes as fuel, and feed making for the livestock, in these spaces. The special kitchen for the postharvest work of paddy is present in most of the landowner households. These tasks yield goods which have economic value.

14. The same domestic space is the site of multitasking by women. The agricultural tasks are performed in unison with other adult women in the household. These tasks are performed in combination with the work of social reproduction.

15. In-depth interviews with women and men have revealed the strong emotional bondages that farm families have with their land and livestock assets and are expressed through various Focus Group Discussions as well.

16. Inter-sectionality has been studied in this research process. Some differences in perception of work and nature of work performed have been observed amongst the different socio-religious groups.

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