



NATIONAL DEFENCE COLLEGE - KENYA

CRITICAL INFRASTRUCTURE IN ENHANCING ECONOMIC SECURITY OF SOUTH-WESTERN BANGLADESH: THE CASE OF PADMA MULTIPURPOSE BRIDGE

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**A Thesis submitted in partial fulfilment of the requirements for the award
of the degree of Masters in National Security and Strategy in the National
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DECLARATION

I do hereby declare that the Project Titled “Contribution of Critical Infrastructure in Enhancing Economic Security of South-Western Bangladesh: The Case of Padma Multipurpose Bridge” is my original work and has not been submitted for a degree or any other academic accreditation at any other university.

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DEDICATION

This paper is dedicated to my mother Mrs. Monowara Haque, who toiled tirelessly and saw to it that not only did I obtain a solid foundation in education but that I also appreciated its worth.

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LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviations And Acronyms	Full Form
PMB	Padma Multipurpose Bridge
JMB	Jamuna Multipurpose Bridge
GOB	Government of Bangladesh
USA	The United States of America
UN	The United Nations
UK	The United Kingdom
DHS	Department of Homeland Security
WIFIA	Water Infrastructure Finance and Innovation Act
BRI	Belt and Road Initiative
CIP	Critical Infrastructure Protection

ABSTRACT

Development of critical infrastructures for national and human security are within the priority list of the governments throughout the world. Government of Bangladesh has recently constructed a strategic level critical infrastructure namely 6.15 kilometers long Padma Multipurpose Bridge, which has been operational since 26 June 2022. Prior to that, the population of South-Western Bangladesh had been suffering a lot due to communication and other associated difficulties. This research endeavours to discover the contribution of critical infrastructure in enhancing economic security in South-Western Bangladesh. For doing so, two social science theories namely Securitization Theory and Systems Theory are consulted to construct the theoretical framework. For this research, data is collected from both primary and secondary sources. Mainly qualitative analysis using descriptive method is carried out in order to bring out the findings. The definition of basic social security in South-Western Bangladesh is access to the infrastructure necessary to meet one's basic needs in terms of health, education, housing, social safety, and job stability. From that point of view, total seven components of economic security are portrayed in this report. These are income security, representation security, labour market security, employment security, job security, work security and skill reproduction security. Research findings show that, the present state of economic security of South-Western Bangladesh is of moderate standard. Again, the findings also indicate that, critical infrastructure has both direct and indirect relationship with the economic security of South-Western Bangladesh, like any other parts of the country, region and world. Furthermore, research also shows that, the key infrastructures especially Padma Multipurpose Bridge will have substantial positive impact on the agriculture, food, communication, service and development sectors in South-Western Bangladesh. Not only that, it will also have significant positive impact on the investment sector and functioning of the government machineries in South-Western Bangladesh. As a whole it can be said that, the economic security of South-Western Bangladesh will significantly be enhanced with the development of critical infrastructures, especially PMB. As a whole, the research findings discover that, the economic security of South-Western Bangladesh will significantly be enhanced with the development of critical infrastructures, especially PMB. Additionally, the research also indicates that the Government of Bangladesh has taken the right decision by constructing the Padma Multipurpose Bridge. Therefore, GOB should take necessary measures in order to ensure complete security and protection of PMB round the clock. Ministry of Infrastructure and Communication should ensure proper maintenance of the bridge regularly in order to ensure that the bridge remains functional round the clock. Efforts should also be made by both the central and regional government offices to ensure rapid industrialization in South-Western Bangladesh.

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.0 Introduction

Plans for the development of critical infrastructures and their connectivity to the national and human security are within the priority list of the governments throughout the world. That includes countries from everywhere on the globe - United States of America, Canada, Australia, Japan and Germany including countries of Asia and Africa. Contemporary security thoughts of the governments have much connectivity with the critical infrastructural development throughout the country. Different scholars have defined the term critical infrastructure in many ways. However, a well-known definition of "critical infrastructure" states that "critical infrastructures" are those physical and digital systems that are necessary for the government and economy to function at all¹.

Despite the variety and the great number of definitions, no single definition provides a complete and accurate description of what constitutes a critical infrastructure; important components are left out. However, there is no official distinction between critical infrastructure and critical information infrastructure, so the terms become interchangeable in some countries. The differences in definitions notwithstanding, the proposed study hypothesizes that there is a strong relationship between critical infrastructure and the security².

Accordingly, the Government of Bangladesh has also been putting adequate importance in the field of critical infrastructure development since long. Bangladesh is a riverine country, and hence, extensive infrastructure development is inherently associated with the overall security

¹ Abele-Wigert, I & Dunn, M 2006, International CIIP handbook 2006, vol. 1, Center for Security Studies, ETH Zurich, Switzerland.

² Anol Bhattacharjee (2012). Social Science Research: Principles, Methods, and Practices. Florida: University of South Florida.

and development of the country. Padma is one of the major rivers in Bangladesh over which the multipurpose bridge was recently constructed and was commissioned for use in June 2022. It was anticipated that the bridge would contribute to the overall security of South-Western Bangladesh since it connects the region with the Capital City, Dhaka. This security would mean the basic seven aspects of security, i.e., economic security, food security, health security, environmental security, personal security, community security, and political security³.

1.1 Background of the Study

The collection of assets, networks, and systems collectively referred to as critical infrastructure ensures a nation's security, economy, and/or public health and safety. Despite the fact that critical infrastructure is the same across all nations owing to necessities of existence, the infrastructure that is considered important might differ depending on a nation's demands, resources, and level of development. There are 16 sectors of critical infrastructure identified by the Department of Homeland Security (DHS) in the United States, including, for example, the Chemical Sector, the Commercial Facilities Sector, the Communications Sector, the Critical Manufacturing Sector, the Dams Sector, the Emergency Services Sector, the Energy Sector, the Financial Services Sector, the Food and Agriculture Sector, and the Government Facilities Sector⁴. The extensive network of roadways, linking bridges and tunnels, railways, utilities, and buildings required to support daily life as usual are only a few examples of crucial infrastructure.

For decades, people have been preoccupied with the idea of security. Security is the condition of being free from threat or danger. Security, in its most basic sense, is the absence of crises or threats to human dignity as well as the presence of peace, safety, joy, and the preservation of human and physical resources, all of which enable the development and

³Gary D. Bouma and Rod Ling. (The Research Process 5th Edition (2004). Oxford University Press.

⁴ Louis Cohen, Lawrence Manion and Keith Morrison (2007). Research Methods in Education Sixth edition. New York: Routledge.

improvement of any human community. Additionally, it refers to a state or sensation of safety or certainty; freedom from dread, anxiety, danger, or other negative emotions. In other words, security refers to a protection or safeguard that provides or secures safety, tranquillity, certainty, etc. Security also refers to safeguarding or defending against intrusion, interference, espionage, etc. In addition, the idea of security refers to resilience against potential harm brought about by others through restricting their ability to act⁵.

The human security schools of thought, which are entirely concerned with the practice of international security, are undoubtedly included in the current security outlook. The traditional idea of national security (a state-centered approach) is being replaced by a focus on the individual, which is still underdeveloped globally and contributes to ongoing problems with disease, poverty, security risks, violence, violations of human rights, and civil conflicts. This modern concept of security seeks to enhance security awareness among the general public by offering trustworthy core knowledge to security experts, contract security firms, and individual readers⁶.

Contrarily, having economic security is being able to consistently meet one's demands. It is associated with both the notion of economic prosperity and the modern welfare state, a kind of government that promises to provide essential guarantees for the security of its citizens. The list of necessities for economic security is influenced by cultural values, therefore both the criteria for what constitutes economic security and the methods for calculating it have evolved over time. In order to monitor economic security, the International Committee of the Red Cross has established five essential livelihood outcomes: food production, food consumption, living

⁵ Ranjit Kumar (2011). *Research Methodology: A Step-by-Step Guide for Beginners* (3rd Edition). New Delhi: Sage Publications.

⁶ Norman K. Denzin (2018) *The SAGE Handbook of Qualitative Research* Fifth Edition. New Delhi: SAGE Publications, Inc.

circumstances, income, and the ability of governments and civil society organizations to provide basic requirements.

The Padma Multipurpose Bridge, a historic landmark for Bangladesh and now the longest bridge in the nation, finally saw the end of its two-decade construction odyssey on June 25, 2022. On this day, the Bangladeshi Prime Minister officially opened the massive infrastructure. The Padma Multipurpose Bridge was Bangladesh's most difficult construction project to date. In terms of both span and overall length, it is the largest bridge in the Padma-Brahmaputra-Meghna River basins of the nation⁷.

This bridge connects the south-western districts with the capital city Dhaka. The \$3.86 billion bridge is anticipated to boost Bangladesh's GDP, create more jobs, boost activity in the service sector, and boost tourism in the south-western regions of the nation. It should be noted that the Padma Bridge is the deepest bridge in the world, with part of its piles set 120–127 meters below the surface of the Padma River. Its spans were set using the biggest floating crane carrier in the entire world. This 6.15-kilometer, dual-purpose bridge spans a single-track railroad on the lower level and a four-lane highway on the higher level⁸.

1.2 Statement of the Research Problem

Prior to the construction of Padma Multipurpose Bridge, the population of South-Western Bangladesh had been suffering a lot due to lack of the crucial transport infrastructure. The presence of the six-kilometer-wide River Padma cut off the population of South-Western Bangladesh from the rest of the country and especially the Capital City Dhaka, which is both the economic and political hub of the country. The only way of accessing the capital city was

⁷ Kori, A. Tashak. (2010). (ed.) *Mixed Method in Social Science and Behavioral Research*. California: Sage Publishers.

⁸ Foresti, M. (2014, February 5). 3 reasons 'governance' should not only be a stand-alone development goal. Retrieved from <http://www.lowyinterpreter.org/post/2014/02/05/3>.

through water vessels such as boats and the ferry and the six-kilometer journey was a risky one across the fast-flowing waters, often characterized by huge waves. Cases of lives lost as boats capsized in the river or ferries stalled midway across the river contributed loss of lives and property. In February 2015, at least 70 people were reported dead when a ferry capsized in River Padma⁹. A similar incident was reported in May 2021, when it was reported that 26 people had perished when a speedboat, they were travelling in crushed into a vessel ferrying sand in River Padma¹⁰.

Due to the transport challenge posed by the absence of a safe passage to Dhaka and other parts of the country, the social economic potential of Bangladesh remained untapped for decades. Similarly, people involved in various productive sectors of the economy such as agriculture and the service industry such as hospitality, telecommunication could not meaningfully contribute to the national economy, besides growing their own levels of economic empowerment. Accessing Dhaka through the raging waters of River Padma presented a real security nightmare to Bangladeshi authorities, eventually leading the country to invest US\$3.86 billion¹¹ in constructing Padma Multi-Purpose Bridge. Despite this heavy investment, no academic research has been conducted to establish how this critical infrastructure has impacted the security of South Western Bangladesh. This is the central question that the proposed study will be seeking to answer.

⁹<https://www.theguardian.com/world/2015/feb/22/bangladesh-ferry-capsizes-100-on-board>

¹⁰<https://www.theguardian.com/world/2021/may/03/boat-accident-bangladesh-padma-river>

¹¹<https://thegeopolitics.com/padma-bridge-the-technological-sublimes-impact-on-local-economy-and-regional-connectivity/>

1.3 Literature Review

1.3.1 Introduction

This part makes an endeavour to examine how different kinds of books, journals, articles, and research works have discussed and analyzed regarding the relationship between the critical infrastructures and security of a particular area or region. While doing so, efforts are made to find out these relationships starting from the international arena, following the regional, and down to Bangladesh. Here, examination is made as to how the critical infrastructure is related to the economic security of an area in particular. This section is divided into three parts. In the first part, the theoretical literature review is made in line with the Securitization and System Theories. Here, the relationship between critical infrastructure and economic security is identified in line with the experts' opinion based on these theories. In the second part, empirical literature review is done based on different published books, literatures, articles and research works. Here, effort is made to discover what these publications have discussed and analyzed on the relationship between critical infrastructure and economic security of any area or region. Thereafter, in the last part, effort is made to find out the gaps in the existing literatures that the study findings have attempted to fill.

1.3.2 Theoretical Literature Review

In this section, efforts are made to discuss and analyze the relationship between critical infrastructures and economic security of any area or region, in line with two theories – Securitization Theory and System Theory. While doing so, at first the conceptual understanding of these two theories is discussed. Thereafter, endeavour is made to find out what the securitization and system theories have explained regarding the nexus between critical infrastructures and economic security of any area or region.

Securitization theorists contend that subjects that successfully securitize receive disproportionately more resources and attention than those that fail to do so, which causes more harm to people. Theorists commonly point out, for instance, how terrorism is given priority in security discussions despite the fact that diseases that may be prevented and traffic accidents claim considerably more lives than terrorism. Securitization studies aim to comprehend "who securitizes" (the actor securitizing), "on what problems" (threats), "for whom" (the referent object), "why," "with what effects," and, last but not least, "under what conditions".

The system setup and services offered are increasingly important to the modern civilization. A functioning infrastructure is another important component of a prosperous society. The satisfaction of the inhabitants as well as the operation of numerous businesses are inevitable. A wide range of detrimental effects in both manufacturing and non-manufacturing divisions of industry would result from its disruption. This infrastructure includes some components that are so crucial that they are referred to be critical infrastructure. The effects of its interruption or failure might be so severe that certain organizations' very survival may be in jeopardy.

Securitization has a process-oriented definition of security as opposed to the materialist methods of conventional security studies. Securitization examines how a specific issue is transformed by an actor into a security concern in order to justify the use of extraordinary measures, in contrast to traditional approaches to security, which focus on the physical manifestations of the threat, such as power dynamics, military prowess, and polarity. Additionally, for the securitization act to be successful, the audience must accept it even if the subject poses a real threat. According to Thierry Braspenning-Balzacq, "securitization is a rule-governed practice, the success of which depends not only on the presence of a genuine threat, but also on the discursive capacity to effectively endow a development with such a distinctive

complexion." Roe has studied how different audiences might perform different duties by adopting a securitization. The audience can be technical, bureaucratic, public, or policymaking.

Each country's critical infrastructure is made up of a number of strategically important components and subjects whose disruption or destruction would significantly harm the interests that the state defends, including the security, the economy, and the basic needs of its citizens. The state oversees all facets of state security and provides for the requirements, but it only partially ensures economic security. Microeconomic security can only come from the subjects themselves, but macroeconomic security can only come from the state. Each member state independently defines the national sectors based on their requirements, which reflect the present security climate. On the whole, nonetheless, it can be claimed that these sectors' structures are quite similar in practically every nation.

A fundamental concept in general systems theory is the focus on interactions. Relationships lead to the conclusion that a single autonomous element behaves differently from how it behaves when it interacts with other independent components. Another key idea is the distinction between open, closed, and isolated systems. In open systems, people, information, matter, and energy are all exchanged with the outside world. In closed systems, neither information nor matter can be shared; only energy can. A closed system doesn't have any elemental exchange. On the foundation of generic systems theory, several approaches were developed. Examples include viable system approach, viable system model, and open system theory. The relationships between organizations and the environment they are a part of are examined by open system theory. This emphasis highlights how well organizations can evolve with the surrounding environment.

Through specific links that develop between them, the relationship between the enterprise and the vital infrastructure can be expressed. These links can be broadly categorized based on their nature into unilateral links, which represent the critical infrastructure sector's influence over the enterprise and the enterprise's dependence on it, and bilateral links, which represent the critical infrastructure sector's dependence on the enterprise. We shall concentrate on a medium-sized manufacturing industrial firm due to the scale of the problem being tackled. At the same time, it is important to note that the enterprise may comprise a crucial component of the infrastructure.

This theory holds that creatures that can process information pertinent to their own habitats are better able to adjust to environmental changes. Two adaptive orders are discovered, and both of them match the informative deviation. The ability to influence behavior through personal goals makes up the first level, which is counteraction. The second step, known as amplification, is related to constructivism theory and results in work on self-organization. Katz and Kahn apply the idea of an open system to the company. The company is viewed as an energetic input-output system, with the energy from the output reactivating the system. Organizations are discussed as socio-technical systems by Emery and Trist, who emphasize that a system's two primary components are a social component (people) and a technological component (technology and machines).

When discussing the modern approach to security in a situation where it permits performing the stated functions as well as their development, which results in developing a new security component - the economic security - the economic side of maintaining the system comes to the fore. The economy of the object whose security is to be ensured must not be in danger from threats that significantly reduce or could reduce its performance efficiency in order to

ensure the object's defense and other security capabilities, social harmony, and competitiveness of the object and each of its individual components on both domestic and international markets.

It should be noted that the system has the ability to alter its behavior. According to the cybernetics theory, the system and its surroundings exhibit varying degrees of complexity since the system cannot perceive the environment's levels of complexity. When used in organizations, the viable system model focuses on conceptual tools for comprehending how systems are organized so that they can be redesigned through change management, understanding the organization as a whole, and assessing the crucial implementation tasks. Sub-systems and supra-systems are suggested as a new way to interpret consolidated strategic organizational and managerial models by the idea. Supra-systems concentrate on the links between businesses and other influencing systemic elements in their setting, whereas sub-systems analyze interactions among internal business components.

1.3.3 Empirical Literature Review

1.3.3.1 Empirical Literature Review for Specific Objective 1

In the Publication, 'U.S. Infrastructure: Government Programs and Economic Impacts', the author Juventino Valenzuela González mentions that, the electrical grid in the US comprises all of the power plants generating electricity, together with the transmission and distribution lines and systems that bring power to end-use customers. The term "Smart Grid" refers to the grid's upgrading to handle the more complicated electricity flows of today. This book's opening chapter discusses current advancements in the Smart Grid. The economic effects of infrastructure investment are examined in the second chapter¹². Recent discussions about the advantages of infrastructure spending by President Trump and certain members of Congress have reignited

¹² Mugenda, O.M. and Mugenda, A.G. (2003) Research Methods, Quantitative and Qualitative Approaches. ACT, Nairobi.

interest in the topic. The third chapter looks at critical infrastructure-related cybersecurity issues. The "Water Infrastructure Finance and Innovation Act" (WIFIA) program, which offers a number of possible benefits and raises some issues that are covered in this book, is the subject of the fourth chapter. The final chapter tackles a variety of frequently asked issues regarding the risk of earthquakes and the elements of the roadway system, particularly bridges.

In the Book, 'Critical Infrastructure Security and Resilience: Theories, Methods, Tools and Technologies', the authors Dimitris Gritzalis and Marianthi Theocharidou present the latest trends in attacks and protection methods of critical infrastructures. It offers ground-breaking research frameworks and effective safeguards against grave new dangers to vital infrastructures and the networks that sustain them. It offers a number of innovative efforts, such as skillfully simulating and executing assaults and necessary security precautions in industrial control systems. Newly recognized technological proficiency in industrial security is one of the initiatives¹³. One of the explanations is the development of hardware and service security, interdependency networks, risk analysis, and control system security, as well as the protocols that support them. The information provided here will aid in the following ways: (i) familiarizing readers with recent developments in the field; (ii) incorporating security research into their commercial or academic work; (iii) improving current modeling and analysis techniques for critical infrastructures; and (iv) managing potential crises and emergencies affecting or arising from critical infrastructure.

In the report, 'Transportation Systems: Critical Infrastructure and Key Resources Sector-specific Plan as Input to the National Infrastructure Protection Plan', U.S. Department of Homeland Security states that, The Transportation Systems Sector comprises all modes of transportation (Aviation, Maritime, Mass Transit, Highway, Freight Rail, and Pipeline)-is a vast,

¹³ Creswell, J.W. (1994). Research design: Qualitative & quantitative approaches. Sage Publications, Inc.

open, interdependent networked system that moves millions of passengers and millions of tons of goods¹⁴. According to the report, a country's transportation system is essential to its way of life and economic health. All sector partners, including government (Federal, State, regional, local, and tribal) and business parties, have the responsibility of ensuring its security. Approximately 4 million miles of roads and highways, more than 100,000 miles of rail, 600,000 bridges, more than 300 tunnels, numerous sea ports, 2 million miles of pipeline, 500,000 train stations, and 500 public-use airports make up the transportation network, which links cities, producers, and retailers every day.

According to Muhammad Imran and Javeria Niazi, authors of the book "Infrastructure and Growth," the development of physical infrastructure has numerous significant direct and indirect consequences on an economy. These effects work via a number of channels. For instance, through increases in worker productivity brought about by better information and communication technology, decreases in stress and commute time, enhancements to health and education, and enhancements to economies of scale and scope across the economy. Both a direct route (the capital stock of the infrastructure acts as a production factor) and an indirect one (the advancement of technology is influenced by improved infrastructure) exist on the supply side. From the perspective of the demand side, infrastructure offers people the services they require and desire, including access to water and sanitation, power for heating, cooking, and lighting, telephone and computer service, and transportation. In Pakistan, the lack of infrastructure development over the past 20 years has created insurmountable obstacles for the economy's output sector. Additionally, it has had an effect on household direct consumption, which has a negative influence on public welfare as a whole. The situation in Pakistan has gotten worse due

¹⁴ Creswell, J.W., & Creswell, J.D. (2017). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Sage Publications.

to ongoing underinvestment in recent years¹⁵. In order to enhance the effectiveness of the development plans, there is a need for strategic selection of the projects/programmes, particularly in the energy sector. This is implied by frequent PSDP reductions and the low levels of allocations. In Pakistan, inadequate and subpar infrastructure has severely lowered the quality of living for the majority of the population while also impeding economic growth. Therefore, the Pakistani government should give very high priority to infrastructure development.

In the Book, ‘Cybersecurity: Protecting Critical Infrastructures from Cyber Attack and Cyber Warfare’, the author Thomas A. Johnson first provides a historical reference, detailing the emergence of viruses, worms, malware, and other cyber threats that created the need for the cybersecurity field. The vulnerability of our crucial infrastructures is then covered, along with the vast array of cyberattack instruments and the different engineering design difficulties related to safeguarding our infrastructures. It then discusses strategies for cyber intelligence, current instances of cyber conflict and warfare, and the most important considerations when coming up with a national defense plan against cyberwarfare¹⁶. How to estimate and quantify the cost of cybersecurity is also covered in the book. It looks at the several cost aspects that are involved and presents the findings of several significant industry-based economic analyses of security breaches that have happened across various countries. The book's conclusion examines potential developments in cybersecurity. It talks about how industry-wide transformational innovations like virtualization, social media, cloud computing, big data, and data analytics may have an impact.

In the Report, ‘Securing Critical Infrastructures and Critical Control Systems: Approaches for Threat Protection’, the author Laing, Christopher provides a full and detailed

¹⁵ Kothari, C.R. (2004) Research Methodology: Methods and Techniques. 2nd Edition, New Age International Publishers, New Delhi.

¹⁶ Flick, U. (2014). An Introduction to Qualitative Research, 5th ed. Los Angeles: SAGE Publications Inc.

understanding of the vulnerabilities and security threats that exist within an industrial control system. The technical, procedural, and management answers to protecting these systems are defined and examined in this collection of research¹⁷. The relevance of vital facilities in enhancing a region's economic security is also discussed in the paper. It continues by stating that protecting crucial infrastructures is equally crucial for the growth of that region's economy. Not only that, but the paper discusses how important infrastructures affect an area's overall development.

The Book, 'Safety and Security Issues in Technical Infrastructures' by Rehak, David, and Bernatik, is a pivotal reference source that provides vital research on the modernization of occupational security and safety practices within information technology-driven buildings. This article addresses contemporary risks and uncertainties and the raising of comprehensive understanding for specialists in this industry while highlighting issues such explosive process safety, nanotechnology, and infrastructure risk analysis¹⁸. The perfect audience for this book includes property owners, students, civil engineers, architects, researchers, construction industry experts, security managers, and material scientists.

The authors of "The Future of National Infrastructure," Jim W. Hall and Robert J. Nicholls, demonstrate how long-term national infrastructure planning can be done while taking into account the interdependencies between energy, transportation, water, waste, and ICT. The United Kingdom is utilized as a case study to demonstrate how the technique and supporting models can be successfully applied in a national infrastructure assessment. Insights and lessons for other industrialized nations and emerging economies must be highlighted in order to deliver

¹⁷ Robson, C. (2016). Real World of Research. Carlton: Blackwell Publications.

¹⁸ Bryman, A. (2008). Social research methods. Oxford: Oxford University Press.

infrastructure services in a variety of future socio-economic and environmental scenarios¹⁹. The concepts, models, and methods required to create and test strong, sustainable, and resilient solutions for the supply of national infrastructure are provided to practitioners, policymakers, and academics in *The Future of National Infrastructure*.

1.3.3.2 Empirical Literature Review for Specific Objective 2

The European Council Directive 114/08 urged the EU Member States to conduct an assessment targeted at the identification and designation of the so-called European Critical Infrastructures (ECI), according to the report "European Critical Infrastructure Protection" by Alessandro Lazari. Every analysis of the results from the "first round" of identifications and designations has just looked at the number of ECIs that have actually been identified, neglecting all other elements that are pertinent to this important step towards a common understanding of "European Security." This article focuses on the elements that have helped or hampered the ambitious European aims as well as any potential barriers to the directive's full potential using an innovative technique. The report offers a thorough analysis of the lessons learned, including those that can be inferred from the US pre-post 9/11 CIP policies, as well as an assessment of the Member States' current condition following the implementation of the directive and projections for impending challenges²⁰.

The writers Tyler Moore and Sujeet Shenoj share novel research findings and cutting-edge applications in the field of infrastructure protection in their book, "Critical Infrastructure Protection IV: Fourth Annual IFIP WG 11.10 International Conference on Critical Infrastructure Protection." Furthermore, it highlights the significance of integrating science, technology, and policy when creating sophisticated yet practical solutions to secure data, computer, and network

¹⁹ Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*. London: Routledge.

²⁰ Crotty, M. (1998). *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: Sage.

assets across a variety of essential infrastructure sectors. In this collection, seventeen edited papers from the Fourth Annual IFIP Working Group 11.10 International Conference on Critical Infrastructure Protection, held at the National Defense University in Washington, DC, on March 15-17, 2010, are included. Members of IFIP Working Group 11.10 and other widely respected authorities on critical infrastructure protection reviewed the papers²¹.

In the Report, ‘The National Infrastructure Plan 2011’, Great Britain: H.M. Treasury, Infrastructure UK sets out the strategy for meeting the infrastructure needs of the UK economy. This tactic consists of three components. The government will first make plans that span multiple industries and the medium term. The Plan outlines a clear pipeline of more than 500 infrastructure projects and compiles a thorough cross-sectoral analysis of the UK's infrastructure networks. By completing these projects, it will be possible to sustain and enhance the infrastructure of the UK over time. Second, the Plan outlines a novel strategy for integrating public and private investment in UK infrastructure in order to generate the funding necessary to complete these projects. It is declared that more infrastructure investment would be paid for by greater cuts to present spending. The government will take steps to encourage the private investment that will pay for most of the infrastructure in the UK²². Thirdly, the Government will actively participate in ensuring that the infrastructure outlined in the Plan is completed effectively and on schedule, with a focus on the initiatives that will have the greatest economic impact.

In the Book, ‘Digitalization for Sustainable Infrastructure: The Road Ahead’, the authors Carlo Secchi, and Alessandro Gili states that, in today’s tumultuous and fast-changing times, digitalization and technology are game changers in a wide range of sectors and have a

²¹ Denzin, N., & Lincoln, Y. (Eds.). (2005). *The Sage Handbook of Qualitative Research* (Third ed.). London: Sage.

²² Hennink, M., Hutter, I., & Bailey, A. (2014). *Qualitative Research Methods*. Los Angeles: Sage.

tremendous impact on infrastructure. The digital and technical shift has a significant impact on roads, trains, electrical grids, aviation, and maritime transport, with benefits for competitiveness, cost-cutting, and safety. Although the fight for digital infrastructure is also a geopolitical one, digitalization is an important tool for developing global commitment to sustainability. A level playing field looks to be far from being agreed upon as the biggest economies in the world begin to embrace competitive strategies. Why are technology and digitalization at the center of the global geopolitical struggle? How are they altering the methods for creating, running, and maintaining infrastructure? How much will the Internet of Things, artificial intelligence, and digitization impact how people travel by land, air, and sea? How can critical infrastructure's cyber security be strengthened?

In the Book, 'Regional Infrastructure Systems: The Political Economy of Regional Infrastructure', the author Colin Turner explores the trend towards the development of regional infrastructure systems within the context of territorial strategy. State positioning within the international system gives rise to regional systems. In addition to identifying the many mechanisms that are powering regional infrastructures, Colin Turner also looks at the formal and informal integration patterns that are guiding advancements. The book also makes the point that as the world economy becomes more integrated, national infrastructure systems must change in order to create a global infrastructure system. In order to meet the territorial demands and preferences of national systems, this network of networks promotes movement between them. This demonstrates how nations use these physical systems strategically to maintain and strengthen their territoriality. The book examines the forces of network fragmentation and integration in great detail via the prism of economic infrastructure.

According to John M. Cockburn, Yazid Dissou, Jean-Yves Duclos, and Luca Tiberti in their book "Infrastructure and Economic Growth in Asia," public spending on infrastructure is crucial for fostering economic growth and reducing poverty. Empirical studies show that underinvestment in infrastructure is certainly a barrier to economic progress. At the same time, numerous further studies have shown that infrastructure investment has the potential to be a very effective tool in the struggle against poverty reduction¹. In this context, the majority of economic growth and poverty reduction plans in developing countries have included the financing of infrastructure as a critical element since the turn of the millennium. In this book, three very different Asian countries—China, Pakistan, and the Philippines—are compared in order to analyze the overall and sectoral implications of increased infrastructure investment. The significance of alternative financing strategies, particularly non-distortionary and distortionary types of finance, is given particular emphasis in order to increase public infrastructure investment. The book will be interesting to researchers and decision-makers interested in economic growth in developing countries.

In the Book, 'Critical Reflections on China's Belt & Road Initiative', the authors Alan Chong, and Quang Minh Pham provide insights into China's Belt and Road Initiative (BRI) from Asia Pacific and the Middle East. It provides critical viewpoints from a variety of angles, including historical research, human geography methods, and neo-Marxist tendencies. One of the largest geopolitical ideas since the Cold War, the BRI offers the potential for a pan-Asianist future as well as an intercontinental view of aid politics. Generally speaking, any geopolitical vision that aims to promote interregional communication and the materialist growth of peoples and economies is inevitably going to have some shortcomings. The Belt and Road Initiative has characteristics of the socio-political tradition of authoritarian infrastructure politics in China

while also posing as a potential challenge to the so-called "Washington Consensus" of liberal democracy, deregulation, and free markets.

In the Paper, 'Infrastructure for Growth and Human Development in Pakistan: A Simulation Analysis of Fiscal Policy Options', the authors Jouko Kinnunen, and Hans Löfgren explores the use of fiscal policy to accelerate development in Pakistan during the period 2013-2022, with a focus on the creation of fiscal space for increased investment in infrastructure. The various policy scenarios highlight how vital it is to choose infrastructure projects with high productivity effects and how crucial financing is in deciding the overall effects of increased government expenditure on infrastructure. Transfer programs can increase welfare immediately, but they lose their effectiveness over time if they aren't made to increase productivity, perhaps by boosting health, nutrition, and educational outcomes. The outcomes for the final scenario show that a combination of significant gains in savings, investment, and total factor productivity may be used to generate rapid growth acceleration.

1.3.3.3 Empirical Literature Review for Specific Objective 3

Author Kristan Stoddart offers a thorough analysis of the challenges and hazards facing the West at the far end of the cybersecurity spectrum in her book, "Cyberwarfare: Threats to Critical Infrastructure." It emphasizes threats to crucial infrastructure, including significant public utilities. It emphasizes the threats posed by China and Russia, the West's two strongest adversaries and competitors, while also considering the threats posed by Iran and North Korea. The arguments and themes are backed up by factual information, but they are also driven by the need to advance the conversation of cyberwarfare and ideas of cyberwar, which is still in its infancy. Both of those ideas are to be advanced and narrowly defined in this book. This book speaks to people interested in cybersecurity, international relations and international security,

law, criminology, and psychology, in addition to the technical cybersecurity community, those in business, government, policing, lawmaking and law enforcement, and the military.

In the Report, 'ICT and Critical Infrastructure: Proceedings of the 48th Annual Convention of Computer Society of India - Vol II', the authors Suresh Chandra Satapathy, P. S. Avadhani, Siba K. Udgata, and Sadasivuni Lakshminarayana present total 85 papers at CSI 2013: 48th Annual Convention of Computer Society of India with the theme "ICT and Critical Infrastructure". The convention was place from December 13–15, 2013, at the Hotel Novotel Varun Beach in Visakhapatnam. It was organized by the Vishakhapatnam Chapter of the Computer Society of India in collaboration with Vishakhapatnam Steel Plant, the parent company of RINL, India. Data mining, data engineering, image processing, software engineering, bioinformatics, network security, digital forensics, cybercrime, internet and multimedia applications, and e-government applications are the key topics covered in this volume's papers.

In the Book, 'Infrastructure Investment in Indonesia: A Focus on Ports', the authors Colin Duffield, Felix Kin Peng Hui, and Sally Wilson present a macroscopic perspective, outlining the broader economic situations confronting Indonesia and Australia, before adopting a more microscopic perspective to closely examine the issues surrounding major infrastructure investment in both countries. Key issues are discussed, case examples in detail are explored, and evidence-based remedies are suggested. These answers address current problems like how to speed up the start of infrastructure projects, how to improve project decision-making for project selection and evaluation, how to boost overall efficiency in the setup of project finance and governance, and how to boost the return on investment from infrastructure investments. A special emphasis is placed on suggested enhancements to Indonesia's portal cities' large infrastructure project governance, policies, engagement, operation, and processes. This book is

an invaluable resource for decision-makers and government representatives in Indonesia and Australia, as well as for organizations that invest in infrastructure and businesses that export services between Indonesia and Australia.

A country's infrastructure has a significant impact on its long-term economic and social trajectory, according to author Daniel F. Runde of the book "Quality Infrastructure: Ensuring Sustainable Economic Growth." Infrastructure is the physical foundation of any society. The author noted that better infrastructure not only contributes to more than half of the nation's and region's enhanced growth performance, but it also has a positive impact on market development, illness prevention, health, and education, as well as indirect advantages for human development. He also demonstrates that the developing nations are where the majority of the world's demand for infrastructure is produced. The demand for efficient and high-quality infrastructure will remain urgent as developing countries continue to face population increase, rapid urbanization, and economic and industrial expansion. There is a clear window of opportunity to introduce a new strategy to infrastructure that focuses on achieving the best long-term value for each infrastructure investment given this gap and the global efforts to fulfill the recently adopted Sustainable Development Goals (SDGs). Japan has taken the lead on this topic in particular by emphasizing "quality infrastructure," a term that is starting to gain favor on a global scale. Developing nations will create the infrastructure they need one way or another, and the decisions they make now will have long-term effects on their economies, societies, and environments. The effects can be severe if a bridge collapses, a power plant doesn't produce as much energy as expected, or a water sanitation facility can't provide clean drinking water. There needs to be an international agreement on high-quality infrastructure and a plan for getting there²³.

²³ Daniel F. Runde. Quality Infrastructure: Ensuring Sustainable Economic Growth (2017). Center for Strategic and International Studies (CSIS).

In the Journal named 'Critical Infrastructure: Where Do We Stand Today? A Comprehensive and Comparative Study of the Definitions of a Critical Infrastructure', the concept of 'critical infrastructure' has been discussed as one of the key issues connected to national security. All industrialized nation-states that depend on information and communication technologies have defined this concept or established a list of critical sectors to identify their critical infrastructures. Despite the high number of definitions, none of them considers a realistic view of a critical infrastructure as it tends to be reduced to its simple computerized dimension. The survey of definitions of critical infrastructure presented in this paper highlights the omissions in these definitions. This paper suggests the need for a new definition of critical infrastructure - a definition which includes the missing elements identified herein.

In the Publication 'Infrastructural Development in China', the Author Rupert Hodder mentioned that the vital importance of an improved, more flexible and efficient infrastructure in any attempt to modernize China's economy is heavily recognized by the Chinese Government. He has given example of energy and transport which, since long, have frequently been referred to as the two most critical constraints on China's economic development. Most of China's natural resources are located either in the west and centre of the country or in the north and north east, whereas the overwhelming majority of industry and population are located along, or relatively near to, the coast. There is thus a need for long-distance bulk transport as well as regional specializations in industry demand good long-distance transport. Agricultural variations across the climatic zones from north to south, and from the coastal irrigated areas to the arid interior, emphasize the need for the transport. These imperatives have been pointed out still further by the current policy of economic integration.

According to Wilmar Salim and Siwage Dharma Negara's article in the journal titled "Infrastructure Development under the Jokowi Administration: Progress, Challenges, and Policies," effective infrastructure is the cornerstone to economic and social development in any rising country. However, Indonesia has a substantial infrastructure deficit as a result of years of underinvestment and bad asset management. This essay examines the major issues that Indonesian infrastructure development has faced since the Yudhoyono era. Not only that, but this essay also explores how many administrations have adopted a more practical strategy to meet the nation's development objectives. One significant approach has been to divert budget funds from fuel subsidies to infrastructure development. Alongside this, efforts to overhaul institutional and regulatory frameworks have persisted. Despite these steps, Jokowi's infrastructure development has not advanced as smoothly as was anticipated overall. The administration had to reconsider the amount of national strategic initiatives and be more selective in assigning priorities to infrastructure projects due to limited resources and capacity. Additionally, in order to achieve coordinated regional development, the national strategic initiatives must be connected to bigger, longer-term development plans, such as the National Spatial Plan and sectoral master plans.

The author Christine Kessides asserts in the publication titled "The Contributions of Infrastructure to Economic Development: A Review of Experience and Policy Implications, Parts 63-213" that contemporary risk management techniques can aid nations in avoiding financial risks that have an impact on long-term plans and future cash flows. They provide defense against the fluctuations in profit brought on by changes in interest rates, exchange rates, and commodity prices. This accessible guidebook examines the risk management tools used successfully by developing countries, including futures, options, forward contracts, commodity swaps, commodity bonds, commodity related loans, currency rate swaps, and interest rate swaps.

An action plan describes how to use the techniques wisely to avoid expensive mistakes. It also outlines the financial and economic rules that nations must implement before implementing any risk management strategies.

In the Book, ‘Economic and Social Development of Bangladesh: Miracle and Challenges’, the authors Yasuyuki Sawada, Minhaj Mahmud, and Naohiro Kitano discuss Bangladesh’s economic and social development that may be called a “miracle” since the country has achieved remarkable development progress under several unfavorable situations. The book also discusses inequality, problems associated with fast urbanization, and exposure to significant disaster risks. It also discusses weak governance and political instabilities. In addition, the writers explore the factors that contributed to this prosperous economic growth as well as any difficulties it may create in an effort to identify beneficial policy changes that other developing nations can adopt. The book also discusses the role that crucial infrastructure can play in Bangladesh's economic development.

1.3.4 Gaps in the literature

Despite a lot of study in the general area under this research, some gaps still exist which can be explored further. In general, the contribution of critical infrastructure in enhancing human and national security in South-Western Bangladesh remains unexplored. Connected to that, three aspects are available for further research. Firstly, analysis of the present state of critical infrastructure development and security of South-Western Bangladesh. Second, examination of the nexus between critical infrastructure development and state of security in South-Western Bangladesh. Finally, determination of the ways of enhancing security in South-Western Bangladesh through critical infrastructure development.

1.4 Study Objectives

1.4.1 General Objective

The general objective of this study is ‘To establish the contribution of critical infrastructure in enhancing economic security in South-Western Bangladesh’.

1.4.2 Specific Objectives

The specific objectives of this study are enumerated as follows:

- i. To analyze the present state of critical infrastructure development and economic security of South-Western Bangladesh.
- ii. To examine the nexus between critical infrastructure development and state of economic security in South-Western Bangladesh.
- iii. To determine ways of enhancing economic security in South-Western Bangladesh through critical infrastructure development.

1.5 Research questions

1.5.1 Primary Question

How has critical infrastructure contributed to the enhancement of economic security in South-Western Bangladesh?

1.5.2 Secondary Questions

1.5.2.1 Secondary Question 1

What is the present state of critical infrastructure development and economic security in South-Western Bangladesh?

1.5.2.2 Secondary Question 2

What is the nexus between critical infrastructure development and state of economic security in South-Western Bangladesh?

1.5.2.3 Secondary Question 3

What are the ways of enhancing economic security in South-Western Bangladesh through critical infrastructure development?

1.6 Justification of the Study

South-Western Bangladesh had been deprived from many of the benefits of citizenship since long. Now with the functioning of the Padma Multipurpose Bridge the situation has started improving. If proper utilization of the bridge can be ensured in all respect, overall security of the population in South-Western Bangladesh can be enhanced. Now is the right time to carry out research and determine the ways of enhancing security of South-Western Bangladesh through critical infrastructure development. Therefore, the study is justified in the current context.

1.7 Theoretical Framework

1.7.1 Securitization Theory and Economic Security

The securitization theory demonstrates that political leaders and other decision-makers carefully craft national security policy rather than letting it happen naturally. Securitization theory states that when political issues are classified as "dangerous," "menacing," "threatening," "alarming," etc. by a "securitizing actor" who has the social and institutional power to move the issue "beyond politics," they are constituted as extreme security issues that need to be addressed immediately. Security concerns must therefore be framed as problems by securitizing actors because they are not just "out there." For example, referring to immigration as a "threat to national security" elevates it from a low priority political concern to a critical issue that calls for action, such as border security. Securitization theory questions conventional approaches to security in IR and claims that problems are not inherently dangerous; rather, they only become security concerns when they are referred to as "security" problems.

1.7.1 Systems Theory and Economic Security

An interdisciplinary study of systems' relationships with one another within a bigger, more complicated system is called systems theory. The fundamental tenet of systems theory is that the whole is greater than the sum of its parts, regardless of the field to which it is applied. This means that certain aspects of the whole—the complex system—cannot be readily explained or rationalized when looking alone at any one of its systems, or its parts, when considering how smaller systems interact to affect the broader complex system holistically. In complex systems, characteristics emerge that appear to be unique to no one system within the total and that systems theory aims to explain and build hypotheses about. Emergent behavior is what is meant by this. When a complex system exhibits emergent behavior, it means that it possesses traits that its attributes do not show by itself.

1.8 Conceptual Framework

There are two major variables in the topic - critical infrastructure, and security in South-Western Bangladesh. Here, the independent variable is 'critical infrastructure' and dependent variable is 'security in South-Western Bangladesh'. With the change of independent variable critical infrastructure, the dependent variable security in South-Western Bangladesh is expected to change. It is expected that, if the state of critical infrastructure is improved, security in South-Western Bangladesh is expected to be enhanced. From that point of view, the overall framework will endeavor to find out the contribution of critical infrastructure in enhancing human and national security in South-Western Bangladesh.

For that, at first, analysis will be done on the present state of critical infrastructure development and security of South-Western Bangladesh. Thereafter, examination will be done on the nexus between critical infrastructure development and state of security in South-Western

Bangladesh. From the above study, appropriate relationship will be established between critical infrastructure development and state of security in South-Western Bangladesh. Having done so, finally, the ways of enhancing security in South-Western Bangladesh through critical infrastructure development will be determined.

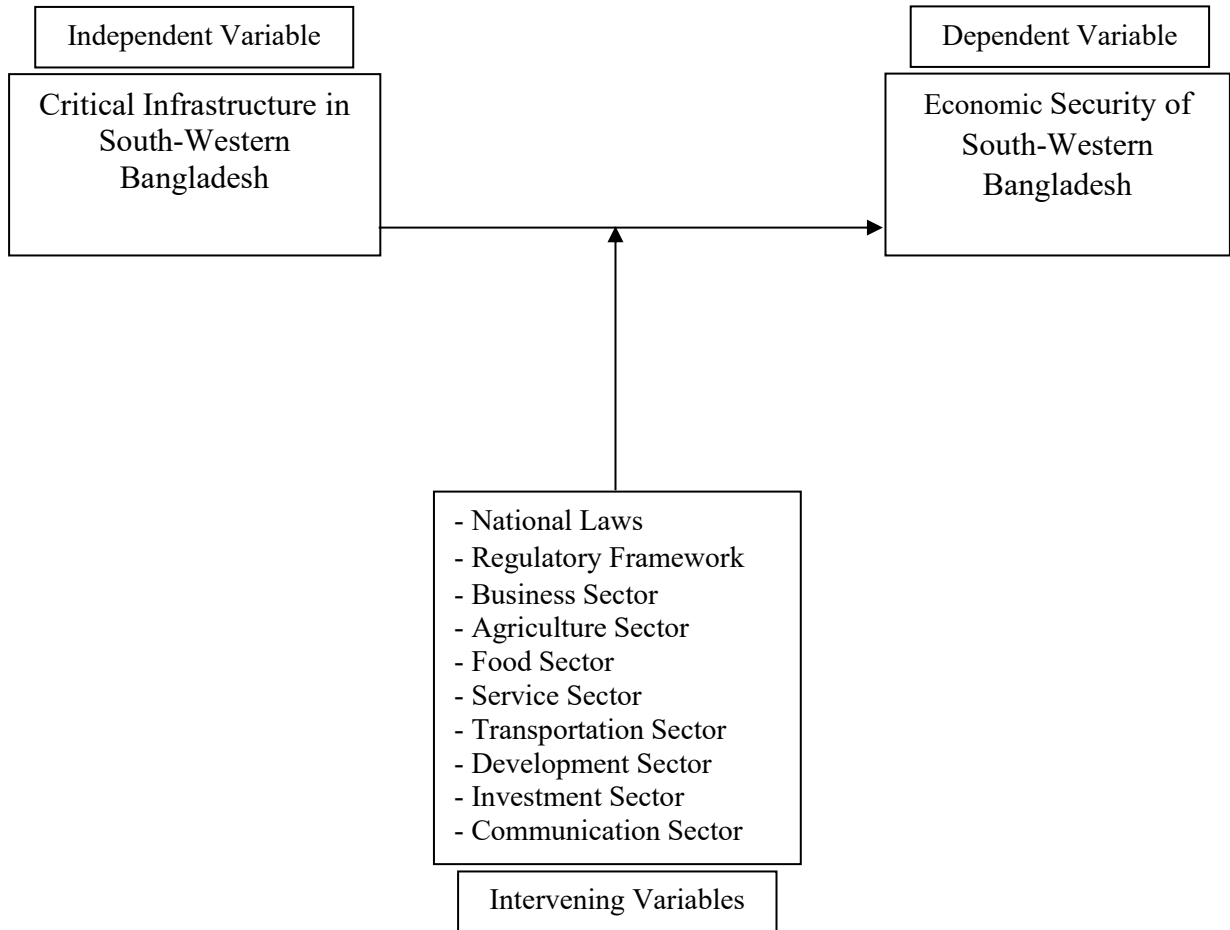


Figure 1.1: Conceptual Framework

1.9 Methodology

1.9.1 Research Design

During the conduct of the research, data was collected from both primary and secondary sources. Descriptive research design was used to collect data. The study described analysis of the present state of critical infrastructure development and economic security of South-Western Bangladesh, examination of the nexus between critical infrastructure development and state of economic security in South-Western Bangladesh; and determination of the ways of enhancing economic security in South-Western Bangladesh through critical infrastructure development. For collecting data, purposive and snowball sampling method was followed. These systems were followed because it facilitated to collect data from the people who were actually capable of contributing to the research. While collecting data, emphasis was given to those groups, who actually had the authenticated and required data. A pragmatic approach consisting of both qualitative and quantitative data was followed for this research. However, more emphasis was given to the qualitative approach. After collecting relevant data, the analysis was done using descriptive method for qualitative data and SPSS tools for quantitative data. After data analysis, the findings were summarized in order to draw the conclusion to attain the objectives set for this research. At the end, some recommendations are also made for the appropriate readers.

1.9.2 Study Scope

This study will be limited to the critical infrastructure development and security in South-Western part of Bangladesh in particular. However, in the process of research, references will also be drawn from the relationship of critical infrastructure development and security in other parts of Bangladesh.

1.9.3 Research Target Population

The target population for this research is different categories of population from South-Western Bangladesh. The target group is grouped into total five categories. The selection of the categories of population is done keeping in mind the capabilities they have in providing required information for this research. They are selected officials from associated government departments, heads of different associated government departments, academia, business community and farmers. Some of the important personnel from the target population are the policy makers from Ministry of Infrastructure and Communication (of Central Government and Barishal Division), Chairman Transport Business Committee, Chairman Department of Trade (Barishal Division), and Chairman Traders' Organization (Barishal Division).

1.9.4 Research Sample and Sampling Technique

For this research, a mixed approach of purposive sampling and snowball sampling is followed. The researcher's own judgement is followed while choosing members of the population to participate in the survey. Not only that, a chain referral sampling approach helped the researcher to find subsequent subjects to gather enough data useful for the research. In this, specific personnel were picked who were found suitable for the research. Emphasis was laid on choosing subsequent personnel from the same department. In this sampling techniques, $N = n$, that is, sample size = size of the target population. These two types of sampling were followed because of valid reasons. First, it helped the researcher to make the best use of a small population of interest and arrive at valuable research outcomes. Second, the chain referral process allowed the researcher to reach population who were difficult to sample otherwise. Again, these techniques needed little planning and fewer workforce compared to other sampling techniques. Furthermore, these methods were also cheap, simple and cost-effective.

1.9.5 Data Collection Method

Both primary and secondary data are collected for this research. Collected data are both qualitative and quantitative in nature, amongst which qualitative data are more in magnitude. However, primary data are much more in volume than secondary data. Primary data are collected from the target population mainly through interview with survey questionnaire. The interview was done through various methods like phone calls, video calls, open ended questionnaire. In this, right types of questionnaire were given to the right groups, so that, appropriate data can easily be collected without much difficulty and confusion. A set of intelligent questionnaire was prepared incorporating total fifteen questions, having five questions for each objective. Secondary data are collected from the available scholarly journals, books, dissertations, government documents, policy report, conference and seminar papers and other online sources.

1.9.6 Reliability of research instrument

The consistency of the research tool in providing comparable results after numerous trials is what reliability measurements are concerned with. So, the reliability of the study equipment was checked using the test-retest method. Nachmias and Nachmias advised the study to aim for a coefficient of reliability better than 0.7. Although a coefficient of higher than 0.7 was preferred, the study was conscious of how challenging it can be to reach that goal due to factors including the test's repeated nature. In fact, it might be challenging to achieve high results because a pilot participant might not be aware of whether the exam was repeated and might not always remember the response they provided in an earlier test. Moreover, possible adjustments in the phenomenon being studied in the interval between the two tests may also have an impact. After the piloting, the tools were deemed dependable for data gathering because the coefficient 44 was found to be 0.76 after two testing spaced two weeks apart.

1.9.7 Validity of research instrument

Nachmias & Nachmias define validity of a research tool as the tool's capacity to measure what it was designed to measure. In this study, the researcher was satisfied that, at face value, the data collection instrument could measure what it was intended to measure by comparing it to the study's objectives and current literature. The statements and indicators that made up the data collection instrument's framework were the areas of attention. Also, the researcher gave the instrument to the supervisors for their feedback given their subject-matter expertise. To improve the instruments' suitability for gathering the data required to meet the study's objectives, the suggestions they made were adopted.

1.9.8 Data Analysis and Presentation

Since pragmatic paradigm is used in this research, data are analyzed mainly through qualitative method. However, in the process, some data are also analyzed through quantitative method, which are embedded within the overall data analysis. For qualitative analysis, various logics, examples and content analysis are made. Not only that, narratives and verbatim quotations are also used for qualitative data analysis. Quantitative data are keyed into Statistical Package for Social Science (SPSS) and analyzed using percentages and frequency counts. For quantitative data the outcomes are presented using tables, charts and graphs. On the other hand, qualitative data are analyzed using narratives and verbatim quotes.

1.9.9 Ethical Considerations

Ethical aspects will be given due consideration while carrying out this research. For collection of data, due authorization will be obtained from various institutions and organizations. Necessary letter of introduction will be obtained from the National Defence College, Kenya, which will then be presented to the Bangladesh authorities for approval of the study. In addition to that, due acknowledgement will be made for all sited works inside the research report.

1.10 Limitations of the Research

This study has some limitations. First, this research is being carried out under a situation where the researcher is away from home country, and it will not be possible to physically access to many of the places and persons. As such, collection of the primary data will be quite challenging. However, this limitation will be overcome with the help of research assistance. I shall collect the primary data through online survey questionnaire and interview. For survey questionnaire, I shall target selected officials from associated government departments and the personnel from community group. And for interview, I shall target the heads of different associated government departments. Second, language of some of the members of the target group, for example farmers will pose some difficulty, since all of them would not be able to respond in English. This limitation will be overcome through translation of the questionnaire in their local language, i.e., Bangla. In addition, I shall also employ interpreter where necessary.

1.11 Definitions of the Terms

Security

Security is the condition of being free from threat or danger. A valuable financial asset with a monetary worth allowing it to be exchanged, sold, or purchased can be summed up as a security in one easy word. Fundamentally, security is the lack of crises or threats to human dignity as well as the presence of peace, safety, joy, and the preservation of human and physical resources; all of which support the growth and advancement of any human community. It can also refer to a condition of security, including the absence of worry, fear, danger, uncertainty, etc. In this research, the term Security will cover the seven dimensions of human security; which are: economic security, food security, health security, environmental security, personal security,

community security, and political security²⁴. In essence, security can be thought of as a tool with a monetary value that is fungible and negotiable. This can take many different forms, but it is simply a certificate proving ownership of a specific asset. It can be traded, or its ownership can be passed from one person to another, by virtue of its very existence.

Economic Security

Economic security is the capacity of a person to consistently meet their demands. The idea is crucial for both individuals and nations since it plays a role in determining national security and is linked to the idea of economic well-being. Determining economic security involves taking into account cultural norms. The capacity to regularly meet one's demands is referred to as economic security. It is linked to both the idea of economic prosperity and the idea of the contemporary welfare state, a body of government that pledges to offer fundamental assurances for the safety of its residents. The list of necessities for economic security is influenced by cultural values, therefore both the criteria for what constitutes economic security and the methods for calculating it have evolved over time. Economic security, according to the ICRC, is the capacity of individuals, families, or communities to meet their basic needs in a way that is both sustainable and respectable. This can change depending on a person's physical requirements, the surrounding environment, and current cultural norms.

Critical Infrastructure

A nation's security, economy, and the health and/or safety of the general population are all guaranteed by the body of systems, networks, and assets referred to as critical infrastructure. The infrastructure considered important can vary depending on a nation's demands, resources, and level of development, even though crucial infrastructure is comparable in all countries due to

²⁴<https://www.gdrc.org/sustdev/husec/z-categories.html>.

the necessities of life²⁵. The assets, systems, buildings, networks, and other components that society depends on to preserve public health and safety, economic viability, and national security are referred to as critical infrastructure. Additionally, key infrastructure is a system or asset that is necessary for delivering crucial economic and social functions, such as food, transportation, electricity, information systems, and financial services. Protecting a region's essential infrastructures, such as its food and agricultural systems or transportation systems, is known as critical infrastructure protection (CIP). It is the duty of every government in every country to safeguard this vital critical infrastructure from terrorist attacks, natural disasters, and, more recently, cyberthreats.

South-Western Bangladesh

The South-Western Bangladesh covers total two divisions namely Barisal Division and Khulna Division. Barisal Division has total six districts namely Barisal, Barguna, Bhola, Jhalokati, Pirojpur and Patuakhali. And Khulna Division has total ten districts namely Khulna, Bagherhat, Sathkhira, Jessore, Magura, Jhenaidah, Narail, Kushtia, Chuadanga and Meherpur. As a whole, the South-Western Bangladesh covers total sixteen districts²⁶. One of Bangladesh's eight administrative divisions is the Barisal Division. It is situated in the south-central region of the nation, covers 13,644.85 km² (5,268.31 sq mi), and had 9,100,102 residents as of the 2011 Census. Within the entirety of Bangladesh, it is the Division with the lowest population. Of Bangladesh's eight divisions, the Khulna Division is the second largest. The population was 17,416,645 according to the preliminary results of the 2022 Bangladesh census, covering an area of 22,285 km² (8,604 sq mi). Khulna City in the Khulna District serves as both its capital and largest city.

²⁵ <https://www.techtarget.com/whatis/definition/critical-infrastructure>.

²⁶ https://www.google.com/search?q=districts+of+khulna+division&rlz=1C1CHBF_enBD859BD863&sxsrf.

1.12 Chapter Outline

The research paper will comprise of total five chapters. Details of the chapter plan are given in the paragraphs below.

Chapter 1 is the introductory chapter; which covers the research proposal. This chapter includes research problem, literature review, objectives of research, significance of research, research questions, research methodology, conceptual framework, and limitations and assumptions of the research.

Chapter 2 shall deal with the Specific Objective 1. In this chapter, analysis will be done on the present state of critical infrastructure development and security of South-Western Bangladesh. Both primary and secondary data will be collected and analyzed here in order to achieve Specific Objective 1. Important findings will be summarized at the end of this chapter.

Chapter 3 shall deal with the Specific Objective 2. Here, examination will be done on the nexus between critical infrastructure development and state of security in South-Western Bangladesh. Necessary data will be collected from both primary and secondary sources, which will be analyzed here in order to achieve Specific Objective 2. Important findings will be summarized at the end of this chapter.

Chapter 4 shall deal with the Specific Objective 3. In this chapter, efforts will be made to determine ways of enhancing security in South-Western Bangladesh through critical infrastructure development. Necessary data will be collected from both primary and secondary sources, which will be analyzed here in order to achieve Specific Objective 3. Important findings will be summarized at the end of this chapter.

Chapter 5 shall contain the summary of the major findings and the recommendations by the researcher.

CHAPTER TWO

PRESENT STATE OF ECONOMIC SECURITY AND CRITICAL INFRASTRUCTURE IN SOUTH-WESTERN BANGLADESH

2.0 Introduction

Due to its crucial roles in the military, economy, and public sector, critical infrastructure is crucial in ensuring the national security of a state. The structural and individual security of the state is directly threatened by the destruction, damage, failure, or other removal of essential infrastructure's operational capacities. In order to achieve the stated objectives based on efficiency criteria, the research methods and techniques used in the research process itself primarily rely on critical analysis of legal acts, organizational and competence-related documents, subject-matter literature, synthesis, and inference. The critical infrastructure is viewed as a collection of systems that significantly affect the security of the state and, obviously, its citizens. It is also true that critical infrastructure encompasses a variety of seemingly varied facilities.

In this chapter, the present state of economic security and critical infrastructure in South-Western Bangladesh is discussed. The discussion is divided in two parts. The present state of economic security in South-Western Bangladesh is discussed in the first part. Thereafter, the present state of critical infrastructure in South-Western Bangladesh is discussed in the second part. The discussion is based on the data collected from both primary and secondary survey. Details of the discussion are portrayed in the subsequent paragraphs.

2.1 Present State of Economic Security in South-Western Bangladesh

Bangladesh aims to build on the economic advances it has made over the last decades to achieve sustainable growth and become an upper middle-income country now that it has passed the lower middle-income threshold. Bangladesh should therefore prioritize infrastructure, logistics, research and development, and industry diversification in order to maintain its

competitiveness in an evolving economic environment. To enhance the business climate, lower operating expenses, and broaden the nation's industrial base, policy reforms must be put into place. It will be essential for Bangladesh to start and maintain a higher growth trajectory to fully use the potential of the nation's varied regions and identify new sources of growth. Bangladesh thus needs a comprehensive development strategy, such as the establishment of economic corridors, to promote structural change and development that is evenly distributed across the region. Economic corridor development is a suitable integrative strategy for the nation because it has been shown to be a successful tool to promote industrial growth, create jobs, upgrade infrastructure, align infrastructure development with urban and social agglomerations, unify domestic markets, and connect production hubs with global value chains.

Economic security in South-Western Bangladesh is explained in terms of basic social security, defined by access to basic needs infrastructure pertaining to health, education, dwelling, information, and social protection, as well as work-related security. From that point of view, total seven components of economic security are portrayed in this report. While all seven dimensions are important, two are essential for basic security: income security and voice representation security²⁷. Here, basic security is discussed keeping in mind the aspects of limiting the impact of uncertainties and risks people face daily. Furthermore, it is also kept in mind so that people can be provided with a social environment in which they can belong to a range of communities, have a fair opportunity to pursue a chosen occupation and develop their capacities via decent work.

2.1.1 Income Security

²⁷ Davidson, Jamie S. *Indonesia's Changing Political Economy: Governing the Roads*. Cambridge: Cambridge University Press, 2015, p34-37.

Income security is defined in this context as having an acceptable amount of actual, perceived, and expected income, whether it comes from work or other sources like social security and other benefits. It includes the amount of income (both in absolute terms and in relation to needs), the assurance of receipt, and the anticipation of present and future income, both while employed and after retiring due to old age or incapacity²⁸. A minimum wage system, wage indexation, comprehensive social security, and progressive taxation are examples of traditional income security protection measures.

At present, the state of average income of the population of South-Western Bangladesh is moderate. Different respondents opined differently regarding the average income of the population. However, the difference of the opinions was not much. Government officials opined that the income of the service personnel is good. Respondents from business community expressed that, the people associated with various businesses have quite good income. This is because the business sector could not excel much due to the absence of the Padma Multipurpose Bridge²⁹. However, they also expressed that the situation is improving with progress of time, with the functioning of the bridge since June 2022.

During the KIIs, the researcher prodded the respondents further for details on the state of income security in South-Western Bangladesh. While doing so, the researcher reminded the KIIs regarding the state of income security in other parts of the country. This is because of the fact that, if they make their opinions keeping in mind the overall state of the country, the degree of reliability of the opinions will be more. In this regard, the response from KII A regarding the state of income security in South-Western Bangladesh is given below:

²⁸ ADB. Meeting Asia's Infrastructure Needs. Manila: Asian Development Bank, 2017 <https://www.adb.org/sites/default/files/publication/227496/special-report-nfrastructure.pdf>, p21-23.

²⁹ Bappenas (National Development Planning Agency). Rencana Pembangunan Jangka Menengah Nasional (RPJMN)2015–2019 National Medium-Term Development Plan (RPJMN) 2015–2019. Jakarta: Bappenas, 2014, p76-78.

In my opinion, the average earnings of the general people in South-Western Bangladesh are somewhat moderate. I'm talking about the state of income during the period when PMB was not in existence. Since it has become operational in the last week of June 2022, I perceive that the earnings of the people of South-Western Bangladesh will slowly and gradually increase with progress of time through proper utilization of the bridge. I believe that you are likely to get similar opinions from the business community and labour union too (KII A, 22nd September 2022).

2.1.2 Representation Security

Both individual and group representation are referred to as representation security in this research. Individual representation discusses both the individuals' access to institutions and their legal rights. Collective representation refers to the right of any person or group to have their interests represented by an organization that can negotiate on their behalf and is sufficiently large, autonomous, and skilled to do so³⁰. The traditional means of providing representation security have been independent trade unions with the freedom to monitor working conditions, strike, and engage in collective bargaining over salaries, benefits, and working conditions.

Respondents from government organizations informed that individual representations are quite good at present, but the state of collective representation needs improvement. Respondents from business community also opined almost the same. According to them, individual's rights are somewhat ensured by law, and they have moderate access to various institutions and organizations³¹. They also expressed that, collective representation has little difficulty at the moment; right of the group to be represented by a body is not much protected on ground. Not only that, groups are also not much competent and independent to do that.

2.1.3. Labour Market Security

³⁰ Brilianto, Herfan. "Addressing the Infrastructure Deficit in Indonesia and Beyond". East Asia Forum, 17 February 2014 <http://www.eastasiaforum.org/2014/02/17/addressing-the-infrastructure-deficit-in-indonesia-and-beyond/>, p55-58.

³¹ "Eminent Domain and Infrastructure under the Yudhoyono and Widodo Administrations". In *Land and Development in Indonesia: Searching for the People's Sovereignty*, edited by John McCarthy and Kathryn Robinson. Singapore: ISEAS – Yusof Ishak Institute, 2016, p71-74.

It is believed that when there are sufficient options for suitable income-earning activities, there is an increase in labor market security. It features a structural element, representing the variety and abundance of opportunities. It also has a cognitive component because it includes assumptions that opportunities are or will be sufficient³². Macroeconomic policies that prioritize full employment, the establishment of employment agencies, and other placement services have all been implemented with the goal of providing this type of security.

Study from the secondary sources reveals that the present state of labour market security is not up to the mark. This phenomenon is also substantiated by the primary survey. Both the surveys indicate that, presently there exists lack of opportunities for adequate income-generating activities. However, the survey indicates that the situation is improving with time. From the recent trend it is discovered that there is likelihood of increasing employment-oriented micro and macro-economic activities in South-Western Bangladesh³³. Therefore, it can be expected that in near future, employment related opportunities will increase and labour market security will be enhanced.

2.1.4. Employment Security

Here, employment security is viewed as a form of insurance against the loss of jobs that generate money. Employment security exists for wage and salary workers in companies and institutions where there is substantial protection against arbitrary or unfair dismissal and where workers can challenge unlawful dismissal. For independent contractors, it means insurance against an abrupt cessation of freelance employment or company failure³⁴. Protection against arbitrary termination, restrictions on recruiting and firing, and the imposing of fines on

³² DJPPR. "Indonesia PPP Day 2017". 2017 <http://www.djppr.kemenkeu.go.id/ppp>, p87-90.

³³ Gonschorek, Gerritt J. and Günther G. Schulze. "Continuity or Change? Indonesia's Intergovernmental Fiscal Transfer System under Jokowi". *Journal of Southeast Asian Economies* 35, no. 2 (August 2018): p143-64.

³⁴ Gustely, Edward. "How Do Foreign Investors Perceive Opportunities in Indonesian Infrastructure?". *Prakarsa: Journal of the Indonesia Infrastructure Initiative* 22 (October 2015): p6.

employers who break the law have historically been common ways to improve employment security.

At present, employment security in South-Western Bangladesh is quite good. However, the state of employment security needs improvement. Secondary sources and the respondents from government organizations indicate that, currently there is medium level of protection against loss of income-generating work. According to them, employees and workers except government service are often subject to unfair dismissal. However, the respondents from business community expressed that there is adequate protection against loss of income-generating work³⁵. According to them, the employees and workers have sufficient ground to redress against unfair dismissal. Whatever is the case, the state of employment security needs to be improved. It is expected that, due to the functioning of Padma Bridge, the employment security will be strengthened in near future.

During the KIIs, the researcher pushed the respondents further for details on the state of employment security in South-Western Bangladesh. While doing so, the researcher reminded the KIIs regarding the state of employment security in other parts of the country. This is because of the fact that, if they make their opinions keeping in mind the overall state of the country, the degree of reliability of the opinions will be more. In this regard, the response from KII B regarding the state of employment security in South-Western Bangladesh is given below:

From my observation since ling, the state of employment of the people of South-Western Bangladesh is of satisfactory standard. This is about the state of employment during the period when PMB was not in existence. Since it has become operational in the last week of June 2022, I perceive that the state of employment of the people of South-Western Bangladesh will slowly and gradually increase with progress of time through proper utilization of the bridge. To my understanding, you are likely to get similar views from the government officials and business community too (KII B, 23rd September 2022).

³⁵ Hamilton-Hart, Natasha and Günther G. Schulze. "Taxing Times in Indonesia: The Challenge of Restoring Competitiveness and the Search for Fiscal Space". *Bulletin of Indonesian Economic Studies* 52, no. 3 (2016): p265–95.

2.1.5. Job Security

According to this study, job security refers to the existence of occupational niches inside companies and across labor markets that give employees some say over the details of their jobs and the chance to advance their careers. While job security refers to a worker's capacity to follow a career in line with his or her interests, training, and abilities, employment security refers to the possibility of a worker continuing to work for an organization³⁶. Barriers to skill dilution such as trade unions, work requirements, restrictive practices, and craft borders have been used as protection mechanisms.

At present, there exists moderate level of job security in various organizations and across labour markets. According to the respondents from the labour and workers union, the workers have less control over the content of a job and the opportunity to build a career. Respondents from government organizations also opined the same. They also expressed that the workers have less opportunity to pursue a preferred line of work in conjunction with his or her interests, training and skills³⁷. However, the respondents from business community stated that the employees and workers have quite good job security at present. It is to be mentioned that, information from secondary sources substantiates the statements of the respondents from workers unions and government organizations.

2.1.6. Work Security

Work security in this report refers to safe working environments that support employees' wellbeing in South-Western Bangladesh. The traditional "workplace health and safety"

³⁶ Heath, Jared. "Infrastructure in Indonesia: Building the Framework for Effective PPPs". 19 November 2013 <http://www.corrs.com.au/thinking/insights/infrastructure-in-indonesia-building-the-framework-for-effective-ppps/>, p44-49.

³⁷ KPIP. "Perkembangan Pembangunan Infrastruktur di Indonesia". 2018 <https://kpip.go.id/tentang-kpip/perkembangan-pembangunan-infrastruktur-di-indonesia/>, p90-91.

requirements that protect workers from occupational diseases, accidents, and risks are crucial here. Workplace security, however, extends beyond this to address the contemporary ills of stress, overwork, absenteeism, and harassment³⁸. Protection measures for workplace security include, among many other things, insurance and protection for workplace accidents and illnesses.

According to the respondents from workers and labour unions, the present state of work security needs improvement. They expressed that the working conditions in various organizations need to be safer and the workers' well-being need to be more taken care of. The government officials from different organizations also opined that, in the private organizations, the provision of shielding workers from occupational hazards, injuries and diseases are not up to the mark³⁹. They added that the aspects of overwork and harassment are also existed, mostly in the private organizations. However, the respondents from business community stated that the workers and employees have adequate work security including provisions and insurance against accidents, illness at work, and limits on working time amongst many others.

2.1.7. Skill Reproduction Security

Here, the term "skill reproduction security" refers to workers' access to both basic education and occupational training to build skills and obtain the credentials required for occupations with high social and economic value⁴⁰. Policies to create widespread opportunities to acquire and keep skills through education, apprenticeships, and employment training are ways to support the security of skill reproduction.

³⁸ Lee, John. "Indonesia's Road Infrastructure: Accelerating the Private Sector Contribution". Prakarsa: Journal of the Indonesia Infrastructure Initiative 22 (October 2015): p22–27.

³⁹ Morris, Nicholas and Irene Tsjin. "How to Solve Indonesia's Infrastructure Crisis". East Asia Forum, 10 June 2015 <http://www.eastasiaforum.org/2015/06/10/how-to-solve-indonesias-infrastructure-crisis/>, p22-29.

⁴⁰ Negara, Siwage Dharma. "Indonesia's Infrastructure Development under the Jokowi Administration". In Southeast Asian Affairs 2016, edited by Malcolm Cook and Daljit Singh. Singapore: ISEAS – Yusof Ishak Institute, 2016, p11-16.

Research findings from the secondary sources indicate that, the state of skill reproduction security in South-Western Bangladesh is of moderate standard. This phenomenon is duly substantiated by the primary survey. According to the respondents from workers and labour union, there exists inadequate opportunities for apprenticeships, training and education in order to gain and improve knowledge and competencies. The respondents from business community also opined the same. According to them, there is less access to basic education as well as vocational training, in order to develop people's capacities and acquire the qualifications required to have an economically and socially valuable profession⁴¹. However, the respondents from government officials expressed that the present state of skill reproduction security is somewhat satisfactory. According to them, people have quite good level of ownership and control over the property rights in competencies leading to skill reproduction security.

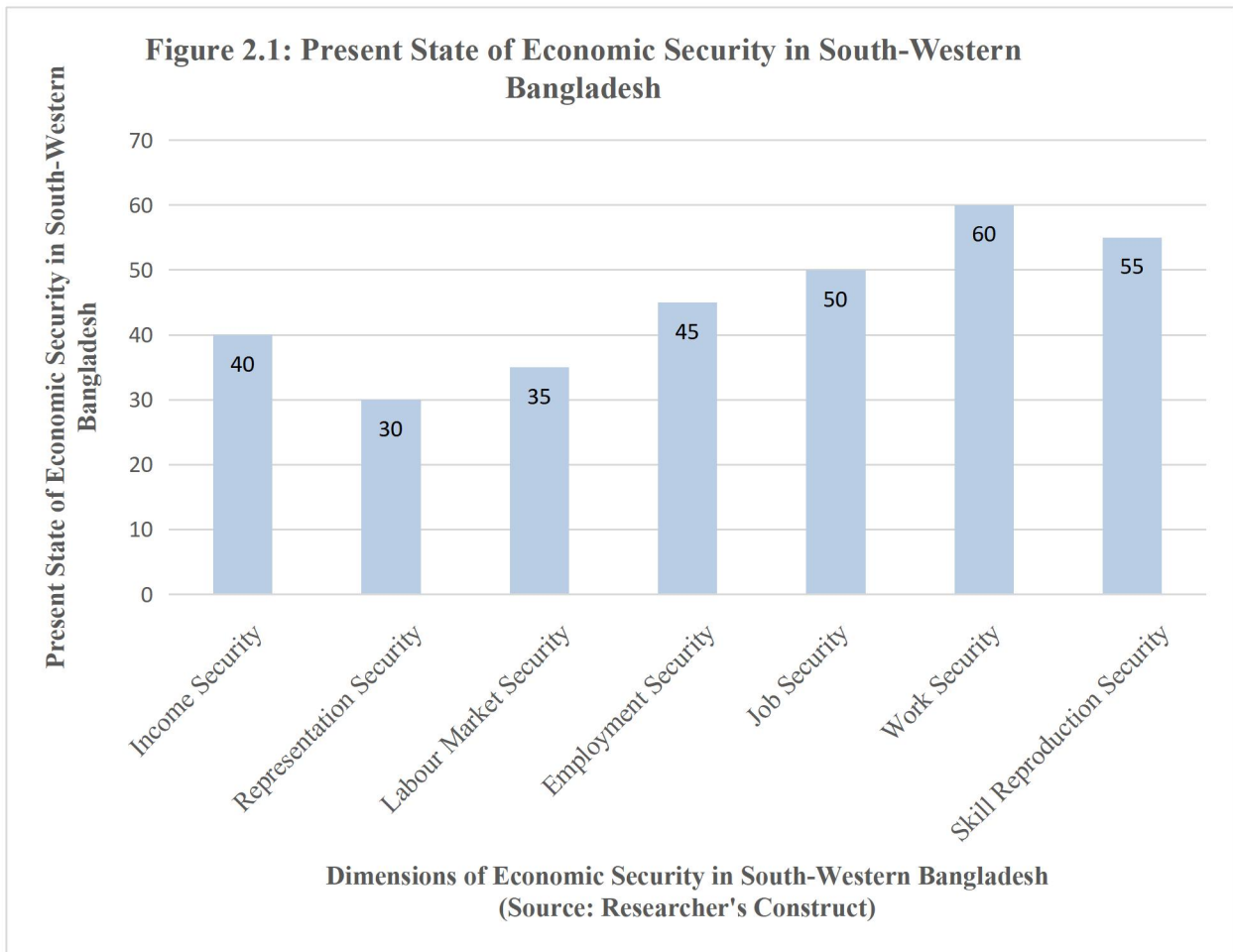
The researcher pressed hard during the KIIs, to provide further details on the state of skill reproduction security in South-Western Bangladesh. While doing so, the researcher reminded the KIIs regarding the state of skill reproduction security in other parts of the country. This is because of the fact that, if they make their opinions keeping in mind the overall state of the country, the degree of reliability of the opinions will be more. In this regard, the response from KII C regarding the state of skill reproduction security in South-Western Bangladesh is given below:

To my understanding, at present, there exists insufficient opportunities for the workers' access to both basic education and occupational training to build skills and obtain the credentials required for occupations with high social and economic value. Appropriate authority needs to formulate required policies in order to create widespread opportunities to acquire and keep skills through education, apprenticeships, and employment training to better support the security of skill reproduction. However, I am hopeful that through proper utilization of PMB the skill reproduction security in South-Western Bangladesh will increase in near future (KII C, 26th September 2022).

⁴¹ OECD. "Private Financing and Government Support to Promote Long-Term Investment in Infrastructure". 2014. "Investment: Upgrading Indonesia Infrastructure". Indonesia Policy Brief, March 2015, p34-35.

2.1.8 Graphical Representation of Present State of Economic Security in South-Western Bangladesh

Endeavour is made to show the present state of economic security in South-Western Bangladesh through the use of a bar chart in Figure 3. Present state of total seven dimensions of economic as discussed above, are shown separately in terms of percentage. As a reference, the highest state of economic security of a developed country like Canada is assumed to be one hundred percent. In Figure 3, the above-mentioned seven dimensions of economic security are shown along X-Axis, and the present state of these seven dimensions of economic security is shown along Y-Axis in terms of percentage.



Survey shows that, the present state of these seven dimensions of security varies from 30% to 60%. However, the average of these seven dimensions is found to be 45%. From these findings, the researcher considers that the average state of present economic security in South-Western Bangladesh to be 45%.

2.1.9 Researcher's Comment on Present State of Economic Security in South-Western Bangladesh

According to the researcher, the present state of economic security in South-Western Bangladesh is not up to the reasonable standard. There are many valid reasons behind this. Firstly, this region is separated from the Capital City Dhaka by two major rivers namely Padma and Meghna. It used to take long time to move from the capital to South-Western Bangladesh through the river route. Before PMB, there has been one bridge named JMB through which the road connectivity was operational between the capital and South-Western Bangladesh. However, moving through this used to take more time, since the road was very long. As a result, JMB did not actually pay much to the enhancement of economic development in South-Western Bangladesh.

Second, industrialization did not flourish much in South-Western Bangladesh due to difficulty in communication. Movement of men, equipment, raw materials and finished products to and from South-Western Bangladesh used to take long time. Feasibility analysis did not support booming of industrialization in this region. Third, the state of employment other than the government one, was also not encouraging because of all these difficulties. Fourth, the state of job and skill reproduction security was also not good due to the similar reasons. Furthermore, the overall development also did not take place to that extent in this region because of the same

reason. As a whole, the overall present economic security is of moderate standard in South-Western Bangladesh.

2.2 Present State of Critical Infrastructure in South-Western Bangladesh

At present, the number of critical infrastructures in South-Western Bangladesh is quite less in comparison to the other parts of the country. This state is mainly collected from the secondary sources. However, it is also duly substantiated by the primary survey. While mentioning this state, the infrastructures connecting the capital with South-Western Bangladesh are also included. Among the present critical infrastructures in South-Western Bangladesh, the important ones are Jamuna Multipurpose Bridge, Padma Multipurpose Bridge, Paira Deep Sea Port, Barishal Airport, and Dopdopia Bridge⁴². Padma Multipurpose Bridge is included in the list since it has already become functional. Details of the present state of infrastructure in South-Western Bangladesh are given in the subsequent paragraphs.

2.2.1 Jamuna Multipurpose Bridge

This is one of the important critical infrastructures in the South-Western Bangladesh. This bridge is functional since June 1998. However, this bridge is included in the list of present critical infrastructure as a connecting hub between the capital and the South-Western Bangladesh. It plays a vital role in connecting the South-Western Bangladesh with the capital. The only difficulty associated with this is that it is not situated on the straight line connecting the South-Western Bangladesh and the capital⁴³. That is why the vehicles need to take a long detour while moving to and from the capital. Whatever is the case, this bridge used to play a vital role in the

⁴² PLN. "Power Supply Business Plan (RUPTL) PT PLN (Persero) 2012–2021". 2013 <http://energy-indonesia.com/02_electricity_law/0130213RUPTL.pdf> (accessed 2 March 2018), p77-79.

⁴³"Power Supply Business Plan (RUPTL) PT PLN (Persero) 2016–2025". 2016. <<http://www.djk.esdm.go.id/pdf/RUPTL/RUPTL%20PLN%202016-2025.pdf>> (accessed 2 March 2018), p87-89.

overall economic security structure of the South-Western Bangladesh before the Padma Multipurpose Bridge.

During the KIIs, the researcher pushed the respondents hard to provide more details on JMB, especially its impact on the economic security in South-Western Bangladesh. While doing so, the researcher reminded the KIIs regarding its contribution on the other parts of the country too. This is because of the fact that, if they make their opinions keeping in mind the overall state of the country, the degree of reliability of the opinions will be more. In this regard, the response from KII D regarding the impact of JMB on the economic security in South-Western Bangladesh is given below:

What I am experienced regarding the contribution of the JMB is that, due to availability of both road and rail facilities in JMB, it provides sufficient scope to transport goods and raw materials easily from the Capital and northern parts of the country to South-Western Bangladesh. However, since the route has comparatively more distance, the cost becomes relatively more; for which the overall impact on the economy of South-Western Bangladesh is not much. However, I am optimistic that through proper utilization of the latest bridge PMB, the overall impact on the economy of South-Western Bangladesh will be much more in the days ahead. I am also hopeful that, you are likely to receive similar responses from the government officials and the business committee (KII D, 27th September 2022).

2.2.2 Paira Deep Sea Port

The Paira Deep Sea Port is another important critical infrastructure in the South-Western Bangladesh. Here, it is to be mentioned that, the construction work of the Paira Port is ongoing, and it is not yet operational. However, from the secondary sources it is learnt that, when this port will be functional, it will play a vital role in the overall economic security of the South-Western Bangladesh⁴⁴. Not only that, respondents from the business community and the government agencies also opined that this port is going to be one of the vital economic hubs in the country.

⁴⁴ Ray, David, and Lili Yan Ing. "Addressing Indonesia's Infrastructure Deficit". *Bulletin of Indonesian Economic Studies* 52, no. 1 (2016): p1–25.

Both the secondary sources and the respondents substantiated that the Paira Port is likely to be functional by June 2023.

2.2.3 Padma Multipurpose Bridge

Padma Multipurpose Bridge is the most important critical infrastructure in the South-Western Bangladesh. This statement is substantiated by both the secondary sources and the respondents from all researched disciplines. This bridge has become operational since 26 June 2022. The bridge has both road and rail communication networks⁴⁵. With progress of time, the degree of movement of goods and services through this bridge is increasing substantially to and from the capital. People in the South-Western Bangladesh are seeing a light of hope through this bridge.

The researcher pressed the respondents hard during the KIIs, to provide more details on PMB, especially its likely impact on the economic security in South-Western Bangladesh. While doing so, the researcher reminded the KIIs regarding its likely contribution on the other parts of the country too. This is because of the fact that, if they make their opinions keeping in mind the overall state of the country, the grade of reliability of the opinions will be more. In this regard, the response from KII E regarding the potential impact of PMB on the economic security in South-Western Bangladesh is given below:

So far my knowledge goes, construction of PMB is one of the best steps taken by GOB in the recent days. I'm optimistic that PMB will be able to contribute much towards enhancement of economic security of South-Western Bangladesh. Only thing is that, all concerned need to ensure proper utilization of the bridge. Since it has both road and railway facilities, it will be able to ensure quick transportation of men, goods and raw materials to and from South-Western Bangladesh and beyond. As one of the most critical infrastructures in Bangladesh, PMB will be able to continue providing a lot of support to the uplifting of economic security of South-Western Bangladesh. Not only that, I am also

⁴⁵ Sandee, Henry. "Improving Connectivity in Indonesia: The Challenges of Better Infrastructure, Better Regulations, and Better Coordination". *Asian Economic Policy Review* 11 (2016): p222–38.

hopeful that, you will get similar response from the business community, transport authority and labour union in this region (KII E, 27th September 2022).

2.2.4 Barishal Airport

Barishal Airport is a domestic airport in South-Western Bangladesh. Many airlines operating in Bangladesh fly daily to and from Barishal Airport. Various airlines connect Barishal Airport with Capital City Dhaka, and other important cities like Chattogram, Rajshahi, and Khulna. Presence of Barishal Airport has made the communication between South-Western Bangladesh and Capital City Dhaka and other important cities very easy and faster. Different business and official affairs have become much easier and faster⁴⁶. However, transportation of heavy items and equipment is not possible through this airport. Whatever is the case, Barishal Airport is a critical infrastructure in South-Western Bangladesh and it can play a significant role in the overall development of the region.

2.2.5 Dopdopia Bridge

Dopdopia Bridge is situated near Barishal town over Kirtonkhola River. This is a two-way metaled road bridge, which connects Barishal with few other districts of South-Western Bangladesh like Bhola, Patuakhali and Barguna. The bridge is operational since December 2010, which has facilitated standard of living of the population of the above mentioned three districts. It has facilitated transportation of people, goods, and services within Barishal Division area at a much faster speed than before⁴⁷. Agricultural and commercial products and raw materials can be transported within short time from Bhola, Patuakhali and Barguna Districts to the Divisional Headquarters and beyond. As a whole, it can be said that, Dopdopia Bridge plays a significant role in the economic security of South-Western Bangladesh.

⁴⁶ SMI. "PT Sarana Multi Infrastructure (Persero): Company Profile". 2017 <<https://www.ptsmi.co.id/wp-content/uploads/2017/09/Company-Profile-PT-SMI-July-2017-EN.pdf>> (accessed 2 March 2018), p44-45.

⁴⁷ U.S. General Accounting Office, Critical Infrastructure Protection: Federal Efforts Require a More Coordinated and Comprehensive Approach for Protecting Information Systems, GAO 02-474 (Washington D.C.: GAO): p1-84.

2.2.6 Port of Barisal

In terms of passenger traffic, the Port of Barisal, sometimes referred to as Barisal River Port, is Bangladesh's second-largest and busiest river port after Dhaka. It is situated in the Barisal city on the banks of the Kirtankhola river. Daily services are run by the port between Dhaka and Barisal and the majority of the southern districts of the nation, including Chandpur, Narayanganj, Bhola, Laxmipur, Pirojpur, and Barguna. Additionally, it runs interdistrict routes in and out of Barisal. An essential hub of Bangladesh's waterway-based transportation system, the port of Barisal connects several regions of the country⁴⁸. It is also regarded as a transit location between the Indian states of West Bengal and Assam and Tripura, as well as between the marine ports of Mongla and Chittagong, Khulna and Dhaka, and other river ports in Bangladesh.

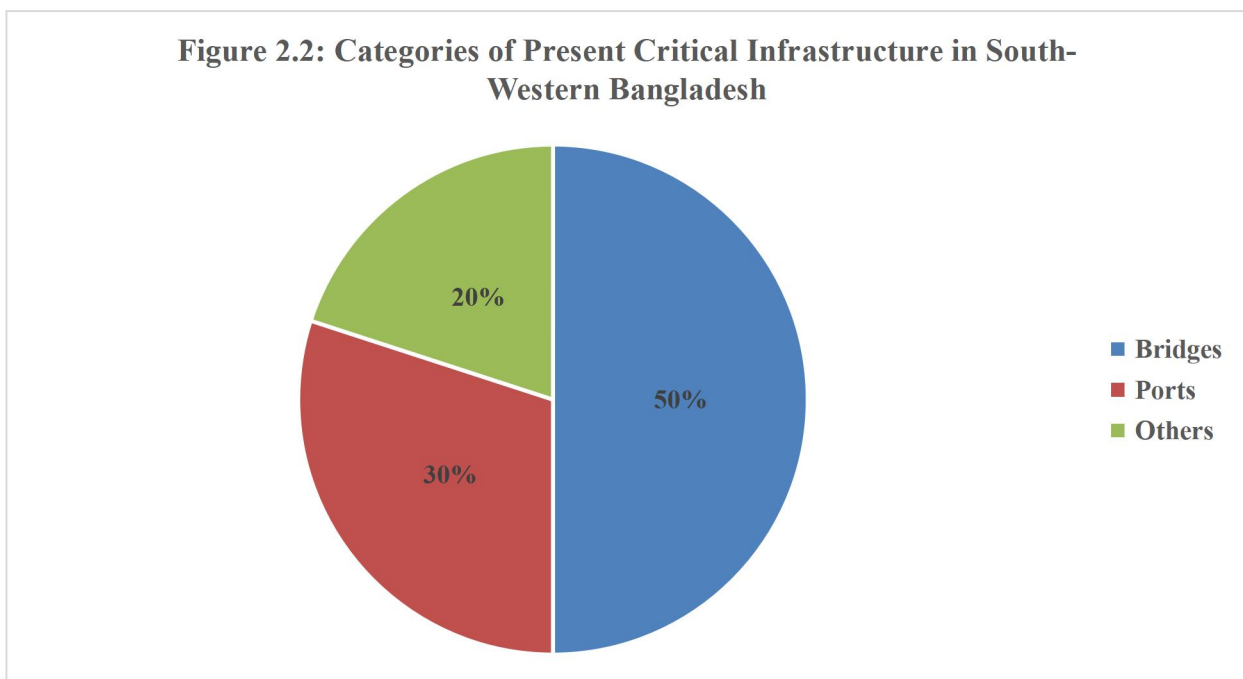
During the KIIs, the researcher pushed the respondents hard to provide additional details on the Port of Barisal, especially its impact on the economic security in South-Western Bangladesh. While doing so, the researcher reminded the KIIs regarding its likely contribution on the other parts of the country too. This is because of the fact that, if they make their opinions keeping in mind the overall state of the country, the rating of reliability of the opinions will be more. In this regard, the response from KII F regarding the present impact of the Port of Barisal on the economic security in South-Western Bangladesh is given below:

The Port of Barisal is one of the significant contributors to the economy of South-Western Bangladesh. Since it is a river port, it cannot allow big ships to come to the port due to the fact that the river is not very deep. However, most of the domestic ships and vessels can operate easily in the port area. People, raw materials and goods can be transported at a larger scale to and from South-Western Bangladesh through this port. However, the time taken for transportation is considerably more due to river route. Whatever is the case, the Port of Barisal is one of the major contributors to the economic development of South-Western Bangladesh. I am also confident that, you will get similar comeback from the business community and transport authority in this region (KII F, 28th September 2022).

⁴⁸ Department of Homeland Security, "Critical Infrastructure Sector Partnerships," DHS.gov, p88-91.

2.2.7 Graphical Representation of Present State of Critical Infrastructure in South-Western Bangladesh

From the primary and secondary survey, it is discovered that, at present, there are various types of critical infrastructure in South-Western Bangladesh. All these critical infrastructures do not bear equal importance. Some of these have strategic importance, while some others have comparatively less importance. However, all these critical infrastructures have significant influence of the economic affairs of South-Western Bangladesh. From the findings of the research, the present critical infrastructures in South-Western Bangladesh are divided into three sub-categories. These categories are bridges, ports and others.



After analyzing the data, the average categories of critical infrastructures in South-Western Bangladesh indicate that, different types of bridges consist of 50%, ports consist of 30% and other categories consist of 20%. The pie chart in Figure 4 shows various categories of present critical infrastructures in South-Western Bangladesh.

2.2.8 Researcher's Comment on Present State of Critical Infrastructure in South-Western Bangladesh

The researcher has identified a number of critical infrastructures in South-Western Bangladesh. Among the existing infrastructures in South-Western Bangladesh, the important ones are JMB, Barisal River Port, Barisal Airpot, Paira Port, Dopdopia Bridge and JMB. It is to be mentioned that, Paira Port is yet to be functional. Its construction works are going on at a high speed, and it is likely to be operational by 2024. These critical infrastructures, if can be utilized properly, can play a significant role in the enhancement of the economic prosperity of South-Western Bangladesh. It is also to be mentioned that, PMB has become operational just before few days, on 26 June 2022. With the operationalization of PBM, it has topped the list of the existing infrastructures in South-Western Bangladesh.

It is expected by the researcher that, PMB would be able to have a significant positive impact on the economic development of South-Western Bangladesh with progress of time. This bridge is a vital strategic infrastructure, which is exceptionally significant not only for South-Western Bangladesh, rather for the whole country. It's location, architectural design and capacity can have strategic positive implications for the whole country. It is also expected that in near future the number of critical infrastructures will be more in the region.

2.3 Summary of the Chapter Key Findings

From the above discussion and analysis, it is revealed that, the present state of economic security in South-Western Bangladesh is of moderate standard. This finding is reached from the point of basic social security, defined by access to basic needs infrastructure pertaining to health, education, dwelling, information, and social protection, as well as work-related security. Analyses on various aspects of economic security like income security, representation security,

labour market security, employment security, job security, work security, and skill reproduction security have substantiated this finding. This result is the outcome of both primary and secondary survey. Again, the state of critical infrastructure in South-Western Bangladesh is also of reasonable standard. Present critical infrastructures include Jamuna Multipurpose Bridge, Padma Multipurpose Bridge, Paira Deep Sea Port, Barishal Airport, Dopdopia Bridge, and Barishal River Port. At present, these critical infrastructures play a significant role in the economic security of South-Western Bangladesh.

CHAPTER THREE

NEXUS BETWEEN CRITICAL INFRASTRUCTURE DEVELOPMENT AND STATE OF ECONOMIC SECURITY IN SOUTH-WESTERN BANGLADESH

3.0 Introduction

Many studies are conducted and studied on the association between investing in crucial infrastructure and the resultant influence on national economies in order to acquire a greater understanding of this relationship. The shared story will be strengthened and aid in the development of a greater understanding of how other nations approach this interdependence through research and analysis. In order to further inform and progress ongoing research and discussion on this important problem for critical infrastructure security and resilience, commonalities in method, concept, and implementation can be found. Any literature that already exists should be taken into account as it contributes to the creation of this shared knowledge. For this story, it was not always clear from the study how crucial infrastructure contributes to national success. Although there is no current work quantitatively examining this, the

correlations through a variety of lenses recognizing the ties between infrastructure investment and economic growth and prosperity can be investigated further for improved understanding and comprehension.

In this chapter, the nexus between critical infrastructure development and state of economic security in South-Western Bangladesh is discussed. From the research, a deep relationship is identified between the development of critical infrastructure and state of economic security. It is not only in case of South-Western Bangladesh, rather applicable this connection is applicable everywhere. This nexus is found valid in the international, regional and national level. This connectivity is established both from the secondary and primary sources. It is revealed that, critical infrastructure development has direct bearing on business sector, agriculture sector, food sector, service sector, transport sector, development sector, domestic investment sector, communication sector, functioning of government machineries, and foreign direct investment⁴⁹. The discussion is based on the data collected from both primary and secondary survey. Details of the discussion are portrayed in the subsequent paragraphs.

3.1 Nexus between Critical Infrastructure and Economic Security in South-Western Bangladesh

3.1.1 Impact on Business Sector

It is revealed from the research that, the development of critical infrastructure has substantial impact on the business sector. This phenomenon is the outcome of both the primary and secondary survey. Though, different respondents expressed differently, all of them are convergent in one aspect. That is, if the state of critical infrastructure is good in a particular area,

⁴⁹ The White House, “Presidential Policy Directive – Critical Infrastructure Security Resilience,” Presidential Memoranda PPD–21 (Washington D.C.: The White House, February 12, 2013).

the business sector flourish faster⁵⁰. Policy makers from the Ministry of Infrastructure and Communication both at the central and South-Western Bangladesh level opined that the critical infrastructure contributes positively towards development of the business sector. Similar response was received from the traders' organization and the transport committee. Therefore, it is found that the development of critical infrastructure has a direct positive relationship with development of the business sector in South-Western Bangladesh.

The researcher pushed the respondents hard during the KIIs, to provide further details on the impact of critical infrastructure on the business sector. While doing so, the researcher reminded the KIIs to especially highlight the nexus between the critical infrastructure and the business sector in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the nexus between critical infrastructure and business sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII G regarding the nexus between critical infrastructure and business sector in South-Western Bangladesh is given below:

What I find is, there is a great relationship between the critical infrastructure and the business sector all over the world. This fact is true starting from United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people and goods also increase to manifold. All these aspects are directly or indirectly related to the booming of the business sector. I am also confident that, you will get similar response from the government officials and transport authority in this region (KII G, 29th September 2022).

3.1.2 Impact on Agriculture Sector

⁵⁰ American Society of Civil Engineer, "Report Card for America's Infrastructure," ASCE, 2013.

From the research it is discovered that the development of critical infrastructure has a direct bearing on the development of agriculture sector. This relationship was found very strong especially in the South-Western Bangladesh. This is because the economy of the South-Western Bangladesh is more dependent on agriculture. Study from the secondary sources reveals that the people of that area consider agriculture as the major source of livelihood⁵¹. The open and fertile landscape also supports their such perception. This finding is duly substantiated through the primary survey.

Policy makers from the Ministry of Agriculture both at the central and regional level also expressed that the economy of South-Western Bangladesh is heavily dependent on agriculture. According to them, people of that area are highly committed on the agriculture sector; and only thing they need more is necessary support including infrastructure development. Respondents from the traders' organization also opined the same. Critical infrastructure development can help the farmers to get the required support quickly and timely, both during production and harvest⁵². As a result, the production cost can be minimized and the farmers can get better price through effective delivery of the products.

3.1.3 Impact on Food Sector

Research also shows that the food sector is equally heavily connected to the development of the critical infrastructure. The organizations and companies associated with the food sector can be efficient in handling the raw materials required for production of food items. Not only that, they can also supply the food products timely to the capital City Dhaka and beyond. This

⁵¹ Sauter, Mark A. and Carafano, James J., *Homeland Security: A Complete Guide* (New York: McGraw Hill, 2012), 403–427).

⁵² Department of Homeland Security, "Dams Sector: Sector Overview," DHS.gov, 2013.

helps the organizations and companies to get the right economic benefits⁵³. Furthermore, they can also bring the required food products from the other parts of the country. As a whole, the food sector becomes more and more vibrant, effective and efficient with the development of critical infrastructure.

This finding is the outcome of both secondary and primary survey. Policy makers from the Food and Agriculture both at the central and regional level conveyed that the food sector in South-Western Bangladesh is deeply dependent on the critical infrastructure development. According to them, the entrepreneurs in this sector can be more attracted with progress of the development of critical infrastructure in South-Western Bangladesh⁵⁴. Respondents from the traders' organization also opined the same. Therefore, it can be said that, critical infrastructure has direct positive impact on the blooming and expansion of the food sector in South-Western Bangladesh.

During the KIIs, the researcher pushed the respondents hard to provide additional details on the impact of critical infrastructure on the food sector. While doing so, the researcher reminded the KIIs to especially highlight the nexus between the critical infrastructure and the food sector in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the nexus between critical infrastructure and food sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII H regarding the nexus between critical infrastructure and food sector in South-Western Bangladesh is given below:

⁵³ 16 Department of Homeland Security, Dams Sector-Specific Plan: An Annex to the National Infrastructure Protection Plan, (Washington, D.C.: DHS, 2010): preface.

⁵⁴ 18 American Society of Civil Engineers, "Report Card for America's Infrastructure: Dams," ASCE, ASCE.org, March, 2013: 14–16.

So far my knowledge goes, there is a positive connection between the critical infrastructure and the food sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people and goods also increase to manifold. All these aspects are directly or indirectly related to the booming of the food sector. I am also hopeful that, you are likely to get same kind of response from the transport authority and the business community in this region (KII H, 30th September 2022).

3.1.4 Impact on the Service Sector

Service Sector in South-Western Bangladesh is equally dependent on the development of critical infrastructure. Both the primary and secondary survey substantiated this phenomenon. According to the respondents from the ministries and traders' organizations, the service sector constitutes one of the major economic parts in the South-Western Bangladesh⁵⁵. They opined that dimensions of the service sector including service maintenance, repairs, training, and consulting among many others are heavily connected to the infrastructure development.

The more is the development in the field of infrastructure, the more it becomes easy for the service provider organizations to excel in the service sector. Again, the service fields like education, hospitality, information technology, media, and entertainment in South-Western Bangladesh can excel rapidly with the development of critical infrastructure like important bridge, airport, seaport, and facilities like that. This finding is also duly substantiated through the secondary survey.

3.1.5 Impact on Transportation Sector

Critical infrastructure has much role to play in the transportation sector. Critical infrastructures like bridges, seaport, and airport help larger, quick, efficient, and timely transportation of various goods and materials from different parts of the country to the South-

⁵⁵ E. Witt, "National Weather Service Weather Forecast Office," NOAA.gov, November 30, 2014, p33-36.

Western Bangladesh. Not only that, South-Western Bangladesh can also be much benefited from the deep-sea port named Paira Port, which is under construction, and likely to be operational in near future⁵⁶. Policy makers from the Ministry of Infrastructure and Communication expressed that the strategic bridges like Padma Multipurpose Bridge, and Jamuna Multipurpose Bridge would contribute much towards furthering the communication facilities for the population of South-Western Bangladesh.

Respondents from the Transport Owners Committee, and Department of Trade also opined that the development of critical infrastructure would play a significant role in the economic security of South-Western Bangladesh by efficient and timely transportation of various goods and services⁵⁷. These findings are also duly substantiated from the available secondary sources. Therefore, it can be said that, critical infrastructure has much to contribute to the transport sector in South-Western Bangladesh.

The researcher pressed the respondents hard during the KIIs, to provide further details on the impact of critical infrastructure on the transportation sector. While doing so, the researcher reminded the KIIs to especially highlight the nexus between the critical infrastructure and the transportation sector in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the nexus between critical infrastructure and transportation sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII I regarding the nexus between critical infrastructure and the transportation sector in South-Western Bangladesh is given below:

⁵⁶ American Society of Civil Engineers, "Report Card for America's Infrastructure: Dams," p12-15.

⁵⁷ Kristina Costa and Donna Cooper, "The 10 States Most Threatened by High-Hazard, Deficient Dams," Center for American Progress, March 14, 2006, p98-100.

From my knowledge and experience, I found there is a direct link between the critical infrastructure and the transportation sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials also increase to manifold. All these aspects are directly or indirectly related to the flourishing of the transportation sector. I am also confident that, you are likely to get similar kind of comeback from the government officials and the business community in this region (KII I, 25th September 2022).

3.1.6 Impact on Development Sector

Research shows that critical infrastructure has significant positive implication on the development sector in South-Western Bangladesh. Secondary sources revealed that critical infrastructure development has direct positive bearing on the economic well-being and quality of life of an area or region. Secondary survey indicates that this phenomenon is applicable at the international, regional, and national level; so is the case for South-Western Bangladesh⁵⁸. This finding is rightly substantiated through the primary survey. Policy makers from the Ministry of Infrastructure and Communication opined that uprising of critical infrastructure can have significant positive impact on the development sector as a whole in the South-Western Bangladesh.

Policy makers at the regional level also opined the same. Not only that, the Chairmen of the Traders Organization and the Transport Business Committee also expressed that development of the critical infrastructure has direct connectivity with the development sector of South-Western region. While expressing their views, they talked about the important

⁵⁸ American Society of Civil Engineers, "Report Card for America's Infrastructure: Dams," p14-16.

significance of the critical infrastructures like Padma Multipurpose Bridge, Jamuna Multipurpose Bridge, Paira Deep Seaport, and the two airports in South-Western Bangladesh⁵⁹.

3.1.7 Impact on Domestic Investment Sector

From the survey it is discovered that the domestic investors are attracted to the area or region where there is presence of critical infrastructures like bridges, seaports, airports and many others. This finding is applicable in the international, regional, and national level. Secondary sources reveal that the domestic investors are attracted to invest in the area having critical infrastructures within⁶⁰. This is because of the reason that, the presence of the critical infrastructure calls for more of security from the government side. For that, the domestic investors feel more secured to make their investments.

This finding is duly substantiated through the primary survey. The policy makers from the central and regional governmental organizations also expressed that the presence of critical infrastructures attracts the domestic investors, since they feel more secure. Not only that, the respondents from the traders' organizations also opined similar to that of the government officials. As a whole, it can be said that, presence of critical infrastructure has direct positive relationship with the degree of domestic investment, leading to the overall improvement and development of any area or region⁶¹.

During the KIIs, the researcher pushed the respondents hard to provide additional details on the impact of critical infrastructure on the domestic investment sector. While doing so, the researcher reminded the KIIs to especially highlight the nexus between the critical infrastructure and the domestic investment sector in South-Western Bangladesh. Not only that, the researcher

⁵⁹ DOWL HKM, "Big Hole River Diversion Dam and Pump Station Replacement," DOWL.com, 2014, p44-48.

⁶⁰ Department of Homeland Security, Water and Wastewater Systems Sector: Sector Overview, DHS.gov, June 12, 2013.

⁶¹ Department of Homeland Security, Water Sector-Specific Plan: An Annex to the National Infrastructure Protection Plan (Washington, D.C.: Department of Homeland Security, 2010).

also reminded the KIIs to keep in mind the nexus between critical infrastructure and domestic investment sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII J regarding the nexus between critical infrastructure and domestic investment sector in South-Western Bangladesh is given below:

So far my knowledge goes, there is a constructive connection between the critical infrastructure and the domestic investment sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the increased security in the area, the domestic investors feel more secure to invest in that area. All these aspects are directly or indirectly related to the booming of the domestic investment sector. I am also hopeful that, you are likely to get same kind of response from the transport authority and the business community in this region (KII J, 26th September 2022).

3.1.8 Impact on Communication Sector

Research reveals that development of critical infrastructure has direct positive relationship with the development of the communication sector. Survey through secondary sources indicates that uprising of critical infrastructure in an area can directly or indirectly enhance the communication services like social media companies, internet search firms, video game makers, telecommunication provider, and streaming media⁶². This finding is true for international, regional, and national level; same is the case for South-Western Bangladesh. Primary survey also substantiates this result.

Policy makers from the Ministry of Infrastructure and Communication expressed that the development of critical infrastructure has positive impact on the diversified telecommunication

⁶² American Society of Civil Engineers, "Report card for America's infrastructure: Drinking Water D," ASCE, March, 2013: 17–19.

services, entertainment, interactive media, and wireless telecommunication services among many others. Not only that, the respondents from the department of trade, both national and regional level, also have direct or indirect bearing on voice, mobile, broadband, cable, streaming media, retail, colocation, cloud, content delivery network, edge computing, proximity, network security, and internet of things⁶³. All these can contribute very positively towards the economic development of South-Western Bangladesh.

3.1.9 Impact on Functioning of Government Machineries

Critical infrastructure development has much influence on the functioning of the government machineries. When there are critical infrastructures in an area or region, government has special attention on that area. Presence of critical infrastructures in South-Western Bangladesh has ensured more attention and involvement of the government. Secondary survey reveals that due to the presence of critical infrastructures, the allocation of functions and responsibilities between departments and ministries have increased to manifold in South-Western Bangladesh⁶⁴. This finding is also substantiated through primary survey.

The policy makers at the national and regional level opined that government's strategy and priorities have changed to many extents in South-Western Bangladesh due to existence of the critical infrastructures. As a result of all these, government officials are also attracted to get posting in the areas where critical infrastructures are present⁶⁵. Furthermore, respondents from the department of trade also expressed that the administrative arrangements and functioning of the government machineries can be enhanced through availability of the critical infrastructures.

⁶³ Utomo, Wahyu. "Tantangan Pembangunan Infrastruktur di Indonesia". 6 November 2017 <<https://kppip.go.id/opini/tantangan-pembangunan-infrastruktur-indonesia/>>.

⁶⁴ Warburton, Eve. "Jokowi and the New Developmentalism". *Bulletin of Indonesian Economic Studies* 52, no. 3 (2016):297–320.

⁶⁵ World Economic Forum (WEF). "The Global Competitiveness Report 2014–2015". 2014 <http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf>.

The researcher requested the respondents firm during the KIIs, to provide extra details on the impact of critical infrastructure on the functioning of government machineries. While doing so, the researcher reminded the KIIs to especially highlight the nexus between the critical infrastructure and the functioning of government machineries in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the nexus between critical infrastructure and functioning of government machineries in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII K regarding the nexus between critical infrastructure and functioning of government machineries in South-Western Bangladesh is given below:

From my knowledge and experience, I found there is a direct link between the critical infrastructure and functioning of government machineries all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials also increase to manifold. All these aspects are directly or indirectly related to the effective functioning of the government machineries. I am also confident that, you are likely to get similar kind of comeback from the government officials and the business community in this region (KII K, 27th September 2022).

3.1.10 Impact on Foreign Direct Investment

From the survey it is discovered that the development of critical infrastructure has direct or indirect relationship with the degree of foreign direct investment. Wherever there is presence of critical infrastructure, the foreign investors perceive that there exists more of security mechanism from the government side. As a result, the foreign investors are more attracted

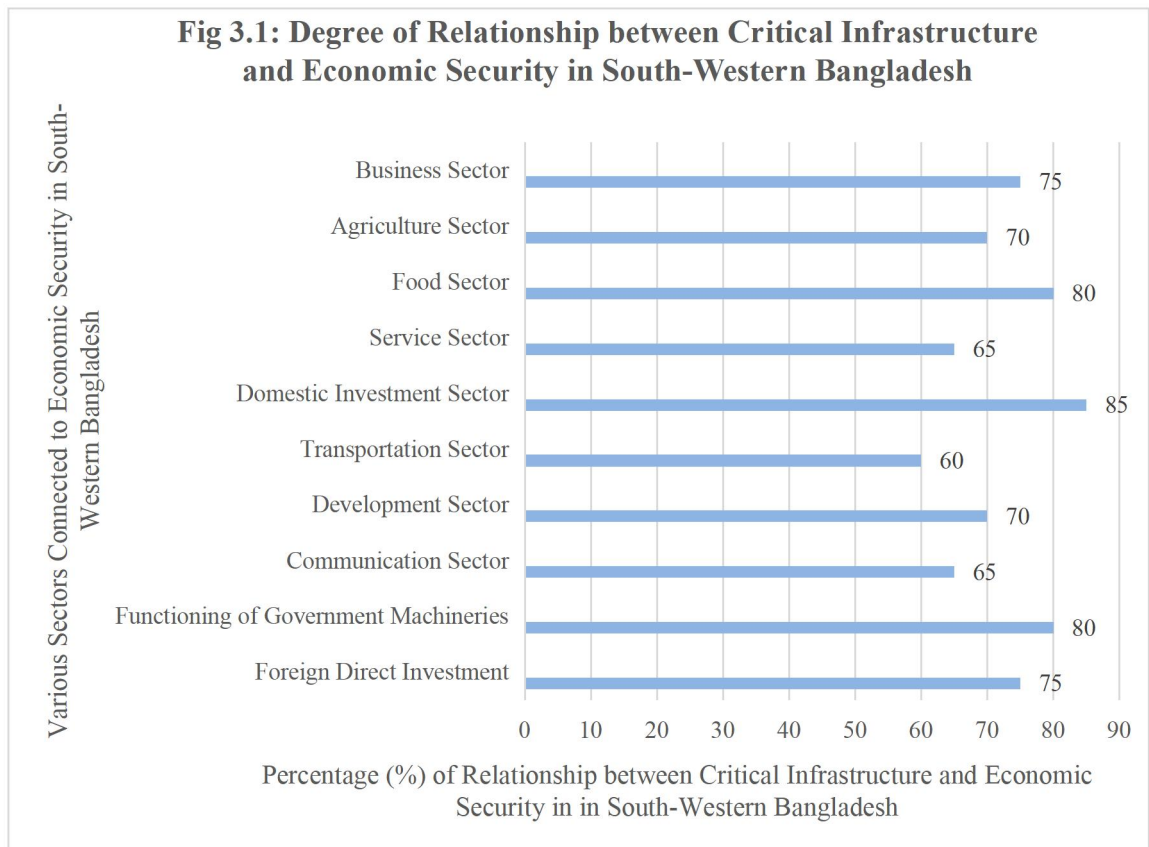
towards investing in such areas⁶⁶. Policy makers from the Ministry of Infrastructure and Communication opined that the foreign investors generally look for secured areas for their investments.

They added that the areas with critical infrastructures provide them with the confidence for adequate security, leading the decision for investment. Chairman of the Department of Trade in South-Western Bangladesh also expressed that presence of critical infrastructure in an area or region, attracts the foreign investors more to invest in that area or region. These findings are duly substantiated through the secondary survey too. At the end it can be said that, development of critical infrastructure has an important positive relationship with the extent of foreign investment.

3.1.11 Graphical Representation of the Nexus between Critical Infrastructure and Economic Security in South-Western Bangladesh

Research indicates that there exists positive relationship between critical infrastructures and economic development of any area or region. A total of ten dimensions of economic security are surveyed through both primary and secondary sources. The respondents' opinions are converted into percentage of relationship between the critical infrastructures and the ten dimensions of economic security in South-Western Bangladesh. While doing so, the researcher considers that the maximum relationship that can exist between critical infrastructures and economic development anywhere in the world may be one hundred percent.

⁶⁶ World Bank. "Indonesia Infrastructure Development Policy Loan". Program Information Document (PID)-Appraisal Stage, Report No. AB3407, 2007.



After combining the responses, it is found that the relationship between critical infrastructures and the ten dimensions of economic security in South-Western Bangladesh varies from 60% to 85%, where the maximum relationship is found with the employment sector, which is 85%. The graphical representation of the relationship between critical infrastructures and economic security of South-Western Bangladesh is shown in a bar chart in Figure 5.

3.1.12 Researcher's Comment

The researcher finds that there is a great relationship between critical infrastructure development and state of security throughout the world. Through the research, this nexus is found relevant in the international, regional and national level. Though at places, degree of this relationship varies, in most cases it is found that, with the increase of development of critical infrastructures in an area, overall security of the area is enhanced. This connectivity is

established from both primary and secondary sources. Various examples in the USA, UK, Canada, Australia, China, India and many other countries clearly indicate positive relationship between development of critical infrastructures and economic security.

Research also shows similar positive nexus between development of critical infrastructures and economic security in South-Western Bangladesh. Out of the study, the researcher found intimate relationship between development of critical infrastructures and business sector, agriculture sector, food sector, service sector and domestic investment sector. Not only that, researcher could also discover that there is deep relationship between critical infrastructures and transportation sector, development sector, communication sector, foreign direct investment sector and functioning of government machineries. From the analysis and findings of this study, the researcher is optimistic that with the development of critical infrastructures, the economic security in South-Western Bangladesh will be improved with passage of time.

3.2 Summary of the Chapter Key Findings

From the analysis of the chapter, it is found that, critical infrastructure has both direct and indirect relationship with the economic activity of a particular area or region. Presence of critical infrastructure has significant positive impact on business, agriculture, and food sectors. Not only that, it also positively drives the service, transport, development, and communication sectors. Furthermore, it attracts both domestic and foreign investors to invest with security. Finally, presence of critical infrastructure in an area has substantial positive impact on the functioning of the government machineries there. All these indicate that development of critical infrastructure has significant positive relationship with the economic security of South-Western Bangladesh.

CHAPTER FOUR

WAYS OF ENHANCING ECONOMIC SECURITY IN SOUTH-WESTERN BANGLADESH THROUGH CRITICAL INFRASTRUCTURE DEVELOPMENT

4.0 Introduction

In this chapter, the ways of enhancing economic security in South-Western Bangladesh through critical infrastructure development is discussed. From the research it is discovered that development of critical infrastructure can significantly enhance economic security of South-Western Bangladesh. More importantly, PMB has a substantial positive impact on the economic security of South-Western Bangladesh. This phenomenon is established both from the secondary

and primary sources. It is revealed that, critical infrastructure development, specially PMP can enhance performance of the business sector, agriculture sector, food sector, service sector, transport sector, development sector, domestic investment sector, communication sector, functioning of government machineries, and foreign direct investment⁶⁷. The discussion and findings are based on the data collected from both primary and secondary survey. Details of the discussion and analysis are presented in the subsequent paragraphs.

4.1 Ways of Enhancing Economic Security in South-Western Bangladesh through Critical Infrastructure Development

4.1.1 Enhancement in Business Sector

According to the research, the development of vital infrastructure like PMB has a significant positive impact on the commercial sector. The results of both the primary and secondary surveys duly substantiate this phenomenon. Despite the fact that each respondent had a unique way of expressing themselves, all of them agreed on one thing. That is, due to the presence of PMB, the commercial sector in South-Western Bangladesh will grow more quickly. A key infrastructure like PMB will play a favorable role in the growth of the commercial sector, according to policymakers from the Ministry of Infrastructure and Communication in both central and south-western Bangladesh⁶⁸. In this regard, both the transport committee and the traders group responded in the similar manner. As a result, it is discovered that the performance of the business sector in South-Western Bangladesh will be enhanced out of the development of key infrastructure, especially PMB.

4.1.2 Growth in Agriculture Sector

⁶⁷Baker, A., Hudson, D., and Woodward, R. (2005). 'Introduction', in Baker, A., Hudson, D., and Woodward, R. (eds) *Governing Financial Globalisation: International Political Economy and Multi-Level Governance*, London: Routledge, p77-81.

⁶⁸ Foresti, M. (2014, February 5). 3 reasons 'governance' should not only be a stand-alone development goal, p22-29.

Beside business sector, from the research it is also discovered that the development of critical infrastructure will have direct positive bearing on the growth of agriculture sector. Both primary and secondary sources reveal that this positive relationship is found very strong in the South-Western Bangladesh. This is because the economy of the South-Western Bangladesh is heavily dependent on agriculture⁶⁹. Study from the secondary sources reveals that the people of that area consider agriculture as the major source of livelihood. The open and fertile landscape also supports their such perception. This finding is duly substantiated through the primary survey.

Policy makers from the Ministry of Agriculture both at the central and regional level also expressed that the economy of South-Western Bangladesh is heavily dependent on agriculture. According to them, people of that area are highly committed on the agriculture sector; and only thing they need more is necessary support including infrastructure development. They opined that, with the functioning of PMB, the agriculture sector in this area will excel further with progress of time⁷⁰. Respondents from the traders' organization also opined the same. Critical infrastructure development like PMB will help the farmers to get the required support quickly and timely, both during production and harvest. As a result, the production cost will be minimized and the farmers will be able to get better price through timely and effective delivery of the products.

The researcher demanded from the respondents hard during the KIIs, to provide additional details on the impact of critical infrastructure on the development of agriculture sector. While doing so, the researcher reminded the KIIs to especially highlight the impact of critical infrastructure on the development of agriculture sector in South-Western Bangladesh. Not only

⁶⁹ Originally published as IPCS Commentary on 16 January 2014. See <http://www.ipcs.org/article/bangladesh/bangladesh-post-elections-2014-redefining-domestic-politics-4261>, html.

⁷⁰ The Interpreter. Retrieved from [http://www.lowyinterpreter.org/post/2014/02/05/3-reasons-governance-should-not-be-a-stand-alone-development-goal.aspx?COLLCC=602054812&Hulme,D.\(2013\),p50-53](http://www.lowyinterpreter.org/post/2014/02/05/3-reasons-governance-should-not-be-a-stand-alone-development-goal.aspx?COLLCC=602054812&Hulme,D.(2013),p50-53).

that, the researcher also reminded the KIIs to keep in mind the impact of critical infrastructure on the development of agriculture sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII L regarding the impact of critical infrastructure on the development of agriculture sector in South-Western Bangladesh is given below:

From my knowledge and experience, I found there is a direct relationship between the critical infrastructure and development of agriculture sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials in that area also increase to manifold. All these aspects are directly or indirectly related to the development of agriculture sector. I am also confident that, you are likely to get similar kind of response from the government officials and the business community in this region (KII L, 28th September 2022).

4.1.3 Enrichment in Food Sector

Research also shows that the food sector is equally heavily connected to the development of the critical infrastructure. The organizations and companies associated with the food sector will be efficient in handling the raw materials required for production of food items. Not only that, they will also be able to supply the food products timely to the capital City Dhaka and beyond⁷¹. This will help the organizations and companies to get the right economic benefits out of food products. Furthermore, they will also be able to bring the required food products from the other parts of the country. As a whole, the food sector will become more and more vibrant, effective and efficient with the development of critical infrastructure, specially PMB.

⁷¹ The Post-2015 development agenda: learning from the MDGs. Southern Voice Occasional Paper 2. Dhaka, Bangladesh: Centre for Policy Dialogue, p33-34.

This finding is the outcome of both secondary and primary survey. Policy makers from the Food and Agriculture both at the central and regional level conveyed that the food sector in South-Western Bangladesh is deeply dependent on the critical infrastructure development. According to them, the entrepreneurs in this sector will be more attracted with progress of the development of critical infrastructure in South-Western Bangladesh⁷². Respondents from the traders' organization also opined the same. Therefore, it can be said that, development of critical infrastructure, specially PMB will have direct positive impact on the blooming and expansion of the food sector in South-Western Bangladesh.

4.1.4 Evolution in Service Sector

In addition to the aforementioned, the development of critical infrastructure, specially PMB will also be able to develop the service sector in South-Western Bangladesh. This finding is supported by both the primary and secondary surveys. One of the key economic sectors in South-Western Bangladesh, according to the respondents from ministries and trade associations, is the service industry, which will be boomed due to the functioning of PMB⁷³. In their opinion, the growth of the critical infrastructure, specially PMB will be able to flourish various concerns of the service sector such as service maintenance, repairs, training, and advising, among many others.

According to the respondents, the ease with which service provider businesses can excel in the service industry will increase with the rise of infrastructural development, specially functioning of PMB. Again, the development of vital infrastructure like key bridges, airports, seaports, and facilities of that sort, specially PMB will allow the other dimensions of service

⁷² Originally published as IPCS Commentary on 17 February 2014. See <http://www.ipcs.org/article/bangladesh/bangladesh-domestic-politics-and-external-actors-4313.html>.

⁷³ Originally published as IPCS Commentary on 17 March 2014. See <http://www.ipcs.org/article/bangladesh/east-meets-west-bangladesh-and-the-bimstec-summit-4343.html>.

sectors like education, hospitality, information technology, media, and entertainment in South-Western Bangladesh to shine quickly with progress of time⁷⁴. The secondary survey adequately supports this conclusion as well.

The researcher pressed the respondents hard during the KIIs, to provide further details on the impact of critical infrastructure on the improvement of the service sector. While doing so, the researcher reminded the KIIs to especially highlight the impact of critical infrastructure on the improvement of the service sector in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the impact of critical infrastructure on the improvement of the service sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII M regarding the impact of critical infrastructure on the improvement of the service sector in South-Western Bangladesh is given below:

Whatever I have seen so far, there is a great connection between the critical infrastructure and improvement of the service sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials in that area also increase to manifold. All these aspects are directly or indirectly related to the improvement of the service sector. I am also confident that, you are likely to get similar kind of response from the business community and the transport sector in this region (KII M, 29th September 2022).

4.1.5 Development in Transportation Sector

A significant role for critical infrastructure exists in the transportation industry. Bridges, ports, and airports, among other crucial infrastructures, will facilitate more extensive, prompt,

⁷⁴Open Working Group proposal for Sustainable Development Goals Document A/68/970. New York: United Nations. Retrieved from <http://undocs.org/A/68/970> Ostrom, B. (2010), 91-93.

effective, and on-time transit of various goods and materials from different regions of the country to South-Western Bangladesh. The transportation sector of South-Western Bangladesh will be further facilitated through the operation of PMB. Not only that, the deep-sea port known as Paira Port, which is currently under development and is anticipated to become operational soon, will also greatly help in the transportation sector of South-Western Bangladesh⁷⁵. The Padma Multipurpose Bridge and Jamuna Multipurpose Bridge, according to policymakers from the Ministry of Infrastructure and Communication, will significantly improve the communication capabilities for the people of South-Western Bangladesh.

The development of critical infrastructure, according to respondents from the Transport Owners Committee and Department of Trade, would significantly contribute to the economic security of South-Western Bangladesh by enabling the timely and efficient transportation of a variety of goods and services. These results are also properly supported by the secondary sources that are readily available⁷⁶. Therefore, it can be claimed that the transportation industry in South-Western Bangladesh will be greatly benefited from the development of vital infrastructures, especially PMB.

4.1.6 Expansion of Development Sector

The development sector in South-Western Bangladesh will be positively expanded by the development of the key infrastructure, according to the research. The development of vital infrastructure will have a direct positive impact on the region's economic health and quality of life, according to secondary sources. According to secondary research, South-Western Bangladesh is a region where this phenomenon will be equally applicable like the national,

⁷⁵ Beyond Markets and States: Polycentric Governance of Complex Economic Systems, p88-90.

⁷⁶ American Economic Review, 100 (June 2010), p1-33.

regional, and international levels⁷⁷. Both the primary and secondary survey appropriately support this conclusion. The development sector in South-Western Bangladesh, according to policymakers from the Ministry of Infrastructure and Communication, will significantly benefit from the growth of vital infrastructure like PMB.

The similar opinion was expressed by the regional policy makers as well. In addition, the Chairmen of the Traders Organization and the Transport Business Committee stated that the South-Western region's development sector will be directly related to the development of the region's key infrastructure, especially PMB. Not only that, they also discussed the crucial importance of South-Western Bangladesh's two airports, Paira Deep Seaport, Padma Multipurpose Bridge, and Jamuna Multipurpose Bridge while voicing their opinions⁷⁸.

The researcher demanded from the respondents hard during the KIIs, to provide additional details on the impact of critical infrastructure on the expansion of development sector. While doing so, the researcher reminded the KIIs to especially highlight the impact of critical infrastructure on the expansion of development sector in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the impact of critical infrastructure on the expansion of development sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII N regarding the impact of critical infrastructure on the expansion of development sector in South-Western Bangladesh is given below:

From my knowledge and experience, I found there is a direct relationship between the critical infrastructure and expansion of development sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia,

⁷⁷ United Nations High-Level Panel. (2012). Realising the future we want for all: report to the Secretary General. New York: United Nations, p44-47.

⁷⁸ Waage, J., Banerji, R, Campbell, O, Chirwa, E, Collender, G, Dieltiens, V, Dorward, A, et al (2010), p66-69.

China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials in that area also increase to manifold. All these aspects are directly or indirectly related to the expansion of development sector. I am also confident that, you are likely to get similar kind of response from the government officials and the business community in this region (KII N, 29th September 2022).

4.1.7 Expansion of Domestic Investment Sector

The research reveals that the presence of important infrastructures like bridges, seaports, airports, and many others attract domestic investors to certain areas or regions. The international, regional, and national levels can all benefit from this discovery. Secondary sources also demonstrate that domestic investors are drawn to locations with vital infrastructure. This is due to the fact that the existence of vital infrastructure necessitates increased protection on the part of the government⁷⁹. Because of this, domestic investors feel more comfortable making investments. The primary survey provides adequate support for this conclusion.

Policymakers from national and regional governments have said that the presence of vital infrastructures, specially PMB in South-Western Bangladesh will draw domestic investors because it will make them feel safer. In addition, respondents from trade associations expressed opinions that were also similar to those of government officials. Overall, it can be argued that the presence of vital infrastructure has a direct, and favourable link with the level of domestic investment, which will promote the growth and development of South-Western Bangladesh⁸⁰.

4.1.8 Blooming in Communication Sector

⁷⁹ 'The Millennium Development Goals: a cross-sectoral analysis and principles for goal setting after 2015' The Lancet, vol 376, no. 9745, 991-1023. DOI: [http://dx.doi.org/10.1016/S0140-6736\(10\)61196-8](http://dx.doi.org/10.1016/S0140-6736(10)61196-8).

⁸⁰ Nixon, Ron. "Obama's 'Power Africa' Project Is Off to a Sputtering Start". New York Times, 21 July, 2015, p33-39.

According to the research, the growth of the communication sector is directly positively related to the development of vital infrastructure. An analysis of secondary sources reveals that the development of vital infrastructure in a region may improve communication services such as those offered by social media companies, internet search companies, video game developers, telecommunications providers, and streaming media, either directly or indirectly. This conclusion is valid at the global, regional, and national levels; it also equally applies to South-Western Bangladesh⁸¹. This conclusion is supported by both primary and secondary survey. The development of vital infrastructure, according to policymakers from the Ministry of Infrastructure and Communication, will have a good effect on a variety of industries, including entertainment, interactive media, wireless telecommunication services, and diversified communications services in South-Western Bangladesh.

Additionally, the national and regional answers from the department of trade have an indirect or direct impact on voice, mobile, broadband, cable, streaming media, retail, colocation, cloud, content delivery network, edge computing, proximity, network security, and the internet of things in South-Western Bangladesh⁸². At the end, it can be said that, development of critical infrastructures, specially PMB will have a very positive blooming impact on the communication sector leading to economic growth of South-Western Bangladesh.

The researcher pressed the respondents hard during the KIIs, to provide further details on the impact of critical infrastructure on the blooming of the communication sector. While doing so, the researcher reminded the KIIs to especially highlight the impact of critical infrastructure on the blooming of the communication sector in South-Western Bangladesh. Not only that, the

⁸¹ The White House, Presidential Decision Directive/NSC-63 (Washington D.C.: The White House, May 22, 1998): 1-18, available at: <http://www.epa.gov/watersecurity/tools/training/cd/Guidance/pdd-63.pdf>, p33-37.

⁸² Originally published as IPCS Commentary on 15 December 2014. See <http://www.ipcs.org/article/south-asia/18th-saarc-summit-a-perspective-from-bangladesh-4776.html>.

researcher also reminded the KIIs to keep in mind the impact of critical infrastructure on the blooming of the communication sector in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII O regarding the impact of critical infrastructure on the blooming of the communication sector in South-Western Bangladesh is given below:

Whatever I have seen so far, there is a great connection between the critical infrastructure and blooming of the communication sector all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials in that area also increase to manifold. All these aspects are directly or indirectly related to the blooming of the communication sector. I am also confident that, you are likely to get similar kind of response from the business community and the transport sector in this region (KII O, 30th September 2022).

4.1.9 Enhancement in Functioning of Government Machineries

The construction of essential infrastructures in a particular area has a significant impact on how well government apparatuses would operate there. Usually, government pays particular attention to areas where important infrastructure is present. The government has been more attentive and involved in South-Western Bangladesh because it holds important infrastructure like PMB. According to the secondary survey, the distribution of duties and responsibilities across departments and ministries in South-Western Bangladesh has been multiplied as a result of the presence of key infrastructures like PMB⁸³. Not only that, the primary survey also supports this conclusion.

⁸³ The White House, Presidential Decision Directive/NSC-63 (Washington D.C.: The White House, May 22, 1998): p1-18.

Policymakers at the national and regional levels expressed the opinion that the presence of essential infrastructure in South-Western Bangladesh has significantly altered the government's strategy and priorities. Due to the above-mentioned reasons, government employees are drawn more to South-Western Bangladesh with progress of time. Additionally, respondents from the department of trade and commerce also stated that the availability of the vital infrastructures in South-Western Bangladesh, specially PMB, will significantly improve the administrative arrangements and the efficiency of government machinery, resulting to enhancement of economic security in the region⁸⁴.

4.1.10 Evolution in Foreign Direct Investment

According to the research, there is a direct or indirect positive correlation between the amount of foreign direct investment and the development of key infrastructure. Foreign investors believe that there are greater security measures in place from the government side, wherever the key infrastructures are present. Foreign investors are therefore, more drawn to invest in those areas. The Ministry of Infrastructure and Communication's policymakers believe that international investors typically seek for secure locations for their projects. They continued by saying that the presence of essential infrastructure gives them the assurance of appropriate security, which influences their decision to invest in certain locations. A key infrastructure's existence in a region or area encourages international investors more to that region or area, according to the Chairman of the Trade Department in South-Western Bangladesh. The secondary survey also adequately supports these findings⁸⁵. In conclusion, it can be claimed that

⁸⁴ World Economic Outlook Database, April 2015, International Monetary Fund at <https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx>, p22-27.

⁸⁵ Department of Homeland Security, NIPP 2013: Partnering for Critical Infrastructure Security and Resilience, (Washington D.C.: DHS, 2013): p2–56.

the amount of foreign investment will significantly increase in South-Western Bangladesh due to development of vital infrastructures, specially PMB.

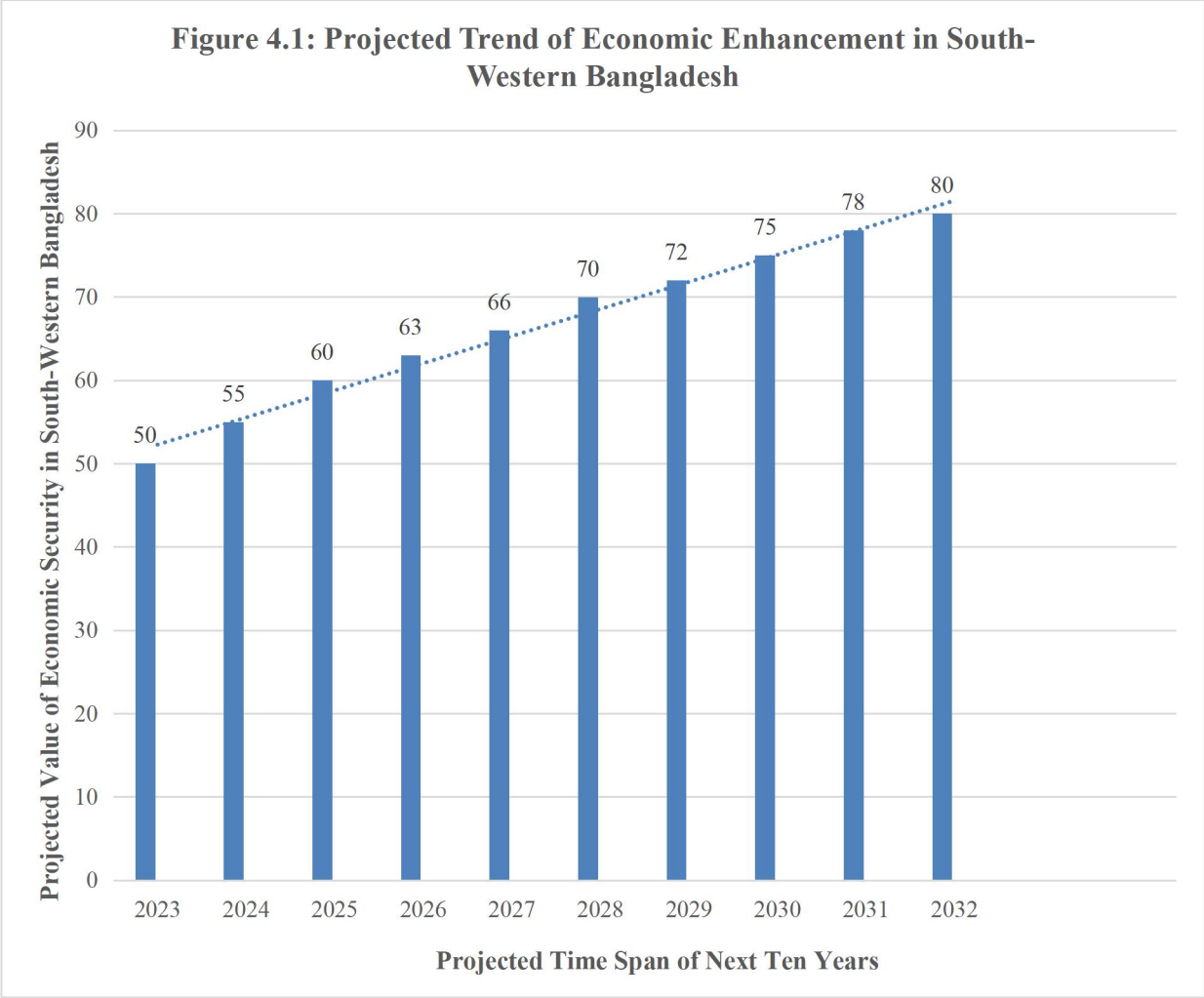
The researcher demanded from the respondents hard during the KIIs, to provide additional details on the impact of critical infrastructure on the enhancement of the foreign direct investment. While doing so, the researcher reminded the KIIs to especially highlight the impact of critical infrastructure on the enhancement of the foreign direct investment in South-Western Bangladesh. Not only that, the researcher also reminded the KIIs to keep in mind the impact of critical infrastructure on the enhancement of the foreign direct investment in the international arena, regional environment and in the other parts of the country. This is because of the fact that, if they make their opinions keeping in mind all these aspects, the grade of reliability of the opinions will be more. In this regard, the response from KII P regarding the impact of critical infrastructure on the enhancement of the foreign direct investment in South-Western Bangladesh is given below:

From my knowledge and experience, I found there is a direct relationship between the critical infrastructure and enhancement of the foreign direct investment all over the world. This circumstance is correct starting from the United States, United Kingdom, Australia, China, India down to Bangladesh. In the same way, this relationship stands good in South-Western Bangladesh too. There are many reasons behind this phenomenon. First, the places where critical infrastructures exist, receive more importance from the government side. Second, security of those areas is also well taken care by the government. Third, because of the presence of critical infrastructure, movement of people, goods and raw materials in that area also increase to manifold. All these aspects are directly or indirectly related to the enhancement of the foreign direct investment. I am also confident that, you are likely to get similar kind of response from the government officials and the business community in this region (KII P, 26th September 2022).

4.1.11 Ways of Enhancing Economic Security in South-Western Bangladesh through Critical Infrastructure Development

From the survey, effort is made to draw a likely projected trend for enhancement of economic security in South-Western Bangladesh. Answers from the interviews, survey

questionnaire and FGDs have been combined to project the trend for next ten years from 2023 to 2032 in Figure 6. The trend is expressed in terms of percentage showing in the Y-Axis, while the yearly timeframe is shown in the X-Axis. Here, as a reference, the state of economic security in a developed country like the United States has been considered and shown as one hundred percent.



Outcome of the research shows that, the projected trend of comprehensive economic enhancement gradual uprising from 2023 to next ten years. With passage of time, the comprehensive economic enhancement is likely to reach eighty percent (80%) in the next years, by 2032. However, this does not mean that there will be no further economic development after 2032; rather, the data was taken for the projection up to 2032.

4.1.12 Researcher's Comment

Both from the primary and secondary survey, the researcher is able to discover that the economic security of South-Western Bangladesh will significantly be enhanced through development of critical infrastructures. However, this enhancement will take place overnight. Instead, this economic development will take place slowly and gradually with passage of time. Many logical reasonings are identified behind this positive declaration. First, with development of critical infrastructures, significant upbringing is expected to take place in business sector. Second, agriculture sector would also have a booming effect due to critical infrastructure development in South-Western Region. Third, along with agriculture sector, adequate development is also expected to take place in food sector. Fourth, beside the above, sufficient improvement would also take place in the service sector. Fifth, not only that, adequate enhancement is also expected to take place in the transportation sector.

Beside all these, there would be a considerable rise in the development sector. This is because of the fact that, due to development of critical infrastructures in South-Western Bangladesh, overall security and law and order of the region is expected to increase significantly with passage of time. In a secured environment, more of development works would take place in South-Western Bangladesh. Again, due to more secure environment, the domestic investment sector is also likely to boom, since the investors would be more attracted to invest in the region. Additionally, sufficient development is also likely to take place in the communication sector because of the improved critical infrastructures in South-Western Bangladesh. Furthermore, due to all the above-mentioned development, the government machineries would be able to function with more effectiveness in the region. Finally, because of all these, the foreign investors are

likely to be attracted to invest more and more leading to enhanced foreign direct investment in South-Western Bangladesh.

4.2 Summary of the Chapter Key Findings

According to the chapter's findings, the key infrastructures of South-Western Bangladesh will have both direct and indirect positive impact on the upbringing of the economic activity in the region. The agricultural, and food sectors will be significantly benefited by the presence of the key infrastructures due to quick and timely transportation of raw material and finished products to and from the region. Additionally, it will support the industries of services, transportation, development, and communication in their accelerated upbringing. Furthermore, it will encourage the domestic and foreign investors to make secure investments⁸⁶. Finally, the availability of essential infrastructure in South-Western Bangladesh will significantly improve the efficiency of the local government apparatus. As a whole it can be said that, the economic security of South-Western Bangladesh will significantly be enhanced with the development of critical infrastructures, especially PMB.

⁸⁶ Thomas D. O'Rourke, "Critical Infrastructure, Interdependencies, and Resilience," *The Bridge* 37:1 (Spring 2007): p22–29.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This is the last chapter of the research paper. This chapter comprises of the key findings, conclusions and recommendations. The materials of this chapter are arranged in three parts. In the first part, the key findings from all the previous chapters are compiled. Thereafter, in the second part, the conclusion is drawn from the key findings. While drawing the conclusion, detail analysis is made on the key findings. Not only that, while constructing the conclusion, the results from both the secondary and primary research were also kept in mind. Finally, in the third part, few recommendations are made for the policy makers, which can be implemented for the economic enhancement of South-Western Bangladesh. At the end, suggestion is also made regarding the areas for further research.

5.2 Summary of the Key Findings

5.2.1 Summary of Specific Objective 1

From the above discussion and analysis, it is revealed that, the present state of economic security in South-Western Bangladesh is of moderate standard. This finding is reached from the point of basic social security, defined by access to basic needs infrastructure pertaining to health,

education, dwelling, information, and social protection, as well as work-related security⁸⁷. Analyses on various aspects of economic security like income security, representation security, labour market security, employment security, job security, work security, and skill reproduction security have substantiated this finding. This result is the outcome of both primary and secondary survey. Again, the state of critical infrastructure in South-Western Bangladesh is also of reasonable standard. Present critical infrastructures include Jamuna Multipurpose Bridge, Padma Multipurpose Bridge, Paira Deep Sea Port, Barishal Airport, Dopdopia Bridge, and Barishal River Port⁸⁸. At present, these critical infrastructures play a significant role in the economic security of South-Western Bangladesh.

5.2.2 Summary of Specific Objective 2

From the analysis of the chapter, it is found that, critical infrastructure has both direct and indirect relationship with the economic activity of a particular area or region. Presence of critical infrastructure has significant positive impact on business, agriculture, and food sectors. Not only that, it also positively drives the service, transport, development, and communication sectors. Furthermore, it attracts both domestic and foreign investors to invest with security⁸⁹. Finally, presence of critical infrastructure in an area has substantial positive impact on the functioning of the government machineries there. All these indicate that development of critical infrastructure has significant positive relationship with the economic security of South-Western Bangladesh.

5.2.3 Summary of Specific Objective 3

⁸⁷ World Economic Forum (WEF). “The Global Competitiveness Report 2014–2015”. 2014 <http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf>.

⁸⁸ Kothari, C.R. (2004) Research Methodology: Methods and Techniques. 2nd Edition, New Age International Publishers, New Delhi.

⁸⁹ Creswell, J.W., & Creswell, J.D. (2017). Research Design: Qualitative, Quantitative and Mixed Methods Approaches. Sage Publications.

According to the chapter's findings, the key infrastructures of South-Western Bangladesh will have both direct and indirect positive impact on the upbringing of the economic activity in the region. The agricultural, and food sectors will be significantly benefited by the presence of the key infrastructures due to quick and timely transportation of raw material and finished products to and from the region. Additionally, it will support the industries of services, transportation, development, and communication in their accelerated upbringing. Furthermore, it will encourage the domestic and foreign investors to make secure investments⁹⁰. Finally, the availability of essential infrastructure in South-Western Bangladesh will significantly improve the efficiency of the local government apparatus. As a whole it can be said that, the economic security of South-Western Bangladesh will significantly be enhanced with the development of critical infrastructures, especially PMB.

5.2.4 Overall Summary

Economic security in South-Western Bangladesh is now at a mediocre level. This conclusion is drawn from the perspective of fundamental social security, which is defined as having access to infrastructure for basic requirements linked to health, education, housing, information, social protection, and work-related security. This conclusion has been supported by analyses of numerous facets of economic security, including income security, representation security, labor market security, employment security, job security, and skill reproduction security. The results of both the primary and secondary surveys are shown here. Again, South-Western Bangladesh's key infrastructure is in a respectable situation. The Jamuna Multipurpose Bridge, Padma Multipurpose Bridge, Paira Deep Sea Port, Barishal Airport, Dopdopia Bridge, and

⁹⁰ Thomas D. O'Rourke, "Critical Infrastructure, Interdependencies, and Resilience," *The Bridge* 37:1 (Spring 2007): p22–29.

Barishal River Port are examples of current important infrastructure. These vital infrastructures currently contribute significantly to the South-Western Bangladesh region's economic security.

The economic activity of a given area or region is directly and indirectly impacted by critical infrastructure. The economic, agricultural, and food sectors are significantly benefited by the presence of key infrastructure. Additionally, it supports the industries of services, transportation, development, and communication. Additionally, it encourages domestic and international investors to make secure investments. Finally, the availability of essential infrastructure in a region significantly improves the efficiency of the local government apparatus. All of them point to a strong positive association between essential infrastructure development and the economic security of South-Western Bangladesh.

The crucial infrastructure of South Western Bangladesh will boost the region's economic activities in both direct and indirect ways. Due to the quick and timely transit of raw materials and completed goods to and from the region, the presence of the major infrastructures would considerably help the agricultural and food sectors. Additionally, it will aid in the quicker development of the communication, development, and services industries. Additionally, it will encourage both domestic and international investors to make safe bets. Finally, the South-Western region of Bangladesh will have access to crucial infrastructure, which will greatly increase the effectiveness of the local government system. Overall, it can be claimed that the growth of crucial infrastructure, especially PMB, will greatly increase the economic security of South-Western Bangladesh.

5.3 Researcher's Comment on Summary of the Key Findings

From the summary of the key findings, it is revealed that different respondents have given different kinds of opinions on the subject matter. Whatever is the case, one aspect of the

subject matter is found common, i.e., all respondents are in the consensus that the overall economic security of the South-Western Bangladesh will be enhanced. Though different groups' degree of assessment varies from one another, their basic line of thinking is found similar towards improvement of economic security. The researcher also thinks that due to increased development of critical infrastructures in South-Western Bangladesh, the economic security of the region will be enhanced with progress of time. Such optimistic assumption of the researcher is also duly substantiated through secondary survey. Again, the researcher also deduces that PMB will contribute much more towards enhancement of economic security in South-Western Bangladesh with passage of time. Finally, the researcher thinks that GOB has taken the time worthy decision to construct the PMB for the betterment of the economic security of South-Western Bangladesh as well as for the whole country.

5.4 Conclusion

5.4.1 Conclusion of Specific Objective 1

From the research it is revealed that, at present, the state of economic security in South-Western Bangladesh is of moderate standard. This conclusion is drawn from the perspective of fundamental social security, which is defined as having access to infrastructure for basic requirements linked to health, education, housing, information, social protection, and work-related security. This conclusion has been supported by analyses of numerous facets of economic security, including income security, representation security, labor market security, employment security, job security, and skill reproduction security⁹¹. The results of both the primary and secondary surveys are shown here. Again, South-Western Bangladesh's key infrastructure is in a respectable situation. The Jamuna Multipurpose Bridge, Padma Multipurpose Bridge, Paira Deep

⁹¹Ranjit Kumar (2011). *Research Methodology: A Step-by-Step Guide for Beginners* (3rd Edition). New Delhi: Sage Publications.

Sea Port, Barishal Airport, Dopdopia Bridge, and Barishal River Port are examples of current important infrastructure. These vital infrastructures currently contribute significantly to the South-Western Bangladesh region's economic security.

5.4.2 Conclusion of Specific Objective 2

Not only that, the research also discovered that, vital infrastructure has a connection to an area's economic activity both directly and indirectly. The economic, agricultural, and food sectors are significantly benefited by the presence of key infrastructure. Additionally, it supports the industries of services, transportation, development, and communication. Additionally, it encourages domestic and international investors to make secure investments. Finally, the availability of essential infrastructure in a region significantly improves the efficiency of the local government apparatus. All of them point to a strong positive association between essential infrastructure development and the economic security of South-Western Bangladesh⁹².

5.4.3 Conclusion of Specific Objective 3

The important facilities of South-Western Bangladesh would positively influence the development of the local economy both directly and indirectly, according to the chapter's findings. Due to the quick and timely transit of raw materials and completed goods to and from the region, the presence of the major infrastructures would considerably help the agricultural and food sectors. Additionally, it will aid in the quicker development of the communication, development, and services industries. Furthermore, it will motivate both domestic and international investors to make safe investments. At the end, the South-Western region of Bangladesh will have access to critical infrastructure, which will greatly increase the

⁹² Journal of Information Warfare, Vol. 16, No. 1 (Winter 2017), Published by: Peregrine Technical Solutions.

effectiveness of the local government system⁹³. Overall, it can be claimed that the growth of critical infrastructure, especially PMB, will greatly increase the economic security of South-Western Bangladesh.

5.4.4 Overall Conclusion

Critical infrastructure has both direct and indirect relationship with the economic security of any nation. This relationship is found applicable throughout the world. Countries like the US, UK, Australia, Canada, China, India are testimony in this regard⁹⁴. In other words, it can be said that, critical infrastructure positively contributes to the economic security, which is found both at international and regional level. Both the primary and secondary sources have revealed this connectivity.

Economic security is currently at a mediocre level in South-Western Bangladesh. From the standpoint of essential social security, which is defined as having access to the infrastructure for necessities connected to health, education, housing, information, social protection, and job-related security, this conclusion is drawn. Numerous assessments of aspects of economic security, such as income security, representation security, labor market security, employment security, job security, and skill reproduction security, have been used to support this conclusion. Here are the findings from the primary and secondary surveys. Again, the main infrastructure in South-Western Bangladesh is in an acceptable state. Current examples of significant infrastructure include the Jamuna Multipurpose Bridge, Padma Multipurpose Bridge, Paira Deep Sea Port, Barishal Airport, Dopdopia Bridge, and Barishal River Port. The South-Western Bangladesh region's economic security now benefits considerably from these essential infrastructures.

⁹³ Norman K. Denzin (2018) *The SAGE Handbook of Qualitative Research* Fifth Edition. New Delhi: SAGE Publications, Inc.

⁹⁴ Foresti, M. (2014, February 5). 3 reasons 'governance' should not only be a stand-alone development goal. Retrieved from <http://www.lowyinterpreter.org/post/2014/02/05/3>.

The study also found that an area's economic activity has a direct and indirect relationship with important infrastructure. The existence of essential infrastructure has a considerable positive impact on the economic, agricultural, and food sectors. Additionally, it aids the communication, transportation, development, and service sectors. It additionally encourages both domestic and foreign investors to make safe bets. Finally, the effectiveness of the local government apparatus is considerably increased when vital infrastructure is present in a region. They all indicate a substantial correlation between the growth of South-Western Bangladesh's key infrastructure and its economic security.

The findings of the chapter indicate that the significant facilities of South-Western Bangladesh would have a good direct and indirect impact on the growth of the regional economy. The presence of the key infrastructures would significantly aid the agricultural and food sectors since they would allow for the timely and quick passage of finished goods and raw materials into and out of the region. It will also help the communication, development, and service sectors develop more quickly. Additionally, it will encourage local and foreign investors to make secure investments. Ultimately, Bangladesh's South-Western region will have access to vital infrastructure, considerably enhancing the efficiency of the local government system. Overall, it can be said that South-Western Bangladesh's economic security will significantly rise as a result of the expansion of key infrastructure, particularly PMB.

5.5 Recommendations

Following recommendations are made from the research:

GOB to take necessary measures in order to ensure complete security and protection of PMB round the clock. For that, the existing composite brigade should be reinforced with one

regiment of air defence artillery and other elements of Security Forces (SF) paramilitary forces as required; who will provide physical protection to the bridge on both sides of Padma River.

Ministry of Infrastructure and Communication to maintain the bridge regularly in order to ensure that the bridge remains functional round the clock. This maintenance should include both the road railway parts. For that, two competent technical teams composed of required expert personnel and equipment should be positioned permanently on both sides of the river.

Efforts to be made by both the central and regional government offices in order to ensure rapid industrialization in South-Western Bangladesh. For that, the traders' organization, business community, and the entrepreneurs should be taken onboard. Optimum utilization of the bridge needs to be ensured for transportation of both raw materials and finished products to and from South-Western Bangladesh.

5.6 Areas for Further Research

Further research may be carried out on How the Human Security of South-Western Bangladesh can be Enhanced through Utilization of PMB. This research has considered only the economic aspect of security of South-Western Bangladesh. Further research may include all other dimensions of human security, like food security, health security, environmental security, personal security, community security, and political security. Further research on these fields may be undertaken by both the regional and central offices of the government. Ministry of Infrastructure and Communication, Ministry of Commerce or even private organizations associated with various aspects of human security may be assigned with further research in this regard.

REFERENCES

- Gary D. Bouma and Rod Ling. *The Research Process* 5th Edition (2004). Oxford University Press.
- Daniel F. Runde. *Quality Infrastructure: Ensuring Sustainable Economic Growth* (2017). Center for Strategic and International Studies (CSIS).
- Muhammad Imran and Javeria Niazi. *Infrastructure and Growth* (2011). Pakistan Institute of Development Economics, Islamabad.
- Journal of Southeast Asian Economies*, Vol. 35, No. 3, Special Issue: The Indonesian Economy in Transition: Policy Challenges in the Jokowi Era and Beyond (Part II) (December 2018).
- Journal of Information Warfare*, Vol. 16, No. 1 (Winter 2017), Published by: Peregrine Technical Solutions.
- Rupert Hodder. *Infrastructural Development in China* (1994). The Chinese University of Hong Kong Press.
- <https://thegeopolitics.com/padma-bridge-the-technological-sublimes-impact-on-local-economy-and-regional-connectivity/>.
- Foresti, M. (2014, February 5). 3 reasons 'governance' should not only be a stand-alone development goal. Retrieved from <http://www.lowyinterpreter.org/post/2014/02/05/3>.
- Abele-Wigert, I & Dunn, M 2006, *International CIIP handbook 2006*, vol. 1, Center for Security Studies, ETH Zurich, Switzerland.
- Anol Bhattacharjee (2012). *Social Science Research: Principles, Methods, and Practices*. Florida: University of South Florida.
- Gary D. Bouma and Rod Ling. (*The Research Process* 5th Edition (2004). Oxford University Press.

- Louis Cohen, Lawrence Manion and Keith Morrison (2007). *Research Methods in Education* Sixth edition. New York: Routledge.
- Ranjit Kumar (2011). *Research Methodology: A Step-by-Step Guide for Beginners* (3rd Edition). New Delhi: Sage Publications.
- Norman K. Denzin (2018) *The SAGE Handbook of Qualitative Research* Fifth Edition. New Delhi: SAGE Publications, Inc.
- Kori, A. Tashak. (2010). (ed.) *Mixed Method in Social Science and Behavioral Research*. California: Sage Publishers.
- Kothari, C.R. (2004) *Research Methodology: Methods and Techniques*. 2nd Edition, New Age International Publishers, New Delhi.
- Mugenda, O.M. and Mugenda, A.G. (2003) *Research Methods, Quantitative and Qualitative Approaches*. ACT, Nairobi.
- Creswell, J.W. (1994). *Research design: Qualitative & quantitative approaches*. Sage Publications, Inc.
- Creswell, J.W., & Creswell, J.D. (2017). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. Sage Publications.
- Flick, U. (2014). *An Introduction to Qualitative Research*, 5th ed. Los Angeles: SAGE Publications Inc.
- Robson, C. (2016). *Real World of Research*. Carlton: Blackwell Publications.
- Bryman, A. (2008). *Social research methods*. Oxford: Oxford University Press.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research Methods in Education*. London: Routledge.
- Crotty, M. (1998). *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: Sage.
- Denzin, N., & Lincoln, Y. (Eds.). (2005). *The Sage Handbook of Qualitative Research* (Third ed.). London: Sage.
- Hennink, M., Hutter, I., & Bailey, A. (2014). *Qualitative Research Methods*. Los Angeles: Sage.
- ADB. *Meeting Asia's Infrastructure Needs*. Manila: Asian Development Bank, 2017 <<https://www.adb.org/sites/default/files/publication/227496/special-report-nfrastructure.pdf>>.

- Bappenas (National Development Planning Agency). Rencana Pembangunan Jangka Menengah Nasional (RPJMN)2015–2019 National Medium-Term Development Plan (RPJMN) 2015–2019. Jakarta: Bappenas, 2014.
- Brilianto, Herfan. “Addressing the Infrastructure Deficit in Indonesia and Beyond”. East Asia Forum, 17 February 2014<<http://www.eastasiaforum.org/2014/02/17/addressing-the-infrastructure-deficit-in-indonesia-and-beyond/>>.
- Davidson, Jamie S. Indonesia’s Changing Political Economy: Governing the Roads. Cambridge: Cambridge University Press, 2015.
- “Eminent Domain and Infrastructure under the Yudhoyono and Widodo Administrations”. In Land and Development in Indonesia: Searching for the People’s Sovereignty, edited by John McCarthy and Kathryn Robinson. Singapore: ISEAS – Yusof Ishak Institute, 2016.
- DJPPR. “Indonesia PPP Day 2017”. 2017 <<http://www.djppr.kemenkeu.go.id/ppp>>.
- Gonschorek, Gerritt J. and Günther G. Schulze. “Continuity or Change? Indonesia’s Intergovernmental Fiscal Transfer System under Jokowi”. Journal of Southeast Asian Economies 35, no. 2 (August 2018).
- Gustely, Edward. “How Do Foreign Investors Perceive Opportunities in Indonesian Infrastructure?”. Prakarsa: Journal of the Indonesia Infrastructure Initiative 22 (October 2015).
- Hamilton-Hart, Natasha and Günther G. Schulze. “Taxing Times in Indonesia: The Challenge of Restoring Competitiveness and the Search for Fiscal Space”. Bulletin of Indonesian Economic Studies 52, no. 3 (2016).
- Heath, Jared. “Infrastructure in Indonesia: Building the Framework for Effective PPPs”. 19 November 2013 <<http://www.corrs.com.au/thinking/insights/infrastructure-in-indonesia-building-the-framework-for-effective-ppps/>>.
- KPPIP. “Perkembangan Pembangunan Infrastruktur di Indonesia”. 2018 <<https://kppip.go.id/tentang-kppip/perkembangan-pembangunan-infrastruktur-di-indonesia/>>.
- Lee, John. “Indonesia’s Road Infrastructure: Accelerating the Private Sector Contribution”. Prakarsa: Journal of the Indonesia Infrastructure Initiative 22 (October 2015).
- Morris, Nicholas and Irene Tsjin. “How to Solve Indonesia’s Infrastructure Crisis”. East Asia Forum, 10 June 2015 <<http://www.eastasiaforum.org/2015/06/10/how-to-solve-indonesias-infrastructure-crisis/>>.

- Negara, Siwage Dharma. “Indonesia’s Infrastructure Development under the Jokowi Administration”. In *Southeast Asian Affairs 2016*, edited by Malcolm Cook and Daljit Singh. Singapore: ISEAS – Yusof Ishak Institute, 2016.
- OECD. “Private Financing and Government Support to Promote Long-Term Investment in Infrastructure”. 2014. “Investment: Upgrading Indonesia Infrastructure”. *Indonesia Policy Brief*, March 2015.
- PLN. “Power Supply Business Plan (RUPTL) PT PLN (Persero) 2012–2021”. 2013 <http://energy-indonesia.com/02_electricity_law/0130213RUPTL.pdf> (accessed 2 March 2018).
- “Power Supply Business Plan (RUPTL) PT PLN (Persero) 2016–2025”. 2016. <<http://www.djk.esdm.go.id/pdf/RUPTL/RUPTL%20PLN%202016-2025.pdf>> (accessed 2 March 2018).
- Ray, David, and Lili Yan Ing. “Addressing Indonesia’s Infrastructure Deficit”. *Bulletin of Indonesian Economic Studies* 52, no. 1 (2016).
- Sandee, Henry. “Improving Connectivity in Indonesia: The Challenges of Better Infrastructure, Better Regulations, and Better Coordination”. *Asian Economic Policy Review* 11 (2016).
- SMI. “PT Sarana Multi Infrastruktur (Persero): Company Profile”. 2017 <<https://www.ptsmi.co.id/wp-content/uploads/2017/09/Company-Profile-PT-SMI-July-2017-EN.pdf>> (accessed 2 March 2018).
- U.S. General Accounting Office, *Critical Infrastructure Protection: Federal Efforts Require a More Coordinated and Comprehensive Approach for Protecting Information Systems*, GAO 02–474 (Washington D.C.: GAO).
- Department of Homeland Security, “Critical Infrastructure Sector Partnerships,” DHS.gov.
- The White House, “Presidential Policy Directive – Critical Infrastructure Security Resilience,” Presidential Memoranda PPD–21 (Washington D.C.: The White House, February 12, 2013).
- American Society of Civil Engineer, “Report Card for America's Infrastructure,” ASCE, 2013.
- Sauter, Mark A. and Carafano, James J., *Homeland Security: A Complete Guide* (New York: McGraw Hill, 2012).
- Department of Homeland Security, “Dams Sector: Sector Overview,” DHS.gov, 2013.
- 16 Department of Homeland Security, *Dams Sector-Specific Plan: An Annex to the National Infrastructure Protection Plan*, (Washington, D.C.: DHS, 2010): preface.

- 18 American Society of Civil Engineers, "Report Card for America's Infrastructure: Dams," ASCE, ASCE.org, March, 2013.
- E. Witt, "National Weather Service Weather Forecast Office," NOAA.gov, November 30, 2014.
- American Society of Civil Engineers, "Report Card for America's Infrastructure: Dams," 15.
- Kristina Costa and Donna Cooper, "The 10 States Most Threatened by High-Hazard, Deficient Dams," Center for American Progress, March 14, 2006.
- American Society of Civil Engineers, "Report Card for America's Infrastructure: Dams,".
- DOWL HKM, "Big Hole River Diversion Dam and Pump Station Replacement," DOWL.com, 2014.
- Department of Homeland Security, Water and Wastewater Systems Sector: Sector Overview, DHS.gov, June 12, 2013.
- Department of Homeland Security, Water Sector-Specific Plan: An Annex to the National Infrastructure Protection Plan (Washington, D.C.: Department of Homeland Security, 2010).
- American Society of Civil Engineers, "Report card for America's infrastructure: Drinking Water D," ASCE, March, 2013.
- Utomo, Wahyu. "Tantangan Pembangunan Infrastruktur Indonesia". 6 November 2017 <<https://kppip.go.id/opini/tantangan-pembangunan-infrastruktur-indonesia/>>.
- Warburton, Eve. "Jokowi and the New Developmentalism". Bulletin of Indonesian Economic Studies 52, no. 3 (2016).
- World Economic Forum (WEF). "The Global Competitiveness Report 2014–2015". 2014 <http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf>.
- World Bank. "Indonesia Infrastructure Development Policy Loan". Program Information Document (PID)- Appraisal Stage, Report No. AB3407, 2007.
- Baker, A., Hudson, D., and Woodward, R. (2005). 'Introduction', in Baker, A., Hudson, D., and Woodward, R. (eds) Governing Financial Globalisation: International Political Economy and Multi-Level Governance, London: Routledge.
- Foresti, M. (2014, February 5). 3 reasons 'governance' should not only be a stand-alone development goal.
- The Interpreter. Retrieved from <http://www.lowyinterpreter.org/post/2014/02/05/3-reasons-governance-should-not-be-a-stand-alone-development-oal.aspx?COLLCC=602054812&Hulme>, D. (2013).

The Post-2015 development agenda: learning from the MDGs. Southern Voice Occasional Paper 2. Dhaka, Bangladesh: Centre for Policy Dialogue.

Open Working Group proposal for Sustainable Development Goals document A/68/970. New York: United Nations. Retrieved from <http://undocs.org/A/68/970> Ostrom, B. (2010). Beyond Markets and States: Polycentric Governance of Complex Economic Systems.

American Economic Review, 100 (June 2010).

United Nations High-Level Panel. (2012). Realising the future we want for all: report to the Secretary General. New York: United Nations.

Waage, J., Banerji, R., Campbell, O., Chirwa, E., Collender, G., Dieltiens, V., Dorward, A., et al (2010).

‘The Millennium Development Goals: a cross-sectoral analysis and principles for goal setting after 2015’ The Lancet, vol 376, no. 9745, 991-1023. DOI: [http://dx.doi.org/10.1016/S0140-6736\(10\)61196-8](http://dx.doi.org/10.1016/S0140-6736(10)61196-8).

Originally published as IPCS Commentary on 17 February 2014. See <http://www.ipcs.org/article/bangladesh/bangladesh-domestic-politics-and-external-actors-4313.html>.

Originally published as IPCS Commentary on 16 January 2014. See <http://www.ipcs.org/article/bangladesh/bangladesh-post-elections-2014-redefining-domestic-politics-4261.html>.

Originally published as IPCS Commentary on 17 March 2014. See <http://www.ipcs.org/article/bangladesh/east-meets-west-bangladesh-and-the-bimstec-summit-4343.html>.

Originally published as IPCS Commentary on 15 December 2014. See <http://www.ipcs.org/article/south-asia/18th-saarc-summit-a-perspective-from-bangladesh-4776.html>.

Originally published as IPCS Commentary on 19 May 2014. See <http://www.ipcs.org/article/us-south-asia/bangladesh-us-towards-new-engagements-446.html>.

World Economic Outlook Database, April 2015, International Monetary Fund at <https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx>.

Nixon, Ron. “Obama’s ‘Power Africa’ Project Is Off to a Sputtering Start”. New York Times, 21 July, 2015.

The White House, Presidential Decision Directive/NSC–63 (Washington D.C.: The White House, May 22, 1998): 1–18, available at: <http://www.epa.gov/watersecurity/tools/Trainingcd/Guidance/pdd-63.pdf>.

The White House, Presidential Decision Directive/NSC–63 (Washington D.C.: The White House, May 22, 1998).

Department of Homeland Security, NIPP 2013: Partnering for Critical Infrastructure Security and Resilience, (Washington D.C.: DHS, 2013).

Thomas D. O'Rourke, "Critical Infrastructure, Interdependencies, and Resilience," *The Bridge* 37:1 (Spring 2007).

SURVEY QUESTIONNAIRE FOR ALL GROUPS

Question 1: In your opinion, what are the aspects should be included in economic security?

Answer 1:

Question 2: What do you think the economic security of South-Western Bangladesh should include?

Answer 2:

Question 3: According to your knowledge and experience, what do you think about the present state of economic security in South-Western Bangladesh?

Answer 3:

Question 4: In your opinion, what are the aspects should be included in critical infrastructure?

Answer 4:

Question 5: According to your knowledge and experience, what do you think about the present state of critical infrastructure in South-Western Bangladesh?

Answer 5:

Question 6: What do you perceive about the nexus between critical infrastructure and economic security in South-Western Bangladesh?

Answer 6:

Question 7: In your opinion, which critical infrastructures have more relationship with economic security in general?

Answer 7:

Question 8: According to your knowledge and experience, which critical infrastructures have more relationship with economic security of South-Western Bangladesh?

Answer 8:

Question 9: Do you think, has the Government of Bangladesh taken adequate care in respect to development of critical infrastructure in South-Western Bangladesh?

Answer 9:

Question 10: What is your suggestion, if any, regarding the development of critical infrastructure in South-Western Bangladesh?

Answer 10:

Question 11: In your opinion, what do you perceive about enhancement of economic security in South-Western Bangladesh?

Answer 11:

Question 12: How can the economic security of South-Western Bangladesh be enhanced through development of critical infrastructure?

Answer 12:

Question 13: What is your opinion regarding the projected trend of enhancement of economic security in South-Western Bangladesh in next 10 years?

Answer 13:

Question 14: What contribution Padma Multipurpose Bridge can make in the enhancement of economic security of South-Western Bangladesh?

Answer 14:

Question 15: In your opinion, do you think that the Government of Bangladesh has taken the time-worthy decision to construct the Padma Multipurpose Bridge with so much of national expenditures?

Answer 15: